

## OFFICIAL RECORD COPY MATERIALS LICENSE

Amendment No. 40

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, 36, 39, 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		In accordance with the letter dated August 14, 1996	
1.	U.S. Environmental Protection Agency National Air and Radiation Environmental Laboratory 540 South Morris Avenue	3. License Number	01-07317-01
2.	Montgomery, Alabama 36115-2601	is amended in its entirety to read as follows:	
		4. Expiration Date	December 31, 2001 (extended)
		5. Docket or Reference No.	030-03576
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 with atomic numbers 3-83, inclusive, except as follows:	A.	Any, except as follows:
	(1) Strontium 90 (2) Iodine 129 (3) Cobalt 60 (4) Cesium 137		(1) Any (2) Any (3) Sealed source (4) Sealed source registered pursuant to 10 CFR 32.210 or equivalent Agreement State regulation
	(5) Nickel 63		(5) Foil and/or plated source in detector cells registered pursuant to 10 CFR 32.210 or an equivalent Agreement State regulation
B.	Americium 241	B.	Any
C.	Americium 243	C.	Any
D.	Curium 244	D.	Any
E.	Plutonium 238	E.	Plated sources
F.	Plutonium 238	F.	Any
G.	Plutonium 239	G.	Plated sources
		A.	Not to exceed 1 millicurie per radionuclide and 1 curie total except as follows (See Condition 20): (1) 10 microcuries (2) 100 microcuries (3) 20 millicuries (4) 150 millicuries (5) No single source to exceed 15 millicuries

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MATERIALS LICENSE  
SUPPLEMENTARY SHEET

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Continued-

## ITEMS 6, 7, AND 8

H.	Plutonium 239/240	H.	Any	H.	200 microcuries
I.	Plutonium 242	I.	Any	I.	100 microcuries
J.	Polonium 210	J.	Any	J.	10 microcuries
K.	Thorium 229	K.	Any	K.	10 microcuries
L.	Thorium 230	L.	Any	L.	10 microcuries
M.	Thorium 232	M.	Any	M.	10 microcuries
N.	Uranium 232	N.	Any	N.	5 microcuries
O.	Uranium 238		Any	O.	100 microcuries (3.7 MBq)
P.	Hydrogen 3	P.	Any	P.	5 Millicuries (185 MBq)
Q.	Any byproduct material as defined in 10 CFR 40.4 (see also paragraph 11.e(2) of the Atomic Energy Act	Q.	As contained in contaminated soil and/or mill tailings	Q.	100 millicuries
R.	Any radioactive material regulated by NRC	R.	Any environmental sample, including samples taken from areas undergoing site radiological evaluation and remediation	R.	See Condition No. 20

## 9. Authorized Use:

- A. through R. Byproduct, source and/or special nuclear material and byproduct material as defined in 10 CFR 40.4 for laboratory research and development (as defined in applicable NRC regulations); for collection, preparation and analysis of environmental samples applicable to the EPA mission; for the calibration and testing of radiation detection equipment; for the conduct of emergency response drills in accordance with procedures described in letter dated August 29, 1994 and enclosures thereto. In addition, licensed materials identified in Subitems 6.P and 6.Q may also be collected and analyzed for areas undergoing site radiological evaluation and/or remediation; and to perform decontamination and decommissioning activities at the facilities located at 1890 Federal Drive, Montgomery, Alabama, in accordance with the decommissioning plan submitted April 27, 1995, and supplementary documents dated May 18, July 20, and December 7 and 12, 1995, and January 4, 1996.

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**CONDITIONS**

- 10.A. Licensed material shall be used only at the licensee's facilities located at 540 South Morris Avenue, Montgomery, Alabama and at temporary job sites of the licensee through out the United States.
- B. In addition, the licensee shall maintain radiological safety control of the site of its former radiological operations at 1890 Federal Drive, Montgomery, Alabama until these facilities are suitable for release for unrestricted use. Until release for non-radiological use, the site may be used by the licensee for emergency response drills as described in letter dated August 29, 1994. Acceptability for release shall be documented by an NRC approved radiological survey. The licensee may conduct decontamination and decommissioning activities at this location as referenced in Condition 9.
11. The Radiation Protection Officer for the activities authorized on this license is **David J. Gray**, and in his absence, 1st Alternate, **Roger A. Goodman**, and in their absence 2nd Alternate, **Samuel W. Poppell**.
12. Licensed material shall be used by, or under the supervision of, Samuel T. Windham, Edwin L. Sensintaffer, Samuel W. Poppell, David J. Gray.
13. Sealed sources containing licensed material shall not be opened by the licensee.
- 14.A.
  - (1) Each sealed source containing licensed material, other than hydrogen 3, with a half-life greater than 30 days and in any form other than gas, shall be tested for leakage and/or contamination at intervals not to exceed 6 months except that each source designed for the purpose of emitting alpha particles shall be tested at intervals not to exceed 3 months.
  - (2) Notwithstanding the periodic leak test required by this condition, any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries or less of beta and/or gamma emitting materials or 10 microcuries or less of alpha emitting material.
  - (3) Except for alpha sources, the periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage before any use or transfer to another person unless they have been leak tested within 6 months before the date of use or transfer.
- B. The 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, the source shall be removed from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the date the leak test result is known with the U. S. Nuclear Regulatory Commission, Region II, Division of Nuclear Materials Safety, Nuclear Material Licensing/Inspection Branch, 101 Marietta Street NW, Suite 2900, Atlanta, Georgia 30323-0199. The report shall specify the source involved, the test results, and corrective action taken. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. Records may be disposed of following Commission inspection.
- C. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State to perform such services.
15. The licensee shall not use licensed material in or on human beings or in field applications where activity is released except as provided otherwise by specific condition of this license.

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(Continued)

**CONDITIONS**

16. The licensee may transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
17. The licensee shall conduct a physical inventory every 6 months to account for all sources and/or devices received and possessed under this license. Records of inventories shall be maintained for 2 years from the date of each inventory.
18. In lieu of using the conventional radiation caution color (magenta or purple on yellow background) as provided in 110 CFR 20.203(a)(1), the licensee is hereby authorized to label detector cells and cell baths, containing licensed material and used in gas chromatography devices, with conspicuously etched or stamped radiation caution symbols without a color requirement.
19. The licensee shall maintain records of information important to safe and effective decommissioning at the licensee's facilities at 540 South Morris Avenue, Montgomery, Alabama pursuant to the provisions of 10 CFR [30.35(g) or 40.36(f) or 70.25(g)] until this license is terminated by the Commission.
20. In addition to the possession limits in item 8, the licensee shall further restrict the possession of licensed material as follows:
  - A. For unsealed licensed material to quantities less than  $10^5$  times the applicable limits in Appendix C, 10 CFR 20 as specified in 10 CFR 30.35(d) or 70.25(d) and/or for readily dispersible source material to less than 100 millicuries as specified in 10 CFR 40.36(b).
  - B. For sealed sources, to quantities less than  $10^{10}$  times the applicable limits in Appendix C, 10 CFR 20 as specified in 10 CFR 30.35(d).
21. The licensee is authorized to hold radioactive material with a physical half-life of less than 65 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 a minimum of 10 half-lives.
  - B. Before disposal as normal waste, radioactive waste shall be surveyed to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.
22. Notwithstanding Sections 2.1.2 and 2.2 of the NAREL Decontamination and Decommissioning Plan for the "Dosing Building", contaminated concrete may be removed by tools other than an air powered pin scrapper, radioactive contaminated waste may be stored at the licensee's facility at 540 South Morris Avenue, Montgomery, Alabama, and the Radiation Protection Officer's oversight of the decommissioning activities may include telecommunications as well as physical presence at the site.



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License Number 01-07317-01

Docket or Reference Number 01-07317-01-03576

Amendment No. 40

(Continued)

## CONDITIONS

23. 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. The 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. Application dated October 24, 1990

B. Letters dated:

- (1) July 29, 1991
- (2) November 13, 1991 (FAX)
- (3) November 15, 1991
- (4) December 11, 1991
- (5) May 1, 1992
- (6) January 20, 1993 [2 letters, change possession limits and add coverage for environmental samples]
- (7) February 9, 1993 [request to add new alternate RSO]
- (8) April 27, 1993 [Add nickel 63 foil/plated sources, delete plutonium 239 neutron source]
- (9) September 14, 1993 [Change street address]
- (10) May 10, 1994 [add Hydrogen 3]
- (11) July 15, 1994 [change RSO, add users]
- (12) August 29, 1994 [Conduct of emergency response drills]
- (13) April 27, 1995 [decommissioning plan for facilities at 1890 Federal Drive]
- (14) May 18, 1995 [water and soil sample results]
- (15) July 20, 1995 [additional information on decommissioning plan]
- (16) October 16, 1995 [change RSO]
- (17) November 13, 1995 [add 2nd Alternate RSO]
- (18) December 7, 1995 [add tools & supervision condition]
- (19) December 12, 1995 [change location of decommissioning waste storage]
- (20) January 4, 1996 [extend Dosing Building decommissioning date]
- (21) February 6, 1996 [change RSO and 2nd Alternate RSO]
- (22) August 14, 1996 [Change Radiation Safety Officer/alternates, delete user supervisors]

C. Radiation Safety Manual dated October 1990

D. Reference March 1, 1996 NRC letter extending expiration date per 10 CFR 30.36(a).

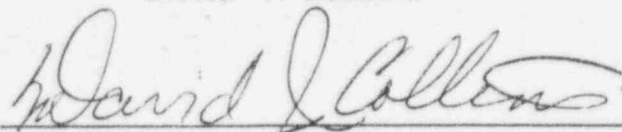
FOR THE U.S. NUCLEAR REGULATORY COMMISSION

DAVID J. COLLINS

DATE

OCT 15 1996

BY



Region II, Division of Nuclear Materials Safety  
101 Marietta Street, N.W., Suite 2900  
Atlanta, Georgia 30323-0199

N:\MLICENSE\01-07318.A40

BETWEEN:

License Fee Management Branch, ARM  
and  
Regional Licensing Sections

: (FOR LFMS USE)  
: INFORMATION FROM LTS  
: -----  
:  
: Program Code: 03620  
: Status Code: 0  
: Fee Category: EX 3M 1D 2C  
: Exp. Date: 20011231  
: Fee Comments: 2C NOT SHIELDING  
: Decom Fin Assur Req: Y  
: ::::::::::::::::::::::::::::::

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED

Applicant/Licensee: ENVIRONMENTAL PROTECTION AGENCY  
Received Date: 960819  
Docket No: 3003576  
Control No.: 257174  
License No.: 01-07317-01  
Action Type: Amendment

2. FEE ATTACHED

Amount: \_\_\_\_\_  
Check No.: \_\_\_\_\_

3. COMMENTS

Signed \_\_\_\_\_  
Date \_\_\_\_\_

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

1. Fee Category and Amount: \_\_\_\_\_

2. Correct Fee Paid. Application may be processed for:

Amendment \_\_\_\_\_  
Renewal \_\_\_\_\_  
License \_\_\_\_\_

3. OTHER \_\_\_\_\_  
\_\_\_\_\_

Signed \_\_\_\_\_  
Date \_\_\_\_\_

October 15, 1996

U.S. Environmental Protection Agency  
Office of Radiation and Indoor Air  
National Air and Radiation Environmental Laboratory  
ATTN: Sam T. Windham, Director  
540 South Morris Avenue  
Montgomery, Alabama 36115-2601

SUBJECT: TRANSMITTAL AND EXPLANATION OF LICENSE AMENDMENT  
(REFERENCE: MAIL CONTROL NO. 257174; DOCKET NO. 030-03576)

Dear Mr. Windham:

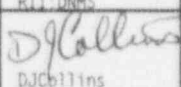

Enclosed is Amendment No. 40 to License No. 01-07317-01, in response to your letter dated August 14, 1996. Please read the amendment closely and carefully. Please contact us should you have any questions. We have printed changed areas in **BOLD**. We have changed the Radiation Safety Officer and alternates, and changed the list of supervisors.

We have separated the request for disposal of environmental samples so that we may obtain the assistance of the Office of Nuclear Materials Safety and Safeguards (NMSS). When we receive an answer, we will contact you. NMSS may contact you directly should they have questions.

Sincerely,

David J. Collins, Health Physicist  
Materials Licensing/Inspection Branch 2  
Division of Nuclear Materials Safety

Enclosure:  
Amendment No. 40, License No. 01-07317-01

OFFICE	R11-DNMS	R11-DNMS				
SIGNATURE						
NAME	DJCollins	JPPotter				
DATE	10 / 15 / 96	10 / 15 / 96	10 / / 96	10 / / 96	10 / / 96	10 / / 96
COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY

DOCUMENT NAME: G:\DNMS\MLIB2\LICLTR\257174.DJC



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
101 MARIETTA STREET, N.W., SUITE 2900  
ATLANTA, GEORGIA 30323-0199

SEP 23 1996

Environmental Protection Agency  
ATTN: Sam T. Windham  
Director, NAREL  
540 South Morris Avenue  
Montgomery, AL 36115-2601

Mail Control No. 257174\_  
Docket No. 030-03576  
License No. 01-07317-01

SUBJECT: ACKNOWLEDGEMENT OF REQUEST FOR A LICENSING ACTION  
(Your: ☒ Letter ☐ Application ☒ Dated ☐ Received **August 14, 1996**)

Dear Sir or Madam:

1. In response to your request, we have performed a preliminary review of your application for a:  
☐ new ☒ amendment ☐ renewal ☐ termination licensing action.
2. It appears that your request is ☐ incomplete ☒ complete and: ☒ routine (see 3-5 below);  
☐ non-routine, and if necessary, can be completed within \_\_\_ - \_\_\_ days, following fee approval and response to any telephone or telefax deficiency requests from our license reviewer.
3. New and amendment actions are normally processed in 20 - 30 days, unless we find major deficiencies, or policy issues requiring central program office assistance.
4. Renewal actions are normally processed in 60 - 90 days, however under timely filing (before expiration) you may continue to operate under your existing license.
5. Termination actions are normally processed in 20 - 30 days, unless confirmatory surveys following decontamination are involved.
6. A copy of your correspondence has been forwarded to Rita Messier, Licensing Fee and Accounts Receivable Branch (301/415-6067) for approval of the fee category and amount.
7. If you have a compelling safety or business-related reason for requesting expedited review, please contact me or our Licensing Assistant, Diane Heim, at 404/331-4673 [voice/ans] or 404/331-7437 [fax] or Internet: ddh@nrc.gov. We will try to complete your request, as stated in 2. above.
8. Please call or write with any questions. I can be reached directly at 404/331-2687 [voice/ans] or via Internet: omm@nrc.gov.

Sincerely,

*Orysia Masnyk-Bailey*

Orysia Masnyk-Bailey, License Reviewer  
Materials Licensing/Inspection Branch 2





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
OFFICE OF RADIATION AND INDOOR AIR  
National Air and Radiation Environmental Laboratory  
540 South Morris Avenue, Montgomery, AL 36115-2601  
(334) 270-3400

August 14, 1996

Mr. Jay L. Henson  
U.S. Nuclear Regulatory Commission  
101 Marietta Street, N. W.  
Atlanta, GA 30323-0199

Dear Mr. Henson:

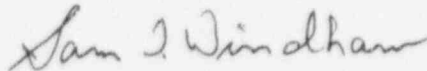
The National Air and Radiation Environmental Laboratory (NAREL) is in the process of formalizing the mechanisms for disposal of environmental samples sent to us for analysis. Our past practice has been to dispose as radioactive waste any samples which had concentrations of radionuclides above normal background. This approach has been effective in the past as the vast majority of our samples had no enhanced contamination. For example, our national monitoring network annually collects about 8,000 samples of milk, drinking water, precipitation, surface water, etc., from throughout the country. These samples are routinely disposed of as non-radioactive waste. However, with our increased assistance to the EPA Superfund cleanup programs and other sampling activities at contaminated sites, we have realized the need to formalize our handling of these wastes.

In accordance with Subpart K, Waste Disposal, of 10 CFR 20, we are requesting that the enclosed "Radioactive Waste Disposal Plan" be accepted by the Commission as a part of our NRC license, 01-07137-01. This plan is based on guidelines provided to us by the NRC for use in the decommissioning of a formerly used building and on the guidelines of 10 CFR 20, Appendix B, Table 3. The criteria for release of solid samples to an unrestricted landfill are based on the allowable limits for release of liquids to the sanitary sewer, but they are more protective of the public health. Our proposed plan also requires the consideration of ALARA principles for the disposal of all samples processed by this laboratory.

In addition, Mark O. Semler, the Radiation Safety Officer for NAREL, has notified us of his retirement from government service effective October 1, 1996. So, effective October 1, 1996 David J. Gray will become the Radiation Safety Officer for the laboratory, Roger A. Goodman will be the first alternate and Samuel W. Poppell will become the second alternate. Also, please remove L. Samuel Keith from the list of supervisors for use of licensed material effective immediately and Mark Semler effective October 1. Summaries of the training and experience for David J. Gray and Roger A. Goodman are enclosed.

Thank you for your timely consideration of this request. If you have any questions or wish further explanation of our plan, please contact me at (334) 270-3401, or Mark Semler at (334) 270-3420.

Sincerely,

A handwritten signature in cursive script that reads "Sam T. Windham".

Sam T. Windham  
Director

Enclosures -3

cc: Mark O.Semler (NAREL)

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY  
RADIOACTIVE WASTE DISPOSAL PLAN**

The following plan will be used at the U.S. Environmental Protection Agency, National Air and Radiation Environmental Laboratory for decision making on disposal of environmental samples and laboratory waste. The NAREL Radiation Protection Officer must approve all radioactive waste disposal actions prior to the action.

**A. Environmental samples**

- 1) Environmental samples including, but not limited to, water, soil, air particulates, vegetation and other biota will be disposed of as radioactive waste if the following conditions apply:
  - i) analysis of a sample indicates that it contains concentrations of radionuclides above background that are in excess of the level identified in paragraphs B and C
  - ii) the samples are spiked with a known radioactive material that exceeds the limits in paragraphs B and C

**B. Disposal of Liquids**

- 1) Liquids will be disposed of via the sanitary sewage system if they meet EPA requirements for chemical content and have concentrations, above background, that are less than the limits identified in 10 CFR 20.2003 and Appendix B, Table 3. A dilution factor equal to the average monthly liquid waste effluent value for NAREL may be used in calculating the concentration. For liquids containing more than one radionuclide, the sum of the fractions for each radionuclide as described in section 20.2003 (a)(3) must be less than or equal to 1.
- 2) NAREL will adhere to the ALARA goal to limit the total quantity of materials released each year to 10% or less of the allowable yearly limit specified in 10 CFR 20.2003 (a)(4). The normal controlled monthly releases will be restricted to no more than  $\frac{1}{12}$  of the yearly total quantity limit.
- 3) Liquids with radionuclide concentrations in excess of the above limits shall be stored for decay if the physical half life is less than 65 days. A minimum of 10 half-lives will be allowed prior to disposal or until the concentration is shown to have decayed to below the limits specified in (B) (1) and (2) above. Other liquids will be converted to solids and disposed of as solid radioactive waste as specified below.

### C. Disposal of Solids

- 1) Solids shall be disposed of as non-radioactive waste if the average concentration of radioactive material present, above background, in the material does not exceed the following limits. These wastes will be discarded along with other laboratory trash at the municipal sanitary landfill.
  - i) Table NAREL-1 below for specific radionuclides
  - ii) For by-product material or other radioactive materials not listed in Table NAREL-1, the limits in 10 CFR 20, Appendix B, Table 2 for liquid effluents released for unrestricted use. The isotope specific concentration limits ( $\mu\text{Ci/ml}$ ) listed in Table 2 will be converted to specific activity ( $\mu\text{Ci/g}$ ) using a conversion of 1 gram = 1 ml. The limit will then be increased by a factor of 10,000 based on the estimated annual consumption of soil as 0.2 g per day compared to 2.0 L (2,000 g) of water<sup>1</sup>. The ALARA goal will be one tenth of the limit as calculated above.
- 2) For samples having a mixture of radionuclides, the fractions for the mixture will be calculated using the method shown in 10 CFR 20, Section 20.2003 (a)(3). The sum of the fractions for all the radionuclides present in the sample must not exceed one for the sample to be discarded in the laboratory trash.
- 3) Solids with concentrations of radionuclides in excess of the above limits will be accumulated and periodically transferred to a licensed radioactive disposal facility for permanent disposal.

### D. Disposal of Sample Containers - Liquid Samples

- 1) Containers having liquids which can be disposed of into the sanitary sewer system will be rinsed, then washed and reused or discarded as nonradioactive waste.
- 2) Containers having liquids which must be disposed of as radioactive waste will also be disposed of as radioactive waste.

E. Disposal of Sample Containers - Solid Samples

- 1) Containers having solid samples which can be discarded as non-radioactive waste will also be discarded as non-radioactive waste. Any identification labels or labels marked "radioactive" will be removed or defaced.
- 2) Containers having solid samples which must be disposed of as radioactive waste will also be disposed of as radioactive waste.

F. Hazardous and Mixed Waste Disposal

- 1) Waste that contains hazardous chemicals in excess of EPA limits for unrestricted release will be disposed of as follows:
  - i) Waste containing hazardous chemicals in excess of EPA limits with radioactive material concentrations below the limits identified in sections B and C of this plan will be disposed of as hazardous waste in compliance with applicable EPA regulations.
  - ii) Waste containing both hazardous chemical in excess of EPA limits and radioactive material that exceeds the limits specified above will be identified as mixed waste and disposed of through licensed mixed waste disposal facilities in compliance with applicable EPA and NRC regulations.

**Table NAREL-1. Concentrations of Specified Radionuclides in Solids Acceptable for Unrestricted Release <sup>2</sup>**

Radionuclide	Allowable Concentration (pCi/gram)	Radionuclide	Allowable Concentration (pCi/gram)
Am-241	30	Ra-226	5
Co-60	8	Ra-228	5
Sr-90	5	Th-Natural*	10
Cs-137	15	U-Natural*	10
Pu-238	25	U-Depleted	35
Pu-239	25	U-Enriched	30

\* Includes natural decay products



- <sup>1</sup> U.S. Environmental Protection Agency, "Health Effects Assessment Summary Tables", OERR 9200.6-303 (91-1)
- <sup>2</sup> USNRC, Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material, August, 1987.

## CURRICULUM VITAE

Date: February 11, 1993  
Name: David J. Gray  
Social Security Number: 366-58-6714  
Present Status: Health Physicist  
Current Address: U.S. Environmental Protection Agency  
Office of Radiation and Indoor Air  
National Air and Radiation Environmental  
Laboratory  
1504 Avenue A  
Montgomery, AL 36115-2601

### EDUCATION:

LEVEL	YEAR GRANTED	MAJOR	NAME OF INSTITUTION
BS	1977	Geology	Michigan State University
MS	1985	Radiation Health	University of Michigan

### PROFESSIONAL EXPERIENCE:

FROM	TO	LOCATION	POSITION DESCRIPTION
07/85	7/87	EPA/ORIA/NAREL	Health Physicist - Environmental Studies Branch. Developed EPA's open-faced and diffusion barrier activated charcoal canister used for passive measurement of radon in structures. Coordinate and run radon in water measurement program. Implement and manage the quality assurance program for activated carbon canisters and radon in water measurements. Serve as alternate radiation protection officer. Participate in field work involving the use of radiation measurement instrumentation.
01/88	Present		

FROM	TO	LOCATION	POSITION DESCRIPTION
07/87	01/88	Roy F. Weston Inc. Albuquerque, NM	Health Physicist - Performed characterization of uranium mill tailings sites for the DOE's UMTRA Project. Duties included on site measurement and analysis of radiation source terms and assessment of population dose/risk analyses.
07/80	02/82	Minatome Corp. Kingsford, MI	Geologist - Involved with the acquisition and analysis of geophysical data used in uranium exploration.

## LIST OF PUBLICATIONS:

Ronca-Battista, M. and Gray, D., "The Influence of Changing Exposure Conditions on Measurements of Radon Concentrations with the Charcoal Adsorption Technique", Radiation Protection Dosimetry, Volume 24, Pages 361 to 365, 1988.

Gray, D. and Windham, S., "EERF Standard Operating Procedures for RN-222 Measurement Using Charcoal Canisters", EPA 520/5-87-005, Office of Radiation Programs, Washington, DC, 1987.

Gray, D. and Windham, S., "The Overresponse of Open-Faced Charcoal Adsorbers Used for Measurements of Indoor Radon Concentrations", paper presented at 1988 EPA Symposium on Radon and Radon Reduction Technology, Denver, CO, October 11-15, 1988.

Gray, D. and Windham, S., "The EPA Diffusion Barrier Charcoal Adsorber for Radon Measurements in Indoor Air", paper presented at 1990 EPA Symposium on Radon and Radon Reduction Technology, Atlanta, GA, February 19-23, 1990.

Gray, D. and Windham, S., "NAREL Standard Operating Procedures for RN-222 Measurement Using Diffusion Barrier Charcoal Canisters", EPA-520/5-90-032, Office of Radiation Programs, Washington, DC, 1990.

Sensintaffar, E. L., Chambless, D. A., Gray, D. J. and Windham, S. T., "Analysis of Error And Minimum Detection Limits for Radon-222 Measurements", Fifth International Symposium On Natural Radiation In The Environment, Salzburg, Austria, September, 1991.

Burkhart, J., Gray, D., Martin, R. and Warrick, B., "A Comparison of Current Collection/Sampling Techniques for Waterborne Radon Analysis", paper presented at the 1991 Annual AARST National Fall Conference, Rockville, MD, October 9-12, 1991.

Gray, D., Burkhart, J. and Jacobson, A. P., "An Evaluation of the Performance of the EPA Diffusion Barrier Charcoal Adsorber for Radon-222 Measurements in Indoor Air", paper presented at the 1992 International Symposium on Radon And Radon Reduction Technology, Minneapolis, MN, September 22-25, 1992.

## ROGER ALLEN GOODMAN

1369 Pine Ridge Rd.  
Montgomery, AL 36109  
Home: (334)213-0617  
Work: (334)270-3417

### EXPERIENCE

1994 To  
Present

U.S. E.P.A., Montgomery, AL  
Health Physicist

Designing and conducting field studies at Mare Island Naval Shipyard. Performing environmental field study adjacent to the Los Alamos National Laboratory and performing evaluations and assessments of data collected from field study. Calibrate, operate, and repair laboratory and portable radiation monitoring instruments for field studies and emergency response operations. Write calibration and operation procedures for radioanalytical equipment. Write procedures for field sampling. Attended the Federal Radiological Monitoring and Assessment Center (FRMAC) training and participated in Handshake II exercise as field team leader and instrumentation support specialist. Provide radiation instrumentation training for laboratory staff. Participated in decontamination and decommissioning of the EERF Dosing Facility.

1988 To  
1994

U.S. E.P.A., Las Vegas, Nevada  
Health Physicist

Calibrate, operate, and repair laboratory and portable radiation monitoring instruments. Write calibration and operation procedures for radioanalytical equipment. Attended the 40 hour Hazardous Materials Incident Response Operations Course. Attended the 40 hour Radiation Safety at Superfund Sites Course. Attended the 40 hour Fundamentals of Radiological Health Physics Course. Attended the Federal Radiological Monitoring and Assessment Center (FRMAC) training and participated in FRMAC 1993. Provide support to Field Studies Branch staff in designing and conducting field studies, Superfund and Federal Facilities operations. Work with contract support staff in conducting radioanalysis and calibrations.

1984 to  
1988

U.S. Navy, USS Enterprise (CVN-65)

Qualified and performed operations and maintenance on a naval nuclear power plant as Reactor Electrician, Load Dispatch and Reactor Plant Electrician. Controller of the ships electrical system. Radiological Control Point Monitor, with continuous training in radiological monitoring and control. Secret security clearance.

1983 to  
1984

U.S. Navy, I.N.E.L., Idaho

Completed qualification as Reactor Electrician. Received extensive instruction and practical experience at the A1W Nuclear Power Plant Prototype. Received instruction in radiation fundamentals, controls, decontamination, and monitoring. Received training in radiological spill and contamination response and cleanup.

### EDUCATION

University of Nevada, Las Vegas, Nevada  
B.S. Health Physics, May 1993  
Major: Health Physics  
GPA: 3.23

Navy Nuclear Power School and Prototype,  
Orlando, FL; I.N.E.L., ID.  
1983 to 1984

Major: Reactor Plant Electrician

Over 600 hours of classroom instruction in:

Health Physics, and Radiation Fundamentals, Math, Physics, Chemistry, Heat Transfer and Fluid Flow, Metallurgy.

### REFERENCES

Available upon request.