Geotechnics

..... GEOTECHNICAL, GEOENVIRONMENTAL, AND GEOSYNTHETIC LABORATORIES

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October 2, 2006

37-30710-01
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Licensing Assistant Section
Nuclear Materials Safety Branch
U.S. Nuclear Regulatory Commission, Region I
475 Allendale Road
King of Prussia, PA 19406-1415

Transmittal
Request for License and Approval
Radiation Safety Training for Portable Nuclear Density Gauges
Nuclear Materials Safety Branch
U.S. Nuclear Regulatory Commission, Region I
King of Prussia, Pennsylvania

To whom it may concern,

Geotechnics would like the opportunity to provide Radiation Safety training for the use of portable nuclear density gauges. Therefore, we have enclosed our proposed training manual for your review and approval as well as a sample examination for your review. Further, we have included the appropriate license application which outlines our training program and the requirements of our classroom instructors.

If you have any questions regarding this submittal or require additional information, please contact me at 412-823-7600.

Sincerely yours,
Geotechnics, Inc.

Randy O'Rourke
President

139523

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999

NMSS/RGN1 MATERIALS-002

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Radiation Safety Training Exam

Name:_____ **Date:**_____

Company:_____

Address:_____

_____

Scored by:_____ **Date:**_____

Correct:_____

Score:_____**%**

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Radiation Safety Training Exam

Name: _____

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INTEGRITY IN TESTING

1. The three primary sub-atomic particles are Protons, Neutrons, and_____.
   a. Quarks
   b. Neutrinos
   c. Electrons
   d. none of the above

2. Which sub-atomic particle has a charge of +1?
   a. Quark
   b. Proton
   c. Electron
   d. none of the above

3. Which sub-atomic particle has a charge of -1?
   a. Proton
   b. Neutron
   c. Electron
   d. none of the above

4. Which sub-atomic particle has no charge?
   a. Neutron
   b. Electron
   c. Proton
   d. all particles have a charge

5. _____ are combinations of the three sub-atomic particles.
   a. Atoms
   b. Elements
   c. Compounds
   d. none of the above

6. An _____ is the smallest portion of an element that has all of the properties of that element.
   a. Compound
   b. Atom
   c. Electron
   d. none of the above

7. The atomic number equals the number of _____ in the nucleus.
   a. Electrons
   b. Protons
   c. Quarks
   d. none of the above

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8. The sum of the protons and neutrons in the nucleus is called the _____.
    a. Atomic Mass Number
    b. Isotope Number
    c. Atomic Weight
    d. none of the above

9. Elements that have the same number of protons, but a different number of neutrons are called *Isotopes*.
    a. True
    b. False

10. *Compounds* are comprised of two or more elements that are united chemically.
    a. True
    b. False

11. An unstable isotope that gives off energy while decaying to a stable isotope is *radioactive*.
    a. True
    b. False

12. The four types of radiation are alpha, beta, _____, and neutron.
    a. isotope
    b. compound
    c. gamma
    d. none of the above

13. Alpha radiation has a charge of +2.
    a. True
    b. False

14. Beta radiation has a charge of _____.
    a. +2
    b. -1
    c. 0
    d. none of the above

15. _____ particles are stopped by a sheet of paper or skin tissue.
    a. Alpha
    b. Beta
    c. Gamma
    d. Neutron

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16. Beta particles are stopped by an inch of wood or a thin sheet of aluminum or plastic.
    a. True
    b. False

17. The gauge operator should always tell the contractor/equipment operators when testing will be performed to reduce the possibility of an accident.
    a. True
    b. False

18. Gamma radiation has no mass.
    a. True
    b. False

19. _____ radiation has the greatest mass.
    a. Alpha
    b. Beta
    c. Gamma
    d. Neutron

20. Alpha, beta, gamma, and neutron radiation are all forms of _____ radiation, which means that they have sufficient energy to change the charge balance of an atom.
    a. Non-ionizing
    b. Ionizing
    c. both a and b
    c. none of the above

21. When dealing with radioactive material, the quantity is less important than the activity. The unit for measuring activity is the _____.
    a. Curie
    b. Half-life
    c. Kilowatt
    d. none of the above

22. The half-life of a radioactive material is described as the time required for half of the atoms of any given mass of radioactive material to decay.
    a. True
    b. False

23. The presence of radioactive material where it is not wanted is known as *contamination*.
    a. True
    b. False

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24. Doubling the distance between a person and a radiation source will reduce the dose by _____.
    a. Half
    b. One-fourth
    c. the radiation will increase
    d. there will be no change in radiation

25. Because the radioactive source material continues to decay, even when the gauge is turned off, it is necessary to standardize the moisture/density gauge before using it each day.
    a. True
    b. False

26. When transporting the moisture/density gauge, the gauge must be locked and secured with straps, blocks, or other means to prevent the gauge from moving.
    a. True
    b. False

27. The maximum density of a soil material can only be obtained if the soil is at or near the _____ content.
    a. minimum moisture
    b. maximum moisture
    c. optimum moisture
    d. none of the above

28. To determine the maximum obtainable density and optimum moisture content of a particular soil, a Proctor is pounded using ASTM D698 or ASTM D1557.
    a. True
    b. False

29. A moisture/density gauge can be used to determine the density of asphalt.
    a. True
    b. False

30. In addition to the moisture/density gauge, select two methods for determining in-place soil density.
    a. Sand Cone
    b. Dynamic Cone Penetrometer
    c. Drive Tube
    d. none of the above

31. When using the _____ method, the source rod is inserted into a hole in the soil, prior to taking measurements.
    a. backscatter
    b. direct transmission
    c. thin-lift
    d. none of the above

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32. When using the _____ method, no hole in the soil is required.
    a. backscatter
    b. direct transmission
    c. drive tube
    d. none of the above

33. The gauge operator should never enter a trench to perform testing unless the trench is less than four feet deep or a trench box/shoring is in place.
    a. True
    b. False

34. If the soil surface is rough prior to testing, the density will be less accurate.
    a. True
    b. False

35. The most accurate density results can be achieved by selecting the _____ minute test.
    a. 15 second
    b. 1 minute
    c. 4 minute

36. Surface voids may be filled with water to improve test accuracy.
    a. True
    b. False

37. Objects above the soil surface, such as a trench wall, can affect the density results.
    a. True
    b. False

38. Sub-surface air voids or boulders will not affect the density results.
    a. True
    b. False

39. When testing the compaction of a trench backfill, the sidewalls of a trench never affect the density results.
    a. True
    b. False

40. When transporting the gauge, the operator should have the following documents:
    a. Copy of the Materials License
    b. Copy of a letter/card authorization from the Radiation Safety Officer
    c. Copy of the Radiation Safety Plan
    d. Copy of the Gauge Operations Manual
    e. Copy of a current Leak Test Certificate
    f. all of the above
    g. none of the above

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NRC FORM 313 U. S. NUCLEAR REGULATORY COMMISSION

(8-1999)
10 CFR 30, 32, 33
34, 35, 36, 39 and 40

APPLICATION FOR MATERIAL LICENSE

APPROVED BY OMB: NO. 3150-0120 EXPIRES:08/31/2002

Estimated burden per response to comply with this mandatory information collection request: 7.4 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0120), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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.

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

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

LICENSING ASSISTANT SECTION
NUCLEAR MATERIALS SAFETY BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

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

SAM NUNN ATLANTA FEDERAL CENTER
U. S. NUCLEAR REGULATORY COMMISSION, REGION II
61 FORSYTH STREET, S.W., SUITE 23T85
ATLANTA, GEORGIA 30303-8931

IF YOU ARE LOCATED IN:

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

MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
801 WARRENVILLE RD.
LISLE, IL 60532-4351

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TX 76011-8064

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 JURISDICTIONS.

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

- [ ] A. NEW LICENSE
- [x] B. AMENDMENT TO LICENSE NUMBER 37-30710-01
- [ ] C. RENEWAL OF LICENSE NUMBER

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

Geotechnics, Inc.
544 Braddock Avenue
East Pittsburgh, PA 15112

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

Geotechnics, Inc.
544 Braddock Avenue
East Pittsburgh, PA 15112

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

TELEPHONE NUMBER
412-823-7600

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 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 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, 36, 39 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 OFJUNE 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.

CERTIFYING OFFICER – TYPED/PRINTED NAME AND TITLE	SIGNATURE	DATE
Randy O'Rourke / President		10-2-06

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			$		
APPROVED BY				DATE	

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Amendment to license number: 37-30710-01

Item number Five:

Radioactive material:

A. Cesium 137	Sealed sources registered either with the U.S Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State.	No single source to exceed the maximum activity specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State
B. Americium 241	Sealed sources registered either with the U.S Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State.	No single source to exceed the maximum activity specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State
C. Californium 252	Sealed neutron sources registered either with the U.S Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State.	No single source to exceed the maximum activity specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State

Geotechnics
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Amendment to license number: 37-30710-01

Item number Six:

Purpose for which licensed material will be used:

Moisture/Density gauges currently used for construction monitoring services will also be used for classroom Radiation Safety training and instruction. Geotechnics intends to perform Radiation Safety training for employees and non-employees. The course will consist of a minimum of 1.5 to 2 hours of radiation safety and regulatory requirements. Additionally, a minimum of 1.5 to 2 hours of practical explanation regarding gauge theory and operation, including demonstrations, will be presented.

Classroom instruction will be given by personnel who possess a Bachelor's degree in a physical or life science or engineering with successful completion of both a portable gauge user course and 8-hour radiation safety course and 8 hours hands-on experience with portable gauges.

Alternately, instructors will have successfully completed a portable gauge users course, successfully completed a 40-hour radiation course, and 30 hours of hands-on experience with portable gauges.

At the completion of the course, an examination with 25 to 50 questions will be administered. A minimum passing grade of 70% correct will be required.

All course attendees who meet the 70% passing grade will be presented with a Certificate of Completion and will be certified to operate a portable nuclear gauge.

All course material and a typical examination are enclosed.

Item number Seven:

The Radiation Safety Officer for this license is Jeffery A. Corchado.

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Amendment to license number: 37-30710-01

Item number Eight:

Training for individuals working in or frequenting restricted areas:

The scope of the proposed Radiation Safety Training course does not include training for individuals working in or frequenting restricted areas. Course instructors will advise students to complete a course pertaining to "Training for Individuals Working In or Frequenting Restricted Areas" prior to using licensed materials under these conditions.

Item number Nine:

As stated in the original license number 37-30710-01, licensed material will be used or stored at the licensee's facilities located at 544 Braddock Avenue, East Pittsburgh, Pennsylvania and may be used at temporary job sites of the licensee anywhere in the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material, including areas of exclusive Federal jurisdiction with Agreement States.

Item number Ten:

The Radiation Safety Program will remain unchanged from that stated in the original license number 37-30710-01.

Item number Eleven:

The Waste Disposal – Gauge Disposal and Transfer procedures will remain the same as those stated in the original license number 37-30710-01.

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Amendment to license number: 37-30710-01

Item number Twelve:

Geotechnics was informed by a representative of the NRC that the type of license required could not be determined until the application had been reviewed. Therefore, any payment required will be sent following analysis by the NRC.

This is to acknowledge the receipt of your letter/application dated

10/2/2006, and to inform you that the initial processing which includes an administrative review has been performed.

Amendment 37-30710-01

☒ There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

☐ Please provide to this office within 30 days of your receipt of this card

_____.

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 139523
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI)
(6-96)

Sincerely,
Licensing Assistance Team Leader