Form AEC-313
(2-73)
10 CFR 30

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved
Budget Bureau No. 38-R0027

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided *references are clear and specific.* Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Materials Branch, Directorate of Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20, and the license fee provisions of Title 10, Code of Federal Regulations, Part 170. The license fee category should be stated in Item 16 and the appropriate fee enclosed. (See Note in Instruction Sheet).

1. (a) NAME AND STREET ADDRESS OF APPLICANT. *(Institution, firm, hospital person, etc. Include ZIP Code and telephone number.)*

Well Logging, Inc.
2835 E. Skelly Dr. Suite 832
Tulsa, Oklahoma 74105

Tel. (918) 749-0941

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. *(If different from 1(a). Include ZIP Code.)*

See attached supplement

h+h 18229
30-14697
03120

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Not applicable

3. PREVIOUS LICENSE NUMBER(S). *(If this is an application for renewal of a license, please indicate and give number.)*

None

4. INDIVIDUAL USER(S). *(Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)*

Mr. Dwight A. Knoblett
President, Well Logging, Inc.

Mr. Steve Knoblett

5. RADIATION PROTECTION OFFICER. *(Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)*

See attached supplement

6. (a) BYPRODUCT MATERIAL. *(Elements and mass number of each.)*

AmBe 241

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. *(If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)*

1 (one) Sealed Source: 3 curie AmBe 241
Neutron Source
(Gearhart-Owen
Part No. 15-2009-48)

manufacturer
model #

RECEIVED BY LFMB
Date JUL 31 1978
Log July 78-P-7 Public
By Brown
Orig. To
Action Compl. 8/1/78

Applicant S. + S. Oil Co. Acct - Victory National Bank - Nowata, OK
Check No. 82-7265
Amount/Fee Category $460-5H
Type of Fee Application
Date Check Rec'd 7/31/78
Received By Jackson

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. *(If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)*

Purpose: Neutron Well Logging
* Source Holder Assembly: Gearhart-Owen Part No. 02-9200-18
* Handling Tool: Gearhart-Owen Part No. 02-9907-10
* Storage Assembly: Gearhart-Owen Part No. 15-2011-03
Neutron Well Logging Tool: Gearhart-Owen Part No. 02-9205-0?

* See attached diagrams.

95733

(Continued on reverse side)

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 *(Use supplemental sheets if necessary)*

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	See attached supplement		Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
		See attached supplement		

10. RADIATION DETECTION INSTRUMENTS *(Use supplemental sheets if necessary.)*

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm^2)	USE (Monitoring, surveying, measuring)
Survey meter Gearhart-Owen Part No. 15-2008-00	1	beta-gamma	0-50 mr/hr	30 mg/cm^2	Surveying

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

See attached supplement

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. *(For film badges, specify method of calibrating and processing, or name of supplier.)*

See attached supplement

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. *(Circle answer)* Yes (No)

See attached supplement

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

See attached supplement

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

See attached supplement

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, 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.

License Fee Category $ Category 5, Application

Fee Enclosed $ 460

Well Logging, Inc.
Applicant named in item 1

By: Robert Schwabe Jr.

Date July 27, 1978

Vice President
Title of certifying official

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.

* U.S. GPO: 1973—543-126/515

Well Logging, Inc. (Applicant)
Byproduct Material License Application
Supplement

Item 1(b)

The Applicant will use the byproduct material for well logging operations at various well sites located in Oklahoma. On occasion, the Applicant will perform well logging at sites in Kansas, as which time timely notice will be given to the Kansas Department of Health and Environment. The Field Office used for storage of the source when not being used is discussed in Item 13.

Item 5

Mr. Dwight Knoblett will serve as the Radiation Protection Officer of Well Logging, Inc. He will coordinate and have overall responsibility for the radiation safety program. His qualifications are listed in Item 8. In addition to those qualifications, he has examined and is familiar with NRC's regulations and the Well Logging, Inc. Operating Instructions and Emergency Procedures Manual. His duties will include:

1. Periodic review of the Well Logging, Inc. records (i.e., job log sheets, and personnel exposure and survey records).

2. Supervision of the leak testing procedures and making arrangements for the calibration of instruments.

3. Providing assistance in the event of accidents or emergencies.

4. Maintenance of supplies necessary for the safe conduct of the well logging operation, including survey instruments, radiation signs and labels, forms, and personnel monitoring equipment.

5. Conducting periodic checks on the entire well logging operation to assure compliance with applicable regulations and license conditions.

Items 8 and 9

Mr. Dwight A. Knoblett has conducted well logging operations for Gold Perforating Co., Inc. (7502 E. 11th, Tulsa, OK 74112: Byproduct Material License No. 35-12733-02) for 21 years. He has extensive experience in every aspect of the well logging operation and is knowledgeable in the safety and emergency procedures necessary for safe well logging activities, including radiation protection, radioactivity measuring and monitoring techniques and instruments, mathematics and calculations necessary for the use and measurement of radioactivity, and the biological effects of radiation. He has operated the well logging program independently for the vast majority of the time he has worked for Gold Perforating. He employed ^{226}RaBe and ^{239}PuBe neutron sources during approximately the first 15 years of his well logging experience. For approximately six years he has used the ^{241}AmBe source. All of these sources were in the 3 Ci range.

Mr. Steve Knoblett is Mr. Dwight Knoblett's son. He has been employed by Gold Perforating Co. in their well logging operations for two years. He also has extensive experience with the well logging process. Following a three month training period, he has been involved in every aspect of the logging operation. He is knowledgeable in safety and emergency procedures necessary for safe well logging activities, including radiation protection, radioactivity measuring and monitoring techniques and instruments, mathematics and calculations necessary for the use and measurement of radioactivity, and the biological effects of radiation. Although he has not yet

operated a well logging program "independently," his knowledge and experience in the field would qualify him for the responsibility. He has used an approximately 3 Ci AmBe neutron source for well logging activities during his two years with Gold Perforating.

Steve Knoblett and his father Dwight Knoblett will conduct the well logging operation as a team.

Item 11

The survey meter shall be calibrated at approximately six month intervals. The meter will be calibrated by:

Gulf Nuclear, Inc.
202 Medical Center Building
Webster, Texas 77598

Item 12

Personnel monitoring will be accomplished with gamma and neutron sensitive film badges manufactured by:

ICN Pharmaceuticals Inc.
26201 Miles Road
Cleveland, Ohio 44128

The badges will be evaluated every month by this company. They are designed to measure whole body exposure, and are to be worn on the shirt pocket.

Item 13

The Applicant will employ the handling tool described in Item 7. A drawing of this instrument is attached. The handling tool is threaded to allow the source holder to be attached remotely (5 feet). It has a deep socket to enable the worker to screw the source holder into either the logging tool or the storage assembly without coming closer than five feet.

Arrangements for the Well Logging, Inc. field office are currently being made. NRC will be informed of the location and provided with a description of the building once final arrangements are complete. The storage facility at the field office will

be such so that radiation levels do not normally exceed 2mr/hr at 18 inches from the exterior surface of the facility. Signs as specified in Part D of the Operating Manual will be provided.

The truck to be used for the well logging operation is a new Ford 7,500# front axle, 17,500# rear axle vehicle with a 16'6" steel body specially outfitted for well logging operations. All equipment necessary for the operation is to be permanently installed in the truck. Gearhart-Owen Industries, Inc. is presently completing the necessary modifications and installing the equipment in the truck.

Survey instrument and logging tool calibration and repairs will not be performed by the Applicant, and therefore no restricted area will be maintained for these purposes.

Item 14

The Well Logging, Inc. Operating Instructions and Emergency Procedures Manual sets forth the information and procedures requested in this Item. The Applicant will keep, in duplicate, those records specified in Part G of the Operating Manual. The procedure for developing these records is set forth in the Operating Manual. When the truck and associated logging equipment and source are received by the Applicant, an inventory will be made of all equipment.

The procedures for controlling access to work and storage areas are set forth in Parts C and D of the Operating Manual.

The procedures for transporting the sealed source are set forth in Part F of the Operating Manual.

The survey program is described in Part B of the Operating Manual.

Emergency procedures are detailed in Part I of the Operating Manual.

The procedures for leak testing are set forth in Part H of the Operating Manual.

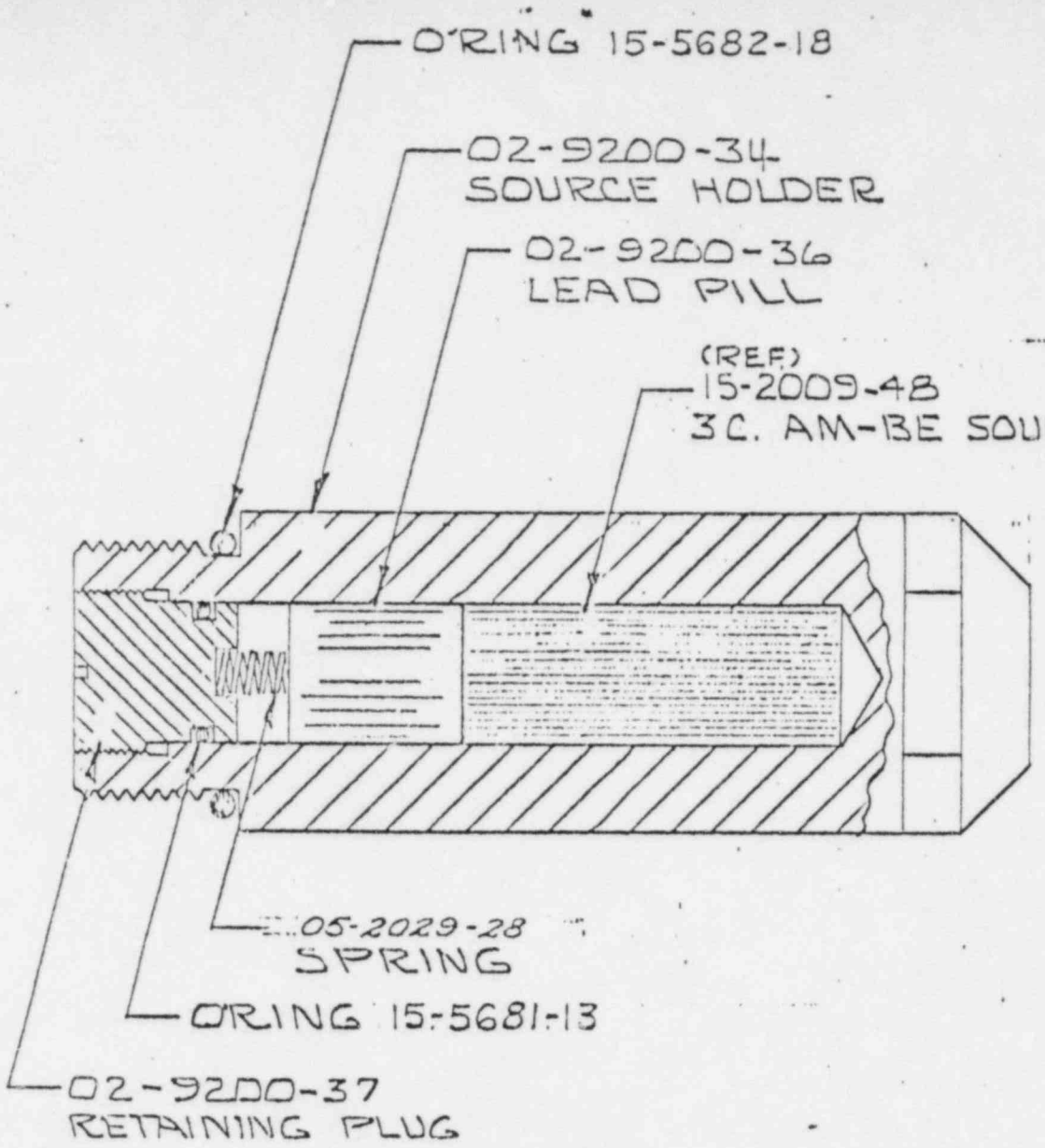
Operating procedures are set forth in Part A of the Operating Manual.

Personnel monitoring provisions are set forth in Part E of the Operating Manual.

Item 15

The sealed source will be returned to the manufacturer or transferred to another properly licensed person in the event Well Logging, Inc. will no longer use the source.

02-9200-18



TOLERANCES UNLESS NOTED OTHERWISE
(DECIMAL ±.005) (FRACTIONAL ±1/64) (ANGULAR ±½°)
DIAMETERS CONCENTRIC TO ± ____ T.I.R.
FINISH MARK √ INDICATES POLISH FINISH
BREAK SHARP EDGES WITH 1/64 RADIUS

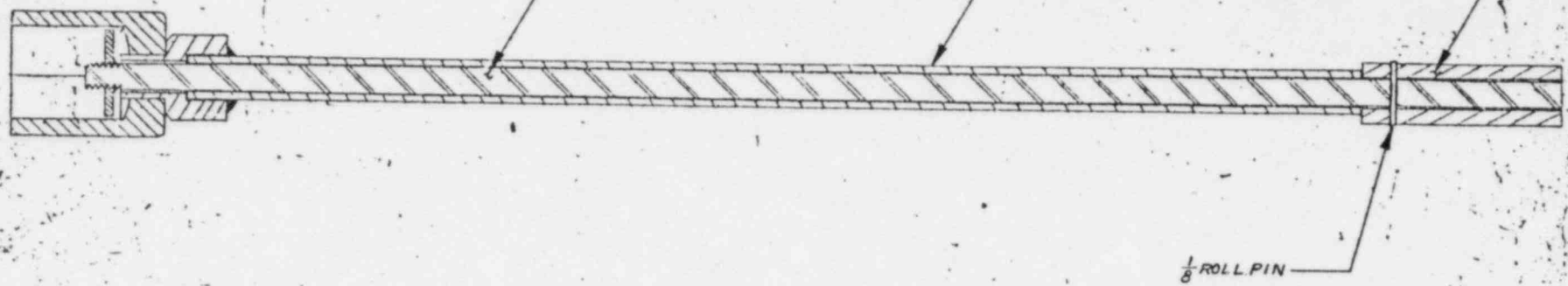
GEARHART-OWEN INDUSTRIES, INC.
BOX 1936 • FORT WORTH, TEXAS 76101

MATL: ——
HEAT TREAT.: ——
SCALE: FULL
DRAWN BY: MONROE
DATE: 10-23-67
APPROVED BY:

ASSY SOURCE HOLDER
3C. AM-BE SOURCE

95733

R. REF RECORD PRINT 2-2-76 RC



TOLERANCES UNLESS NOTED OTHERWISE
(DECIMAL ±.005) (FRACTIONAL ±1/64) (ANGULAR ±½°)
DIAMETERS CONCENTRIC TO ± ____ T.I.R.
FINISH MARK √ INDICATES POLISH FINISH
BREAK SHARP EDGES WITH 1/64 RADIUS

R.	REF RECORD PRINT	1-9-75	PT
R.	REF RECORD PRINT	1-9-73	PT

MATL: NOTED
HEAT TREAT:
SCALE: NO SCALE
DRAWN BY: MONROE
DATE: 2-26-65
APPROVED BY:

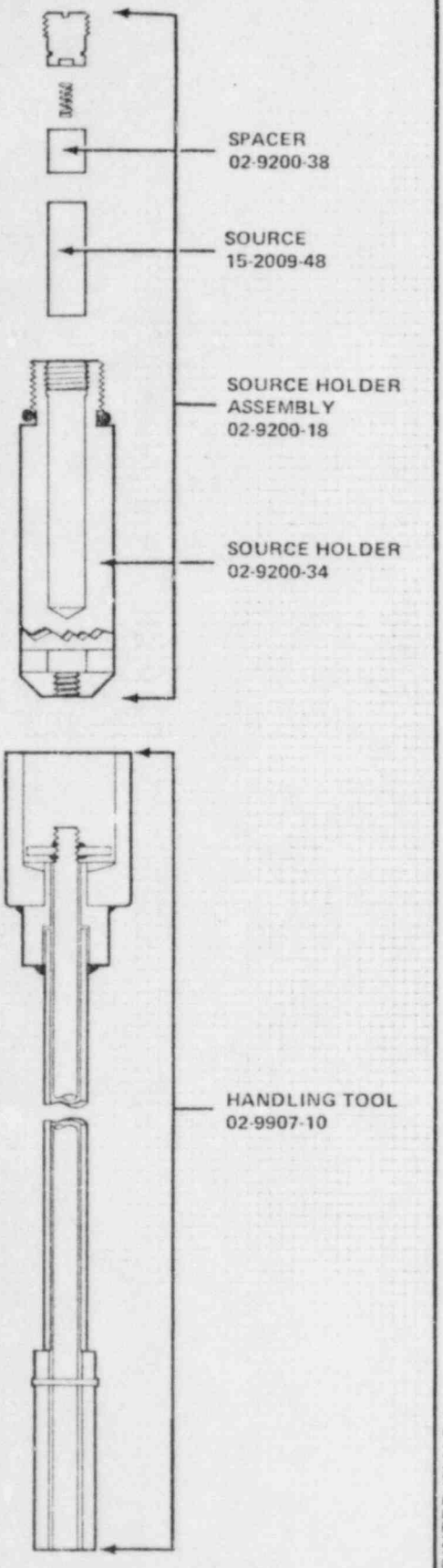
GEARHART-OWEN, INC.
BOX 1936 • FORT WORTH, TEXAS 76101

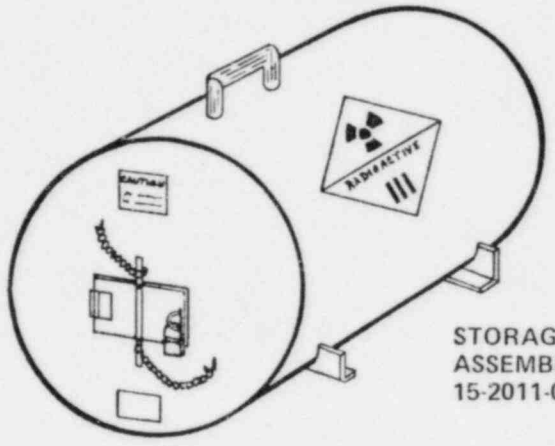
ASSEMBLY
SOURCE LOADING TOOL
F/1¼ SOURCE HOLDER

02-9907-20

GEARHART-OWEN

RADIOACTIVE MATERIAL HANDLING EQUIPMENT





STORAGE
ASSEMBLY
15-2011-03

DESCRIPTION

Handling and storage of radioactive materials must be performed in the strictest adherence to Nuclear Regulatory Commission and state health regulations. The Source Storage Assembly (15-2011-03) is approved by these agencies and by the Department of Transportation. This storage assembly was designed for the 6.6×10^6 N/S (3 curie) AmBe 241 Source (15-2009-48) and Source Holder (02-9200-18).

The Source Holder is designed to accept the GO Source Handling Tool (02-9907-10), which will permit the worker to maintain a distance of five feet from the source. The Source Handling Tool is threaded to capture the Source Holder while moving it to or from the storage assembly or downhole tool. It also has a deep socket to enable the worker to screw the Source Holder into either of these devices so that he need never approach the source.

For API calibration purposes, Gearhart-Owen manufactures a Neutron Calibration Unit (02-9903-01) and a Gamma Ray Calibrator (02-9902-03). The neutron calibrator represents 1000 API units in 7-7/8" fluid filled open hole. Departure curves are available for different hole sizes and for cased holes.

For best results when using this calibrator, the neutron tool should be four feet from the ground.

The Gamma Ray Calibrator consists of a small radium source mounted on a four foot spacer bar that is placed over the center of the gamma ray detector. This calibrator will introduce 120 API units in increased counting rate.

PRINTED IN U.S.A.

GEARHART-OWEN INDUSTRIES, INC.

P.O. BOX 1936 FORT WORTH, TEXAS 76101 PHONE (817) 293-1300

WELL LOGGING, INC.

OPERATING INSTRUCTIONS
AND
EMERGENCY PROCEDURES
MANUAL

TABLE OF CONTENTS

A. HANDLING AND USE OF RADIOACTIVE SOURCES

At all times, the approved logging personnel of Well Logging, Inc. will be directly in charge of the logging operations utilizing radioactive sources and will be responsible for protection of the health and safety of personnel associated with the sources and the general public. These personnel must supervise all source handling operations, transportation, storage and shipping according to the following procedures. Mr. Dwight Knoblett is designated as the Radiation Protection Officer.

1. Only the approved logging personnel of Well Logging, Inc. shall perform operations involving radioactive sources. All customer personnel shall be required to be remote to these operations.

2. Only the approved handling tool may be used for removing the source holder from the storage assembly and placing the source holder in the logging tool, and the subsequent return of the source to the storage assembly.

3. Radioactive sources are to be transported and stored in the approved, locked, and secured storage assembly.

4. For calculations of possible exposures, the neutron logging source assembly encloses a 3.0 curie Americium-241 Beryllium (AmBe 241) neutron source. A dose rate of approximately 48-54 mr/hr (neutron and gamma) is present at one meter from the source assembly.

5. Using the approved remote handling tool, the source is removed from the storage container. The source is promptly attached to the logging tool and lowered into the well. When the logging operation is finished, the logging tool will be returned to the surface. The logging operator will remove the tool from the well, and utilizing the approved remote handling tool, will remove the source from the logging tool and immediately place it back in the storage container. The storage container will then be locked. The time-distance factors must be used effectively when working with radioactive sources to keep exposure to a minimum. When utilizing the remote handling tools a safe distance is provided but great care should be taken so as to keep the handling exposure time to an absolute minimum.

6. Surveys as discussed below should be taken and recorded at the proper times.

7. In the event the logging tool is lost in the well, see the instructions in Part I below.

B. RADIATION SURVEYS

In general a survey should be taken each time a source is manipulated or moved. The approved portable low level survey meter should be used for the surveys.

1. Before travel to a job site, survey the truck on all four sides, and survey the storage assembly at its surface and at a distance of three feet from the surface. Record on Job Log Sheet. The radiation level at the surface of the container may not exceed 200 mr/hr and at three feet from the surface no radiation level may exceed 10 mr/hr. The radiation level at 18 inches from any surface of the truck or in the passenger cab shall not exceed 2 mr/hr.

2. Upon arrival at the well site, survey the area and the well bore at the surface before commencing the job. Record these readings. After the logging tool is removed from the hole and the source is removed from the tool, survey the area, the logging tool, and the well bore to determine whether there is any contamination around the well site. Record on Job Log Sheet.

3. A survey of the Field Office Storage Facility shall be conducted monthly. The readings at 18 inches from each external wall of the facility shall be recorded. No such reading is to be in excess of 2 mr/hr.

4. A leak test wipe must be surveyed before forwarding the wipe for assay. Record the result in the leak test records. High levels of contamination on the wipe shall be reported to the manufacturer of the source assembly and use of the source shall be discontinued.

5. In the event a source is lost in the well, frequent surveys of the recovery operation will be made and recorded. Further procedures are described in Part I below.

6. A survey of the truck when the source storage assembly is in the Field Office Storage Facility will be made and recorded on a monthly basis.

C. ACCESS CONTROL PROCEDURES

1. All containers carrying or storing or used for transporting radioactive materials will bear a tag with the identification of the radioactive material, the quantity of the radioactive material, and the date that the radioactive material was that particular quantity. The tag will also state: "Caution -- Radioactive Material."

2. The truck will be labeled and operated according to the procedures specified in Part F below.

3. For logging operations performed at well sites, logging personnel will, at all times during the operation, maintain surveillance of the area and prevent unauthorized personnel from entering that area at any time the source holder is not secured in the storage assembly.

D. STORING AND SECURING RADIOACTIVE MATERIALS

1. As described in Part A above, the storage container will remain locked or within the immediate line of sight of logging personnel whenever the source holder is placed therein.

2. Surveys as required in Part B above will be conducted of the source storage assembly, the Field Office Storage Facility, and the truck.

3. The "RADIOACTIVE" placards described in Part F below will be placed on the truck whenever the storage assembly is placed therein.

4. The Field Office Storage Facility will be securely locked when the source storage assembly is placed therein. Signs reading "Caution -- Radioactive Material" will be placed in conspicuous and obvious locations around the Storage Facility. These signs will bear the radiation symbol and will be magenta and safety yellow in color.

E. PERSONNEL MONITORING PROCEDURES

1. Logging personnel shall wear personnel monitoring devices at all times when conducting activities in the well logging program.

2. Logging personnel will wear a film badge attached to the outside of a shirt pocket during all operations involving the radioactive source.

3. Each film badge shall be assigned to and worn by only one individual.

4. The processing results of the film badge shall be recorded and maintained until their disposal is authorized by the Nuclear Regulatory Commission. The doses entered on the records shall be maintained on a quarterly basis.

5. It is understood that the maximum acceptable dose levels for individuals is 1.25 Rem per calendar quarter. In the event that the doses to any individual exceed that limit, notice will be given to the Nuclear Regulatory Commission, Office of Inspection and Enforcement, Washington, D.C. and the Regional Enforcement Office.

6. Personnel monitoring equipment shall be stored away from the source when logging operations are not being conducted.

7. Film badges will be sent in for processing at intervals not to exceed one month.

F. PROCEDURES FOR TRANSPORTING RADIOACTIVE SOURCES

1. Upon removal of the storage assembly from the Field Office Storage Facility, the storage assembly shall be placed on the truck and secured in its designated position. It should be sufficiently secured to prevent shifting of the storage assembly in transit.

2. Surveys as described in Part B above should be taken and the results recorded at the proper stages of the well logging operation.

3. The truck shall bear a placard on four sides which bears the word "RADIOACTIVE." This sign shall be approximately 6" x 30" and will be placed on the truck only when it is transporting or storing the radioactive materials. The sign shall have black lettering on a safety yellow background.

G. RECORDS MANAGEMENT

1. A record of the initial receipt of the radioactive source shall be made by the Radiation Protection Officer. This record shall be kept for at least two years after receipt.

2. Personnel exposure records of the film badge results will be maintained in a separate file, along with quarterly reports on the exposures of each person utilizing radioactive materials.

3. Leak test records will be maintained on the sealed source. The leak tests shall be performed and the results recorded at six month intervals.

4. Survey records of the Field Office Storage Facility shall be maintained. These records will reflect, in milliroentgens per hour, the readings at a point 18 inches from the external surface of each wall of the storage facility. These surveys will be done on a monthly basis.

5. Survey records of the job sites and truck as set forth in Part B above will be maintained.

6. Survey meters will be calibrated at approximately six month intervals. A record will be maintained of the current calibration certificates.

H. LEAK TEST PROCEDURES

1. The sealed source shall be tested for leakage at intervals not to exceed six months.

2. The wipe shall be made of the surface of the source holder and any other surface which may be contaminated if the source is leaking.

3. The wipe shall be surveyed before transmittal for assaying to determine if high levels of radiation are present.

4. In the event that either the preliminary survey of the wipe or the leak test results indicate the source is leaking, the source shall be withdrawn from use.

5. Records of the leak test results shall be maintained as described in Part G above.

I. EMERGENCY PROCEDURES

In the event of any accident specifically dealt with in the following procedures, or any other emergency situation which may develop, the following persons should be notified immediately by telephone and telegraph, mailgram or facsimile:

Director, NRC Regional Office (Region IV)
Office of Inspection and Enforcement
611 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76012
Telephone: 817/334-3841

Corporate Officers of Well Logging, Inc.
These persons can be reached through the
Well Logging, Inc. office number.
Telephone: 918/749-0941

In addition, the following state officials should be immediately notified if the emergency is within that state:

Oklahoma
Director, Oklahoma Department of Energy
4400 N. Lincoln Blvd.
Oklahoma City, OK 73105
405/521-2995

Kansas
Director, Kansas State Department
of Health and Environment
Bureau of Radiation Control
Topeka, Kansas
913/862-9360 (ext. 284 through 287)

1. Vehicle Wreck

In the event of an accident while transporting radioactive materials, efforts should be made to minimize the exposure of any persons. These would include roping off the area and maintaining surveillance to prevent unauthorized persons from entering the area. The appropriate officials listed above should be notified, but surveillance of the area should be continuously maintained.

2. Procedure for Lost Source Downhole

a. When a source is lost, notify the well owner or his representative that a source is stuck in the well. As soon thereafter as possible, hand the well operator a drawing of the source and the logging tool. This will enable him to know before he starts the fishing operation the quantity, type of radioactive material, and the mechanical construction of the source and the logging tool involved.

b. Immediately notify the persons listed above and keep them informed of the progress toward recovery of the source.

c. Personnel monitoring equipment should be distributed to the rig personnel and company personnel. The well operator should be advised that these are for their protection and are intended primarily for a record of the operation.

d. During the fishing operation, the mud being circulated should be monitored using survey equipment capable of measuring gamma ray radiation.

e. It is necessary to minimize possible exposures by controlling the time and distance factors during the fishing operation. Where practical, everyone, except the well operator and enough personnel to provide necessary assistance during the operation, should be kept from the area. All handling of the drilling rig equipment should be handled by the well operator and actual handling of the source should be done by the Radiation Safety Officer or a qualified designee.

Abandonment Procedures

3. Fires

a. Notify all personnel in the area immediately.

b. Attempt to put out the fire if a radiation hazard is not immediately present.

c. Notify the fire department.

d. Notify the Radiation Protection Officer.

e. The Radiation Protection Officer will set up restrictions governing the fire fighting and other emergency activities.

f. Following the emergency, monitor the area and ascertain the emergency devices necessary for safe contamination.

g. Notify the authorities listed above.

h. Decontaminate the area.

i. The Radiation Protection Officer will have to approve the area before work can resume.

j. Monitor all persons involved in combating the emergency.

k. Prepare a complete report of the accident for transmittal to the authorities listed above.

4. Leaking Source

a. If the logging tool indicates that a source is leaking, shut the operation down.

b. Notify the well owner.

c. The Radiation Protection Officer will set up control procedures for keeping personnel out of the immediate area until recovery is commenced.

J. REVIEW OF RADIATION SAFETY PROGRAM

The Radiation Protection Officer will conduct quarterly reviews of the radiation safety program. These reviews will include:

1. Determining that these established procedures are being followed to ensure the protection of the health and safety of well logging personnel and the general public.

2. Check to see that all required records are being maintained, including those records described in Part G above.

3. Determining that all equipment associated with the well logging operation is in safe working order.