

# NUCLEAR TESTING SERVICES

Anytime

Anywhere

Specializing in Nuclear Moisture Density  
TESTING, LEASING, REPAIR

P. O. Box 26723  
Salt Lake City, Utah 84125

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1515 Major Street • Salt Lake City, Utah 84115 • (801) 467-3892

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July 15th, 1982

Rec 8/17/82  
CAM

United States Regulatory Commission  
Region IV  
ATTN: R.J. Everett  
Chief, Materials Radiation  
Protection Section  
611 Ryan Plaza Drive, Suite 1000  
Arlington Texas 76012

Re: License: 43-17936-01; Docket: 30-13675

Gentlemen,

In reply to your letter of June 29th, 1982, and the corresponding Notice of Violation, Nuclear Testing Services is submitting the accompanying material and documentation for your review and consideration. This compilation is an explanation for the corrective measures and procedures adapted, and currently in effect as company policy to enforce and adhere to the regulatory violations noted on the violation notice.

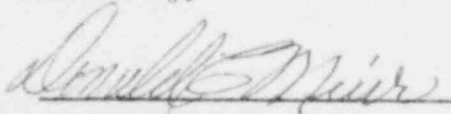
For purposes of order, and clarity this material is presented in numerical order corresponding to the items listed on the violation notice. The copies of the supportive statements documents and forms now in use are included in the appendix to this report. An abstract statement is also correlative to the violation notice which presents a concise and brief narrative of the violation item, and our corrective action, or response. A comprehensive and detailed explanation is discussed in the body of the text.

I have attempted to respond to each violation item in sequence to maintain clarity for your convenience in reviewing this matter. Nuclear Testing Services has endeavored to correct the problem categories and amend the policies that were in violation, and initiate new business practices and client relationships to correspond to the applicable N.R.C. regulations.

In those specific areas where further corrections may be required, further efforts will be conscientiously pursued. Please let me know if you have any further questions or comments.

Thankyou for your interest and consideration to this action submitted in response to the subject violation.

Sincerely,



Donald C. Muir

8209240387 820820  
NMS LIC30  
43-17936-01 PDR

**NTS**

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United States Regulatory Commission  
Region IV

ATTN: R.J. Everett  
Chief, Materials Radiation  
Protection Section

611 Ryan Plaza Drive, Suite 1000  
Arlington Texas 76012

Re: License: 43-17936-01; Docket: 30-13675

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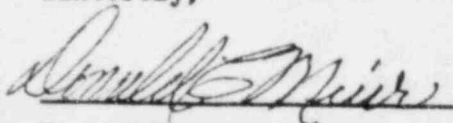
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Sincerely,



Donald C. Muir

DCM/bv

**NTS**

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July 27th, 1982

Mr. John T. Collins  
Regional Administrator  
United States Nuclear  
Regulatory Commission  
Region IV  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76012

Re: License: 43-17936-01  
Docket: 30-13675

Dear Mr. Collins,

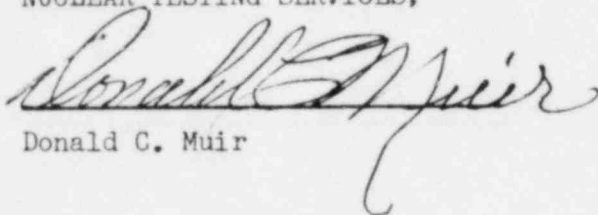
Subsequent to a brief phone conversation with Mr. Hooker, I am writing to request a fifteen day extension to our response to Nuclear Testing Service's notice of violation.

This request is based upon the late arrival of the violation notice which was dated June 29th, 1982; but was not received by us until July 6th, 1982 due to the intervening July 4th holiday. Further, in Utah July 23rd is a State holiday with most business operations being closed. The assemblage of information through the mail and from our records can be organized more efficiently and thoroughly with approval of this additional time allocation.

Thankyou for your consideration to this extension request.

Very truly yours,

NUCLEAR TESTING SERVICES;



Donald C. Muir

**NTS**

## ABSTRACT

LICENSE NO: 43-17936-01;  
DOCKET: 30-13675

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Violation 1.) Repair Facility site:

Corrective Action:

An amendment to Nuclear Testing Services Radioactive Materials license has been approved by the N.R.C. requesting authorization to utilize the site at 1540 Smily Drive, Salt Lake City, Utah as a temporary storage facility for the repair and servicing of NTS, owned gauges and client equipment.

Violation 2.) Removal of source rod from Troxler gauges during repair operation.

Corrective Action:

An amendment has been submitted and approved by the N.R.C. to allow NTS to remove the source rod from Troxler gauges for specific repair operations where essential to the gauge function, and in accordance with prescribed monitoring and shielded storage methods during the removal period. Record maintenance and careful control will be mandatory for future work. This practice will be in effect on the date of license amendment approval.

Violation 3.) License Condition 15, failure to conduct and submit 6 month physical inventory to account for sealed sources.

Corrective Action:

An inventory for May, 1982 has been completed, and back inventories for the preceding intervals have been completed. A file for these documents has been established, and a directive has been issued declaring that June and December of each year is to be the inventory period without exception. Copies of all inventories will be maintained in chronological order.

Violation 4.) Transfer of by-product material to unauthorized gauge users.

Corrective Action:

A memo has been distributed to all NTS personnel (copy attached) requiring a client license to be "in file" prior to any lease or transaction in N.R.C. States and in all Agreement States. policy will be controlled and enforced. Letters have been written requesting license copies from those clients who did not have licenses available at NTS. Copies of these letters and of the licenses received and currently on file are in the appendix. Duplicate copies will be maintained in an active N.R.C. file for inspection purposes.

Violation 5.) License authorization for transfer of by-product material. As above, letters have been written to acquire licenses from recipients of portable gauges that had not submitted licenses previously. It should be noted that in certain instances, clients listed in the violation did indeed have licenses on file with NTS at the time of

LICENSE NO: 43-17936-01;

DOCKET: 30-13675

Abstract Cont'd.

the inspection. These licenses are defined in the appropriate section of this report, and copies are included in the appendix. As in the preceding violation, memo and company policy now dictate actual possession of a suitable Agreement State, or N.R.C. license prior to consummating a lease, sale or purchase transaction for a testing gauge. Each client by name and item a.) through f.) is discussed in the body of this report.

Violation 6.)

- a.) Transporting licensed material; with description of hazardous material on shipping form.

Corrective Action:

A special form for transporting the equipment is now in use, and a log book is maintained for each NTS gauge transported from one site to another on public highways. Copies of the forms and a page extracted from the log book are in the appendix.

- b.) Maintenance on file of the proper Specification 7A package forms for materials shipped on public highways.

Corrective Action:

These forms have been acquired, and are now on file for each portable gauge owned by NTS. Increased effort and attention will be accorded to maintaining and upgrading all pertinent files to include the necessary proper forms.

- c.) Certification for special form radioactive material not on file.

Corrective Action:

A request has been made to the manufacturer supplier of the soil test units, and the files will be updated to include these documents upon receipt. Copies of the forms now available are included in the appendix. Special emphasis will be made to post these items in the proper file when additional gauges are acquired.

Violation 7.) Radiation records maintaining for individual users.

Corrective Action:

Film Badges have been ordered from R.S. Landauer Jr. and the individual users have been instructed to utilize them during the operation and involvement with the radioactive instruments. The records submitted by the supplier will be maintained in individual personnel files, and will be available to each individual for inspection and his personnel information, as well as being an integral part of the established N.R.C. file. A separate file is maintained for each user.

Violation 8.) Submittal of personnel monitoring reports.

Corrective Action:

These reports have now been prepared and are hereby submitted in the appendix to this report. Accessibility to this data will be maintained in the appropriate files.

Violation 9.) Statistical Summary reports not submitted for 1978 and 1979.

LICENSE NO: 43-17936-01;

DOCKET: 30-13675

Abstract cont'd.

Corrective Action:

This information has been derived from records on file and is contained in the body to this report. A research of our available records, and confirmation by R.S. Landauer indicated our inception date to have been April 10, 1979. Prior to this date, our gauge utilization was limited to Radium Beryllium sources. Therefore, our report appropriate to this section is for the year 1979 only.

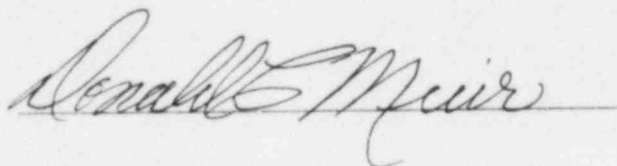
SUMMATION

Violations were incurred in part due to required documentation not being readily available and accessible in a separately maintained file for the specific purpose of a Nuclear Regulatory Commission inspection. As of this date, a filing cabinet and an appropriate filing system have been established to provide presentation for this information and required document storage in an orderly manner.

Included in this file will be copies of the amendment to our current Nuclear Regulatory Commission materials license approving the requests for changes applicable to violations one and two for this report.

Nuclear Testing Services personnel have been notified of the serious nature of the violations incurred, and of the importance of maintaining proper transporting, and record keeping relating to nuclear gauge utilization.

Respectfully submitted,

A handwritten signature in cursive script, reading "Donald E. Muir", written over a horizontal line.

Nuclear Testing Services:

STATEMENT AND EXPLANATION IN REPLY TO NOTICE OF VIOLATIONS

License No: 43-17936-01

Docket No: 30-13675

1.) Repair Facility Violation License Condition 10;

In reply to this violation, an amendment request was submitted to the Nuclear Regulatory Commission to provide for utilization of the premises at 1540 Smily Drive, Taylorsville, Utah, for the purposes of repair and calibration of portable gauges. The amendment was submitted as a corrective action on June 28, 1982. Approval was granted on August 2, 1982.

To avoid further violations, all repairs and calibration procedures will be in strict compliance with the dictates prescribed in the amendment. Copies of the amendment will be posted with the materials license and maintained in the N.R.C. inspection file.

Compliance will be achieved upon receipt of the approved amendment from the N.R.C. licensing branch and upon notification of the involved Nuclear Testing Services personnel directly involved with maintaining the new facilities for repair and calibration operations.

2.) Sealed Source Removal; License Condition 13

In reply to this violation, an amendment was requested to provide authorization for removal of a source rod from the portable gauges as an integral part of the gauge repair operation. Source rod removal will be limited only to those repair procedures where removal is essential to the functioning of the gauge and the required repair operation. In these specific situations, removal will be in exacting accord with the amendment provisions detailed in the amendment request submitted on June 28th, and approved on August 2, 1982. In addition to observing the license amendment safety control factors, complete records will be maintained as per the original amendment proposal.

In order to avoid further violations, the NTS personnel involved with this procedure will be instructed in the provisions and details outlined in the amendment, and they will be required to adhere to the methodology described therein. Further, a file will be maintained in accord with the amendment statement.

Implementation of this violation correction is also contingent upon receipt of the N.R.C. license amendment, which will be on or about the 10th of August, 1982.

It is important that it be clearly understood by the Nuclear Regulatory Commission and Nuclear Testing Services that this violation and corrective action is only concerned with source ROD removal from the portable gauges, and does not in any way apply to actual source removal from the source rod. Nuclear Testing Services has never been involved with this process and has no intention of attempting this removal or tampering in any manner with the by product material in the subject equipment.

Nuclear Testing Services:  
Cont'd.

STATEMENT AND EXPLANATION IN REPLY TO NOTICE OF VIOLATIONS

License No: 43-17936-01  
Docket No: 30-13675

3.) Six Month Physical Inventory Violation; License Condition 15.

This violation has been corrected by preparation of a current inventory for May, 1982. Research of available records indicates that Radium-Beryllium Source Model 2401 Troxler gauges were owned and operated by Nuclear Testing Services prior to June 1979.

Six month inventories subsequent to that date have been prepared retroactive to June 1979, from available records and research sources.

Corrective action to avoid further violation includes an established Nuclear Testing policy dictating June and December of each operating year to be dates for conducting the inventories. Also, a file specifically designated for the inventory has been included with the other material set aside for inspection documentation.

However; the date of inception for this current action was May, 1982. Copies of the inventories are included in the appendix to this report.

4.) Transfer of By-product Material Violation:

To prevent further occurrences of this violation, a memo has been issued to all NTS personnel prohibiting the lease, or other transfer of equipment without a copy of the recipient's license actually being "in file". Further, all transfer, by any manner, is to be in accord with this directive including all N.R.C. States and all Agreement States, as well. A separate file in the N.R.C. inspection file has been activated to contain duplicate license copies for all transactions, in addition to the license in each client folder. (Memo Copy in Appendix.)

In regard to the existing violations for client transfer licenses that were not available at the inspection date: Letters have been submitted to the respective licensees requesting copies of their current licenses. Copies of the letters and the licenses thus far returned are also presented in the appendix to this report. As before, duplicate copies will be included in the applicable N.R.C. folder.

It is considered that the file established for storage of these documents, and the Nuclear Testing Services' policy already established by issuance of the transfer memo will serve to prevent any further violations of this nature.

This policy and the file are now in effect.

In reply to specific license transfer omissions for the a.) and b.) subparagraphs for violation 4.): action taken is as follows:

- a.) Utah Division of Water Resources.  
Concurrent with a N.R.C. investigation at the Utah D.O.T., Nuclear Testing Services was informed that the Division of



STATEMENT AND EXPLANATION IN REPLY TO NOTICE OF VIOLATIONS

License No: 43-17936-01  
Docket No: 30-13675

Water Resources was not authorized by extension of a N.R.C. license issued to the Utah D.O.T. to operate portable gauges. Subsequently, a trade was made by NTS from the unit they were originally leased in violation to a Troxler Model 2401 gauge containing a Radium-Beryllium source. This unit was in use at the time of the N.R.C. inspection. To prevent further situations arising where there is confusion and misunderstanding regarding the licensing and leasing arrangements, the policy will be to utilize radium-beryllium equipment or obtain license copies.

The action taken by the Division of Water Resources; State of Utah was to obtain a N.R.C. materials License and a copy has been submitted to NTS as per our request. Copies of the license No. 43-21077-01; Expiration Date July 31, 1987, are in the appropriate files, and also included with this report.

- b.) Union Moly Corp. Lease. Questa, New Mexico.  
In order to correct this violation, a letter has been sent to Mr. Gary Eisebraun, Chief Engineer, requesting a copy of their current New Mexico State by-product Materials License authorizing possession of a portable testing unit. Upon receipt of their license copy, it was noted that their amendment provides for possession of radium 226/Beryllium source Seaman gauges only, and not for Troxler gauges as previously utilized from Nuclear Testing Services. In conformity with Nuclear Testing Services' current operating policies, no further gauge leases or any other transfer of radioactive units will be conducted without a proper amendment to this license, or contingent availability of a Seaman Nuclear Model C-200, as per item 6.G. and 9.G. of the subject license.

The final decision to discontinue any further transactions with Union Molycorp unless the provision listed above are met, was initiated upon receipt of their license copy, and is now in effect.

- 5.) License Transfer By-product Material Violation:  
Violations within this category are sub-listed under headings a.) through f.), inclusive, and are discussed in corresponding order including corrective action statements, wherever applicable.

- a.) Transfer of portable gauge to J.R. Simplot Co. in Pocatello, Idaho, August 1980.  
Corrective action on this item started with a letter to Mr. Vern Perman, at Simplot, requesting a copy of their Idaho State Materials License on July 13, 1982. Mr. Perman's reply and copies of their license are included in this report along with

STATEMENT AND EXPLANATION IN REPLY TO NOTICE OF VIOLATION

License No: 43-17936-01  
Docket No: 30-13675

a copy of the request letter. Copies of the Simplot license will be maintained in the appropriate files for future reference prior to any further transactions.

It is noted that the subject license expires on August 31, 1982; therefore, in the event any further leasing is considered, a renewal or current license copy would be obtained by Nuclear Testing Services prior to any commitment.

Filing of the document and establishment of the policy requiring a lease on file is now in effect.

- b.) Transfer of Troxler portable gauge to Kansas City Testing Laboratory, Shawnee Mission, Kansas, June 1980. Although a copy of a State of Kansas radioactive materials license was in the client file at the time of inspection, a subsequent close review of this document reveals an actual expiration date of May 31, 1980, for their amendment No. 4. A copy of their license amendments is attached. The corrective action on this item will be to require a current license prior to any further transfer, and to enforce a more comprehensive study of all licenses submitted in the future to prevent any reoccurrence of this expiration problem or other license infractions.

A policy requiring license possession and review is in effect at this date.

- c.) Transfer of a Troxler gauge to Twin City Testing, in Bismarck, North Dakota. September 1980. As indicated by the cover letter from Mr. Gary Arman of Twin City Testing Laboratories, dated August 8, 1980; there was indeed a submittal of a revised radioactive materials license prior to the transfer of portable gauges to Bismarck, North Dakota. Their license No. is 22-01376-04, and amendments included in the attached copies which appear to cover the subject portable unit transfers are included in the appendix. Corrective action relative to this issue will include a concentrated effort to organize filing systems in a manner whereby required N.R.C. documentation will be readily available and accessible for inspection in the established N.R.C. file. This action is now in effect.

- d.) Transfer of Troxler portable gauges to Western Testing Laboratories, Denver, Colorado, January 10, 1981. Regarding this violation; At the inspection date, the only license documentation in our possession was a December 31, 1980, letter from the Colorado Department of Health, signed

STATEMENT AND EXPLANATION IN REPLY TO NOTICE OF VIOLATIONS

License No: 43-17936-01

Docket No: 30-13675

by Mr. Michael L. Brown, Health Physicist, stating that Western Testing Laboratories license had been amended to utilization of a Troxler Model 2401 portable gauge. Until the inspection, NTS had considered this document to be sufficient confirmation of materials license endorsement. Subsequent to the inspection, a letter was written to Mr. Wally Perkins requesting copies of their current Colorado Materials license to be placed in the appropriate N.R.C. file. Copies of the letter and their license amendment are appended to this report. Corrective action will involve increased vigilance to insure exchange of appropriate licensing, and review of all pertinent amendments to provide legal transfer of all by-product material in the future.

This action is currently in effect.

- e.) Transfer of Troxler portable gauges to Western Testing Laboratories, Denver, Colorado, April 12, 1982.

As in the preceding item; The transfer was predicated upon copies of the same Colorado licensing documents in the Western Testing Laboratories, client file at NTS.

The corrective action will be to update the filing system to include current copies of the client license in Colorado and place duplicate copies in the appropriate N.R.C. file. These corrective measures are now in operation.

- f.) Transfer of Troxler 2401 gauge to Douglas City, Douglas, Wyoming, May 1982.

The transfer of the radioactive unit was scheduled to coincide with N.R.C. approval of their radioactive materials license. Verbal approval had been granted by the N.R.C. licensing division and a license number had been assigned. The transfer of the gauge was promised upon NTS recording that number in file. However, as indicated by the inspection, a copy of the license had not yet been received by NTS at the time of the actual transfer, nor at the date of inspection. This omission has now been corrected by receipt of a current and valid copy of a U.S. Nuclear Regulatory license. No. 49-19967-01; expiration date, March 31, 1987. A confirmatory copy is included with this report.

A policy to prevent transfer of any portable gauge without a copy of the gauge recipients license actually being on file has now been initiated.

- 6.) Transport of licensed material outside confines of place of use.

- a.) Transportation violation for not providing proper forms. To correct this violation, NTS has now adapted a form (enclosed in a transparent plastic slip-in cover) to accompany all portable

STATEMENT AND EXPLANATION IN REPLY TO NOTICE OF VIOLATIONS

License No: 43-17936-01  
Docket No: 30-13675

gauge transportation and movement from the place of origin at 1515 South Major Street in Salt Lake City, Utah. The pertinent and required gauge data for each gauge and the respective movement will be entered in the appropriate line or column on the exterior of each plastic cover by a grease pencil or other suitable marking device. The forms have all the specific gauge data printed except the number of Curies, or MilliCuries, which will be entered in each instance of transportation. The Date, Time, Destination, and portable gauge serial number will also be written on the form. Copies of the various forms used by NTS are included in the appendix. These forms are now in use by NTS.

- b.) Package certification documents for licensed material transported or shipped on public highways. This violation has been corrected by a request to Troxler Electronics Laboratory for copies of the packaging certification forms for three types of shipping and storage containers manufactured by Troxler for the portable units operated by NTS. These certifications have been received and copies are now on file with the equipment and in the N.R.C. inspection file. Copies of each accompany this report.
- c.) Certification for special form radioactive material not on file. As before, it was necessary to contact the gauge manufacturer in order to obtain copies of these certification forms. Troxler has supplied them and they are on file in the specific folders for N.R.C. review and inspection, and in each gauge file, in conformity with the applicable regulation. A copy is attached for verification of this correctional action by NTS.

- 7.) Radiation exposure records maintenance for personnel for 1979, 1981, and 1982.

To comply with this regulation, all back NTS radiation exposure records from our supplier, R.S. Landauer Jr., were researched and missing segments were subsequently supplied as requested from R.S. Landauer records. These data are inclusive from the date of inception April, 1979, to date. The Landauer radiation dosimetry reports are on file and serve as a basis for individual personnel reports, also maintained on file. To prevent further omissions, a policy has been adapted whereby each month's reports are reviewed to derive the personnel data for each individual user and this information is available in the proper file established for this purpose. A letter from Landauer substantiating the request for the missing records is included in the appendix.

STATEMENT AND EXPLANATION IN REPLY TO NOTICE OF VIOLATIONS

License No: 43-17936-01  
Docket No: 30-13675

- 8.) Submittal of personnel monitoring reports for first quarter 1978, and 1979 for individuals for whom monitoring was provided. 10 CFR 20.407(a)

To correct this violation, NTS has prepared radiation dosage reports for the subject periods of 1979. No reports were prepared for the period prior to April 1979, since this was the inception date for Donald C. Muir, and Boyd Alvey. These individuals were the principle gauge users for whom personnel monitoring service was provided at that time. Prior to that date, the radioactive units utilized by NTS were radium-baryllium source gauges, and it was not deemed necessary to provide radiation monitoring until NTS was involved with Cesium-Americium sources. Therefore, the reports prepared and submitted with this report are for a monitored period continuous from 1979 through 1982. Boyd Alvey was deleted from the monitoring service on November 1980, and subsequently removed from the N.R.C. license by amendment August 1982. To avoid further violations in this category, Dannie K. Pollock and Joseph L. Leatham have also been enrolled in the film badge personnel monitoring service; and their radiation reports submitted herewith. Separate files are maintained for each individual reports and records.

- 9.) Submittal of a statistical summary report for personnel monitoring information for calendar years 1978 and 1979. 10CFR 20.407(b)

These statistical data are applicable for NTS personnel Donald C. Muir and Boyd Alvey. Since NTS did not subscribe to a monitoring service until April 1979, for the reasons elicited in the preceding section, this summary statement is for 1979 only.

For Donald C. Muir, the annual summary count was reported by R.S. Landauer to be: 110 Millirems, which converts to 0.11 rems as per the exposure ranges in 20-407 b).

For Boyd Alvey, the reported range was 20 millirems for 1979, which converts to 0.02 rems, or less than 0.1 on the exposure range in 20-407 b).

As previously stated, efforts will be expended to maintain consistent reporting and filing of all radiation exposure records, and to comply with all reporting requirements.

The policy and filing facilities to effect this action is current as of this date.

APPENDIX

# NUCLEAR TESTING SERVICES

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July 1st, 1982

MEMO:

TO: All Nuclear Testing Services, Personnel.

FROM: Donald C. Muir; General Manager.

SUBJECT: Operational Policy For All Transfer Transactions and Portable Gauge Utilization Compliance With Applicable Nuclear Regulatory Commission Regulations.

Effective this date forward, all Nuclear Testing Services' transactions involving Testing Gauges for leasing, sales operation or transporting will be reviewed for approval by Donald C. Muir prior to client commitment, and project implementation. In those specific situations where lease or sale of portable units are proposed, there will be no negotiation or direct involvement until a current and legal copy of the clients Nuclear Regulatory Commission radioactive materials license is received in the Nuclear Testing Services' office and a copy placed in the project compilation.

Further, all radioactive equipment operation, repair, transportation and related business endeavor will be conducted in strict accordance with all applicable N.R.C. rules and provisions.

It is most important that all records pertaining to the actual sale or lease of portable gauges, and gauge operations, as well as other pertinent N.R.C. control items be maintained in the N.R.C. record inventory file specifically established for this documentation storage. All records including licenses are to be duplicated, and one copy to be placed in the applicable client or equipment file, and the other copy to stored in the appropriate N.R.C. file.

There will be no exceptions to these Nuclear Testing Services policies regarding portable moisture-density gauge operation and utilization.

NUCLEAR TESTING SERVICES



Donald C. Muir  
General Manager.

7-1-82

**NTS**

This Copy Is For Your Files

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number

43-17936-01

Docket or Reference number

Amendment No. 03

Nuclear Testing Services  
1515 South Major Street (Front)  
Salt Lake City, Utah 84115

In accordance with letters dated May 12, 1982, and June 21, 1982,  
License Number 43-17936-01 is amended as follows:

To ADD:

- |   |  |   |
|---|--|---|
| <p>6. Byproduct, source, and/or special nuclear material</p> <p>D. Cesium 137/<br/>Americium 241</p> <p>E. Cesium 137</p> <p>F. Americium 241</p> | <p>7. Chemical and/or physical form</p> <p>D. Combined sealed sources (Campbell Pacific Model CPN-131)</p> <p>E. Sealed sources (Campbell Pacific Model CPN-131)</p> <p>F. Sealed sources (Campbell Pacific Model 131)</p> | <p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>D. Not to exceed 10 millicuries of Cesium 137 and 50 millicuries of Americium 241 per source</p> <p>E. Not to exceed 10 millicuries per source</p> <p>F. Not to exceed 50 millicuries per source</p> |
|---|--|---|
- 
9. Authorized use
- D. For use in Campbell Pacific Model B(R) Series gauges for density/moisture measurements and for use in demonstration of the use and training of individuals in the use of these devices.
- E. and F. For use in Campbell Pacific Model MC Series gauges for density/moisture measurements and for use in the demonstration of the use and training of individuals in the use of these devices.



MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number:

43-17936-01

Docket or Reference number

Amendment No. 03

Conditions 10., 12. and 17. are amended to read:

- 10. Licensed material may be used at the licensee's facilities at 1515 South Major Street (Front), Salt Lake City, Utah; 1540 Smily Drive, Salt Lake City, Utah and 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.
- 12. Licensed material shall be used by, or under the supervision and in the physical presence of, Donald C. Muir, Dannie K. Pollock, Dannie Joe Pollock, Joseph L. Leatham and individuals who have completed the training program described in the attachment to the licensee's letter dated January 24, 1980.
- 17. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated December 30, 1977, and letters dated March 24, 1978, April 10, 1979, May 21, 1979, September 11, 1979, January 24, 1980, May 12, 1982, and June 21, 1982. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

Condition 18. is added:

- 18. The licensee is authorized to perform repairs and maintenance on the moisture/density gauges including removal of the source rods from the gauges.

For the U.S. Nuclear Regulatory Commission

*[Handwritten Signature]*

Material Licensing Branch

Division of Fuel Cycle and  
Material Safety  
Washington, D.C. 20555

Date AUG 02 1982

NUCLEAR TESTING SERVICES

SEMI-ANNUAL PHYSICAL INVENTORY  
Moisture-Density Gauges

June 1979

DATE	GAUGE S/N & MODEL	SOURCE & QUANTITY	LEAK TEST	PHYSICAL - INSPECTION INSPECTOR, LOCATION & REMARKS
1979				
6-1-79	1894 2401	Cs/Am-Be 7.8/50 mCi.	6-9-79	In Storage @ NTS. 1515 So. Major St. S.L.C. Utah Shipped to Questa, New Mexico. July 1979 Muir.

NUCLEAR TESTING SERVICES

SEMI-ANNUAL PHYSICAL INVENTORY

Moisture-Density Gauges

DECEMBER - 1979

DATE 1979	GAUGE S/N & MODEL	SOURCE & QUANTITY	LEAK TEST	PHYSICAL - INSPECTION INSPECTOR, LOCATION & REMARKS
12-1-79	1894 2401	Cs/Am-Be 7.8/50 mCi.	12-11-79	In. Use. at Questa, New Mexico. <span style="float: right;">Muir</span>
12-1-79	1874 2401	Cs/Am-Be 7.8/50 mCi.	11-26-79	In Storage at NTS 1515 So. Major St. S.L.C. Utah <span style="float: right;">Muir.</span>
12-1-79	2586 2401	Cs/Am-Be 8.8/50 mCi.	10-22-79	Not in Use. In storage. NTS 1515 so. Major St. Salt Lake City, Utah <span style="float: right;">Muir.</span>

NUCLEAR TESTING SERVICES

SEMI-ANNUAL PHYSICAL INVENTORY

Moisture-Density Gauges

June - 1980

DATE 1980	GAUGE S/N & MODEL	SOURCE & QUANTITY	LEAK TEST	PHYSICAL - INSPECTION INSPECTOR, LOCATION & REMARKS
6-1-80	1512 2401	Cs/Am-Be 8.0/50 mCi.	5-29-80	In Storage @ NTS: 1515 So. Major St. S.L.C. Utah Muir
6-1-80	1513 2401	Cs/Am-Be 8.1/50 mCi.	5-29-80	In Storage @ NTS: 1515 So. Major St. S.L.C. Utah Muir
6-1-80	1514 2401	Cs/Am-Be 8.1/50 mCi.	N/A	NOT IN USE: permanent storage @ NTS 1515 So. Major St. Salt Lake city, Utah Muir
6-1-80	1515	Cs/Am-Be 7.8/50 mCi.	5-29-80	In Storage; NTS: at 1515 So. Major St. S.L.C. Utah Muir
6-1-80	1516 2401	Cs/Am-Be 10/50 mCi.	5-29-80	In Storage, & not in use. 1515 So. Major St. S.L.C. Ut. Muir
6-1-80	1517 2401	Cs/Am-Be 7.3/50mCi.	5-28-80	In Storage @ NTS: 1515 So. Major St. S.L.C. Utah Muir
6-1-80	1518 2401	Cs/Am-Be 10/50 mCi.	N/A	NOT IN USE: permanent Storage. 1515 So. Major St. S.L.C. Utah Muir
6-1-80	1894 2401	Cs/Am-Be 7.8/50mCi.	7-15-80	Questa, New Mexico,
6-1-80	2586 2401	Cs/Am-Be 8.8/50	4/1-80	In use. Empire Laboratories, Ft. Collins Colorado.
6-1-80	6364 3401-B	Cs/Am-Be 8.2/40 mCi.	4-21-80	NOT IN USE: In Storage; NTS, 1515 So. Major St. Salt Lake City, Utah, Muir

NUCLEAR TESTING SERVICES

SEMI-ANNUAL PHYSICAL INVENTORY  
Moisture-Density Gauges

DECEMBER - 1980

DATE 1980	GAUGE S/N & MODEL	SOURCE & QUANTITY	LEAK TEST	PHYSICAL - INSPECTION INSPECTOR, LOCATION & REMARKS
12-1-	1513 2401	Cs/Am-Be 8.1/50 mCi.	12-2-80	In Storage; NTS 1515 So. Major St. S.L.C. Utah Muir
12-1	1514 2401	Cs/Am-Be 10/50 mCi.	N/A	NOT IN USE: Storage @ NTS 1515 So. Major St. S.L.C. U Muir
12-1	1517 2401	Cs/Am-Be 7.3/50 mCi.	5-29-80 2-11-81	NOT IN USE: Storage @ NTS 1515 So. Major St. S.L.C. Muir
12-1	2586 2401	Cs/Am-Be. 8.8/50 mCi.	8-19-80	In Storage @ NTS 1515 So. Major St. S.L.C. Utah Muir
12-1	6364 3401-B	Cs/Am-Be 8.2/40 mCi.	12-3-80	In Storage @ NTS 1515 So. Major St. S.L.C. Utah Muir

NUCLEAR TESTING SERVICES

SEMI-ANNUAL PHYSICAL INVENTORY  
Moisture-Density Gauges

JUNE - 1981

DATE 1981	GAUGE S/N & MODEL	SOURCE & QUANTITY	LEAK TEST	PHYSICAL - INSPECTION INSPECTOR, LOCATION & REMARKS
6-1-	1513 2401	Cs/Am-Be 8.0/50 mCi.	2-23-81	Union Molycorp, Questa New Mexico.
6-1-	2586 2401	Cs/Am-Be 8.8/50 mCi.	2-11-81	In Storage @ NTS: 1515 So. Major St. S.L.C. Ut. Muir
6-1-	3149 2401	Cs/Am-Be 10/50 mCi.	3-25-81	In Storage @ NTS: 1515 So. Major St. S.L.C. Ut. Muir
6-1-	3579 2401	Cs/Am-Be 10/50 mCi.	3-25-81	In Storage @ NTS: 1515 So. Major St. S.L.C. Utah Muir
6-1-	6364 3401-B	Cs/Am-Be 8.2/40 mCi.	5-27-81	IN Storage @ NTS: 1515 So. Major St. S.L.C. Utah Muir
6-1-	7747 3411-B	Cs/Am-Be 8.9/40 mCi.	4-9-81	In Storage @ NTS: 1515 So. Major St. S.L. C. Utah Muir
6-1-	7579 3411-B	Cs/Am-Be 7.3/40 mCi.	12-31-80	In Storage @ NTS: 1515 So. Major St. S.L.C. Utah Muir
6-1-	7756 3411-B	Cs/Am-Be 7.7/40 mCi.	4-13-81	In Use @ Questa New Mexico. Muir
6-1-	7771 3401-B	Cs/Am-Be 7.9/40 mCi.	4-15-81	In Storage @ NTS 1515 So. Major St. S.L.C. Utah Muir

NUCLEAR TESTING SERVICES

SEMI-ANNUAL PHYSICAL INVENTORY  
Moisture-Density Gauges

DECEMBER - 1981

DATE 1981	GAUGE S/N & MODEL	SOURCE & QUANTITY	LEAK TEST	PHYSICAL - INSPECTION INSPECTOR, LOCATION & REMARKS
12-1-	2586 2401	Cs/Am-Be 8.8/50mCi.	10-8-81	In Storage @ NTS; 1515 So. Major St. S.L.C. Utah Muir
12-1-	3579 2401	Cs/Am-Be 10/50mCi.	10-28-81	In use @ Questa, New Mexico.
12-1-	6364 3401-B	Cs/Am-Be 8.2/40mCi.	1-9-82	NOT IN USE: Storage @ NTS; 1515 So. Major St. S.L.C. U Muir
12-1-	7747 3411-B	Cs/Am-Be 8.9/40mCi.	1-6-82	NOT IN USE: Storage @ NTS; 1515 So. Major St. Salt Lake City, Utah Muir
12-1-	7579 3411-B	Cs/Am-Be 7.3/40 mCi.	1-27-82	NOT IN USE: Storage @ NTS; 1515 So. Major St. Salt Lake city, Utah Muir
12-1-	7756 3401-B	Cs/Am-Be 7.7/40 mCi.	10-28-82	In Use @ Questa, New Mexico
12-1-	7771 3401-B	Cs/Am-Be 7.9/40 mCi.	1-8-82	In Storage @ NTS; 1515 So. Major St. Muir

# CBC CONSULTING ENGINEERS

Lakeway Professional Center  
P. O. Box 2530 • Gillette, Wyoming 82716 • (307) 682-5777

June 9, 1982

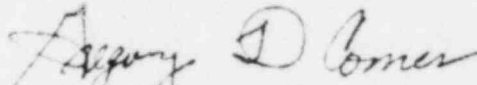
Nuclear Testing Services  
Post Office Box 26723  
Salt Lake City, Utah 84126

Attention: Mr. Don Muir

The purpose of this letter is to inform you that, as of May 23, 1982, CBC Consulting Engineers has in their possession a Troxler Model 3411-B S/N 7579 as per our lease agreement.

If any further information is required, please do not hesitate to call on us.

Yours very truly,  
CBC CONSULTING ENGINEERS

  
GREGORY D. COMES  
Principal



# NUCLEAR TESTING SERVICES

*Anytime*

*Anywhere*

Specializing in Nuclear Moisture Density

TESTING, LEASING, REPAIR

P. O. Box 26723

Salt Lake City, Utah 84125

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1515 Major Street • Salt Lake City, Utah 84115 • (801) 467-3892

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July 12th, 1982

Utah Division of Water Resources  
231 East 400 South / Suite 300  
Salt Lake City, Utah 84111

Attn: Mr. Jim Palmer:

Dear Mr. Palmer:

In compliance with the requirements of a recent Nuclear Regulatory Commission inspection it will be necessary to have copies of all materials licenses on file prior to leasing nuclear gauges. Your assistance in sending us a copy of your license for our permanent file would be greatly appreciated in order to correct our inspection deficiencies, and for future reference.

Thankyou for your prompt attention to this request.

Yours truly,

NUCLEAR TESTING SERVICES

  
Donald C. Muir

THIS COPY IS FOR YOUR FILES

MATERIALS LICENSE

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 1, Parts 30, 31, 32, 33, 34, 35, 36, 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); and to import such byproduct and source material. 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		3. License number	43-21077-01
1. State of Utah Utah Division of Water Resources 1636 West North Temple Street Salt Lake City, Utah 84116		4. Expiration date	July 31, 1987
		5. Docket or Reference No.	
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. Cesium 137/ Americium 241	A. Combined sealed neutron sources (Troxler Dwg. A-100281, Rev. B)	A. Not to exceed 10 millicuries of Cesium 137 and 50 millicuries of Americium 241 per source	
B. Cesium 137	B. Sealed sources (Troxler Dwg. A-102112)	B. Not to exceed 10 millicuries per source	
C. Americium 241	C. Sealed neutron sources (Troxler Dwg. A-102451)	C. Not to exceed 50 millicuries per source	
9. Authorized use			
A. For use in Model 2401 surface moisture density gauges to measure properties of construction materials.			
B. For use in Model 3401, 3401B, 3411, or 3411B surface moisture density gauges to measure properties of construction materials.			

CONDITIONS

10. Licensed material may be used at 1636 West Temple Street, Salt Lake City, Utah and at temporary job sites of the licensee anywhere in the State of Utah.

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number  
43-21077-01  
Docket or Reference number

CONDITIONS

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."
12. Licensed material shall be used by, or under the supervision and in the physical presence of, any individual designated by W. James Palmer, Radiation Protection Officer. Each individual user under this license shall complete the Utah Department of Transportation training program, or the Troxler training program.
13. A. (1) Each sealed source containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.  
(2) 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 prior to any use or transfer to another person unless they have been leak tested within six months prior to 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. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five (5) days of the test with the U. S. Nuclear Regulatory Commission, Region IV, Office of Inspection and Enforcement, 611 Ryan Plaza Drive, Suite 1000, Arlington, Texas 76012, describing the equipment involved, the test results, and the corrective action taken.

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number 43-21077-01
Docket or Reference number

CONDITIONS

13. continued

- D. 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.
- E. The licensee is authorized to collect leak test samples in accordance with the procedures described in the licensee's letter dated June 15, 1982 for analysis by Gulf Nuclear, Inc.
- 14. Sealed sources containing licensed material shall not be opened or removed from the devices by the licensee.
- 15. The licensee shall conduct a physical inventory every six (6) months to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for two (2) years from the date of the inventory for inspection by the Commission, and shall include the quantities and kinds of byproduct material, location of sealed sources, and the date of the inventory.
- 16. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions."
- 17. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated May 12, 1982; and letter dated June 15, 1982. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

For the U.S. Nuclear Regulatory Commission

*John W. M. [Signature]*  
Material Licensing Branch

By \_\_\_\_\_

Division of Fuel Cycle and  
Material Safety  
Washington, D.C. 20555

AUS 02 1992

Date \_\_\_\_\_

# NUCLEAR TESTING SERVICES

Anytime

Anywhere

Specializing in Nuclear Moisture Density  
TESTING, LEASING, REPAIR

P. O. Box 26723  
Salt Lake City, Utah 84125

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1515 Major Street • Salt Lake City, Utah 84115 • (801) 467-3892

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July 14, 1982

Mr. Gary F. Eisebraun  
Chief Engineer  
Molycorp Inc.  
P.O. Box 469  
Questa, New Mexico 87556

Dear Mr. Eisebraun;

In response to a recent Nuclear Regulatory Commission Inspection we are required to maintain permanent file copies for nuclear gauge leases to specifically include the lessor's radioactive materials license copy. Toward this regulation we would need a copy of your current New Mexico radioactive materials license authorizing your possession for nuclear moisture-density gauges. This would be applicable to the regulation covered in our recent gauge lease to Union Molycorp in New Mexico.

We appreciate your consideration in sending a copy of the license at your earliest convenience.

Yours truly,

NUCLEAR TESTING SERVICES

  
Donald C. Muir

Molycorp, Inc.

Questa Division  
P. O. Box 469  
Questa, New Mexico 87556  
Telephone: (505) 586-0212



August 6, 1982

Mr. Donald C. Muir  
Nuclear Testing Services  
P.O. Box 26733  
Salt Lake City, Utah 84125

Dear Don:

In response to your July 14, 1982 letter, enclosed is a copy of Molycorp's Radiation Material License, as amended to include our Seaman gauge. Prior to this amendment, the license covered only those stationary nuclear instruments used in our milling complex.

Very truly yours,

A handwritten signature in black ink, appearing to read "Gary Eisbraun". The signature is written in a cursive style with a long horizontal stroke at the end.

Gary Eisbraun  
Chief Engineer

fa

Encl.



STATE OF NEW MEXICO

ENVIRONMENTAL IMPROVEMENT DIVISION  
RADIOACTIVE MATERIAL LICENSE

License Number NM-MOL-GA-06 is amended to become License Number NM-MOL-GA-07

Molybdenum Corporation of America  
Questa Mine  
Questa, NM 87556

In accordance with letter dated March 10, 1982, signed by Archie Trujillo, Engineering Technician, subject license is amended as follows:

To add:

- 6.G. Radium 226/Be
- 7.G. Sealed Source  
(Amersham Corp.  
Model R.A.N., W-25)
- 8.G. One Source not  
to exceed 4.5  
millicuries.
- 9.G. In Seaman Nuclear Corporation Model C-200 analyzer and density meter.

For the New Mexico HED Environmental Improvement Division

Date March 15, 1982

By Benito J. Garcia  
Benito J. Garcia - Program Manager  
Licensing and Registration Section

# NUCLEAR TESTING SERVICES

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Anywhere

Specializing in Nuclear Moisture Density  
TESTING, LEASING, REPAIR

P. O. Box 26723  
Salt Lake City, Utah 84125

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1515 Major Street • Salt Lake City, Utah 84115 • (801) 467-3892

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July 13th, 1982

Mr. Vern Permann  
J.R. Simplot Co.  
P.O. Box 912  
Pocatello Idaho 83201

Dear Mr. Permann:

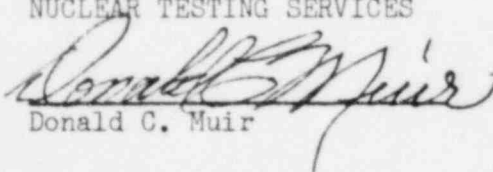
Nuclear Testing Services is currently in the process of correcting certain Nuclear Regulatory Commission deficiencies noted in a recent inspection of our operation. Among those noted was our failure to maintain a current copy of a radioactive materials license for J. R. Simplot Co. in Idaho in our file pertaining to the nuclear gauge lease transaction of August 1982 to September 1980.

It would be greatly appreciated if you would send us a copy of your current radioactive materials license, and any documents that may have been in effect during the actual lease period.

Thankyou for your prompt reply to this request,

Sincerely,

NUCLEAR TESTING SERVICES

  
Donald C. Muir

DCM/cb

NTC



MINERALS & CHEMICAL DIVISION

July 21, 1982

Nuclear Testing Services  
P. O. Box 26723  
Salt Lake City, Utah 84125

Attention: Donald C. Muir

Dear Mr. Muir:

I have enclosed a copy of the Radioactive Materials License #IDA-39-2 issued by the State of Idaho for use by the J. R. Simplot Company. This license covers the period of August 1980 to August 1982.

In your correspondence of July 13, 1982, you state the lease transaction was for the period of August 1982 to September 1980.

You will also find enclosed a copy of certification for the operators of the Nuclear Density Gauge in question.

Please contact me if you need any further assistance.

Sincerely,

*Vern Permann*

Vern Permann  
Chief Clerk/Records Coordinator

sr  
enclosures

STATE OF IDAHO  
RADIOACTIVE MATERIALS LICENSE

Pursuant to the Radiation and Nuclear Material Act (Sections 39-3001-39-3019) and the Idaho Radiation Control Regulations, Part B and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive material(s) designated below; and to use such radioactive materials for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations, and orders now or hereafter in effect of the Idaho Department of Health and Welfare and to any conditions specified below.

Licensee 1. Name J. R. Simplot Co. P.O. Box 912 2. Address Pocatello, Idaho 83201		3. License number IDA-39-2
		4. Expiration date August 31, 1982
		5. License cross reference IDA-39-1
6. Radioactive materials (element and mass number)  Americium-241:Beryllium  Cesium-137	7. Chemical and/or physical form  Sealed sources Troxler Dwg. #(A-100281 Rev.B)	8. Maximum quantity licensee may possess at any one time  10 millicuries of Cesium-137 and 50 millicuries of Americium-241:Beryllium

9. Authorized use.  
 For use in a Troxler Model 2401 gauge for soil moisture and density studies.

CONDITIONS

- ~~XX~~
10. The authorized place of use is at temporary jobsites throughout the state of Idaho.
  11. The licensee shall comply with the provisions of Part C, "Standards for Protection Against Radiation" of the Idaho Radiation Control Regulations.
  12. Radioactive material shall be used by the following individuals:
    - A. Dennis Facer
    - B. Samuel Okelberry

STATE OF IDAHO  
RADIOACTIVE MATERIALS LICENSE

CONDITIONS, continued

License Number IDA-39-2

13. Sealed sources containing radioactive material shall not be opened by the licensee.
14. A. Each sealed source containing radioactive material, other than Hydrogen-3 with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be put into use until tested.
- B. The test shall be capable of detecting the presence of 0.005 microcurie of removable contamination on the source. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Idaho Radiation Control Office.
- C. If the test reveals the presence of 0.005 microcurie of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Idaho Radiation Control Regulations. A report shall be filed within five days of receipt of test results with the Radiation Control Section, Idaho Department of Health and Welfare, Statehouse, Boise, Idaho 83720, describing the equipment involved, the test results and the corrective action taken.
- D. Tests for leakage and/or contamination shall be performed by the licensee or other persons specifically authorized by the Idaho Radiation Control Office, another Agreement State, or the U.S. Nuclear Regulatory Commission.
15. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described items 6, 7, and 8 of this license in accordance with statements, representations and procedures contained in letters dated July 8, 1980, and July 30, 1980.

Date August 18, 1980

For the Idaho Department of Health &amp; Welfare

By Robert D. FunderburgRobert D. Funderburg  
Manager  
Radiation Control Section

STATE OF KANSAS  
RADIOACTIVE MATERIALS LICENSE

Pursuant to the Nuclear Development and Radiation Control Act (L. 1963, ch. 290) and the Radiation Protection Regulations, Part 3, and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive material(s) designated below; and to use such radioactive materials for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations, and orders now or hereafter in effect of the State Department of Health and to any conditions specified below.

Licensee		3. License number
1. Name	Kansas City Testing Company 2012 West 104th Street	22-C250-01 (A 74)
2. Address	Shawnee Mission, Kansas 66206	4. Expiration date
		January 31, 1974
		5. Reference number
6. Radioactive materials (element and mass number)	7. Chemical and/or physical form	8. Maximum quantity licensee may possess at any one time
See page #2	See page #2	See page #2

CONDITIONS

9. Authorized use. (Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.)
  - A. & B. To be used as components of Troxler Model 2401 Surface Moisture-Density Testing Gauges for determining surface moisture and density of soils.
10. Radioactive material may be used at the facilities of the licensee at 2012 West 104th Street, Shawnee Mission, Kansas, 66206, and at temporary job sites of the licensee anywhere in the State of Kansas where the Kansas State Department of Health maintains jurisdiction for regulating the use of radioactive material.
11. Radioactive material shall be used by, or under the supervision of, and in the physical presence of, Thomas Werder, Robert Harris, Curtis Dempsey, Lee Spencer, Jerry Hilliard, and Harry Tormey.
12. A. Each sealed source containing radioactive material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be put into use until tested.

STATE OF KANSAS  
RADIOACTIVE MATERIALS LICENSE

Supplementary Sheet:

License Number 22-C250-01

6. Radioactive materials (element and mass number)	7. Chemical and/or physical form	8. Maximum quantity licensee may possess at any one time
A. Radium-226/Beryllium	A. Sealed sources (Troxler Drawing No. A-100280 Rev. B)	A. 4 sources total, not to exceed 3.0 milligrams per source
B. Cesium-137 Americium-241/ Beryllium	B. Sealed sources (Troxler Drawing No. A-100280 Rev. B)	B. 2 sources total, not to exceed 10 millicuries Cesium-137 and 50 millicuries Americium-241 each.

CONDITIONS continued

12. B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Department.
- C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Department regulations. A report shall be filed within 5 days of the test with the Chief, Radiation Control Section, Kansas State Department of Health, Topeka, Kansas, 66612, describing the equipment involved, the test results, and the corrective action taken.
- D. Tests for leakage and/or contamination shall be performed by the licensee using the Troxler Model RK-1 leak test kit.
3. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in:
- (a) the application dated December 20, 1971 signed by Thomas A. Werder, with attachments.
  - (b) the letter dated January 11, 1972 signed by Thomas A. Werder, with attachments.
4. Sealed sources containing radioactive material shall not be opened or removed from their respective source holders by the licensee.

40

STATE OF KANSAS  
RADIOACTIVE MATERIALS LICENSE

Supplementary Sheet:

CONDITIONS

License Number 22-C250-01

15. The transportation of Kansas licensed material shall be subject to all applicable regulations of the Department of Transportation and other agencies of the United States having jurisdiction. When Department of Transportation regulations in Title 49, Chapter 1, Code of Federal Regulations, Parts 173 - 179, are not applicable to shipments by land of Kansas licensed material by reason of the fact that the transportation does not occur in interstate or foreign commerce, (1) the transportation shall be in accordance with the requirements relating to packaging of radioactive material, marking and labeling of the package, placarding of the transportation vehicle, and accident reporting set forth in the regulations of the Department of Transportation in §§ 173.389 - 173.399, 173.402, 173.414, 173.427, 49 CFR Part 173, "Shippers, " and §§ 177.823, 177.842, 177.843, 177.861, 49 CFR Part 177, "Regulations Applying to Shipments Made by Way of Common, Contract, or Private Carriers by Public Highways," and (2) any requests for modifications or exceptions to those requirements, and any notifications referred to in those requirements shall be filed with, or made to, the Kansas State Department of Health, Radiation Control Section.

FOR THE STATE DEPARTMENT OF HEALTH



By \_\_\_\_\_

Robert C. Will, Chief  
Radiation Control Section

JAN 24 1972

Date \_\_\_\_\_



**STATE OF KANSAS**  
**RADIOACTIVE MATERIALS LICENSE**

Amendment No. 1

Pursuant to the Nuclear Development and Radiation Control Act (L. 1963, ch. 290) and the Radiation Protection Regulations, Part 3, and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive material(s) designated below; and to use such radioactive materials for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations, and orders now or hereafter in effect of the State Department of Health and to any conditions specified below.

Licensee		3. License number	22-C250-01 is hereby amended in its entirety (E 76)
1. Name	Kansas City Testing Company	4. Expiration date	May 31, 1976
2. Address	2012 West 104th Street Shawnee Mission, Kansas 66206	5. Reference number	
6. Radioactive materials (element and mass number)	7. Chemical and/or physical form	8. Maximum quantity licensee may possess at any one time	
A. Radium 226/Beryllium	A. Sealed Sources (Troxler Drawing No. A-100280 Rev. B)	A. Four sources, not to exceed 3.0 milligram radium 226 per source.	

**CONDITIONS**

9. Authorized use. (Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.)
- A. To be used as components of Troxler Model 2401 Surface Moisture-Density Testing Gauges for determining surface moisture and density of soil.
10. Radioactive material may be used at facilities of the licensee at 2012 West 104th Street, Shawnee Mission, Kansas, 66206, and at temporary job sites of the licensee anywhere in the State of Kansas where the Kansas State Department of Health maintains jurisdiction for regulating the use of radioactive material.
11. Radioactive material shall be used by, or under the supervision and in the physical presence of, Harry Tormey, Junior Baskett, Zaki Hajir, Paul Hambilton, Robert Harwig, Richard Jackson, Richard Leeds, or Ray Roth.
12. A. Each sealed source containing radioactive material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be put into use until tested.

Page \_\_\_\_\_ of \_\_\_\_\_

**STATE OF KANSAS**  
**RADIOACTIVE MATERIALS LICENSE**

Supplementary Sheet

License Number 22-C250-01

12. B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Department.
- C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Department regulations. A report shall be filed within 5 days of the test with the Director, Radiation Control Program, Kansas State Department of Health, Topeka, Kansas, 66620, describing the equipment involved, the test results, and the corrective action taken.
- D. Tests for leakage and/or contamination shall be performed by the licensee using the Troxler Model RK-1 leak test kit, or by other persons specifically authorized by the Department, the United States Atomic Energy Commission, or an Agreement State to perform such services.
13. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in the application dated May 13, 1974, signed by Harry Tormey.
14. Sealed sources containing radioactive material shall not be opened or removed from their respective source holders by the licensee.
15. The transport of licensed material by the licensee, or the delivery of licensed material to a carrier for transport, shall be in accordance with the provisions of Kansas Radiation Protection Regulation 28-35-195.

FOR THE STATE DEPARTMENT OF HEALTH



Date MAY 23 1974

By \_\_\_\_\_

33-2079



12-69-4M

Robert C. Will, Director  
Radiation Control Program



STATE OF KANSAS  
RADIOACTIVE MATERIALS LICENSE

Supplementary Sheet

License Number 22-C250-01  
Amendment No. 2

Kansas City Testing Company  
2012 West 104th Street  
Shawnee Mission, Kansas 66206

License number 22-C250-01 is hereby amended as follows:

TO READ:

ITEM 3: 22-C250-01 (E 78)

ITEM 4: May 31, 1978

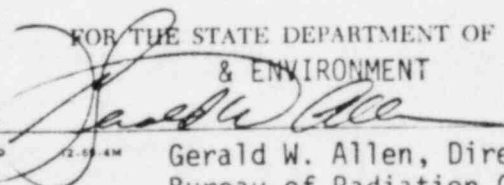
Condition 11. Radioactive material shall be used by, or under the supervision and in the physical presence of Harry Tormey, Paul Hamblton, Robert Harwig, Richard Jackson, Richard Leeds, John Lynch, Don Meador, Jerry Nusbaum, Jerry Riedel, Vance Silvers, or Dennis Torrey.

Date MAY 13 1976

33-2078

12-15-4M

By

FOR THE STATE DEPARTMENT OF HEALTH  
& ENVIRONMENT  
  
Gerald W. Allen, Director  
Bureau of Radiation Control

STATE OF KANSAS  
RADIOACTIVE MATERIALS LICENSE

Supplementary Sheet

License Number 22-C250-01

Amendment No. 3

Kansas City Testing Laboratory  
2012 West 104th Street  
Shawnee Mission, Kansas 66206

License number 22-C250-01 is hereby amended as follows:

TO READ:

ITEM 1: Kansas City Testing Laboratory

6. Radioactive materials (element and mass number) 7. Chemical and/or physical form 8. Maximum quantity licensee may possess at any one time

A. Five sources, no single source to exceed 3.0 milligram Radium 226 per source.

TO ADD:

B. Cesium 137

B. Sealed sources (Troxler Drawing Number A-102112)

B. Four sources, no single source to exceed 10.0 millicuries.

C. Americium 241/  
Beryllium

C. Sealed sources (Troxler Drawing Number A-102451)

C. Four sources, no single source to exceed 50.0 millicuries.

CONDITIONS

9. B. and C. to be used as components of Troxler model 3401 or 3411 Surface Moisture Density Gauges for determining surface moisture and density of soil.

TO READ:

11. Radioactive material shall be used by, or under the supervision and in the physical presence of, Harry Tormey, J. Dave Campbell, Carl B. Dotson, Paul Ellensohn, Paul Hamblton, Robert Harwig, Rick Jackson, Richard Leeds, John Lynch, Don Meador, Keith Payne, or Vance Silvers.

STATE OF KANSAS  
RADIOACTIVE MATERIALS LICENSE

Supplementary Sheet

License Number 22-C250-01  
Amendment No. 4

Kansas City Testing Laboratory  
2012 West 104th Street  
Shawnee Mission, Kansas 66206

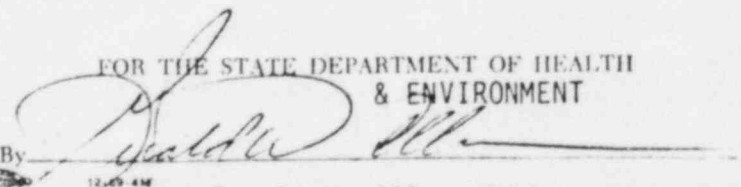
License number 22-C250-01 is hereby amended as follows:

ITEM 3: 22-C250-01 (E 80)

ITEM 4: May 31, 1980

FOR THE STATE DEPARTMENT OF HEALTH  
& ENVIRONMENT

By



Date MAR 29 1978



Gerald W. Allen, Director  
Bureau of Radiation Control



**TWIN CITY TESTING**  
and engineering laboratory, inc.

3100 BROADWAY  
BOX 1114  
BISMARCK, ND 58501  
PHONE 701/223-6149

August 8, 1980

Nuclear Testing Services  
1515 South Major Street  
Salt Lake City, UT 84115

Attn: Don Muir

Gentlemen


Subj: Nuclear Density Gauges  
Troxler Model 2401

Attached, please find a copy of our revised radioactive materials license as issued by the North Dakota Department of Health. This should take care of the difficulties with regard to shipment of the above referenced nuclear density gauges.

Also in our letter of July 21, containing the original order for two model 2401 Troxler gauges, we advised you that we may wish to purchase a third machine. We would like to purchase three machines now, instead of two, and they should all be shipped and billed as previously listed in our letter of July 21, 1980.

If you have any questions, or if you need any additional information, please contact the Bismarck office.

Very truly yours

  
Gary L. Arman, P.E.  
Operations Manager  
Western North Dakota

GLA:cma

Encs

cc: -Twin City Testing-St Paul  
Attn: Richard H Bierbaum

**U. S. NUCLEAR REGULATORY COMMISSION  
MATERIALS LICENSE**

This Copy is For Your Files

CORRECTED COPY

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 1, Parts 30, 31, 32, 33, 34, 35, 36, 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); and to import such byproduct and source material. 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.

<b>Licensee</b>		
1. Twin City Testing and Engineering Laboratory, Inc. Soils and Geology Department 2. 662 Cromwell Avenue St. Paul, Minnesota 55114		3. License number 22-01376-04
		4. Expiration date May 31, 1983
		5. Docket or Reference No.
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. Cesium 137	A. Sealed Sources (Troxler Dwg. No. A-102112)	A. 10 sources of 8 millicuries each
B. Americium 241	B. Sealed Sources (Troxler Dwg. No. A-102451)	B. 10 sources of 40 millicuries each
9. Authorized use		
A. and B. To be used in Troxler Electronic Laboratories, Inc. Model 3401 compac or 3411 portable gauges to measure moisture and surface density of material.		

**CONDITIONS**

10. Licensed material may be used at the licensee's facilities located at (1) 662 Cromwell Avenue, St. Paul, Minnesota; (2) 2730 Melby Street, Eau Claire, Wisconsin; (3) 300 South 17th Avenue, Wausau, Wisconsin; (4) 2710 Commerce Street, La Crosse, Wisconsin; (5) 1609 "C" Avenue, Sioux Falls, South Dakota; (6) Deadwood Avenue, Rapid City, South Dakota and at temporary job sites of the licensee anywhere in the United States where the Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material.

U. S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Supplementary Sheet

License Number 22-01376-04

CORRECTED COPY

Docket or  
Reference No. \_\_\_\_\_

(continued)

CONDITIONS

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."

12. Licensed material shall be used by, or under the supervision and in the physical presence of, individuals designated by, Donald Voigt or Allan Bonde and trained in accordance with the procedures contained in the licensee's application dated February 9, 1978.

13. A. (1) Each sealed source containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.

(2) 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 prior to any use or transfer to another person unless they have been leak tested within six months prior to 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. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U. S. Nuclear Regulatory Commission, Region III, Office of Inspection and Enforcement, 799 Roosevelt Road, Glen Ellyn, Illinois 60137, describing the equipment involved, the test results, and the corrective action taken.

D. 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.

MATERIALS LICENSE

Supplementary Sheet  
CORRECTED COPY

License Number 22-01376-04

Docket or  
Reference No. \_\_\_\_\_

(continued)

CONDITIONS

14. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Section 71.5, Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material For Transport."

15. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated February 9, 1978.

JUN 16 1978

Date \_\_\_\_\_

For the U. S. Nuclear Regulatory Commission

*Joseph M. Brown, Jr.*  
by Radioisotopes Licensing Branch  
Division of Materials and Fuel Cycle  
Facility Licensing  
Washington, D. C. 20555

U. S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Supplementary Sheet

License Number 22-01376-04

Docket or  
Reference No. \_\_\_\_\_

Amendment No. 01

Twin City Testing and Engineering  
Laboratory, Incorporated  
Soils and Geology Department  
662 Cromwell Avenue  
St. Paul, Minnesota 55114

In accordance with letter dated March 27, 1981, License Number 22-01376-04 is amended as follows:

Subitems 8.A. and 8.B. are amended to read:  
Items 6., 7., 8., and 9. are amended to add:

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. Cesium-137	A. Sealed Sources (Troxler Dwg. No. A-102112)	A. No single source to exceed 9 millicuries
B. Americium-241	B. Sealed Sources (Troxler Dwg. No. A-102451)	B. No single source to exceed 50 millicuries
C. Cesium-137/ Americium-241	C. Sealed Sources (Troxler Dwg. No. A-100281)	C. No single source to exceed 10 millicuries of Cesium-137 and 50 millicuries of Americium-241

9. Authorized use

C. To be used in Troxler Electronic Laboratories, Inc. Model No. 2401 portable gauges to measure moisture and surface density of material.

Conditions 10. and 15. are amended to read:

10. Licensed material may be used at the licensee's facilities located at (1) 662 Cromwell Avenue, St. Paul, Minnesota; (2) 3908 Commerce Court Southwest, Rochester, Minnesota; (3) 2730 Melby Street, Eau Claire, Wisconsin; (4) 5807 1/2 Prairie Street, Weston Meadow, Schofield, Wisconsin; (5) 705 Hickory Farm Lane, Appleton, Wisconsin; (6) 2710 Commerce Street, LaCrosse, Wisconsin; (7) 529 Logan Avenue, Waterloo, Iowa; (8) 601 East 48th Street North, Sioux Falls, South Dakota; (9) Rural Route 4, Box 55-G, Rapid City, South Dakota; (10) 341 East "E" Street, Casper, Wyoming; (11) 3306 East 2nd Street - Unit B, Gillette, Wyoming and 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 the licensed material.



MATERIALS LICENSE

Supplementary Sheet

License Number 22-01376-04

Docket or  
Reference No. \_\_\_\_\_

Amendment No. 01

Continued From Page 1

Conditions amended:

15. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6., 7., and 8. of this license in accordance with statements, representations, and procedures contained in application dated February 9, 1978; and letter dated March 27, 1981. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

Conditions 16., 17., and 18. are added:

16. The licensee shall conduct a physical inventory every six (6) months to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for two (2) years from the date of the inventory for inspection by the Commission, and shall include the quantities and kinds of byproduct material, location of sealed sources, and the date of the inventory.

17. Sealed sources containing licensed material shall not be opened or removed from gauges by the licensee.

18. Maintenance, repair, and initial radiation survey of devices containing licensed material and installation, replacement, and disposal of sealed sources containing licensed material used in devices shall be performed only by the manufacturer or by other persons specifically authorized by the Commission or an Agreement State to perform such services.

MAY 14 1981

Date \_\_\_\_\_

For the U. S. Nuclear Regulatory Commission

*John W. Cropper*  
by \_\_\_\_\_  
Material Licensing Branch

Division of Fuel Cycle and  
Material Safety  
Washington, D.C. 20555

RADIOACTIVE MATERIAL LICENSE

Amendment No. 02

Pursuant to Section 23-20.1-01 through Section 23-20.1-11 of Chapter 23-20.1 of the North Dakota Century Code, and Regulation 83 of the North Dakota State Department of Health, Radiological Health Regulations, Part Three, and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive materials for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders now or hereafter in effect of the North Dakota State Department of Health and to any conditions specified below:

Licensee		3. License Number
1. Name	Twin City Testing and Engineering Laboratory, Inc.	33-01376-01 is amended in its entirety in accordance with applications dated April 28, 1975; June 13, 1975 and August 28, 1975.
2. Address	662 Cromwell Avenue St. Paul, Minnesota 55114	4. Expiration Date October 31, 1980
		5. Reference Number
6. Radioactive Materials (element and mass number)	7. Chemical and/or physical form	8. Maximum quantity which licensee may possess at any one time
Cobalt 60	A. Sealed Sources (Automation Industries, Model 34500; Gamma Industries, Model B-2-B)	A. No single source to exceed 10 curies
B. Iridium 192	B. Sealed Sources (Automation Industries, Model 41701; Gamma Industries, Model B-1-B; Technical Operations, Model 531B; Nuclear Environmental Engineering, Model RB-1)	B. No single source to exceed 100 curies
C. Iridium 192	C. Sealed Sources (Automation Industries, Model 41701; Gamma Industries, Model B-1-B; Technical Operations, Model 531B; Nuclear Environmental Engineering Model RB-1)	C. No single source to exceed 30 curies



RADIOACTIVE MATERIAL LICENSE

(Continued)

supplemental sheet

License Number 33-01376-01

Amendment Number 02

- |   |  |  |
|---|--|--|
| 6. Radioactive Materials<br>(element and mass number) | 7. Chemical and/or physical<br>form  | 8. Maximum quantity which<br>licensee may possess at<br>any one time |
| D. Iridium 192  | D. Sealed Sources<br>(Automation Industries,<br>Model 200-520-008;<br>Gamma Industries Model<br>B-8-B; Nuclear Environ-<br>mental Engineering,<br>Model RA-17) | D. No single source to<br>exceed 100 curies                          |
| E. Iridium 192  | E. Sealed Sources<br>(Technical Operations,<br>Model A-424-9; Nuclear<br>Environmental Engineering,<br>Model TR-15)  | E. No single source<br>to exceed 100 curies                          |
| F. Radium 226   | F. Sealed Sources<br>(Troxler Drawing Number<br>A-100280, Revision B)  | F. No single source to<br>exceed 5 millicuries                       |
| G. Radium 226   | G. Sealed Sources<br>(Campbell-Pacific,<br>Model 131-1)  | G. No single source to<br>to exceed 5 millicuries                    |

---

9. Authorized Use:

- A. For use in Automation Industries Model 110AB exposure device for industrial radiography and in Automation Industries Model I-563 or Gamma Industries Model C-8 source changers for storage and replacement of sources.
- B. For use in Automation Industries Model 100A or 100A-1 exposure devices for industrial radiography and in Automation Industries Model 41026, Gamma Industries Model C-10, Technical Operations Model 414 or 650, or Nuclear Environmental Engineering Model RC-6C source changers for storage and replacement of sources.



RADIOACTIVE MATERIAL LICENSE

License Number 33-01376-01

(Continued)

supplemental sheet

Amendment Number 02

9. Authorized Use:

- C. For use in Automation Industries Model 40BA exposure devices for industrial radiography and in Automation Industries Model 41026, Gamma Industries Model C-10, Technical Operations Model 414 or 650, or Nuclear Environmental Engineering Model RC-6C source changers for storage and replacement of sources.
- D. For use in Automation Industries Model 520 exposure devices for industrial radiography and in Automation Industries Model 43868, Gamma Industries Model C-10, or Nuclear Environmental Engineering Model RC-6C source changers for storage and replacement of sources.
- E. For use in Technical Operations Model 660 exposure devices for industrial radiography and in Technical Operations Model 414 or 650, or Nuclear Environmental Engineering Model RC-6C source changers for storage and replacement of sources.
- F. For use in Troxler Model 2401 Soil Moisture/Density Gauges for soil measurements.
- G. For use in Campbell-Pacific Portaprobe Model BR Soil Moisture/Density Gauges for soil measurements.

CONDITIONS

- 10. The authorized places of use are the North Dakota headquarters of the licensee located at 2105 7th Avenue North in Fargo, North Dakota; U.S. Highway 2 East in Minot, North Dakota; 2003 Gateway Drive in Grand Forks, North Dakota; and 3100 East Broadway in Bismarck, North Dakota, and temporary jobsites of the licensee in the State of North Dakota.
- 11. The licensee shall comply with the provisions of Part 4 of Regulation 83 of the North Dakota State Department of Health, "Standards for Radiation Protection", and Part 6, "Industrial Radiography."
- 12. Radioactive material shall be used by, or under the supervision of, individuals designated by the Radiation Safety Officer, Howard T. Schulze.
- 13. Each sealed source containing radioactive material shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be put into use until tested.

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

RADIOACTIVE MATERIAL LICENSE

License Number 33-01376-01

(Continued)

supplemental sheet

Amendment Number 02

CONDITIONS

leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.

The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Department.

If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Department regulations. A report shall be filed within 5 days of the test with the Director, Division of Environmental Engineering, North Dakota State Department of Health, State Capitol, Bismarck, North Dakota, 58505, describing the equipment involved, the test results, and the corrective action taken.

Tests for leakage and/or contamination shall be performed by the licensee in accordance with procedures contained in "the Administrative Manual for Supervisors of the Radiography Program at Twin City Testing and Engineering Laboratory, Inc.," revision dated September 15, 1975.

14. Sealed sources containing radioactive material shall not be opened.
15. The licensee is authorized to receive, possess, and use sealed sources of Iridium 192 or Cobalt 60 where the radioactivity exceeds the maximum amount of radioactivity specified in Item 8 of this license provided:
  - A. Such possession does not exceed the quantity per source specified in Item 8 by more than 20% for Iridium 192 or 10% for Cobalt 60;
  - B. Records of the licensee show that no more than the maximum amount of radioactivity per source specified in Item 8 of the license was ordered from the supplier or transferor of the radioactive material; and

RADIOACTIVE MATERIAL LICENSE

License Number 33-01376-01

(Continued)

supplemental sheet

Amendment Number 02

CONDITIONS

- C. The levels of radiation for radiographic exposure devices and storage containers do not exceed those specified in Section 6.310 of Regulation 83 of the Department.
16. Pursuant to Section 1.110 of Regulation 83 of the Department, the licensee is authorized to possess, use, transfer and import up to 450 kilograms of uranium contained as shielding material in the radiography exposure devices and source changers authorized by this license.
  17. Quarterly inventory records, utilization logs, personnel exposure records, radiation survey records, leak test records, receipt and transfer records, and disposal records for radioactive material authorized by items 6.A. through 6.E. shall be maintained at the Fargo branch office.
  18. Personnel exposure records, leak test records, receipt and transfer records, and disposal records for radioactive material authorized by items 6.F. and 6.G. shall be maintained at the Fargo office.
  19. Each branch office shall maintain the records listed in Conditions 17. and 18. above for the radioactive material used or stored at the individual branch offices.
  20. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in applications dated July 28, 1971, November 27, 1973, and June 13, 1975; letters dated April 28, 1975, and August 28, 1975; and Twin City Testing and Engineering Laboratory, Inc., Supervisor's and Radiographer's Manual revised September 15, 1975.

Date: 12/10/75

FOR THE NORTH DAKOTA STATE DEPARTMENT OF HEALTH:

by Gene A. Christianson

Gene A. Christianson, Director  
Division of Environmental Engineering

RADIOACTIVE MATERIAL LICENSE

supplemental sheet

License Number 33-01376-01  
Amendment No. 03

Twin City Testing and Engineering  
Laboratory, Inc.  
662 Cromwell Avenue  
St. Paul, Minnesota

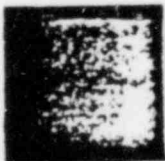
In accordance with application dated May 19, 1977, License No.  
33-01376-01 is amended as follows:

To Add:

- | 6. Radioactive Materials<br>(element and mass number) | 7. Chemical and/or<br>physical form                | 8. Maximum quantity<br>which licensee may<br>possess at any one<br>time |
|---|--|---|
| H. Cesium 137   | H. Sealed sources<br>(Troxler Drawing<br>A-102112) | H. No single source<br>to exceed 8<br>millicuries                       |
| I. Americium 241                                      | I. Sealed Sources<br>(Troxler Drawing<br>A-102451) | I. No single source<br>to exceed 40<br>millicuries                      |

9. Authorized Use:

H. and I. For use in Troxler Model 3401 or 3411 COMPAC Surface  
Moisture/Density gauge.



NORTH DAKOTA STATE DEPARTMENT OF HEALTH

Page 2 of 2 pages

RADIOACTIVE MATERIAL LICENSE

License Number 33-01376-01

supplemental sheet

Amendment No. 03

(Continued)

To Revise Conditions 11. and 15.:

11. The licensee shall comply with the provisions of R23-20.1-04, "Standards for Protection Against Radiation", R23-20.1-05, "Radiation Safety Requirements for Industrial Radiographic Operations", and R23-20.1-10, "Notices, Instructions and Reports to Workers; Inspections", of the Radiological Health Regulations of the State of North Dakota.
  
15. The licensee is authorized to receive, possess, and use sealed sources of Iridium 192, Cobalt 60, Cesium 137, or Americium 241 where the radioactivity exceeds the maximum amount of radioactivity specified in Item 8 of this license provided:
  - A. Such possession does not exceed the quantity per source specified in Item 8 by more than 20 percent for Iridium 192, and 10 percent for Cobalt 60, Cesium 137, and Americium 241;
  
  - B. Records of the licensee show that no more than the maximum amount of radioactivity per source specified in Item 8 of the license was ordered from the supplier or transferer of the radioactive material; and
  
  - C. The levels of radiation for radiographic exposure devices and storage containers do not exceed those specified in 05.401 of Regulation R23-20.1-05.

Date: 5/25/77

FOR THE NORTH DAKOTA STATE DEPARTMENT OF HEALTH:

by



Director, Division of Environmental  
Engineering



RADIOACTIVE MATERIAL LICENSE

License Number 33-01376-01

supplemental sheet

Amendment No. 05

Twin City Testing and  
Engineering Laboratory, Inc.  
662 Cromwell Avenue  
St. Paul, MN 55114

In accordance with application dated July 30, 1980, License  
No. 33-01376-01 is ammended as follows:

To add:

- |   |   |  |
|---|---|--|
| 6. Radioactive Materials<br>(element and mass number) | 7. Chemical and/or<br>physical form                   | 8. Maximum quantity<br>which licensee<br>may possess at<br>any one time. |
| K. Americium 241                                      | K. Sealed source<br>(Troxler Drawing<br>No. A 100281) | K. No single<br>source to<br>exceed 50<br>millicuries                    |
| L. Cesium 137   | L. Sealed source<br>(Troxler Drawing<br>No. A 100281) | L. No single<br>source to<br>exceed 10<br>millicuries                    |
9. Authorized Use:
- K. and L. For use in Troxler Model 2401 Surface Moisture/Density  
Gauge.

Date: 8/6/80

FOR THE NORTH DAKOTA STATE DEPARTMENT OF HEALTH:  
by Dana K. Mount  
Dana K. Mount, Director  
Division of Environmental Engineering

## RADIOACTIVE MATERIAL LICENSE

Amendment No. 06

Pursuant to Section 23-20.1-01 through Section 23-20.1-11 of Chapter 23-20.1 of the North Dakota Century Code, and Article 33-10 of the North Dakota State Department of Health, and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess, and use the radioactive materials for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders now or hereafter in effect of the North Dakota State Department of Health and to any conditions specified below:

Licensee		3. License Number 33-01376-01 is amended in its entirety in accordance with application dated 9/26/80, 2/10/81
1. Name	Twin City Testing & Engineering Laboratory, Inc.	4. Expiration Date
2. Address	662 Cromwell Avenue St. Paul, Minnesota 55114	May 31, 1986
		5. Reference Number
6. Radioactive Materials (element and mass number)	7. Chemical and/or physical form	8. Maximum quantity which licensee may possess at any one time
A. Cobalt 60	A. Sealed sources (Gamma Ind. Model B-2-G)	A. No single source to exceed 10 curies
B. Iridium 192	E. Sealed sources (Gamma Ind. Model B-1-G or Gulf Nuclear, Inc. Model RBR-1)	B. No single source to exceed 100 curies
C. Iridium 192	C. Sealed sources (Gamma Ind. Model B-1-G or Gulf Nuclear, Inc. Model RBR-1)	C. No single source to exceed 30 curies
D. Iridium 192	D. Sealed sources (Gamma Ind. Model B-8-6 or Gulf Nuclear, Inc. Model RT-15)	D. No single source to exceed 100 curies
E. Iridium 192	E. Sealed sources (Tech. Ops., Inc. Model A-424-9 or Gulf Nuclear, Inc. Model TR-15)	E. No single source to exceed 100 curies
F. Radium 226	F. Sealed sources (Troxler Dwg A-100280 Rev.B)	F. No single source to exceed 5 milli-curies
G. Radium 226	G. Sealed sources (RaBe Campbell Pacific Model 131-10)	G. No single source to exceed 5 milli-curies

RADIOACTIVE MATERIAL LICENSE

License Number 33-01376-01

Amendment No. 06

(6, 7, & 8 Continued)

supplemental sheet

6. Radioactive Materials (element & mass number)	7. - Chemical and/or physical form	8. Maximum quantity which licensee may possess at any one time.
H. Cesium 137	H. Sealed sources (Troxler Dwg A-102112)	H. No single source to exceed 8 milli-curies
I. Americium 241	I. Sealed source (AmBe Troxler Dwg A-102451)	H. No single source to exceed 40 milli-curies
J. Cobalt 60	J. Sealed sources (Tech. Ops., Inc. Model A-424-18)	J. No single source to exceed 30 curies
K. Americium 241	K. Sealed sources (AmBe Troxler Dwg A-100281)	K. No single source to exceed 50 milli-curies
L. Cesium 137	L. Sealed sources (Troxler Dwg A-100281)	L. No single source to exceed 10 milli-curies

9. Authorized Use:

- A. For use in Automation Industries Model 110A-B exposure device and in Gamma Industries Model C-8 source changer for storage and replacement of sources.
- B. For use in AII Models 100A or 100A-1 exposure devices and in Gamma Industries Model C-10 or Gulf Nuclear, Inc. Model RC-6C source changers for storage and replacement of sources.
- C. For use in AII Model 40BA exposure device and in Gamma Industries Model C-10 or Gulf Nuclear, Inc. Model RC-6C source changers for storage and replacement of sources.
- D. For use in AII Model 520 exposure device and in Gamma Industries Model C-10 or Gulf Nuclear, Inc. Model RC-6C source changers for storage and replacement of sources.

RADIOACTIVE MATERIAL LICENSE

(9. Authorized Use: Continued)

supplemental sheet

License Number 33-01376-01

Amendment No. 06

- E. For use in Technical Operations, Inc. Model 660 exposure device and in Technical Operations, Inc. Models 414 or 650 or Gulf Nuclear, Inc. Model RC-6C source changers for storage and replacement of sources.
- F. For use in Troxler Gauge Model 2401 for soil moisture/density measurements.
- G. For use in Campbell-Pacific Portaprobe Model BR for soil moisture/density measurements.
- H. and I. For use in Troxler Model 3401 or 3411 Compac surface moisture/density gauge.
- J. For use in Technical Operations, Inc. Model 741 exposure device.
- K. and L. For use in Troxler Gauge Model 2401 for soil moisture/density measurements.

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CONDITIONS

- 10. Licensed material may be used at 3100 E. Broadway, Bismarck, North Dakota; 2105 7th Avenue North, Fargo, North Dakota; 2033 Gateway Drive, Grand Forks, North Dakota; Highway 2E, Minot, North Dakota; and at temporary job sites of the licensee in the State of North Dakota.
- 11. The licensee shall comply with the provisions of Chapter 33-10-04, "STANDARDS FOR PROTECTION AGAINST RADIATION", Chapter 33-10-15, "RADIATION SAFETY REQUIREMENTS FOR INDUSTRIAL RADIOGRAPHIC OPERATIONS", and Chapter 33-10-10, "NOTICES, INSTRUCTIONS AND REPORTS TO WORKERS-INSPECTIONS."
- 12. Radioactive material shall be used by, or under the supervision of, individuals designated by Howard T. Schulze, company Radiation Safety Officer or Gary L. Arman, North Dakota Radiation Safety Officer.
- 13. A. Each sealed source containing radioactive material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the

RADIOACTIVE MATERIAL LICENSE

(CONDITIONS Continued)

License Number 33-01376-01  
Amendment No. 06

supplemental sheet

absence of a certificate from a transferor, indicating that a test has been taken within six months prior to the transfer, the sealed source shall not be put into use until tested.

- B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Department.
- C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated, repaired, and retested or to be disposed of in accordance with Department regulations. A report shall be filed within five (5) days of the test with the Director, Division of Environmental Engineering, North Dakota State Department of Health, Missouri Office Building, 1200 Missouri Avenue, Room 304, Bismarck, North Dakota 58505, describing the equipment involved, the test results, and the corrective action taken.
- D. Tests for leakage and/or contamination shall be performed by the licensee, or by other persons specifically authorized by the Department, another Agreement State, or the U.S. Nuclear Regulatory Commission to perform such services.

14. The licensee is authorized to receive, possess, and use sealed sources of Iridium 192 and Cobalt 60, where the radioactivity exceeds the maximum amount of radioactivity specified in Item 8 of this license provided:

- A. Such possession does not exceed the quantity per source specified in Item 8 by more than 20% for Iridium 192 or 10% for Cobalt 60.
- B. Records of the licensee show that no more than the maximum amount of radioactivity per source specified in Item 8 of the license was ordered from the supplier or transferor of the radioactive material; and

RADIOACTIVE MATERIAL LICENSE

(CONDITIONS Continued)

supplemental sheet

License Number 33-01376-01

Amendment No. 06

- C. The levels of radiation for radiographic exposure devices and storage containers do not exceed those specified in Section 33-10-05-04.1 of Chapter 33-10-05.
15. Pursuant to Section 33-10-01-05. of Chapter 33-10-01., the licensee is authorized to possess, use, transfer and import up to 450 kilograms of uranium contained as shielding material in the radiography exposure devices and source changers authorized by this license.
16. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in applications and letters dated September 26, 1980, October 10, 1980, and February 10, 1981.

Date: 5/11/81

FOR THE NORTH DAKOTA STATE DEPARTMENT OF HEALTH:

by Dana K. Mount

Dana K. Mount, Director

Division of Environmental Engineering

RADIOACTIVE MATERIAL LICENSE

supplemental sheet

License Number 33-01376-01

Amendment No. 07

Twin City Testing and Engineering  
Laboratory, Inc.  
562 Cromwell Avenue  
St. Paul, Minnesota 55114

In accordance with application dated May 19, 1981, License Number 33-01376-01 is amended as follows:

To Revise Condition 7.D. to read:

7.D. Sealed sources (Gamma Industries Model B-8-G or Gulf Nuclear, Inc. Model RAG-17)

To Revise Condition 7.E. to read:

7.E. Sealed sources (Tech/Ops, Inc. Model A-424-9 or Gulf Nuclear, Inc. Model RT-15)

To Revise Condition 7.G. to read:

7.G. Sealed sources (RaBe Campbell Pacific Model 131-1)

Date:

5/27/81

FOR THE NORTH DAKOTA STATE DEPARTMENT OF HEALTH:

by

Dana K. Mount, Director

Environmental Engineering

# NUCLEAR TESTING SERVICES

*Anytime*

*Anywhere*

Specializing in Nuclear Moisture Density  
TESTING, LEASING, REPAIR

P. O. Box 26723

Salt Lake City, Utah 84125

---

1515 Major Street • Salt Lake City, Utah 84115 • (801) 467-3892

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July 14th, 1982

Western Testing Laboratories  
Mr. Wally Perkins  
775 Sheridan Blvd.  
Denver, Colorado 80214

Dear Mr. Perkins;

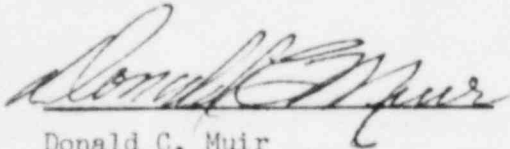
In accord with the applicable Nuclear Regulatory Commission regulations pertaining to Nuclear Gauge leasing, and sale, or other transfer of possession for radioactive materials it is necessary for us to have a current copy of your radioactive materials license in our file.

Copies of your Colorado License authorizing possession for nuclear gauges dating back to April 12th, 1982 would also be appreciated to satisfy the deficiencies reported by the Nuclear Regulatory Commission in a recent inspection.

Also in compliance with the applicable provisions for shipping and receiving nuclear gauges; Nuclear Testing Services policy will preclude acceptance and service of units not shipped with proper shipping forms, source documentation and in the proper N.R.C. approved containers. Source locks must also be in place on all units delivered to Nuclear Testing Services.

Thankyou for your attention to the license copy request and your cooperation in transporting gauges to and from our service area.

Yours truly;



Donald C. Muir  
NUCLEAR TESTING SERVICES





# COLORADO DEPARTMENT OF HEALTH

Richard D. Lamm  
Governor

Frank A. Traylor, M.D.  
Executive Director

December 31, 1980

Nuclear Testing  
1515 So. Major Street  
Salt Lake City, Utah 84115

ATTN: Don Muir

Dear Mr. Muir:

Western Testing Laboratories license condition 8.A. has been amended to read:  
No single source to exceed 10 millicuries of Cesium 137 and 50 millicuries  
of Americium 241. These materials are to be used in Troxler Model 2401  
surface moisture density gauges.

Sincerely,

*Michael L. Brown*  
Michael L. Brown  
Health Physicist  
Radiation and Hazardous  
Wastes Control Division

MLB/ddb

cc: Wally Perkins  
Western Testing Laboratories, Inc.  
96 South Zuni St.  
Denver, CO 80223

STATE OF COLORADO  
COLORADO DEPARTMENT OF HEALTH  
RADIOACTIVE MATERIALS LICENSE

License Number Colo. 189-01  
(Amendment No. 2)  
(Expiration Date: July 31, 1983)

Western Testing Laboratories, Inc.  
775 Sheridan Blvd.  
Denver, Colorado 80214

In accordance with letter dated November 25, 1980 License Number Colo. 189-01 is amended as follows:

Item 8.A., is amended to read:

8.A. No single source to exceed 10 millicuries of Cesium 137 and 50 millicuries of Americium 241.

Condition 12 is amended to read:

- 12.A. Radioactive material shall be used by, or under the supervision of, individuals designated by the Radiation Safety Officer, Wallace E. Perkins.
- B. The licensee shall maintain written records indicating the date and basis of approval of designated users in field operations.

FOR THE COLORADO DEPARTMENT OF HEALTH

Date April 14, 1981  
ORH-2H-18 Rev. 1 (7-31-76)

By *W. E. Perkins*

*This copy is for filing*

**MATERIALS LICENSE**

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 1, Parts 30, 31, 32, 33, 34, 35, 36, 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); and to import such byproduct and source material. 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		
1. Town of Douglas		3. License number 49-19967-01
2. 130 South Third Street Douglas, Wyoming 82633		4. Expiration date March 31, 1987
		5. Docket or Reference No.
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. Cesium 137/ Americium 241	A. Combined sealed sources (Troxler Dwg. A-102281)	A. Not to exceed 10 milli- curies of Cesium 137 and 50 millicuries of Americium 241 per source
B. Cesium 137	B. Sealed sources (Troxler Dwg. A-102112)	B. Not to exceed 10 milli- curies per source
C. Americium 241	C. Sealed neutron sources (Troxler Dwg. A-102451)	C. Not to exceed 50 milli- curies per source

9. Authorized use

- A. For use in Troxler Model 2401, 2402, 2451, and 2452 gauges to measure properties of material.
- B. and C. For use Troxler Model 3401, 3401B, 3411, or 3411B gauges to measure properties of materials.

CONDITIONS

- 10. Licensed material may be used at the licensee's facilities at 130 South Third Street, Douglas, Wyoming and 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.

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number	49-19967-01
Docket or Reference number	

CONDITIONS

(continued)

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."
12. Licensed material shall be used by, or under the supervision and in the physical presence of, Stephen Bennett, Gary Case, or Richard Cayer.
13. Sealed sources containing licensed material shall not be opened or removed from the portable gauges by the licensee.
14. A. (1) Each sealed source containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.  
  
(2) 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 prior to any use or transfer to another person unless they have been leak tested within six months prior to 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. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.  
  
C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U. S. Nuclear Regulatory Commission, Region IV, Office of Inspection and Enforcement, 611 Ryan Plaza Drive,

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number

49-19967-01

Docket or Reference number

14. continued

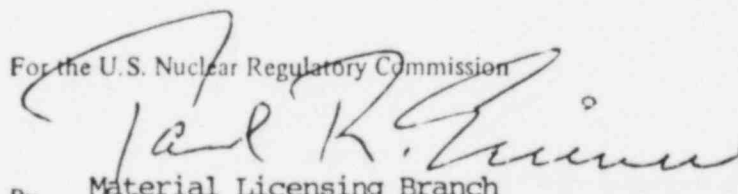
D. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State to perform such services.

15. The licensee shall conduct a physical inventory every six (6) months to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for two (2) years from the date of the inventory for inspection by the Commission, and shall include the quantities and kinds of byproduct material, location of sealed sources, and the date of the inventory.

16. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions."

17. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated December 1, 1981; and letter dated February 4, 1982. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

For the U.S. Nuclear Regulatory Commission



By Material Licensing Branch

Division of Fuel Cycle and  
Material Safety  
Washington, D.C. 20555

Date MAR 29 1982

TRANSPORTATION  
CERTIFICATE FOR  
NUCLEAR GAGE

DATE \_\_\_\_\_  
TIME \_\_\_\_\_  
DESTINATION \_\_\_\_\_

NATURE AND QUANTITY OF CONTENT					PACKAGE			
Proper Shipping Name	Radio-nuclid	Group	Form	Activity		Category	Transport Index	Type
For U.S. Shipments See Section 2 CAB 82, Tariff 6-D	Name Or Symbol of Principal Radioactive Content	Group Number of Groups I To VII	Chemical Form And Physical State (Gas/Liquid/Solid) or Special Form, or Special Encapsulation	Number Of Curies, or Milli-Curies	Number Of Packages	I-White or II-Yellow or III-Yellow Label	For Yellow Label Categories Only	Industrial or Type A, or Type B
Radioactive Materials, Special Form (n.o.s.)  IATA Article # 2129	Cs 137 Am 241	III I	Special Form		I	II - Yellow	0.1	Type A

This certifies that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, labelled and in proper condition for transportation according to applicable national government regulations.



Evaluation of Transport Case Drawing # C-100260 as USA DOT 7A

For Model(s) 2400

Description of Radioactive Source(s)

Combined source: 50 mCi  $\pm$  10% americium-241/beryllium and 8 mCi  $\pm$  10% cesium-137 [Troxler drawing certification A-100281, ANSI Classification C54544, and Special Form Number GB:SFC 113 (form included)].

- 1) Label(s): List each and their position on Transport Case.

The transport case has one U.S. DOT Yellow II plate showing a Transport Index of 0.5 on both sides. One Special Form Type A Radioactive Material USA DOT 7A plate and one identification plate which states: model, serial number of the gauge, manufacturer's name and address. These are on the top of the case.

- 2) Shielding incorporated within the instrument (include Radiation Profile):

Troxler Drawing # D-100425 (drawing included)

Give brief description: The source capsule is placed in a stainless steel source rod which is fusion welded. The source rod is then installed in the gauge. In the safe or transport position the source rod is surrounded by tungsten and lead shielding.

- 3) Internal bracing or cushioning for Transport Case. Yes  No

Material composition: 2 PCF polyethylene closed cell foam, 1" thick  
3/8" plywood, wooden block

- A) Is material adequate to assure the distance from inner container to the outside wall remains within the limits of package design?

Yes  No  Explain:

The gauge is constrained by a wooden block at the top and a plywood partition at the bottom. The base of the gauge is surrounded by polyethylene foam. These inserts constrain the gauge from moving in any direction.

- B) Is material adequate to assure that external radiation levels will not exceed the transport index when being transported?

Yes  No  Explain:

The inserts will hold the gauge securely in place (see 3-A above), maintaining the proper spacing from source to transport case surface, so that correct external radiation levels are maintained.



#### 4) Transport Case

Material composition: 3/4" Exterior Plywood

- A) Describe hardware which is incorporated in the case that will maintain the gauge in the case during transport.

Lid hinges on a nickel plated, cold-rolled steel hinge. Two cad-plated, cold-rolled steel, draw pull tension latches hold case shut.

- B) Will the material composition and design be able to withstand environmental conditions, so as not to release the radioactive material, maintain the effectiveness of the case and maintain shielding efficiency and leak tightness when exposure to:

1) (Heat) Direct sunlight at an ambient temperature of 130° F in still air?

Yes. At 180°F the plywood showed no delamination or any other significant effects.

2) Cold, an ambient temperature of -40°F in still air and shade?

Yes. At -40°F the plywood showed no significant effects.

3) Reduce pressure, ambient atmospheric pressure of 0.5 atmosphere (absolute) (7.3 PSIA)

Yes. Atmospheric pressure has no effect on the case.

4) Vibration normally incident to transportation?

Yes. A 24 hour vibration test with a displacement of 0.1" @ 12.5 Hz has no effect on the case or contents.

1) WATER SPRAY: Subject packaging to a water spray heavy enough to keep the entire surface of the package except the bottom continuously wet during a period of 30 minutes.

Exempt? No  Yes  Reason for exemption: Wood is exempt.

2) FREE DROP: Between 1 1/2 and 2 1/2 hours after the water spray test, drop the case from a distance of 4 feet onto a flat essentially unyielding horizontal surface, striking the surface in a position for which maximum damage is expected.

Exempt? No  Yes  Reason for exemption: See Item #1 Above.

3) CORNER DROP: A free drop onto each corner of the package in succession from a height of 1 foot onto a flat essentially unyielding horizontal surface.

Exempt? No  Yes  Reason for Exemption: Gross weight exceeds 110 pounds

4) PENETRATION: Impact of the hemispherical end of a vertical steel cylinder 1 1/4 inches in diameter and weighing 13 pounds, dropped from a height of 40 inches onto the exposed surface of the package which is expected to be most vulnerable to puncture. The long axis of the cylinder shall be perpendicular to the package surface.

Visual Description of Damage: Small indentation at point of impact

Surface Dose Rate Prior 5 mrem/hr After 5 mrem/hr

Dose Rate @ 3 Feet Prior 0.4 mrem/hr After 0.4 mrem/hr

Initial WWE

5) COMPRESSION: A compression load equal to either five times the weight of the package or 2 pounds per square inch multiplied by the maximum horizontal cross section of the package, whichever is greater. The load shall be applied during a period of 24 hours, uniformly against the top and bottom of the package in the position in which the package would normally be transported.

Visual Description of Damage: No visible damage.

Surface Dose Rate Prior 5 mrem/hr After 5 mrem/hr

Dose Rate @ 3 Feet Prior 0.4 mrem/hr After 0.4 mrem/hr

Initial WWE

Signature [Handwritten Signature]

NOTES: A. This shipping case contains an electronic instrument which contains a Special Form radioactive source. The instrument itself when removed from all packing materials will meet USA DOT 7A Specifications except for transport labeling requirements. The Transport Index will increase by 0.1 or less.

B. Tests more severe than those listed above were performed during 1969 and 1970. The above tests were conducted in March, 1981 to show exact compliance to 49 CFR 178.350.

Yellow ABS

Evaluation of Transport Case Drawing number C-102187 as USA DOT 7A

For Model(s): 3401, 3411, 3401B, and 3411B

Description of radioactive source(s):

- 1) 8 millicuries  $\pm$  10% Cesium 137 [Troxler Drawing A-102112 ANSI classification of C44444, and Special Form Certification Number GB:SFC 140, (form included)]
- 2) 40 millicuries  $\pm$  10% Americium 241:Beryllium [Troxler Drawing A-102451 ANSI classification of C54444, Special Form Certification Number GB:SFC 7, (form included)]

- 1) Label(s): State each and their position on Transport Case.

The shipping case is labeled on the top and bottom with a US DOT-Yellow II plate showing a transport index of 0.1. Also, on the top is one Special Form Type A Radioactive Material USA DOT 7A and one identification plate which states the name, model and serial number of the gauge, and the manufacturer's name and address.

- 2) Shielding incorporated within the instrument (include Radiation Profile):

Troxler Drawing # D-102055 (drawing included)

Give brief description:

The Cesium capsule is placed into a stainless steel source rod which is fusion welded. The source rod is then installed in the gauge. In the safe or transport position the source rod is surrounded by tungsten shielding.

The Americium capsule is placed in the base of the gauge. It is surrounded by lead and held in place by a threaded source plug.

- 3) Internal bracing or cushioning for Transport Case. Yes  No

Material composition: 4 lb/ft<sup>3</sup> Flexible polyurethane foam.

- A) Is material adequate to assure the distance from inner container to the outside wall remains within the limits of package design?  
Yes  No  Explain:

The foam constrains the gauge from moving in any direction when the case is closed. The foam has a compressive strength of 2.5 psi for a deflection of 25%. The minimum effective area that the gauge presents to the foam on any one side is 66 in.<sup>2</sup>. The gauge weighs 36 lbs., and therefore the maximum force resulting from the weight of the gauge at any one location is 0.55 psi. The compression due to the weight of the gauge will therefore be negligible. Any momentary deflection such as that due to a drop from a height, may cause a temporary compression set of approximately 5%. Because of the resiliency of this material even permanent compression set resulting from a long term use will not exceed 10%.

- B) Is material adequate to assure that external radiation levels will not exceed the transport index when being transported?

Yes   X   No        Explain:

The foam will hold the gauge in position with negligible movement (see 3-A above), thus not exceeding allowable radiation levels at the surface of the transport case.

#### 4) Transport Case

Material composition: ABS Plastic (.300" thick sheet, before vacuum-forming)

- A) Describe hardware which is incorporated in the case that will maintain the gauge in the case during transport:

The plastic is riveted and epoxied into mating aluminum extrusions at the parting line of the case. When the case is closed the extrusions form a tongue and groove joint. Riveted to these extrusions are 1/4 turn spring-loaded tension latches, constructed of 0.05" cadmium plated SAE 4130 steel.

- B) Will the material composition and design be able to withstand environmental conditions, so as not to release the radioactive material, maintain the effectiveness of the case and maintain shielding efficiency and leak tightness when exposure to:

1) (Heat) Direct sunlight at an ambient temperature of 130° F in still air?

YES. The change in tensile, compressive, and flexural properties of ABS is small up to 180°F. The polyurethane foam also shows no significant effects when heated to 180°F.

2) Cold, an ambient temperature of -40°F in still air and shade?

YES. Mechanical properties of ABS are increased at lower temperatures, except for impact resistance. A sample of the case material was cooled to -40°F. It could not be shattered with a 16 ounce hammer. The polyurethane foam also shows no significant effects at this temperature.

3) Reduce pressure, ambient atmospheric pressure of 0.5 atmosphere (absolute) (7.3 PSIA)?

YES. Atmospheric pressure has no effect on ABS plastic.

4) Vibration normally incident to transportation?

YES. A 24 hour vibration test with a displacement of 0.1" @ 12.5 Hz has no effect on the case or contents.

1) WATER SPRAY: Subject packaging to a water spray heavy enough to keep the entire surface of the package except the bottom continuously wet during a period of 30 minutes.

Exempt? No  Yes  Reason for exemption: Plastic is exempt.

2) FREE DROP: Between 1 1/2 and 2 1/2 hours after the water spray test, drop the case from a distances of 4 feet onto a flat essentially unyielding horizontal surface, striking the surface in a position for which maximum damage is expected.

Exempt? No  Yes  Reason for exemption: See Item #1 Above.

3) CORNER DROP: A free drop onto each corner of the package in succession from a height of 1 foot onto a flat essentially unyielding horizontal surface.

Exempt? No  Yes  Reason for Exemption: Not constructed of wood or fiberboard.

4) PENETRATION: Impact of the hemispherical end of a vertical steel cylinder 1 1/4 inches in diameter and weighing 13 pounds, dropped from a height of 40 inches onto the exposed surface of the package which is expected to be most vulnerable to puncture. The long axis of the cylinder shall be perpendicular to the package surface.

Visual Description of Damage: No Visible Damage

Surface Dose Rate Prior 3.8 mrem/hr After 3.8 mrem/hr

Dose Rate @ 3 Feet Prior 0.09 mrem/hr After 0.09 mrem/hr

Initial R. W. D.

5) COMPRESSION: A compression load equal to either five times the weight of the package or 2 pounds per square inch multiplied by the maximum horizontal cross section of the package, whichever is greater. The load shall be applied during a period of 24 hours, uniformly against the top and bottom of the package in the position in which the package would normally be transported.

Visual Description of Damage: No Visible Damage

Surface Dose Rate Prior 3.8 mrem/hr After 3.8 mrem/hr

Dose Rate @ 3 Feet Prior 0.09 mrem/hr After 0.09 mrem/hr

Initial R. W. D.

Signature [Signature]

NOTES: A. This shipping case contains an electronic instrument which contains a Special Form radioactive source. The instrument itself when removed from all packing materials will meet USA DOT 7A Specifications except for transport labeling requirements. The Transport Index will increase by 0.1 or less.

B. Tests more severe than those above were performed during 1973. The above tests were conducted in March, 1981 to show exact compliance to 49 CFR 178.350.

*Cardboard Case*

Evaluation of Transport Case Drawing # B-102379 as USA DOT 7A

For Model(s) 3401, 3411, 3401B, and 3411B

Description of Radioactive Source(s)

- 1) 8 millicuries  $\pm$  10% Cesium 137 [Troxler Drawing A-102112 ANSI classification of C44444, and Special Form Certification No. GB:SFC 140, (form included)]
- 2) 40 millicuries  $\pm$  10% Americium 241:Beryllium [Troxler Drawing A-102451 ANSI classification of C54444, and Special Form Certification No. GB:SFC 7, (form included)]

- 1) Label(s): List each and their position on Transport Case.

The shipping case is labeled on the top and bottom with a US DOT-Yellow II plate showing a transport index of 0.1. Also, on the top is one Special Form Type A Radioactive Material USA DOT 7A and one identification plate which states the name, model and serial number of the gauge, and the manufacturer's name and address.

- 2) Shielding incorporated within the instrument (include Radiation Profile):

Troxler Drawing # D-102055 (drawing included)

Give brief description: The Cesium capsule is placed into a stainless steel source rod which is fusion welded. The source rod is then installed in the gauge. In the safe or transport position the source rod is surrounded by tungsten shielding.

The Americium capsule is placed in the base of the gauge. It is surrounded by lead and held in place by a threaded source plug.

- 3) Internal bracing or cushioning for Transport Case. Yes  No

Material composition: 4 lb/ft<sup>3</sup> Flexible Polyurethane Foam  
(Drawing No. D-102107)

- A) Is material adequate to assure the distance from inner container to the outside wall remains within the limits of package design?  
Yes  No  Explain:

The foam constrains the gauge from moving in any direction when the case is closed. The foam has a compressive strength of 2.5 psi for a deflection of 25%. The minimum effective area that the gauge presents to the foam on any one side is 66 in.<sup>2</sup>. The gauge weighs 36 lbs., and therefore the maximum force resulting from the weight of the gauge at any one location is 0.55 psi. The compression due to the weight of the gauge will therefore be negligible. Any momentary deflection such as that due to drop from a height, may cause a temporary compression set of approximately 5%. Because of the resiliency of this material even permanent compression set resulting from a long term use will not exceed 10%.

- B) Is material adequate to assure that external radiation levels will not exceed the transport index when being transported?  
Yes  No  Explain:

The inserts will hold the gauge securely in place (see 3-A above), maintaining the proper spacing from source to transport case surface, so that correct external radiation levels are maintained.

#### 4) Transport Case

Material composition: 200 psi Bursting Strength Corrugated Cardboard

- A) Describe hardware which is incorporated in the case that will maintain the gauge in the case during transport.

No hardware. The box is held closed by PVC tape. (Tensile strength = 35 pounds per square inch).

- B) Will the material composition and design be able to withstand environmental conditions, so as not to release the radioactive material, maintain the effectiveness of the case and maintain shielding efficiency and leak tightness when exposure to:

1) (Heat) Direct sunlight at an ambient temperature of 130° F in still air?

Yes. A box heated to a temperature of 180°F showed no delamination or any other effect due to the heat. The polyurethane foam also shows no significant effects when heated to 180°F.

2) Cold, an ambient temperature of -40°F in still air and shade?

Yes. A box cooled to a temperature of -40°F showed no effect due to the cold. The polyurethane foam also shows no significant effects at this temperature.

3) Reduce pressure, ambient atmospheric pressure of 0.5 atmosphere (absolute) (7.3 PSIA)

Yes. Atmospheric pressure has no effect on the case.

4) Vibration normally incident to transportation?

Yes. A 24 hour vibration test with a displacement of 0.1" @ 12.5 Hz has no effect on the case or contents.

TESTS

1) WATER SPRAY: Subject packaging to a water spray heavy enough to keep the entire surface of the package except the bottom continuously wet during a period of 30 minutes.

Exempt? No X Yes \_\_\_\_\_ Reason for exemption:

Visual Description of Damage: Cardboard case stayed intact, but lost some of its rigidity.

Surface Dose Rate Prior 3.8 mrem/hr After 3.8 mrem/hr

Dose Rate @ 3 Feet Prior 0.09 mrem/hr After 0.09 mrem/hr

Initial WWJ

2) FREE DROP: Between 1 1/2 and 2 1/2 hours after the water spray test, drop the case from a distances of 4 feet onto a flat essentially unyielding horizontal surface, striking the surface in a position for which maximum damage is expected.

Exempt? No X Yes \_\_\_\_\_ Reason for exemption:

Visual Description of Damage: No visible damage

Surface Dose Rate Prior 3.8 mrem/hr After 3.8 mrem/hr

Dose rate @ 3 Feet Prior 0.09 mrem/hr After 0.09 mrem/hr

Initial WWJ

3) CORNER DROP: A free drop onto each corner of the package in succession from a height of 1 foot onto a flat essentially unyielding horizontal surface.

Exempt? No X Yes \_\_\_\_\_ Reason for Exemption:

Visual Description of Damage: Dented corners in. No other damage.

Surface Dose Rate Prior 3.8 mrem/hr After 3.8 mrem/hr

Dose Rate @ 3 Feet Prior 0.09 mrem/hr After 0.09 mrem/hr

Initial WWJ

4) PENETRATION: Impact of the hemispherical end of a vertical steel cylinder 1 1/4 inches in diameter and weighing 13 pounds, dropped from a height of 40 inches onto the exposed surface of the package which is expected to be most vulnerable to puncture. The long axis of the cylinder shall be perpendicular to the package surface.

Visual Description of Damage: Polyurethane foam split at point of impact, but didn't penetrate through to gauge.

Surface Dose Rate Prior 3.8 mrem/hr After 3.8 mrem/hr

Dose Rate @ 3 Feet Prior 0.09 mrem/hr After 0.09 mrem/hr



TESTS (cont'd)

5) COMPRESSION: A compression load equal to either five times the weight of the package or 2 pounds per square inch multiplied by the maximum horizontal cross section of the package, which ever is greater. The load shall be applied during a period of 24 hours, uniformly against the top and bottom of the package in the position in which the package would normally be transported.

Visual Description of Damage: No visible damage

Surface Dose Rate            Prior 3.8 mrem/hr            After 3.8 mrem/hr

Dose Rate @ 3 Feet        Prior 0.09 mrem/hr        After 0.09 mrem/hr

Initial WWB

Signature [Handwritten Signature]

NOTES: A. This shipping case contains an electronic instrument which contains a Special Form radioactive source. The instrument itself when removed from all packing materials will meet USA DOT 7A Specifications except for transport labeling requirements. The Transport Index will increase by 0.1 or less.

\*\*\*\* QUALITY CONTROL \*\*\*\*

- A. IMMERSION TEST-THE SOURCE IS IMMERSSED IN WATER WHICH IS RAISED TO 100 DEGREES C AND HELD AT THAT TEMPERATURE FOR 10 MINUTES. THE WATER IS THEN REMOVED, THE SOURCE COOLED, AND THE PROCEDURE REPEATED TWICE. SOURCES ARE PASSED IF THE ACTIVITY EXTRACTED IN THE FINAL PROCEDURE DOES NOT EXCEED 0.005 MICROCURIES.
- B. BUBBLE TEST-THE SOURCE IS IMMERSSED IN A SUITABLE LIQUID (ETHANEDIOL) AND THE PRESSURE IN THE VESSEL REDUCED TO 100 MILLIMETERS OF MERCURY. NO BUBBLES MUST BE OBSERVED.
- C. LEAK TEST-THE SOURCE IS WIPED WITH A TISSUE, MOISTENED WITH SOLVENT; THE ACTIVITY REMOVED IS MEASURED WITH A FLOW-THRU COUNTER CAPABLE OF DETECTING 0.00005 MICROCURIES. THE REMOVEABLE ACTIVITY MUST NOT EXCEED 0.005.
- D. ANSI-THE LIMITS OF TEST FOR THE LISTED SPECIFICATION MAY BE DETERMINED BY REFERRING TO ANSI N542-1977 ISSUED BY THE AMERICAN NATIONAL STANDARDS INSTITUTE. THE CLASSIFICATION IS BASED ON SAFETY REQUIREMENTS FOR TYPICAL USES AND DEFINES TEMPERATURE, EXTERNAL PRESSURE, IMPACT, VIBRATION AND PUNCTURE.
- E. IAEA SPECIAL FORM-TESTS FOR 'SPECIAL FORM' ARE CERTIFIED BY THE COMPETENT AUTHORITY FOR THE NATION OF ISSUE BASED ON TESTS WHICH CONFORM TO IAEA SAFETY SERIES NO. 6. THE REQUIRED TESTS ARE PERCUSSION, HEAT, AND IMPACT.
- F. RECOMMENDED WORKING LIFE-A WORKING LIFE OF 15 YEARS IS RECOMMENDED FOR THIS SOURCE AND IS BASED ON TOXICITY, HALF-LIFE, INITIAL ACTIVITY, CAPSULE DESIGN AND OPERATIONAL EXPERIENCE. SOME USAGE MAY SHORTEN THIS LIFE AND IT IS THE USER'S RESPONSIBILITY TO ASSESS AT WHAT POINT DURING THE 'RECOMMENDED WORKING LIFE' THE SOURCE SHOULD BE REPLACED.

**R. S. Landauer, Jr. & Co.**

Division of Tech/Ops, Incorporated

Glenwood Science Park  
Glenwood, Illinois 60425  
Telephone (312) 755-7000

**Tech/Ops**

**Landauer**

August 5, 1982

Nuclear Testing Service  
Attn: Don Muir  
1515 Major Street  
Salt Lake City, UT 84115

Reference: Account #31186

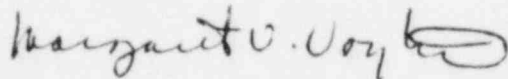
Dear Mr. Muir:

In response to your telephone request, I have enclosed copies of your dosimetry reports from exposure periods 8/10/81 through 3/10/82.

If I may be of further assistance, please contact me.

Sincerely,

R.S. LANDAUER JR. & CO.  
DIVISION OF TECH/OPS, INC.



Margaret V. Voytina  
Customer Assistance

MVV/gl



# NUCLEAR TESTING SERVICES

Anytime

Anywhere

## RADIATION DOSAGE RECORD-FILM BADGE REPORT WHOLE BODY EXPOSURE

Name *Boyd Alvey* Date of Birth *Aug. 11, 1944*

Social Security No. *528-581-481* Film Badge Code No. *0002*

Period of Exposure <i>1980</i> From - To	Dosage (mrem)			Cumulative Dosage						
				Quarter			Year			
	G	B	N	G	B	N	G	B	N	
<i>(1-10-80) - (2-9-80)</i>	<i>M</i>		<i>M</i>	<i>M</i>			<i>M</i>			
<i>(2-10-80) - (3-9-80)</i>	<i>20</i>		<i>M</i>	<i>20</i>			<i>20</i>			
<i>(4-10-80) - (5-9-80)</i>	<i>30</i>		<i>M</i>	<i>30</i>			<i>50</i>			
<i>(5-10-80) - (6-9-80)</i>	<i>30</i>		<i>M</i>	<i>60</i>			<i>80</i>			
<i>(8-10-80) - (9-9-80)</i>	<i>20</i>		<i>M</i>	<i>20</i>			<i>100</i>			
<i>(9-10-80) - (10-9-80)</i>	<i>M</i>		<i>M</i>	<i>20</i>			<i>100</i>			
<i>(10-10-80) - (11-9-80)</i>	<i>M</i>		<i>M</i>	<i>M</i>			<i>100</i>			
<i>FINAL REPORT: DELETE: ALVEY</i>										

G - Gamma;    B - Beta;    N - Neutron  
\* - Less than    mrem G;    mrem B;    mrem N

*FINAL Cumulative total 130 mrem*



# NUCLEAR TESTING SERVICES

Anytime

Anywhere

## RADIATION DOSAGE RECORD-FILM BADGE REPORT WHOLE BODY EXPOSURE

Name Donald C. Muir Date of Birth Oct 25 1933

Social Security No. 528-46-7345 Film Badge Code No. 0001

Period of Exposure From - To	Dosage (mrem)			Cumulative Dosage						
				Quarter			Year			
	G	B	N	G	B	N	G	B	N	
(1-10-80)-(2-9-80)	M		M	M				M		
(2-10-80)-(3-9-80)	40		M	40				40		
(4-10-80)-(5-9-80)	60		M	60				100		
(5-10-80)-(6-9-80)	90		M	150				190		
(7-10-80)-(8-9-80)	60		M	60				250		
(8-10-80)-(9-9-80)	20		M	80				270		
(9-10-80)-(10-9-80)	M		M	80				270		
(10-10-80)-(11-9-80)	30		M	30				300		
(11-10-80)-(12-9-80)	20			50				320		
(12-10-80)-(1-9-81)	100			150				420		

G - Gamma;                      B - Beta;                      N - Neutron  
 \* - Less than                      mrem G;                      mrem B;                      mrem N

1980/1980 Cumulative M to Date 530

# NUCLEAR TESTING SERVICES

Anytime

Anywhere

## RADIATION DOSAGE RECORD—FILM BADGE REPORT WHOLE BODY EXPOSURE

Name Donald C. Muir Date of Birth Oct 25, '33

Social Security No. 528-46-7345 Film Badge Code No. 0001

Period of Exposure 1981 From - To	Dosage (mrem)			Cumulative Dosage					
				Quarter			Year 1981		
	G	B	N	G	B	N	G	B	N
(1-10-81)-(2-9-81)	70		M	70			70		
(2-10-81)-(3-9-81)	50		M	50			120		
(3-10-81)-(4-10-81)	30		M	150			150		
Landover Note: 110 M.R. subtracted due to control dosimeter exposure									
(4-10-81)-(5-9-81)	150		M	150			300		
(5-10-81)-(6-9-81)	20		M	170			320		
(6-10-81)-(7-9-81)	50		M	220			370		
Landover Note: 60 M.R. deducted due to control dosimeter exposure									
(7-10-81)-(8-9-81)	40		M	40			410		
(8-10-81)-(9-9-81)	30		M	<del>40</del>			440		
(9-10-81)-(10-9-81)	40		M	110			480		
(10-10-81)-(11-9-81)	60		M	60			540		
(11-10-81)-(12-9-81)	90		M	150			630		
(12-10-81)-(1-9-82)	M		M	150			630		

G - Gamma;    B - Beta;    N - Neutron  
 \* - Less than    mrem G;    mrem B;    mrem N



# NUCLEAR TESTING SERVICES

Anytime

Anywhere

## RADIATION DOSAGE RECORD-FILM BADGE REPORT WHOLE BODY EXPOSURE

Name <i>Donald C. Muir</i>			Date of Birth <i>Oct. 25, '33</i>						
Social Security No. <i>528-46-7345</i>			Film Badge Code No. <i>0001</i>						
Period of Exposure <i>1982</i> From - To	Dosage (mrem)			Cumulative Dosage					
				Quarter			Year <i>1982</i>		
	G	B	N	G	B	N	G	B	N
<i>(1-10-82)-(2-9-82)</i>	<i>50</i>		<i>M</i>	<i>50</i>			<i>50</i>		
<i>(2-10-82)-(3-9-82)</i>	<i>20</i>		<i>M</i>	<i>70</i>			<i>70</i>		
<i>Landauer Note: 70 MR subtracted from personnel dosimeters</i>									
<i>(3-10-82)-(4-9-82)</i>	<i>120</i>		<i>M</i>	<i>190</i>			<i>190</i>		
<i>LANDAUER NOTE: 60 MR. Deducted due to control dosimeter exposure</i>									
<i>(4-10-82)-(5-9-82)</i>	<i>20</i>			<i>20</i>			<i>210</i>		
<i>LANDAUER NOTE: 50 MR. Deducted due to control dosimeter exposure</i>									
<i>(5-10-82)-6-9-82</i>	<i>M</i>		<i>M</i>	<i>20</i>			<i>210</i>		

G - Gamma;

B - Beta;

N - Neutron

\* - Less than

mrem G;

mrem B;

mrem N

*6-10-82 Total Permanent to Date 1370 mrem*

# NUCLEAR TESTING SERVICES

Anytime

Anywhere

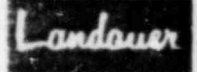
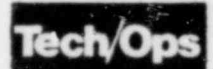
## RADIATION DOSAGE RECORD-FILM BADGE REPORT WHOLE BODY EXPOSURE

Name <i>DK. Pollock</i>			Date of Birth						
Social Security No. <i>529-383-319</i>			Film Badge Code No. <i>90</i>						
Period of Exposure From — To	Dosage (mrem)			Cumulative Dosage					
				Quarter			Year		
	G	B	N	G	B	N	G	B	N
<i>START (5-10-82)-6-9-82</i>	<i>M</i>		<i>M</i>	<i>M</i>		<i>M</i>	<i>M</i>		

G — Gamma;  
\* — Less than
B — Beta;  
mrem G;
N — Neutron  
mrem B; mrem N

# CURRENT OCCUPATIONAL RADIATION EXPOSURE

Prepared by **R. S. Landauer, Jr. & Co.**  
Division of Tech/Ops, Inc.



Glenwood Science Park  
Glenwood, Illinois 60425

ACCOUNT NO 31136	SERIES CODE	PARTICIPANT NO 00001	PREPARATION DATE MO. DAY YR 3/02/82	<input type="checkbox"/> TERMINATION REPORT	<input type="checkbox"/> FIRST REPORT FOR MONITORED INDIVIDUAL (to be completed by customer)
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### IDENTIFICATION

1. NAME (LAST, FIRST AND MIDDLE) MUIR DON	2. SOCIAL SECURITY NUMBER 528 - 46 - 7345	3. SEX M	4. DATE OF BIRTH MO. DAY YEAR 10 / 25 / 33
5. NAME OF LICENSEE OR REGISTRANT NUCLEAR TST		6. EMPLOYER - IF DIFFERENT FROM LICENSEE (COMPLETED BY CUSTOMER)	
7. CITY OR STATE REGISTRATION NUMBER		8. NRC OR AGREEMENT STATE LICENSE	

### OCCUPATIONAL EXPOSURE (EXTERNAL)

9. DOSE RECORD FOR y <input type="checkbox"/> 2	CODE: TOTAL BODY - 1 SKIN OF TOTAL BODY - 2 RIGHT HAND - 3 LEFT HAND - 4	CODE: RIGHT WRIST - 5 LEFT WRIST - 6 OTHER EXTREMITY - 7 OTHER TOTAL BODY - 8	10. METHOD OF MONITORING <input type="checkbox"/> 1	CODE: FILM BADGE - 1 POCKET CHAMBER - 2 CALCULATIONS - 3	CODE: SOLID STATE - 4 OTHER - 5								
11. PERIOD OF EXPOSURE													
MO	DAY	YR	MO	DAY	YR	12. X OR GAMMA DOSE FOR THE PERIOD (REMI) DECIMAL	13. BETA DOSE FOR THE PERIOD (REMI) DECIMAL	14. UPTAKE DOSE FOR THE PERIOD (REMI) DECIMAL	15. TOTAL DOSE FOR THE PERIOD (REMI) DECIMAL	16. TOTAL LIFETIME ACCUMULATED DOSE (REMI) DECIMAL	17. PERMISSIBLE X OR GAMMA DOSE (REMI) DECIMAL	18. UNUSED PART OF PERMISSIBLE ACC DOSE (REMI) DECIMAL	19. NUMBER OF BADGES REPORTED
1/10/81			4/09/81				490		640	1170			3
4/10/81			7/09/81				4		220	1390			3
7/10/81			10/09/81				4		140	1530			3
10/10/81			1/09/82				070		229	1720			3
							YEARLY TOTAL		1190				
20. INCEPTION DATE OF SERVICE WITH R. S. LANDAUER JR & CO. 1/79						21. PREVIOUSLY SUPPLIED TOTAL OCCUPATIONAL EXTERNAL RADIATION EXPOSURE HISTORY INCLUDED IN COLUMN 15			DECIMAL 2	22. SKIN DOSE EXPOSURE INCLUDES SUM OF X OR GAMMA BETA AND NEUTRON EXPOSURE. M INDICATES EXPOSURE LESS THAN 10 MR			

### ESTIMATE OF INTERNAL EXPOSURE (TO BE COMPLETED BY CUSTOMER)

22. PERIOD OF EXPOSURE						23. NUCLIDE(S)	24. CRITICAL ORGAN(S)	25. ESTIMATE OF EXPOSURE
MO	DAY	YR	MO	DAY	YR			

This form is for use in place of certain reports required by OSHA, NRC licensees and by state regulations (29 CFR 1910.96 n, 10 CFR 19.13 and 10 CFR 20.401 - 20.409) or for the maintenance of individual personal radiation exposure files and satisfies regulations that require reporting of exposure to employees. It contains the requisite information for NRC FORM - 5, California RH - 2365, Illinois RMA - 1, Nebraska NRH - 2, New Hampshire RCA - 7, Tennessee RNS 8-2, and other similar forms.

This report is furnished to you under the provisions of the Nuclear Regulatory Commission regulation 10 CFR part 19. You should preserve this report for further reference.