

December 28, 2021

Document Control Desk
Director, Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

RE: Incident Follow-up Report
Humboldt Nuclear Density Gauge – Serial No. 3141
License No. 24-32231-01

Document Control Desk:

This report is being provided to document the damage of a nuclear density gauge operated by a representative of Jacobi Geotechnical Engineering, Inc. (JGE), while at a construction site.

On December 3, 2021, our Humboldt 5001EZ nuclear density gauge, serial number 3141, was damaged in the field. The incident occurred at approximately 11:20 AM, at a project site located near the northeast corner of Mid Rivers Mall Drive and North Saint Peters Parkway in Saint Peters, Missouri. The project is a multi-family development consisting of apartment buildings. The JGE representative was requested on-site to perform field density testing on fill placed within the west end of Building 9.

Two contractor representatives (equipment operators) were preparing the building pad when one operator informed the JGE representative they were ready for testing. JGE began preparing the test area and performing the test when the second operator, who was operating a skid steer, travelled relatively close to the testing area, within about 5 feet. JGE and the first operator attempted to get the attention of the second operator. The first operator indicated he had made contact with the second operator, then signaled to JGE that he was okay to continue testing. At completion of the test, JGE returned the source rod to the "safe" position and prepared to record the test results; however, the second operator rapidly backed towards the testing area before results could be documented. The JGE representative was able to get out of the path of the skid steer and attempted to retrieve the nuclear density gauge but was unsuccessful.

RM Wester and Associates, Inc. (RM Wester), was called to the site to survey the gauge and area to determine if the source was still within the gauge and to collect the gauge for transportation and eventual disposal. The sources were determined to be intact within the gauge and the gauge was transferred to RM Wester, who supplied the attached report of their findings. Exposure is not anticipated to have occurred since all source materials remained intact and shielded within the gauge.

The source material involved consisted of the following:

- Cesium 137, 10 mCi, serial number 8524GQ
- Americium 241:Be, 40 mCi, serial number NJ03366

The incident was likely caused by miscommunication between the operators as well as between the first operator and the JGE representative. JGE has discussed with their authorized gauge users the importance of clear communication with operators as well as the importance of maintaining distance from moving equipment. JGE is in the process of implementing safer work practices, such as not performing density tests with the nuclear density gauge if equipment is operating in/near the testing area.

If you have any questions concerning this letter or need additional information, please call.

Sincerely,

Jacobi Geotechnical Engineering, Inc.

A handwritten signature in blue ink that reads "Christine E. Dayton". The signature is written in a cursive style.

Christine E. Dayton, P.E.
Radiation Safety Officer

Enclosure: RM Wester Report

Distribution: Luis Nieves Folch, via email: Luis.NievesFolch@nrc.gov

December 3, 2021

Ms. Christine Dayton
Jacobi Geotechnical Engineering
798 Hoff Road
O'Fallon, MO 63366

Ms. Dayton,

R. M. Wester and Associates, Inc. responded to a call from Jared Holland regarding a portable nuclear density gauge that had been run over by a skid steer. The gauge was located between Kisker Road and Mid Rivers Mall Drive off North St. Peters Parkway at a construction site. We responded to the site at approximately 12:30 pm on December 3, 2021 and found the gauge with the depth rod broken. It appeared the sources were still intact and within the gauge. Radiation levels at 3feet were background (0.2 – 0.3 mR.hr), 0.5 mR/hr at 1foot and 10 mR/hr on contact. The gauge was able to be loaded back into the case and the instrument was transported to R. M. Wester and Associates, Inc., NRC License No.: 24-20091-01.

A leak test was performed, and the results are attached. The gauge is a Humboldt Model 5001EZ, Serial number 3141. The sources are a 10 mCi Cs-137 serial 8524GQ and a 40 mCi Am-241/Be serial NJ03366.

The instrument used to detect the radiation was a Ludlum Model 3, serial 128020 with a 44-9 serial PR0123536, last calibrated April 15, 2021. The instrument was checked prior to use and found to be acceptable.

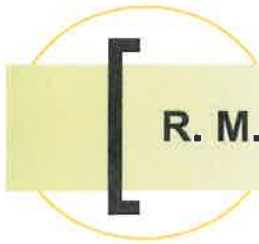
Please let me know if you need any additional information.

Sincerely,



Joseph D. Koch, PhD, RPIH
Vice President, Operations, Safety, Quality/RSO

Enc.



RADIOACTIVE SEALED SOURCE LEAK TEST REPORT

Test Date: December 3, 2021

Analytical Date: December 3, 2021

Source Identification:

Manufacturer: Humboldt

Model No.: 5001EZ

Mach S/N: 3141

Radionuclide: Cs-137

Activity: 10.0 mCi

Source S/N: 8254GQ

Radionuclide: Am-241/Be

Activity: 40.0 mCi

Source S/N: NJ03366

Sample Submitted By: Julian Hansen

Facility: Jacobi Geotechnical Engineering, Inc.

Address: 798 Hoff Rd.

O'Fallon, MO 63366

The identified sealed source listed above has been tested for leakage of radioactive materials as required by the United States Nuclear Regulatory Commission. The analysis of the wipe material used in testing the sealed source reveals the presence of $\leq 7.60 \times 10^{-5}$ μCi of loose contamination for Cs-137 and $\leq 6.45 \times 10^{-5}$ μCi of loose contamination for Am-241.

- (X) This source is acceptable for continued use.
- () This source has been found to have a level of loose contamination greater than 0.005 μCi of removable radioactive materials, and should be removed from service immediately.
- (N/A) Operational and performance check of shutter mechanism satisfactory.

Next Leak Test Date: June 3, 2021

Analysis By: Julian Hansen

Reviewed By: 

Shipper's No. _____

Date: 12/3/21
June 6, 2019

Carrier: R. M. Wester and Associates, Inc.

at 94 and Kisker

from Jacobi Geotechnical Engineering

To:

Consignee: R. M. Wester and Associates, Inc.

Shipper: Jacobi Geotechnical Engineering

Street: 215 Indacom Dr.

Street: 798 Hoff Road

Destination: St. Peters, MO Zip 63376

Origin: O Fallon, MO Zip 6366

Route: major roads and highways

Number and Type of Packages	HM	I. D. Number	Description of Articles	Hazard Class	Pkg. Grp.	Total Quantity (mass, volume, or activity)	Weight (subject to correction)	Class or Rate
1 unit Box	X	UN3332	Radioactive Material, Type A Package, special form	7			100 lb	
			Yellow II					
			TI = 0.2					
			Cs-137 - 10 mCi					
			Am-241/Be - 40 mCi					
			<i>Gaug s/d 3141</i>					
			<i>Humboldt 5001</i>					

Shipper: Jacobi

Carrier: R. M. Wester and Associates, Inc

Per: _____ Date: 12/3/21

Per: Joseph Koch Date: 12/3/21

Signature: *Christina B...*

Signature: *Joseph Koch*

EMERGENCY RESPONSE TELEPHONE NUMBER: 636-928-9628

This is to certify that the above named materials are properly classified, packaged, described, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. Per above signature.