

INSPECTION RECORD

Region III **Inspection Report No.** 030-35293/2008-001(DNMS)
License No. 24-32231-01 **Docket No.** 030-35293
NMED No. 080006

Licensee (Name and Address):
Jacobi Geotechnical Engineering, Inc.
798 Hoff Road
O'Fallon, Missouri 63366

Licensee Contact: James N. Pyatt, P.E. **Telephone No.** 636-978-7112

Priority: K5 **Program Code:** 3121

Date of Last Inspection: September 28, 2005

Date of This Inspection: January 2, 2008

Type of Inspection: Initial Announced Unannounced
 Routine Special

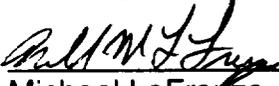
Next Inspection Date: NA Normal Reduced

Justification for reducing the routine inspection interval:

This was a special inspection to review the circumstances surrounding a moisture/density gauge being damaged by a large construction vehicle. No change in the next inspection date is warranted.

Summary of Findings and Actions:

- No violations cited, clear U.S. Nuclear Regulatory Commission (NRC) Form 591 or regional letter issued
- Non-cited violations (NCVs)
- Violation(s), Form 591 issued
- Violation(s), regional letter issued
- Followup on previous violations

Inspector(s) 
Michael LaFranzo, Materials Inspector

Date 1/1/08

Approved _____
(Name)

Date

PART I-LICENSE, INSPECTION, INCIDENT/EVENT, AND ENFORCEMENT HISTORY

1. AMENDMENTS AND PROGRAM CHANGES:

<u>Amendment No.</u>	<u>Date</u>	<u>Subject</u>
3	12/01/2005	Remove from license a location of use and storage

2. INSPECTION AND ENFORCEMENT HISTORY:

Last inspection was performed on 9/28/2005: No violations of NRC requirements were identified.

3. INCIDENT/EVENT HISTORY:

(List any incidents, or events reported to NRC since the last inspection. Citing "None" indicates that regional event logs, event files, and the licensing file have no evidence of any incidents or events since the last inspection.)

None

PART II - INSPECTION DOCUMENTATION

1. ORGANIZATION AND SCOPE OF PROGRAM:

(Management organizational structure; authorized locations of use, including field offices and temporary job sites; type, quantity, and frequency of material use; staff size; delegation of authority)

President
Radiation Safety Officer

The licensee possessed 16 humboldt gauges and approximately 20 employees authorized to use the gauges. Each gauge contains Cs-137 and Am-241 for use in the construction field. The licensee uses the gauges at temporary job sites throughout the St. Louis and surrounding areas on an as-needed-basis. Gauges are more commonly used in the spring, summer and fall when construction activity is high. However, licensed activities are performed during the winter months as weather permits or within enclosed areas.

2. SCOPE OF INSPECTION:

(Identify the inspection procedure(s) used and focus areas evaluated. If records were reviewed, indicate the type of record and time periods reviewed)

Inspection Procedure Used: 87124

Focus Areas Evaluated: 3.01-3.04

Inspection Observations: This was a special inspection to review the circumstances surrounding a Humboldt moisture density gauge which was hit with a S250 front-end loader bobcat. The incident occurred in the city of Pevely, Missouri off I-55 near Horine Road. On or about December 26, 2007 at 10:00 am; the gauge operator was working in a vehicle driving area on the high side of a retaining wall. The gauge was not operating appropriately that morning and the operator was taking soil measurements to isolate the problem. According to the gauge operator, he was finished with the second test when he looked up and saw a S250 bobcat backing up and approaching rapidly on his position. The gauge operator stepped out of the way and moments later, the bobcat had clipped the gauge and damaged the housing. (A photo of the damaged gauge was attached to this record contained within the Consultants report dated December 28, 2007.)

The operator immediately secured the area and the Radiation Safety Officer and the licensee's consultant, R. M. Wester and Associates, Inc., arrived on site between 11:00 am and 12:00 pm. The gauge was surveyed by the consultant and no excessive radiation levels were identified. The consultant also took a

wipe test of the gauge; no leakage was noted. The gauge was retrieved by the consultant that day and sent to the manufacturer for repair.

At the request of the licensee, the consultant contacted the NRC on December 27, 2007 to report that a gauge was damaged.

3. **INDEPENDENT AND CONFIRMATORY MEASUREMENTS:**

(Areas surveyed, both restricted and unrestricted, and measurements made; comparison of data with licensee's results and regulations; and instrument type and calibration date)

The gauge had been returned to the manufacturer prior to the inspector arriving on-site. However, the consultant R. M. Wester and Associates, Inc. has performed wipe surveys of the gauge and soil samples in the area where the gauge was damaged. No radiological contamination was identified and the sources were intact. The consultant's report to the licensee, dated December 28, 2007, is attached to this inspection record.

4. **VIOLATIONS, NCVs, AND OTHER SAFETY ISSUES:**

(State the requirement, how and when the licensee violated the requirement, and the licensee's proposed corrective action plan. For NCVs, indicate why the violation was not cited. Attach copies of all licensee documents needed to support violations.)

Based on the inspection results, the NRC identified that the licensee maintained control and constant surveillance of the gauge in accordance with 10 CFR 20.1802. Also based on the damage of the gauge, the licensee was not required to report the incident in accordance with 10 CFR 30.50(a). Therefore, no written report is required by the licensee regarding this event.

No Violations of NRC requirements were identified.

5. **PERSONNEL CONTACTED:**

(Identify licensee personnel contacted during the inspection, including those individuals contacted by telephone.)

Use the following identification symbols:

Individual(s) present at entrance meeting

* Individual(s) present at exit meeting

Carl Jacobi – President

#* James Pyatt – Radiation Safety Officer

Donnie Inman – Laboratory Manager

Dave Steiner – Field Technician

R. M. WESTER *and ASSOCIATES, INC.*
215 INDACOM DRIVE - ST. PETERS, MISSOURI 63376
(636) 928-9628 - FAX (636) 928-9857
RMWester.com

December 28, 2007

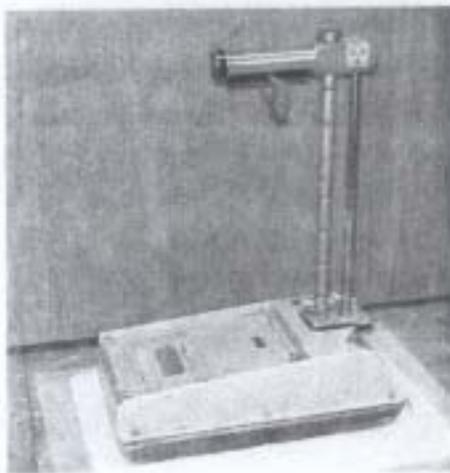
James N. Pyatt, RSO
Jacobi Geotechnical Engineering
798 Hoff Road
O'Fallon, MO 63366-1920
(636)978-7112

Dear Mr. Pyatt,

On December 26th, 2007 Kevin McCann and I, Ken Barnes, traveled to the construction site located in Peveley, Missouri in response to your call about the Humboldt Model 5001 EZ, SN: 693, that was damaged that morning in an incident with a Bobcat.

We arrived about 1:30 in the afternoon and surveyed the site of the accident with a Ludlum Model 19 survey meter meters(SN: 87193, calibrated December 18, 2007, calibration checked daily) two Ludlum Model 3 survey meters(SN: 128020, calibrated November 29, 2007, and SN: 158589, calibrated October 10, 2007, both calibration checked daily) with 44-9 pancake probes(SN: 129335 and 163380). The roadway had been barricaded and the location of the incident marked with an X in fluorescent paint. This survey showed only background radiation levels (10 to 30 microR/hr) as verified by taking readings some distance from the site along the same stretch of roadway. Four composite soil samples were taken from a 2 meter wide stretch of roadway over a distance of 4 meters. Additional samples of the broken plastic housing were also taken.

The Humboldt moisture/density gauge was examined in detail. The end of the base housing was damaged and a section of the plastic housing was broken as shown in the photos below:



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The metal rods and the interior metal housing containing the sources were all visibly intact and handheld survey meters did not indicate any contamination. Two wipes were taken of the interior of the device and one wipe was taken of the exterior. One wipe was also taken of the truck used to transport the broken device in its case.

As shown in the attached Soil Analysis Report there was no indication of contamination in the soil samples and The Wipe Test Report indicates no indication of leakage of the source or contamination of the truck.

The incident was reported to the NRC(incident number: 43868) and the device was shipped to Humboldt on December 28th 2007.

Please feel free to contact me or Mr. McCann if you have any question or we can be of any further service.

Sincerely,
R. M. Wester and Associates, Inc.



Kenneth Barnes
Health Physicist

Enclosure:

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Sample Description: Soil Sample #2
 Sample Mass: 28.8 grams

Energy (keV)	Nuclide(s)	Count Time (min)	cpm	Background cpm	Net Activity	Specific Activity (dpm/g)
60	Am-241	1	86	70	< 97 pCi*	< 3.4 pCi/g*
662	Cs-137	1	62.0	84.0	< 95 pCi*	< 3.3 pCi/g*
0-2000	Gross γ	5	235.4	241.8	< 180 pCi*	< 6.3 pCi/g*

Sample Description: Soil Sample #3
 Sample Mass: 28.6 grams

Energy (keV)	Nuclide(s)	Count Time (min)	cpm	Background cpm	Net Activity	Specific Activity (dpm/g)
60	Am-241	1	85.8	70	< 97 pCi*	< 3.4 pCi/g*
662	Cs-137	1	61.5	84.0	< 95 pCi*	< 3.3 pCi/g*
0-2000	Gross γ	5	244.8	241.8	< 180 pCi*	< 6.3 pCi/g*

* Based on MDA values.

Sample Description: Soil Sample #4

Sample Mass: 24.0 grams

Energy (keV)	Nuclide(s)	Count Time (min)	cpm	Background cpm	Net Activity	Specific Activity (dpm/g)
60	Am-241	1	94.6	70	< 97 pCi*	< 4.0 pCi/g*
662	Cs-137	1	62.0	84.0	<95 pCi*	< 4.0 pCi/g*
0-2000	Gross γ	5	230.0	241.8	< 180 pCi*	< 7.5 pCi/g*

Sample Description: Plastic Housing on Ground #5

Sample Mass: 2.4 grams

Energy (keV)	Nuclide(s)	Count Time (min)	cpm	Background cpm	Net Activity	Specific Activity (dpm/g)
60	Am-241	1	85.8	70	< 97 pCi*	< 40 pCi/g*
662	Cs-137	1	61.5	84.0	<95 pCi*	< 40 pCi/g*
0-2000	Gross γ	5	244.8	241.8	< 180 pCi*	< 75 pCi/g*

* Based on MDA values.

Conclusion:

There is no indication of Americium-241 or Cesium-137 in the soil.

Analysis Performed By:

Kenneth Barnes, Health Physicist

R. M. Wester and Associates, Inc.
Wipe Analysis Report
Humboldt Moisture Gauge Accident Site
Peveley, MO
December 28, 2007

Samples:

Collection Date: December 26, 2007
Collector: Kevin McCann—Health Physicist
Location: Peveley, MO

Gamma Spectrum Analysis:

Instrument: Perkin Elmer 1480 Automatic Gamma Counter(SN: 4800614, Calibration checked daily)

Efficiencies:

Standard	Energy KeV	Photopeak cpm	Standard dpm	Photopeak Efficiency
Am-241	60	2268640	12513917	18.1%
Cs-137	662	1902704	9440007	20.2%

Samples:

Wipe	Location	Am-241 (microCuries)	Cs-137 (microCuries)
1	interior of housing	< 5.6*10 ^{-5*}	< 5.2*10 ^{-5*}
2	exterior of shield	< 5.6*10 ^{-5*}	< 5.2*10 ^{-5*}
3	exterior of housing	< 5.6*10 ^{-5*}	< 5.2*10 ^{-5*}
4	transport truck	< 5.6*10 ^{-5*}	< 5.2*10 ^{-5*}

* Based on MDA values.

Conclusion:

There is no indication of Americium-241 or Cesium-137 contamination on the device or the truck used to transport it.

Analysis Performed By:

Kenneth Barnes, Health Physicist

R. M. WESTER *and ASSOCIATES, INC.*

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James Pyatt-RSO
Jacobi Geotechnical Engineering
798 Hoff Road
O'Fallon, MO 63366-1920

December 27, 2007

Dear Mr. Pyatt,

In the table below you will find the results of the Interior and exterior wipes of the damaged Humboldt Model 5001 EZ, SN: 693(containing a 10 mCi Cs-137 source, SN: 1176GH, and a 40 mCi Am-241:Be source, SN: NJC0659). The leak test wipes were taken on December 26th 2007 and analyzed on December 26th 2007. The analysis was performed using a Perkin Elmer Wizard 3" Gamma Counter(serial number 4800614, calibration checked daily).

Wipe	Location	Am-241 (microCuries)	Cs-137 (microCuries)
1	interior of housing	$< 5.6 * 10^{-5}$	$< 5.2 * 10^{-5}$
2	exterior of shield	$< 5.6 * 10^{-5}$	$< 5.2 * 10^{-5}$
3	exterior of housing	$< 5.6 * 10^{-5}$	$< 5.2 * 10^{-5}$

The sources identified above have been tested for removable radioactive contamination as required by the United States Nuclear Regulatory Commission. The analysis of the wipes used in testing the sealed sources reveals that the device is acceptable for shipment according to DOT regulations.

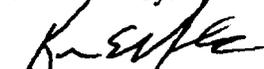
Please feel free to call me if you have any questions or anything else I can be of help with.

Thank you for choosing R. M. Wester and Associates for you radiological safety and environmental needs.

Sincerely,


Kenneth Barnes, Health Physicist

Reviewed by:


Kevin McCann, Health Physicist

Copy: Humboldt

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