

EXHIBIT B



**TRUCK MONITOR CORRELATION
REPORT**

CASELLA WASTE SYSTEMS, INC.

DATE OF SURVEY: MARCH 26, 2015

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1 Introduction

Gamma radiation detectors are routinely used at landfill weighing scales to determine if entering trucks contain unauthorized radioactive materials. However, readings on the monitors cannot easily be related to the quantity of radioactive materials in loads. Computer algorithms to estimate radioactivity concentrations from gamma emissions from trucks have numerous uncertain input variables such as load density, truck wall thickness, container to detector geometry, and radionuclide series equilibrium. Therefore, an actual in-field correlation test was performed to more accurately relate gamma count rate to radionuclide concentration in a load.

The specific situation studied during this test is the estimation of the radium-226 concentration in relatively uniform material.

2 Methods

2.1 General Method

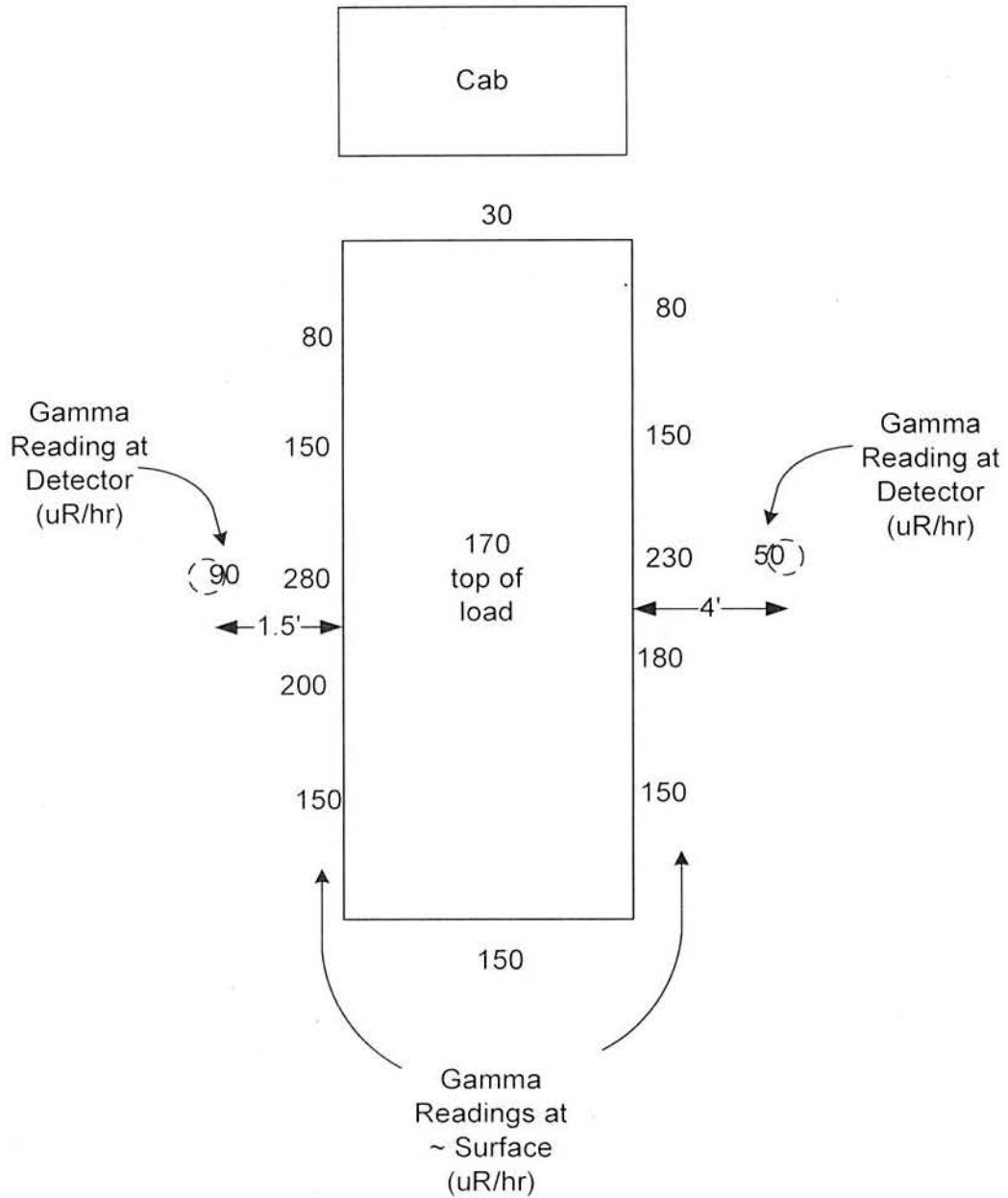
A Ludlum Model 375P-1000 gamma radiation monitor at the McKean County, Pa. landfill was used to measure gamma emissions from a roll-off filled with radium-bearing sludge cake. The sludge cake was very uniform, having been de-watered and pressed into 1" thick plates which were broken into chunks that filled the 30-cubic yard roll-off. The brown material had a moderately dry, clay-like consistency. Both visual observation and a perimeter scan with a hand-held uR meter indicated that the material was relatively uniform. The load contained 27,680 lbs of sludge cake.

First, the radiation monitor background was recorded (3.5 KCPS) then the roll-off was moved in between the detectors. The resultant reading was recorded (36.8 KCPS). Gamma exposure rates at the two detectors were also checked with a hand held uR meter. An empty roll-off was then used to record an "empty truck" background reading on the monitor (2.4 KCPS).

A composite sample of the sludge cake was collected from 4 spots near the center of the load (approximately where the detectors were positioned) and was sent to Pace Laboratories (NELAP-certified) for gamma spectroscopic analysis after 21-day radon progeny ingrowth.

3 Results

The gamma readings at the surface of the roll-off and at the Model 1000 detectors are shown in the figure below:



Readings were performed with the following instrument:

Manufacturer	Meter Model	Serial #	Detector or Meter Type	Calib. Date
Ludlum Measurements	12S	77640	NaI-based uR meter	8/28/14

Observations:

The front of the roll-off exhibited far less gamma emission than the middle of load because the front was only partially filled. The middle and rear of the roll-off were completely full. The rear exhibited slightly less than the middle due to the difference in source geometry.

The detectors were positioned at the center (maximum gamma reading) of the roll-off. The truck was not quite centered, being 1.5 feet from the left detector and 4 feet from the right detector. This should not affect the test since the count rate from the detectors are summed.

Readings:

The readings on the Model 375-1000 follow:

Background (no truck present): 3.5 KCPS

Background (empty truck present): 2.5 KCPS

Hot Load Reading (detectors at middle of truck side walls): 36.8 KCPS

Laboratory Results (complete lab report shown in Attachment A):

The pertinent radionuclide concentrations from the sample analysis are also shown below (rounded):

Ra-226 (186 line): 112 +- 15 pCi/g
Bi-214 (609 line): 106 +- 14 pCi/g
Ra-228 (Ac-228 911 line): 15.5 +- 2.7 pCi/g
K-40 : 0.5 +- 5.5 pCi/g

Note: the above concentrations are based on *in situ* mass (sample not dried in the laboratory).

Calculation of Conversion Factor:

$$= (36.8 \text{ KCPS} - 2.5 \text{ KCPS}) / 112 \text{ pCi/g} = 0.306 \text{ KCPS/(pCi/g)} \text{ over background}$$

4 Conclusion

The result of this test of a 30-yard roll-off, filled to near capacity, resulted in a gamma count rate to radium concentration conversion factor of 0.306 KCPS/(pCi/g) over background.

For a monitor with a background of 3.6 KCPS (the background occurring during the most recent calibration of the Chemung County Landfill monitor), the count rate corresponding to a 25 pCi/g radium-226 investigation level would be $(0.306 \times 25) + 3.6 = 11.25$ KCPS.

Presently the Chemung County monitor's alarm levels are 10 KCPS sum alarm (sum of both detectors) and a sigma alarm of 110 which equates to approximately 7 KCPS depending on truck speed entering the detection area. (The sigma alarm sounds if it detects a rapid increase in count rate even if the sum alarm is not reached.) These alarm settings are well within the 11.25 KCPS level corresponding to 25 pCi/g of radium. Therefore, the present alarm settings at the Chemung County Landfill are sufficient to detect a roll-off containing 25 pCi/g or more of radium-226.

Attachment A – Pace Laboratory

Analysis Report – page 6



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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: McKean Monitor Test
 Pace Project No.: 30145525

Sample: 032615A Lab ID: 30145525001 Collected: 03/26/15 11:44 Received: 04/14/15 09:55 Matrix: Solid
 PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc. (MDC) Carr Trac	Units	Analyzed	CAS No	Qual
Bismuth-212	EPA 901.1	15.936 ± 5.494 (5.320) C:NA T:NA	pCi/g	05/20/15 15:13	14913-49-6	
Bismuth-214	EPA 901.1	106.260 ± 14.260 (1.160) C:NA T:NA	pCi/g	05/20/15 15:13	14733-03-0	
Lead-212	EPA 901.1	12.398 ± 1.899 (1.114) C:NA T:NA	pCi/g	05/20/15 15:13	15092-94-1	
Lead-214	EPA 901.1	116.180 ± 15.563 (1.450) C:NA T:NA	pCi/g	05/20/15 15:13	15057-28-4	
Potassium-40	EPA 901.1	0.497 ± 5.475 (4.931) C:NA T:NA	pCi/g	05/20/15 15:13	13966-00-2	
Radium-226	EPA 901.1	111.950 ± 14.908 (1.160) C:NA T:NA	pCi/g	05/20/15 15:13	13982-63-3	
Radium-228	EPA 901.1	15.476 ± 2.686 (1.668) C:NA T:NA	pCi/g	05/20/15 15:13	15252-20-1	
Thallium-208	EPA 901.1	4.766 ± 1.015 (0.648) C:NA T:NA	pCi/g	05/20/15 15:13	14913-50-9	
Thorium-234	EPA 901.1	11.446 ± 11.278 (18.300) C:NA T:NA	pCi/g	05/20/15 15:13	15055-10-8	
Uranium-235	EPA 901.1	8.633 ± 1.515 (0.949) C:NA T:NA	pCi/g	05/20/15 15:13	15117-96-1	

REPORT OF LABORATORY ANALYSIS

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