

Attachment 1

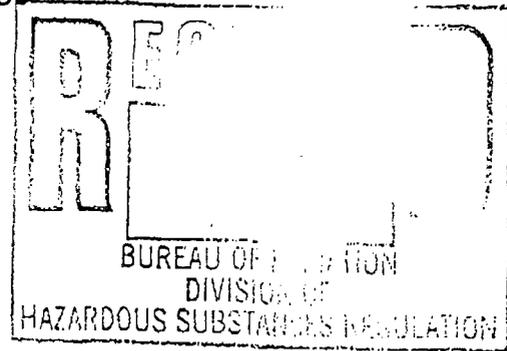
T-364



## Department of Energy

Washington, DC 20585

AUG 07 1991



[REDACTED] PhD  
 Director, Bureau of Radiation  
 New York State Department  
 of Environmental Conservation  
 50 Wolf Road  
 Albany, New York 12233

Dear [REDACTED]:

The Department of Energy (DOE) is inviting the State of New York Department of Environmental Conservation to participate in the radiological survey of a landfill near Tonawanda, New York. This survey is scheduled to begin September 9, 1991, and will be conducted by Oak Ridge National Laboratory (ORNL).

In our telephone discussion, you explained that the New York State Department of Environmental Conservation was concerned about the possible presence of wastes containing americium at this site. Although DOE's concern is limited to the soil and sediments containing uranium, I agreed to have ORNL measure the americium in a portion of the survey samples. You indicated this would be helpful to the State. ORNL has indicated that they will be able to measure the americium, and these measurements will be included in the survey.

I also asked if members of your staff might wish to participate in the survey activities. You indicated that this participation might be appropriate, given the State's concerns with the possible presence of americium in the landfill. This letter is to formally extend the invitation with these understandings:

- o State personnel will work under the direction of the ORNL survey team leader and will wear clothing appropriate for field measurement activities.
- o Participation of State personnel will be appropriately acknowledged in the survey report(s).
- o The State will pay the costs of participation by its personnel, and these costs will not be reimbursed by DOE.
- o DOE will pay all costs for ORNL's measurement of americium in survey samples.
- o DOE will furnish six copies of the final survey report to the State for use in its regulatory program.

If these provisions are acceptable to you, please provide me with the names and telephone numbers of the State personnel who will participate in the survey. You may reach me at 301-353-8149, if you would like to discuss this further.

Sincerely,

[Redacted signature]

[Redacted name] PhD  
Designation and Certification Manager  
Off-Site Branch  
Division of Eastern Area Programs  
Office of Environmental Restoration

010  
*JM*

New York State Department of Environmental Conservation  
50 Wolf Road, Albany, New York 12233



August 27, 1991

[Redacted] Ph.D.  
Designation and Certification Manager  
Off-Site Branch  
Division of Eastern Area Programs  
Office of Environmental Restoration  
U.S. Department of Energy  
Washington, D.C. 20585

Dear [Redacted]:

The New York State Department of Environmental Conservation, Bureau of Radiation would like to accept the Department of Energy's invitation to participate in the radiological survey of a landfill near Tonawanda, New York. Your provisions under which this invitation is extended to us are agreeable.

The DEC staff who will be participating in this survey are: [Redacted], [Redacted], [Redacted], [Redacted], [Redacted], and myself. All of these people will not be on site at one time. I intend to rotate staff in groups for the duration of the survey.

DEC staff will collect and split some samples with Oak Ridge National Laboratory (ORNL) and have them analyzed in our contract laboratory. This will provide an independent verification to the ORNL lab analysis.

Again, I would like to thank you for agreeing to include americium as a radionuclide of interest in the survey samples. Please let me know if there are any changes in the proposed schedule. If you have any questions or need further information, please contact me at the above number.

Sincerely,

[Redacted Signature]

Bureau of Radiation

cc: [Redacted], Region 9

New York State Department of Environmental Conservation  
50 Wolf Road, Albany, New York 12233



Commissioner

DIVISION OF HAZARDOUS SUBSTANCES REGULATION  
BUREAU OF RADIATION

INSPECTION FIELD REPORT

INSPECTION DATE: September 26-29, 1991

NAME: Town of Tonawanda Landfill  
ADDRESS: Town of Tonawanda

COUNTY: Erie DEC REGION: 9

RADIATION SAFETY OFFICER: N/A  
TELEPHONE NUMBER: \_\_\_\_\_

DEC PERMIT NUMBER(S): N/A  
PERMIT EXPIRATION DATE: \_\_\_\_\_

RADIOACTIVE MATERIALS LICENSE NUMBER: N/A  
RML ISSUING AGENCY: ( ) NYSDOH ( ) NYCDOH ( ) NYSDOL ( ) USNRC

DATE OF PREVIOUS INSPECTION: N/A  
CURRENT INSPECTION FREQUENCY (PRIORITY): \_\_\_\_\_

TYPE OF INSPECTION: ( ) ANNOUNCED ( ) UNANNOUNCED ( ) INITIAL  
( ) REINSPECTION (X) SPECIAL ( ) PRE-PERMIT

REPORTING INSPECTOR: [REDACTED]

[REDACTED]  
\_\_\_\_\_  
Signature

*January 15, 1992*  
\_\_\_\_\_  
Date of Report

ACCOMPANYING INSPECTOR(S): [REDACTED]

INSPECTION RESULTS: N/A  
( ) IN COMPLIANCE ( ) RECOMMENDATIONS GIVEN  
( ) NONCOMPLIANCE ( ) ENFORCEMENT ACTION  
NEEDED

NEXT INSPECTION DATE: N/A ( ) NORMAL ( ) REDUCED  
( ) EXTENDED

NEW INSPECTION FREQUENCY (PRIORITY): N/A

REVIEWED BY: [REDACTED]  
\_\_\_\_\_  
*o o o*

DATE: *1/27/92*  
\_\_\_\_\_

## Tonawanda Landfill Survey Report

September 26, 1991

### Background:

During the operating years of EAD in the Town of Tonawanda, discharges from EAD into the sewer resulted in the concentration of americium-241 in the sewage sludge. This sewage sludge was then incinerated in the town's incinerator. The resulting contaminated ash was then discarded in the town's sanitary landfill. In addition, the landfill was known to contain soils dredged from Two Mile Creek. It was suspected that Manhattan Engineering District (MED) material may have eroded into the creek prior to the dredging.

The survey of the Tonawanda landfill was scheduled to coincide with the Department of Energy's (DOE) survey of the landfill. We were given the opportunity (see Attachment 1) to assist them as a learning experience. The DOE was surveying the landfill to locate and characterize the area of contamination resulting from disposal of the Two Mile Creek dredgings.

### Objective:

1. Survey the reported area of incinerator ash disposal.
2. Assist the DOE surveying the reported area of dredging disposal.
3. Collect water or soil samples from any areas with surface radiation levels significantly above background.

### Instrumentation:

Ludlum Model 2221 Serial Number 71230 with a Bicron G2 probe  
(2 X 2 NaI)  
Ludlum Model 2221 Serial Number 71244 with a 5 X 2 NaI  
(FIDLER)  
Ludlum Model 19 Micro R Meter

### Agency Representatives:

The following Department of Energy and DEC representatives were present:

Department of Energy: W. Alexander Williams (Sept. 26, 1991)

Oak Ridge Associated University: survey team led by Michael Murray and Richard Rodriguez

DEC Bureau of Radiation: John Mitchell (Sept. 26-28, 1991), Barbara Youngberg (Sept. 28 & 29 1991)

### Description of Activities:

Bureau representatives were supposed to accomplish two goals. The first was to assist, and learn from, the DOE while surveying the landfill area that potentially contained the dredge spoils. The second goal was to identify and collect samples from the area where the incinerator ash was placed. Unfortunately, the reported area where the dredgings were placed, and therefore where DOE surveyed, did not coincide with the location where the incinerator ash was deposited. (See Attachment 2)

On September 26 and 27, [REDACTED] accompanied DOE on its survey. DOE personnel in groups of four systematically walked the pre-surveyed grids. Several areas of elevated readings were found using this method. The Bureau staff collected split samples as a cross-check for the DOE. The samples are identified in Table 1.

On Sept. 28, 1991, [REDACTED] and [REDACTED] walked a line traversing the area of incinerator ash disposal (see Attachment 2). Within the area identified on the map as contaminated, we were, within an hour, able to identify 5 locations of elevated readings. See Table 2. With time being the limiting factor, the decision was made to terminate the survey and obtain some samples for analysis by our contracted laboratory.

On September 29, 1991, [REDACTED] returned with the DOE team to DEC's location 2, where the day before we had stopped digging when the micro R meter was reading 4 mR/hr at the bottom of a 12-inch deep hole. (In their records, DOE refers to this site as "far east landfill.") The DOE team brought with them several instruments, including an ORNL designed and built cutie-pie, with a range up to 10 R/hr, a detector with a pancake probe, and an alpha detector.

Upon arrival at location 2, DOE took a soil sample from the soil we had excavated the day before (0 - 12"). To survey the hole, one member of the team put a large plastic bag over the cutie pie, picked up the instrument, and pulled the bag over his hand and lower arm. He then put the instrument in the hole. The reading was about 3 mr/hr.

To prepare for further excavation, they spread a clean plastic bag on the ground near the hole, and propped up the pancake probe near the bag, facing the hole, so that each spade of dirt would pass near the probe as it was taken from the hole. With the audible signal turned on, this would give an early alarm, if a spadeful were particularly hot.

They slowly excavated, surveying each spadeful with the pancake before adding it to the discard pile. Once a spadeful was removed that obviously held the contamination, they spread the dirt out on a plastic bag, and looked for items likely to be the source. Twigs and stones were picked up, surveyed, and discarded. Then they used the spade to segregate and further spread out small portions of the dirt, discarding portions that had no elevated readings. They continued to subdivide the hot material until they sorted out two pieces of metal, about 1.5 by 2 inches in size. These were the source of the high readings. They were surveyed with the alpha probe before being bagged, and alpha contamination was noted on the sample bag.

The hole was then surveyed and found to read about 45,000 cpm. They continued to dig and survey to a depth of 24 inches, taking samples of each 6" layer. They found no more sources or elevated readings. At the bottom of the hole, the reading was 5,500 cpm.

The pieces of metal were put on DOE's MCA. It appears they contain radium and uranium.

#### **Samples:**

Eight split samples were collected from the area the DOE surveyed. See Table 1. Eight samples were collected within the alleged EAD ash disposal area, which included two cores. These cores were subdivided into several samples for analysis. See Table 3.

#### **Conclusions:**

The area in which the DOE surveyed contained a fair number of locations with elevated readings. The area in which the ash was allegedly disposed had easily recognizable areas of elevated readings. The initial lab results (Attachment 3) from this area showed considerable levels of Americium-241 contamination. Upon receiving the remaining lab analysis results more discussion will be needed.

Table 1

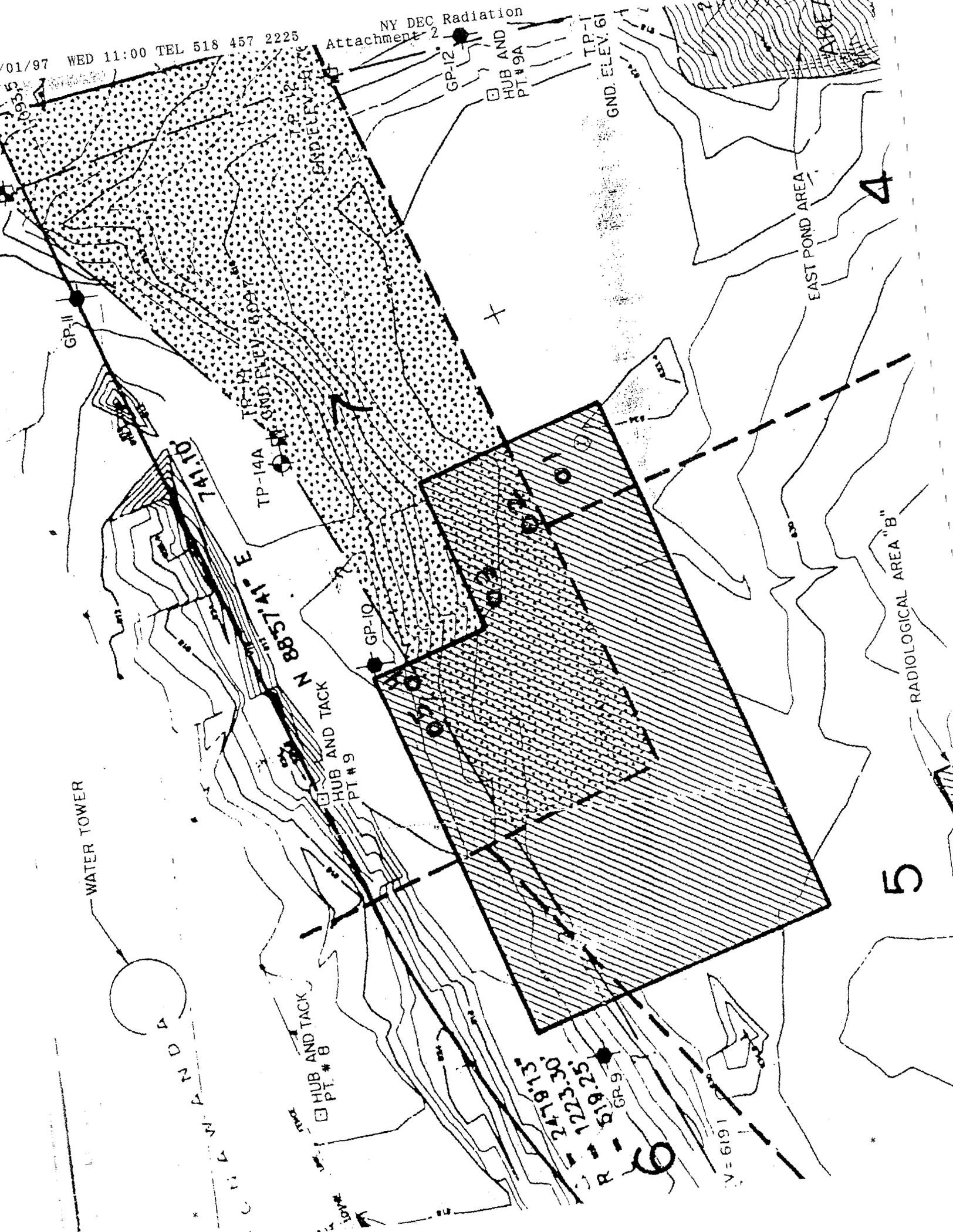
Location	Depth	Ludlum Model 2221 w/ 2 X 2 NaI Reading (cpm) (bkg 1,300)	Sample Number	DOE Number
1	Surface	2349		
	0 - 6"	3310	1	TNY001B003A
	6 - 12"	3080	2	TNY001B003B
	12 - 18"	2532	3	TNY001B003C
2	Surface	19918		
	0 - 6"	2920	4	TNY001B004A
	6 - 12"	1365	5	TNY001B004B
3	Surface	20083		
	0 - 6"	45102	6	TNY001B005A
	6 - 12"	5130	7	TNY001B005B
	12 - 18"	2888	8	TNY001B005C

Table 2

Field Location	Depth	Ludlum Model 2221 w/ 2 X 2 NaI Reading (cpm) (bkg 3000)	Field Sample Number	DEC Analytical Sample Number/Description
1	Surface	16,180		
	0 - 6"	24,382	9	NR991-001-092809
	found rock	32,109	DOE took	
2	Surface	16,841	10	
	0 - 6"	130,940	11	NR991-001-092811
	10 - 12"		DOE took	found rock 80 m/R on contact with DOE's
	14 - 15"			"cutie pie," also found 2 pieces of metal -
	12 - 18"		15	1 piece had alpha contamination
	12 - 14"		16	NR991-001-092815 NR991-001-092816 - small rock w/alpha contamination
3	0 - 18" core	Surface 5120	17	See Table 3
4	0 - 24" core	Surface 9241	12	See Table 3
5	Surface	78,000		
	0 - 6" under sumacs 0 - 3"		13 14	See Table 3 NR991-001-092814

Table 3

Field Location	Depth	DEC Analytical Sample Number
3	0 - 4"	NR991-001-092817
3	4 - 8"	NR991-001-092818
3	8" - end	NR991-001-092819
4	0 - 4"	NR991-001-092812
4	4 - 8"	NR991-001-092820
4	8 - 12"	NR991-001-092821
5	0 - 4"	NR991-001-092813
5	4" - end	NR991-001-092822



4

5

6

31813  
 247830  
 12235  
 R - 619.25  
 GP-9

V=6191

EAST POND AREA

RADIOLOGICAL AREA "B"

WATER TOWER

WATER TOWER

HUB AND TACK PT #8

HUB AND TACK PT #9

HUB AND TACK PT #9A

TP-14A GND. ELEV. 6027

GP-12

HUB AND TACK PT #9A

TP-1

GND. ELEV. 61

GP-11

GP-10

GP-9

74110

N 883741 E



CUSTOMER [REDACTED]  
ATTENTION [REDACTED]  
ADDRESS 208 PICKERING CRK. IND. PK  
CITY LIONVILLE, PA 19353  
W.O. NO. 91-10-157

Attachment 3



Work I.D.

10/08/91

SAMPLES RECEIVED

Customer Identification	Date Collected	Type of Analysis	Total Wt. (g) wet/dry	pCi/g (dry)
NR-9-91-001-092812 4" Flag Location 4	09/28/91	Am-241	35/28	313+-7
		Co-60		0+-0.39
		Cs-137		0+-0.93
		K-40		19.9+-11.3
		Pb-212		0.98+-0.92
		Pb-214		0+-1.5
		Ra-226		0+-1.6
		Th-232		0+-3.0
		Tl-208		0+-1.4
		U-238		0+-8.1
NR-9-91-001-092820 8" Flag Loc 4	09/28/91	Am-241	48/36	27.7+-2.6
		Co-60		0+-0.55
		Cs-137		0+-1.4
		K-40		0+-12
		Pb-212		1.10+-0.81
		Pb-214		0+-1.4
		Ra-226		0+-1.4
		Th-232		0+-2.2
		Tl-208		0+-1.8
		U-238		0+-7.9
NR-9-91-001-092821 END Flag Loc 4	09/28/91	Am-241	27/20	29.6+-1.6
		Co-60		0+-0.41
		Cs-137		0+-1.1
		K-40		11.1+-9.2
		Pb-212		0+-0.67
		Pb-214		0+-0.86
		Ra-226		0+-0.96
		Th-232		0+-2.1
		Tl-208		1.18+-0.91
		U-238		0+-6.4

REPORTED VIA TELEPHONE  FAX

PAGE 1 OF 3

**MA Eberline**  
Thermo Analytical Inc.

701 PAN AMERICAN FREEWAY, N.E.  
ALBUQUERQUE NEW MEXICO 87109

APPROVED BY [REDACTED]

Data Analyst  
11/22/91

DATE

CUSTOMER  
 IDENTIFICATION  
 ADDRESS 208 FICKERING CRK. IND. PK  
 CITY LIONVILLE, PA 19353  
 P.O. NO. 91-10-157



SAMPLES RECEIVED

Customer Identification	Date Collected	Type of Analysis	Total Wt. (g) wet/dry	pCi/g (dry)
91-001-092822 13 -4" Flag Loc 5	09/28/91	Am-241	23/21	285+-7
		Co-60		0+-0.59
		Cs-137		1.02+-0.91
		K-40		0+-19
		Pb-212		0+-0.89
		Pb-214		0+-1.3
		Ra-226		0+-1.2
		Th-232		0+-2.4
		Tl-208		0+-1.7
		U-238		0+-9.4
91-001-092822 -4" ID Flag Loc 5	09/28/91	Am-241	31/25	138+-5
		Co-60		0+-0.50
		Cs-137		0+-0.95
		K-40		0+-19
		Pb-212		1.12+-0.67
		Pb-214		0+-1.4
		Ra-226		0+-1.4
		Th-232		0+-2.5
		Tl-208		0+-2.0
		U-238		0+-7.7
91-001-092817 -4" Flag Loc 3	09/28/91	Am-241	60/46	82.8+-4.2
		Co-60		0+-0.63
		Cs-137		0+-1.4
		K-40		0+-12
		Pb-212		0.88+-0.66
		Pb-214		0+-1.4
		Ra-226		0+-1.2
		Th-232		0+-2.4
		Tl-208		0+-1.2
		U-238		0+-9.3

REPORTED VIA TELEPHONE  FAX

PAGE 2 OF 3

**IA Eberline**  
 ermo Analytical Inc.

2 PAN AMERICAN FREEWAY, N.E.  
 BUQUERQUE, NEW MEXICO 87109

APPROVED BY  Data Analyst  
 11/22/91

DATE

CUSTOMER  
 ATTENTION  
 ADDRESS 208 FICKERING CRK. IND. PK  
 CITY LIDNVILLE, PA 19353  
 W.O. NO. 91-10-157



Customer Identification: [REDACTED] SAMPLES RECEIVED

Customer Identification	Date Collected	Type of Analysis	Total Wt. (g) wet/dry	pCi/g (dry)
NR-9-91-001-092818 4-811  F-145 Loc 3	09/28/91	Am-241	51/46	33.1+-2.7
		Co-60		0+-0.55
		Cs-137		0+-0.91
		K-40		0+-20
		Pb-212		0+-1.02
		Pb-214		0+-1.2
		Ra-226		0+-1.5
		Th-232		0+-2.3
		Tl-208		0+-1.7
U-238		0+-8.1		
NR-9-91-001-092819 3 END  Flas Loc 3	09/28/91	Am-241	20/17	23.2+-2.6
		Co-60		0+-0.83
		Cs-137		0+-1.8
		K-40		15.6+-11.6
		Pb-212		0+-0.88
		Pb-214		0+-1.4
		Ra-226		0+-1.3
		Th-232		0+-3.7
		Tl-208		0+-2.2
U-238		0+-8.7		

U-238-Based on the Th-234 daughter.  
 Ra-226-Based on the Bi-214 and Pb-214 daughter.  
 Th-232-Based on the Pb-212 daughter.

REPORTED VIA TELEPHONE  FAX

PAGE 3 OF 3

**MA Eberline**  
 Thermo Analytical Inc.

APPROVED BY [REDACTED], Data Analyst  
 11/22/91