



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 377TH AIR BASE WING (AFMC)

RECEIVED

1 August 1996

377 ABW/EMC  
2000 Wyoming Blvd. SE  
Albuquerque NM 87117-5659

Mr. Coby Muckelroy  
Program Manager, RCRA Enforcement  
Hazardous and Radioactive Materials Bureau  
New Mexico Environment Department  
P.O. Box 26110  
2044A Galisteo  
Santa Fe NM 87502

RE: Skeet Range Information, Follow-up to 22 Jul 96 Meeting  
EPA I. D. Number: NM 9570024423

Dear Mr. Muckelroy

On July 22, 1996 our staff presented you and Cornelius Amindyas a memo on the KAFB Skeet Range Incident with the lead shot. We had two open items when we left the meeting. One open item, "How many times has this practice of scraping the range and disposing of the debris occurred in the past?" is addressed in attachment 1.


Our second open item was a need for more sampling of lead to be performed, to include one for leachability (see attachment 2, sample number 9607221110). Samples were taken from the skeet range up the roadway up to and through the landfill roads (see attachment 3). One of our staff members, an engineer, performed an accumulation calculation of lead shot on the skeet range (see attachment 4) for your information. Other characterization samples have been taken on July 30/31 1996 and results will be forwarded to your office upon receipt.

KAFB1795



If you have any questions, please contact Marsha Carra at (505) 846-7847 or myself at (505) 846-5037. We appreciate your help and cooperation.

Sincerely

  
WALTER S. DARR III  
Chief of Compliance  
Environmental Management Division

**Attachments:**

1. Incident Memo
2. Sample # 9607221110
3. Skeet Range Road Samples
4. Accumulation Calculation Memo

**MEMO FOR RECORD  
SANDIA SKEET CLUB**

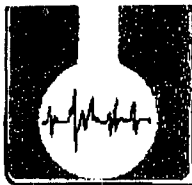
31 July 1996

After several phone conversations with Roger Thorp, John Ballard and Bill Hunt from the Sandia Skeet Club, with regard to the removal of clay pigeons from the range, it was their consensus that Civil Engineering had only done three removal operations since the late 1970's. Prior to that time they had no knowledge or recollection of such operations.

President: Roger Thorp 292-0169  
Historian: Bill Hunt 299-6692  
Past President: John Ballard 299-3486  
Past President: John Clark 898-8083  
Skeet Range Phone: 846-0196



**ROBERT P. FLINT**  
Environmental Protection Specialist



**ASSAIGAI  
ANALYTICAL  
LABORATORIES**

7300 Jefferson, N.E. • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259  
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Report Generated:  
 July 29, 1996 14:54

**CERTIFICATE OF ANALYSIS  
 RESULTS BY SAMPLE**

SENT PHILLIPS LABORATORY/EMD WORKORDER # : 9607238  
 TO: 3651 LOWERY AVE. SE WORK ID : LANDFILL  
 ALBUQUERQUE, NM 87117-5777 CLIENT CODE : PHI08  
 DATE RECEIVED : 07/22/96  
 ATTN: MARSHA CARRA/WALTER DARR

Page: 1

Lab ID: 9607238-01A  
 Sample ID: 9607221110

Collected: 07/22/96 11:10:00  
 Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
% SOLIDS(TCLP XT)EPA 160.3	100.00	% (Percent)				
TCLP (FAA) DIG/1311/3005	07/24/96	N/A				
TCLP EXTRACTION/TCLP 1311	07/23/96	N/A				
TCLP LEAD(FAA)/1311/7420 Lead, Pb	2.7	mg/L	0.10	1.0	07/24/96	TIF4

Lab ID: 9607238-02A  
 Sample ID: 9607221115

Collected: 07/22/96 11:15:00  
 Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3050	07/24/96	N/A				
LEAD (FAA)/SW846 7420 Lead, Pb	6.1	mg/Kg	5.0	1.0	07/24/96	SIF6

Lab ID: 9607238-03A  
 Sample ID: 9607221125

Collected: 07/22/96 11:25:00  
 Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051	07/23/96	N/A				
LEAD (FAA)/SW846 7420 Lead, Pb	95.7	mg/Kg	5.0	1.9	07/24/96	SIF4

Lab ID: 9607238-04A  
 Sample ID: 9607221130

Collected: 07/22/96 11:30:00  
 Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051	07/23/96	N/A				
LEAD (FAA)/SW846 7420						

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 Independent Laboratories, Inc.

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 THIS REPORT MAY NOT BE USED IN ANY MANNER BY THE CLIENT OR ANY OTHER THIRD PARTY TO CLAIM  
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Report Generated:  
July 29, 1996 14:54

## CERTIFICATE OF ANALYSIS RESULTS BY SAMPLE

SENT PHILLIPS LABORATORY/EMD WORKORDER # : 9607238  
 TO: 3651 LOWERY AVE. SE WORK ID : LANDFILL  
 ALBUQUERQUE, NM 87117-5777 CLIENT CODE : PHI08  
 DATE RECEIVED : 07/22/96  
 ATTN: MARSHA CARRA/WALTER DARR

Page: 1

Lab ID: 9607238-01A  
Sample ID: 9607221110

Collected: 07/22/96 11:10:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
% SOLIDS(TCLP XT)EPA 160.3	100.00	% (Percent)				
TCLP (FAA) DIG/1311/3005	07/24/96	N/A				
TCLP EXTRACTION/TCLP 1311	07/23/96	N/A				
TCLP LEAD(FAA)/1311/7420						
Lead, Pb	2.7	mg/L	0.10	1.0	07/24/96	TIF4

Lab ID: 9607238-02A  
Sample ID: 9607221115

Collected: 07/22/96 11:15:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3050	07/24/96	N/A				
LEAD (FAA)/SW846 7420						
Lead, Pb	6.1	mg/Kg	5.0	1.0	07/24/96	SIF6

Lab ID: 9607238-03A  
Sample ID: 9607221125

Collected: 07/22/96 11:25:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051	07/23/96	N/A				
LEAD (FAA)/SW846 7420						
Lead, Pb	95.7	mg/Kg	5.0	1.9	07/24/96	SIF4

Lab ID: 9607238-04A  
Sample ID: 9607221130

Collected: 07/22/96 11:30:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051	07/23/96	N/A				
LEAD (FAA)/SW846 7420						



Lab ID: 9607238-04A  
 Sample ID: 9607221130

Collected: 07/22/96 11:30:00  
 Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
LEAD (FAA)/SW846 7420 Lead, Pb	ND	mg/Kg	5.0	1.9	07/24/96	SIF4

Lab ID: 9607238-05A  
 Sample ID: 9607221140

Collected: 07/22/96 11:40:00  
 Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3050 LEAD (FAA)/SW846 7420 Lead, Pb	07/24/96 140	N/A mg/Kg	5.0	1.0	07/24/96	SIF6

Lab ID: 9607238-06A  
 Sample ID: 9607221145

Collected: 07/22/96 11:45:00  
 Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051 LEAD (FAA)/SW846 7420 Lead, Pb	07/23/96 ND	N/A mg/Kg	5.0	2.0	07/24/96	SIF4

Lab ID: 9607238-07A  
 Sample ID: 9607221150

Collected: 07/22/96 11:50:00  
 Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051 LEAD (FAA)/SW846 7420 Lead, Pb	07/23/96 226	N/A mg/Kg	5.0	2.0	07/24/96	SIF4

Lab ID: 9607238-08A  
 Sample ID: 9607221155

Collected: 07/22/96 11:55:00  
 Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3050 LEAD (FAA)/SW846 7420 Lead, Pb	07/24/96 ND	N/A mg/Kg	5.0	1.0	07/24/96	SIF6

Lab ID: 9607238-09A  
 Sample ID: 9607221205

Collected: 07/22/96 12:05:00  
 Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051 LEAD (FAA)/SW846 7420 Lead, Pb	07/23/96  253	N/A  mg/Kg	5.0	2.0	07/24/96	SIF4

*12.65 ppm*

Lab ID: 9607238-10A  
 Sample ID: 9607221210

Collected: 07/22/96 12:10:00  
 Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051 LEAD (FAA)/SW846 7420 Lead, Pb	07/23/96  ND	N/A  mg/Kg	5.0	2.0	07/24/96	SIF4

Lab ID: 9607238-11A  
 Sample ID: 9607221215

Collected: 07/22/96 12:15:00  
 Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051 LEAD (FAA)/SW846 7420 Lead, Pb	07/23/96  45.7	N/A  mg/Kg	5.0	2.0	07/24/96	SIF4

*2.28 ppm*

Lab ID: 9607238-12A  
 Sample ID: 9607221220

Collected: 07/22/96 12:20:00  
 Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051 LEAD (FAA)/SW846 7420 Lead, Pb	07/23/96  ND	N/A  mg/Kg	5.0	2.0	07/24/96	SIF4

Lab ID: 9607238-13A  
 Sample ID: 9607221225

Collected: 07/22/96 12:25:00  
 Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051 LEAD (FAA)/SW846 7420 Lead, Pb	07/23/96  60.0	N/A  mg/Kg	5.0	2.0	07/24/96	SIF4

*3 ppm*

Lab ID: 9607238-14A  
Sample ID: 9607221230

Collected: 07/22/96 12:30:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051	07/23/96	N/A				
LEAD (FAA)/SW846 7420 Lead, Pb	ND	mg/Kg	5.0	2.0	07/24/96	SIF4

Lab ID: 9607238-15A  
Sample ID: 9607221240

Collected: 07/22/96 12:40:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051	07/23/96	N/A				
LEAD (FAA)/SW846 7420 Lead, Pb	1160	mg/Kg	5.0	2.0	07/24/96	SIF4

Lab ID: 9607238-16A  
Sample ID: 9607221245

Collected: 07/22/96 12:45:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051	07/23/96	N/A				
LEAD (FAA)/SW846 7420 Lead, Pb	ND	mg/Kg	5.0	2.0	07/24/96	SIF4

Lab ID: 9607238-17A  
Sample ID: 9607221255

Collected: 07/22/96 12:55:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051	07/23/96	N/A				
LEAD (FAA)/SW846 7420 Lead, Pb	154	mg/Kg	5.0	2.0	07/24/96	SIF4

Lab ID: 9607238-18A  
Sample ID: 9607221300

Collected: 07/22/96 13:00:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051	07/23/96	N/A				
LEAD (FAA)/SW846 7420 Lead, Pb	ND	mg/Kg	5.0	2.0	07/24/96	SIF4



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Lab ID: 9607238-19A  
Sample ID: 9607221305

Collected: 07/22/96 13:05:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3050 LEAD (FAA)/SW846 7420 Lead, Pb	07/24/96 11.2 <i>5 ppm</i>	N/A mg/Kg	5.0	1.0	07/24/96	SIF6

Lab ID: 9607238-20A  
Sample ID: 9607221310

Collected: 07/22/96 13:10:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3051 LEAD (FAA)/SW846 7420 Lead, Pb	07/23/96 ND	N/A mg/Kg	5.0	2.0	07/24/96	SIF4

Lab ID: 9607238-21A  
Sample ID: 9607221330

Collected: 07/22/96 13:30:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3050 LEAD (FAA)/SW846 7420 Lead, Pb	07/24/96 15.5 <i>17 ppm</i>	N/A mg/Kg	5.0	1.0	07/24/96	SIF6

Lab ID: 9607238-22A  
Sample ID: 9607221335

Collected: 07/22/96 13:35:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3050 LEAD (FAA)/SW846 7420 Lead, Pb	07/23/96 7.7	N/A mg/Kg	5.0	1.0	07/24/96	SIF5

Lab ID: 9607238-23A  
Sample ID: 9607221340

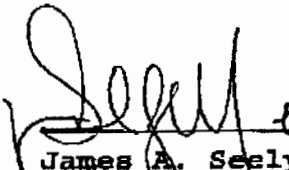
Collected: 07/22/96 13:40:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3050 LEAD (FAA)/SW846 7420 Lead, Pb	07/23/96 10.7 <i>5 ppm</i>	N/A mg/Kg	5.0	1.0	07/24/96	SIF5

Lab ID: 9607238-24A  
Sample ID: 9607221345

Collected: 07/22/96 13:45:00  
Matrix: SOIL

TEST / METHOD	RESULT	UNITS	LIMIT	D_F	DATE ANAL	BATCH_ID
(FAA) DIG SOIL/SW846 3050	07/23/96	N/A				
LEAD (FAA)/SW846 7420 Lead, Pb	ND	mg/Kg	5.0	1.0	07/24/96	SIF5

  
James A. Seely  
Operations Manager

**WORKORDER COMMENTS**

DATE : 07/29/96

WORKORDER:

**DEFINITIONS/DATA QUALIFIERS**

The following are definitions, abbreviations, and data qualifiers which may have been utilized in your report:

ND = Analyte "not detected" in analysis at the sample specific detection limit.

D\_F = Sample "dilution factor"

NT = Analyte "not tested" per client request.

B = Analyte was also detected in laboratory method QC blank.

E = Analyte concentration (result) is an estimated value or exceeds analysis calibration range.

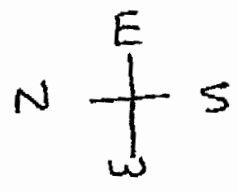
LIMIT = The minimum amount of the analyte that AAL can detect utilizing the specified analysis.

Please Note: Multiply the "Limit" value (AAL's Detection Limit) by Dilution Factor (D\_F) to obtain the sample specific Detection Limit.

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**REPORT COMMENTS**

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7 ppm 11:40  
ND 11:45 \*

11:50 11:3 ppm  
11:55 ND \*

2.2 ppm 11:30  
ND 11:35 \*

4.7 ppm  
11:30 ND \*

12:06 ppm 12:05  
ND 12:10 \*

12:15 2.28 ppm  
12:20 ND \*

3 ppm 12:25  
ND 12:30 \*

12:40 58 ppm  
12:45 ND \*

12:55 7.7 ppm  
13:00 ND \*

Guard Shack

13:05 5 ppm  
13:10 ND \*

To Eubank

To Golf Course

Monitor Well

13:30 7.7 ppm  
13:35 ND \*  
5 ppm 13:40  
ND 13:45 \*

Memo for Record

1. On 23 July 1996, Mr. Walter S. Darr III, Chief of the Environmental Compliance Section (377 Air Base Wing (ABW)/EMC) referenced a letter from Gene Sears Supply Company that a total of 87,340 pounds of lead material had been removed from the Sandia Skeet Shooting Range near the corner of Wyoming Boulevard and Pennsylvania Avenue on south Kirtland Air Force Base. The office building for the skeet shooting range is Building 20719, while the skeet shooting area is 20718.
2. On 24 July 1996, Mr. Pepper discussed the lead shot accumulation with Mr. John Yoder of the Sandia Skeet Range, and other shooters who were at the skeet range building. They stated that they use number 9 shotgun shells with 583 BB's per shell and a range of 690 - 950 feet. The weight of the total BB's in one shotgun shell is 1 and 1/8 ounce. They also average about 150 rounds per weekend day at 25 shots per round. On Wednesday afternoon, they only use about 50 rounds, the total for an entire week is approximately 8750 shots (see equations 5 - 7). They shoot at the clay pigeon approximately 100 feet away. The BB's exiting the rifle expand to an approximate 2 foot radius at 100 feet when they hit the clay pigeon. One shooter claims most shooters have a 97 - 98% success rate, but I used a 95% success rate (see equation 14). Mr. Yoder and the shooter claim that the BB's start losing their velocity immediately. Depending on the angle coming out of the shotgun, the BB's will land approximately 300 - 700 feet away.
3. A survey of the area found broken clay pigeons from the 100 - 200 foot range from the shooters' standing areas. There was less accumulation of broke clay pigeons from 200 - 300 feet from the shooting standing area, but I hardly found any BB's. The grassy area starts at approximately 300 feet from the shooting standing area where I started to find BB's laying in the dirt. From 300 feet - 700 feet (where warning signs were posted), I found BB's scattered around a wide area. At the 700 foot area, I found an anthill surrounded by BB's with a road built by the ants leading away from the anthill made of BB's!
4. Equation 11 shows that only 2 years and 9 months are required to build up an accumulation of 87,340 pounds of BB's. Estimating that only 4.5 BB's shatter a clay pigeon and starts dropping quicker in the 200 - 300 foot range, only 669 pounds of BB's are in the 200 - 300 foot range (see equations 1 - 4, and 13 - 17). The majority of BB's that continue their trajectory without interference would drop in the 300 - 700 foot range, about 86,671 pounds (see equation 18).
5. Mr. Yoder stated that the last time lead BB's were removed was in early 1994; however, documentation from Ms. Marsha F. Carra indicates that lead was removed in 1980, 1989, and early 1993. The shooting skeet range began operation in 1967. Estimates done by me are for continuous, steady operation of the shooting skeet range.



DAVID W. PEPPER  
Environmental Inspector

Estimated Calculations:

(Most calculations have a round-off)

- Eq 1. Side area of clay pigeon: 1" high x 3.5" wide = 3.5 square inches
- Eq 2. 2 foot area of shot: r = 12 inches, (pi)r squared = 452 square inches
- Eq 3. 583 BB's / one shot X one shot / 452 square inches = 1.3 BB's / square inch
- Eq 4. 3.5 square inches X 1.3 BB's / square inch = 4.5 BB's per clay pigeon
- Eq 5. 150 shots / round X 25 rounds = 3750 shots
- Eq 6. 50 shots / round X 25 rounds = 1250 shots
- Eq 7. 1250 shots (Wednesday)  
3750 shots (Saturday)  
3750 shots (Sunday)
- Eq 8. 8750 shots / week X 52 weeks / 1 year = 455,000 shots / year
- Eq 9. 455,000 shots / year X 1.125 ounces / shot = 511,875 ounces / week
- Eq 10. 511,875 ounces X 1 pound / 16 ounces = 31,992 pounds / year
- Eq 11. 87,340 pounds removed X year accumulation / 31,980 pounds = 2.75 years or -  
2 years, 9 months
- Eq 12. 1.125 ounces / shot X 1 shot / 583 BB's = 0.002 ounce / BB
- Eq 13. 455,000 shots / year X 0.95 successful shots = 432250 successful shots / year
- Eq 14. 432250 successful shots / year X 4.5 BB's / clay pigeon = 1,945,125 BB's / yr
- Eq 15. 1,945,125 BB's / year X 0.002 ounces / BB = 3890 ounces / year
- Eq 16. 3890 ounces / year X 1 pound / 16 ounces = 243 pounds / year (in the 200 - 300  
foot range)
- Eq 17. 243 pounds / year X 2.75 years = 669 pounds over 2.75 years (in the 200 - 300  
foot range)
- Eq 18. 87,340 pounds - 669 pounds = 86,671 pounds in the 300 - 700 foot range over  
2.75 years