



NORTH DAKOTA
STATE DEPARTMENT OF HEALTH
AND CONSOLIDATED LABORATORIES

State Capitol
Bismarck, North Dakota 58505

recd 4 Apr 88; 0730E

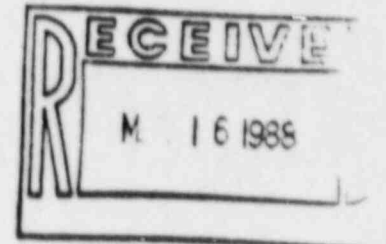
SE 375
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ENVIRONMENTAL HEALTH SECTION

March 9, 1988

1200 Missouri Avenue
P.O. Box 5520
Bismarck, North Dakota 58502-5520

Mr. Robert D. Martin
Regional Administrator
U.S. Nuclear Regulatory Commission
State Agreements Program
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011



Attention: Mr. Robert J. Doda

Re: Report on Survey of 3M Devices/Facilities

Dear Mr. Martin:

During the period of February 8 - 17, 1988, this office conducted on-site radiation surveys and leak tests of 3M Polonium-210 static elimination devices at six North Dakota facilities.

Field surveys were conducted to evaluate removable contamination with portable survey instrumentation. Wipe samples were evaluated in the field and also analyzed by the Department's Laboratory. The results of leak tests and wipes samples are listed below:

A. Sample Group #1

1. Location: William Langer Jewel Bearing Plant, Rolla, ND
2. Devices Tested:
 - a. 4 - Model 210 6" static control bars @ 12 millicuries Po-210
(Serial #'s B06708/B06709/B06353/B06354)
 - b. 4 - Model 906F air guns @ 10 millicuries Po-210
(Serial #'s F33452/F33453/F33454/F33455)
3. Survey Types:
 - a. Surface-"frisker" survey (field)
 - b. Leak test wipes (Lab)
 - c. Usage area wipe samples (Lab)

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Environmental
Enforcement
701-224-3234

Environmental
Engineering
701-224-2348

Waste Management &
Special Studies
701-224-2366

Water Supply &
Pollution Control
701-224-2354

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4. Instruments:
 - a. Field measurements conducted with Ludlum Model 12 survey meter with pancake probe.
 - b. Laboratory measurements conducted with Canberra Model 2404 Alpha/Beta/Gamma sealed gas proportional counter.
 5. Field survey conducted by Jeff Burgess, Manager, Radiation Control Program, State Department of Health and Consolidated Laboratories, Division of Environmental Engineering.
 6. Bulova Watch Company operates two facilities to produce:
 - a. Jewel Bearings under contract for the U.S. Government (Building #1), and
 - b. Prototype testing of dosimeter production (Building #2).
 7. Results of Surveys:
 - a. Twenty samples were collected on-site for analysis.
 - b. Field Survey: Removable contamination below 0.005 microcurie of Po-210.
 - c. Laboratory Analysis: See Attachment 1
 8. No samples of containers or products were collected for analysis.
- B. Sample Group #2
1. Location: Turtle Mountain Corporation, Dunseith, ND
 2. Devices Tested:

2 - Model 902F air guns @ 10 millicuries Po-210
(Serial #'s F34864/F34865)
 3. Survey Types:
 - a. Surface-"frisker" survey (field)
 - b. Leak test wipes (Lab)
 - c. Usage area wipe samples (Lab)
 4. Instruments:
 - a. Field measurements conducted with Ludlum Model 12 survey meter with pancake probe.
 - b. Laboratory measurements conducted with Canberra Model 2404 Alpha/Beta/Gamma sealed gas proportional counter.

5. Field survey conducted by Terry Lindsey, Environmental Scientist, Radiation Control Program, State Department of Health and Consolidated Laboratories, Division of Environmental Engineering.
6. Facility produces circuit board components for several companies and the U.S. Government.
7. Results of Surveys:
 - a. Eleven samples were collected on-site for analysis.
 - b. Field Survey: Removable contamination below 0.005 microcurie of Po-210.
 - c. Laboratory Analysis: See Attachment 2
8. No samples of containers or products were collected for analysis.

C. Sample Group #3

1. Location: Northrop Corporation, New Town, ND
2. Devices Tested:
 - 1 - Model 906 air gun @ 20 millicuries Po-210 (Serial # E10137)
3. Survey Types:
 - a. Surface-"frisker" survey (field)
 - b. Leak test wipes (Lab)
 - c. Usage area wipe samples (Lab)
4. Instruments:
 - a. Field measurements conducted with Ludlum Model 12 survey meter with pancake probe.
 - b. Laboratory measurements conducted with Canberra Model 2404 Alpha/Beta/Gamma sealed gas proportional counter.
5. Field survey conducted by Terry Lindsey.
6. Facility contracts with various corporations and the U.S. Government to produce electronic components for electrical assemblies.
7. Results of Surveys:
 - a. Three samples were collected on-site for analysis.
 - b. Field Survey: Removable contamination below 0.005 microcurie of Po-210.

c. Laboratory Analysis: See Attachment 3

8. No samples of containers or products were collected for analysis.

D. Sample Group #4

1. Location: Ninety Minute Photo, Jamestown, ND

2. Devices Tested:

1 - Model 902 air gun @ 10 millicuries Po-210
(Serial #C16189)

3. Survey Types:

a. Surface-"frisker" survey (field)

b. Leak test wipes (Lab)

c. Usage area wipe samples (Lab)

4. Instruments:

a. Field measurements conducted with Ludlum Model 12 survey meter with pancake probe.

b. Laboratory measurements conducted with Canberra Model 2404 Alpha/Beta/Gamma sealed gas proportional counter.

5. Field survey conducted Terry Lindsey.

6. Facility is a photo processing and portrait studio.

7. Results of Surveys:

a. Five samples were collected on-site for analysis.

b. Field Survey: Removable contamination below 0.005 microcurie of Po-210.

c. Laboratory Analysis: See Attachment 4

8. No samples of containers or products were collected for analysis.

E. Sample Group #5

1. Location: American Photo Group, Fargo, ND

2. Devices Tested:

1 - Model 908 in-line device @ 10 millicuries
(Serial #D64659)

3. Survey Types:

a. Surface-"frisker" survey (field)

March 9, 1988

- b. Leak test wipes (Lab)
- c. Usage area wipe samples (Lab)

4. Instruments:

- a. Field measurements conducted with Ludlum Model 12 survey meter with pancake probe.
- b. Laboratory measurements conducted with Canberra Model 2404 Alpha/Beta/Gamma sealed gas proportional counter.

5. Field survey conducted by Terry Lindsey.

6. Facility is a photo processing center.

7. Results of Surveys:

- a. Three samples were collected on-site for analysis.
- b. Field Survey: Removable contamination below 0.005 microcurie of Po-210.
- c. Laboratory Analysis: See Attachment 5

8. No samples of containers or products were collected for analysis.

F. Sample Group #6

1. Location: Monarch Photo, Fargo, ND

2. Devices Tested:

9 - Model 902 air guns @ 10 millicuries Po-210
(Serial #'s C10458 through C10466)

3. Survey Types:

- a. Surface-"frisker" survey (field)
- b. Leak test wipes (Lab)
- c. Usage area wipe samples (Lab)

4. Instruments:

- a. Field measurements conducted with Ludlum Model 12 survey meter with pancake probe.
- b. Laboratory measurements conducted with Canberra Model 2404 Alpha/Beta/Gamma sealed gas proportional counter.

5. Field survey conducted by Terry Lindsey.

6. Facility is a regional photo processing center.

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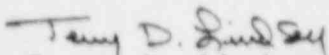
7. Results of Surveys:

- a. Twenty-two samples were collected on-site for analysis.
- b. Field Survey: Removable contamination below 0.005 microcurie of Po-210.
- c. Laboratory Analysis: See Attachment 6

8. No samples of containers or products were collected for analysis.

If you have any questions regarding the information provided in this report, please contact this office.

Sincerely,


Terry D. Lindsey
Environmental Scientist
Radiation Control Program
Div. of Environmental Engineering

TDL:saj
cc: LaVert Seabron, FDA/CDRH

Attachment 1

State Department of Health and Consolidated Laboratories

Laboratory Analysis Results - Preliminary

Location: William Langer Jewel Bearing Plant, Rolla, ND

Date Collected: February 8, 1988

<u>Sample No.</u>	<u>Location/Type of Sample</u>	<u>CPM</u>	<u>Net CPM</u>	<u>DPM</u>	<u>uCi</u>
1	Wipe Before Decon Frame Adj Room (Bldg 2)	0.75±.38	0	0	0
2	Wipe After Decon Frame Adj Room (Bldg 2)	0.4±.28	0	0	0
3	Control Sample (Bldg 1)	0.5±.31	0	0	0
4	Control Sample (Bldg 2)	0.55±.23	0	0	0
5	Leak Test Wipe of Model 210 Serial #B06353 Static Bar (Bldg 2)	0.85±.41	0	0	0
6	Leak Test Wipe of Model 210 Serial #B06709 Static Bar (Bldg 1)	3.4±.82	2.8	33	0.00002
7	Leak Test Wipe of Model 210 Serial #B06354 Static Bar (Bldg 2)	0.9±.4	0	0	0
8	Leak Test Wipe of Model 210 Serial #B06708 Static Bar (Bldg 1)	1.9±.61	1.3	15	.00001
9	Leak Test Wipe of Model 902F Serial #F33452 Air Gun (Bldg 2)	0.35±.25	0	0	0
10	Leak Test Wipe of Model 902F Serial #F33453 Air Gun (Bldg 2)	0.5±.3	0	0	0
11	Leak Test Wipe of Model 902F Serial #F33454 Air Gun (Bldg 2)	0.45±.29	0	0	0
12	Leak Test Wipe of Model 902F Serial #F33455 Air Gun (Bldg 2)	0.64±.36	0	0	0

Attachment 1

13	Wipe Before Decon Acid Room (Bldg 1)	0.64±.35	0	0	0
14	Wipe After Decon Acid Room (Bldg 1)	0.35±.26	0	0	0
15	Wipe Before Decon Packing Room (Bldg 1)	0.2±.2	0	0	0
16	Wipe After Decon Packing Room (Bldg 1)	0.25±.22	0	0	0
17	Wipe Before Decon Final Insp. Room (Bldg 1)	0.2±.2	0	0	0
18	Wipe After Decon Final Insp. Room (Bldg 1)	0.75±.33	0	0	0
19	Wipe Before Decon Molding Room (Bldg 2)	0.25±.22	0	0	0
20	Wipe After Decon Molding Room (Bldg 2)	0.35±.26	0	0	0

Note: Samples analyzed on CANBERRA Model 2404 ALPHA, BETA, GAMMA
Gas proportional counter with THORIUM 230 used as standard.

288 CPM/3330 DPM = 8.6% efficiency

Background counts at 20 minutes = 0.6 CPM ± .34

Attachment #2
State Department of Health and Consolidated Laboratories

Laboratory Analysis Results - Preliminary

Location: Turtle Mountain Corporation, Dunseith, ND
Date Collected: February 11, 1988

<u>Sample No.</u>	<u>Location/Type of Sample</u>	<u>CPM</u>	<u>Net CPM</u>	<u>DPM</u>	<u>uCi</u>	<u>% Eff</u>
1	Leak Test Dry Wipe Sample Model 902F #F34864	0.2 ± .2	0	0	0	19.4
2	Leak Test Dry Wipe Sample Model 902F #F34865	6.35 ± 1.12	6.22	32	0.00001	19.4
3	Floor-Wipe Sample Area #1 (UNISYS)	0.1 ± .14	0	0	0	19.4
4	Floor Mat-Wipe Sample Area #1 (UNISYS)	0.25 ± .22	0	0	0	19.4
5	Table-Wipe Sample Area #1 (UNISYS)	0.1 ± .14	0	0	0	19.4
6	Control Sample-Area #1	0.1 ± .14	0	0	0	19.4
7	Floor Mat-Wipe Sample Area #2 (Solder Room)	0.05 ± .1	0	0	0	19.4
8	Table-Wipe Sample Area #2 (Solder Room)	0.1 ± .14	0	0	0	19.4
9	Floor Area-Wipe Sample Area #2 (Solder Room)	0.05 ± .1	0	0	0	14.7
10	Filter from Model 902F Air Gun SN F34864	14.95 ± 1.72	14.82	101	0.00005	14.7
11	Filter From Model 902F Air Gun SN F34865	0.05 ± .1	0	0	0	14.7

Note: Variance in efficiency is based upon relative thickness of sample analyzed (i.e., filter paper versus swab or other type of sample collected).

Attachment #3
State Department of Health and Consolidated Laboratories

Laboratory Analysis Results - Preliminary

Location: Northrop Corporation, New Town, ND

Date Collected: February 12, 1988

<u>Sample No.</u>	<u>Location/Type of Sample</u>	<u>CPM</u>	<u>Net CPM</u>	<u>DPM</u>	<u>uCi</u>	<u>% Eff</u>
12	Control Sample Northrop Corp.	0.15 ± .17	0	0	0	19.4
13	Leak Test Dry Wipe Sample Model 906 #E10137	0.1 ± .14	0	0	0	19.4
14	Floor Area-Wet Wipe Sample Northrop Corp.	0.2 ± .2	0	0	0	19.4

Attachment #4
State Department of Health and Consolidated Laboratories

Laboratory Analysis Results - Preliminary

Location: Ninety Minute Photo, Jamestown, ND

Date Collected: February 16, 1988

<u>Sample No.</u>	<u>Location/Type of Sample</u>	<u>CPM</u>	<u>Net CPM</u>	<u>DPM</u>	<u>uCi</u>	<u>% Eff</u>
1	Leak Test Dry Wipe-Swab Model 902 #C16189	0.05 ± .1	0	0	0	13.2
2	Leak Test Dry Wipe-Filter Paper Model 902 #C16189 (Front)	0.2 ± .2	0	0	0	19.4
3	Photo Processing Unit-Wipe of Working Table Area	0.15 ± .17	0	0	0	19.4
4	Leak Test Dry Wipe-Swab Model 902 #C16189 (Back)	0.15 ± .17	0	0	0	13.2
5	Leak Test Dry Wipe-Swab Model 902 #C16189 (Connector)	0.25 ± .22	0	0	0	13.2

Note: Variance in efficiency is based upon relative thickness of sample analyzed (i.e., filter paper versus swab or other type of sample collected).

Attachment #5
State Department of Health and Consolidated Laboratories

Laboratory Analysis Results - Preliminary

Location: American Photo Group, Fargo, ND
Date Collected: February 16, 1988

<u>Sample No.</u>	<u>Location/Type of Sample</u>	<u>CPM</u>	<u>Net CPM</u>	<u>DPM</u>	<u>uCi</u>	<u>% Eff</u>
6	Leak Test Dry Wipe-Swab Model 908 #D64659	0.15 ± .17	0	0	0	13.2
7	Photo Processing Unit-Wipe of Working Table Area	0.1 ± .14	0	0	0	19.4
8	Leak Test Dry Wipe-Airstream Model 908 #D64654	0.1 ± .14	0	0	0	19.4

Note: Variance in efficiency is based upon relative thickness of sample analyzed (i.e., filter paper versus swab or other type of sample collected).

Attachment #6
State Department of Health and Consolidated Laboratories

Laboratory Analysis Results - Preliminary

Location: Monarch Photo, Fargo, ND

Date Collected: February 17, 1988

<u>Sample No.</u>	<u>Location/Type of Sample</u>	<u>CPM</u>	<u>Net CPM</u>	<u>DPM</u>	<u>uCi</u>	<u>% Eff</u>
9	Leak Test Dry Wipe-Swab Model 902 #C10458	0.15 ± .17	0	0	0	13.2
10	Leak Test Dry Wipe-Filter Model 902 #C10458	0.15 ± .17	0	0	0	19.4
11	Leak Test Dry Wipe-Swab Model 902 #C10459	0.15 ± .17	0	0	0	13.2
12	Leak Test Dry Wipe-Filter Model 902 #C10459	0.2 ± .2	0	0	0	19.4
13	Leak Test Dry Wipe-Swab Model 902 #C10460	0.2 ± .2	0	0	0	13.2
14	Leak Test Dry Wipe-Filter Model 902 #C10460	0.1 ± .14	0	0	0	19.4
15	Leak Test Dry Wipe-Swab Model 902 #C10461	0.25 ± .22	0	0	0	13.2
16	Leak Test Dry Wipe-Filter Model 902 #C10461	0.15 ± .17	0	0	0	19.4
17	Leak Test Dry Wipe-Swab Model 902 #C10462	0.25 ± .22	0	0	0	13.2
18	Leak Test Dry Wipe-Filter Model 902 #C10462	0.25 ± .22	0	0	0	19.4
19	Leak Test Dry Wipe-Swab Model 902 #C10463	0.35 ± .26	0	0	0	13.2
20	Leak Test Dry Wipe-Filter Model 902 #C10463	0.35 ± .26	0	0	0	19.4

Note: Variance in efficiency is based upon relative thickness of sample analyzed (i.e., filter paper versus swab or other type of sample collected).

Sample No.	Location/Type of Sample	CPM	Net CPM	DPM	uCi	% Eff
21	Leak Test Dry Wipe-Swab Model 902 #C10464	0.3 ± .24	0	0	0	13.2
22	Leak Test Dry Wipe-Filter Model 902 #C10464	0.35 ± .26	0	0	0	19.4
23	Leak Test Dry Wipe-Swab Model 902 #C10465	0.45 ± .29	0	0	0	13.2
24	Leak Test Dry Wipe-Filter Model 902 #C10465	0.35 ± .26	0	0	0	19.4
25	Leak Test Dry Wipe-Swab Model 902 #C10466	0.05 ± .1	0	0	0	13.2
26	Leak Test Dry Wipe-Filter Model 902 #C10466	0.15 ± .17	0	0	0	19.4
27	Norit Mini-Lab 901 Wipe of Processing Area (C10466)	0.0	0	0	0	19.4
28	Kodak Processor Wipe of Processing Area (C10462)	0.2 ± .2	0	0	0	19.4
29	Processing Area Wipe (C10463)	0.25 ± .22	0	0	0	19.4
30	Control Sample Night Supervisor Desk Wipe	0.25 ± .22	0	0	0	19.4

Note: Variance in efficiency is based upon relative thickness of sample analyzed (i.e., filter paper versus swab or other type of sample collected).