Department of Energy
Field Office, Albuquerque
Los Alamos Area Office
Los Alamos, New Mexico 87544

OCT 28 1994

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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Barbara Hoditschek, Program Manager
RCRA Permits Program
Hazardous and Radioactive Materials
Bureau
New Mexico Environment Department
525 Camino de los Marquez
P. O. Box 26110
Santa Fe, NM 87502

Dear Ms. Hoditschek:

The Department of Energy (DOE) and the Management and Operating contractor for the Los Alamos National Laboratory (LANL), the University of California, are providing this final report on the treatment of plutonium-impregnated nitrated cheesecloth at LANL by the Inert Atmosphere Decomposition Unit (IADU) located at Technical Area 55, in Building PF-4, Room 420, pursuant to Section II.K.1 of the 90-day emergency permit number NM8900010515-EP1. This letter also constitutes the certification required by Section II.K.2 of the permit.

On July 7, 1994, LANL began treating plutonium-impregnated nitrated cheesecloth managed as a mixed waste for ignitability and reactivity. A total of 3,841 grams of this cheesecloth was treated from July 7, 1994 through August 31, 1994. In addition to the nitrated cheesecloth, 27,628 grams of plutonium-impregnated, non-nitrated (and non-hazardous) cheesecloth was also treated at the same time. A total of 90 runs were required to work off these wastes. As a result of treatment, 6,630 grams of non-hazardous treatment residue was generated. Enclosed is a table showing each process run, including amount of nitrated and non-nitrated cheesecloth processed, date, start and end times of each process, and beginning and maximum temperatures.

As shown in the enclosed table, the IADU was operated at a process temperature below 800°C during the first 55 process runs, which was below the process temperature prescribed in the permit. The cause of the lower operating temperature was insufficient sizing of the heating coils and excessive cooling of the unit by the inert argon atmosphere. This was further exacerbated by the placement of the thermocouple used to measure process temperature too distant from the waste being processed and inadequate insulation of the process unit. Therefore, IADU

process temperatures did not reach 800°C during runs 1 through 55. On August 12, after relocating the thermocouple, installing high temperature heating coils and additional insulation, the IADU began operating at 800°C. On August 18, during run 66, the IADU failed to register 800°C. To assure proper deactivation of the hazardous components, all treatment residues generated below 800°C were reprocessed. The final 34 runs, except for run 66, including one run for reprocessing all residues generated below 800°C (i.e., runs 1-55) and a rerun on residue from run 66, were performed at or above 800°C. Thus, all the waste including all nitrated cheesecloth stored in Building 4, was ultimately subjected to temperatures at or above 800°C and achieved complete pyrolysis and thereby rendered non-hazardous.

LANL performed a review of the potential non-radioactive off-gassing that may have occurred during the processing of plutonium-impregnated nitrated and non-nitrated cheesecloth below 800°C. The decomposition of cheesecloth in the IADU may result in off-gassing of aldehydes, ketones, and alcohols into the caustic scrubber. At 131°C, or the minimum temperature measured during run number 10, the maximum estimated hourly emission for each of these compounds was found to be 0.57 lb/hr (1.71 lb/hr total). The emission limit, in accordance with Section 702 of the New Mexico Air Quality Regulations (AQCR) is 10 lb/hr. Therefore, the AQCR standard was never exceeded as a result of lower treatment temperatures.

Two discrepancies were found in the operating parameters provided by LANL in the permit application: (1) Attachment A, page 4, described feed rate at 10 percent by weight when the operating procedures for the IADU recommended 10 percent *by volume*; and (2) Attachment A, page 6, required replacement of scrubber water upon discoloration when the actual condition should have been pH. On August 17, Mr. Juan Corpion spoke with Ms. Stephanie Kruse of your staff regarding the discrepancies in the operating permit. Subsequently, on August 18, Ms. Kruse called Mr. Corpion and recommended that DOE and LANL send a letter clarifying the language in the permit to coincide with the operating parameters of the IADU. Ms. Kruse also advised that this action was not considered by the New Mexico Environment Department (NMED) as a permit modification. This clarification was sent to NMED in a letter from DOE on September 2, 1994. A response approving the parameters described in the September 2 letter was provided to DOE in a letter from NMED dated September 12, 1994.

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If you have any questions regarding this matter, please contact Joseph Vozella at (505) 665-5027, or Jon Mack at (505) 665-5026.

Sincerely,

Joseph C. Vozella 10/20/94

Joseph C. Vozella Date
Acting Asst. Area Manager
Office of Environment and Projects
U. S. Department of Energy

LAAMEP:2JM-014

10/28/94

Dennis Erickson, Director Date
Environment, Safety, and Health
Division
Los Alamos National Laboratory

Enclosure

Table 1. Record of Nitrated and Non-Nitrated Cheesecloth Process Runs

Run	Date	Start Time	End Time	Nitrated Rag Weight (g)	Non-Nitrated Rag Weight (g)	Beginning Temp. (°C.)	Maximum Process Temp. (°C.)
1[a]	7/6/94	13:00	14:10	0.0	128.8	25.0	328.0
2	7/7/94	10:20	12:25	22.0	216.4	25.0	500.0
3	7/8/94	10:11	11:45	22.5	225.8	61.0	328.0
4	7/11/94	10:00	11:08	21.7	218.0	21.0	438.0
5	7/12/94	09:35	11:20	16.3	212.5	25.0	380.0
6	7/13/94	09:30	11:07	26.4	251.3	23.0	362.0
7	7/14/94	07:55	08:36	24.8	240.9	25.0	400.0
8	7/14/94	14:21	15:42	21.2	212.4	25.0	160.0
9	7/15/94	09:30	11:20	24.8	257.3	25.0	140.0
10	7/18/94	07:40	08:54	22.6	226.5	25.0	131.0
11	7/18/94	10:18	11:40	30.0	300.0	50.0	151.0
12	7/18/94	13:07	14:35	28.3	283.6	75.0	141.0
13	7/19/94	07:45	09:52	22.3	228.0	25.0	146.0
14	7/19/94	11:14	14:05	27.2	277.6	30.0	150.0
15	7/19/94	15:25	17:00	52.3	523.3	50.0	166.0
16	7/20/94	07:52	10:02	58.9	589.0	25.0	530.5
17	7/20/94	13:03	14:36	42.2	422.6	55.0	451.0
18	7/20/94	15:01	17:00	33.1	331.5	50.0	530.0
19	7/21/94	07:46	09:00	27.9	279.1	24.0	579.0
20	7/21/94	10:35	12:30	26.7	266.9	50.0	390.0
21	7/21/94	14:30	17:00	40.2	400.9	50.0	380.0
22	7/22/94	07:42	10:35	43.2	432.5	25.0	442.8
23	7/22/94	11:15	13:20	52.4	524.6	45.0	445.0
24	7/25/94	07:54	10:53	49.0	490.2	25.0	460.0
25	7/25/94	13:03	14:25	27.7	273.5	25.0	410.0
26	7/25/94	15:27	17:19	21.8	218.7	25.0	143.0
27	7/26/94	07:40	09:15	35.4	353.2	25.0	292.0
28	7/26/94	10:05	11:44	35.5	353.9	25.0	373. 6
29	7/26/94	12:35	13:57	21.7	217.2	50.0	460.0
30	7/26/94	14:46	16:36	40.3	403.8	25.0	536.0
31	7/27/94	07:42	09:17	27.0	270.5	25.0	55 0.0
32	7/27/94	09:57	12:00	35.0	350.4	35.0	458.0
33	7/27/94	13:00	13:45	21.3	217.1	25.0	654.0
34	7/27/94	14:15	15:00	27.9	279.6	100.0	520.0
35	7/27/94	15:15	16:00	20.0	196.5	50.0	363.0
36	7/29/94	07:46	11:15	23.9	239.8	25.0	299.0
37	8/1/94	07:52	11:30	34.6	346.6	25.0	394.0
38	8/1/94	12:15	14:17	23.2	232.0	25.0	300.5
39	8/1/94	14:45	16:58	29.8	298.2	25.0	279.0
40	8/2/94	07:30	09:00	32.0	160.5	25.0	270.0
41	8/2/94	09:56	11:22	57.0	285.6	100.0	230.0
42	8/2/94	12:00	14:30	41.6	208.3	50.0	300.0
43	8/3/94	07:30	10:30	55.5	275.2	25.0	352.0
44	8/3/94	11:03	13:44	90.4	452.0	25.0	360.0
45	8/3/94	14:40	17:05	84.4	422.0	25.0	235.0
46	8/4/94	07:45	10:30	80.9	404.7	25.0	282.0
47	8/4/94	11:00	11:45	43.6	218.0	25.0	220.0
48	8/4/94	13:00	16:06	55.4	277.0	25.0	293.0
49	8/8/94	08:15	10:45	40.4	204.4	25.0	412.0
50	8/8/94	11:15	12:30	42.4	212.4	50.0	415.0
51	8/8/94	13:00	15:20	61.6	308.3	50.0	591.0
52	8/9/94	07:45	10:30	83.8	419.3	25.0	596.0
53	8/9/94	11:45	15:43	95.0	475.5	25.0	616.0
54	8/10/94	11:35	13:00	67.8	339.9	25.0	465.0

Table 1. Record of Nitrated and Non-Nitrated Cheesecloth Process Runs

Run	Date	Start Time	End Time	Nitrated Rag Weight (g)	Non-Nitrated Rag Weight (g)	Beginning Temp. (°C.)	Maximum Process Temp. (°C.)
55	8/11/94	10:30	16:58	17.9	179.6	25.0	760.0
56	8/12/94	07:35	08:45	18.7	187.5	25.0	802.0
57	8/12/94	09:50	10:55	20.8	208.7	25.0	814.0
58	8/12/94	12:08	12:50	34.0	340.9	50.0	817.0
59	8/15/94	07:45	08:50	26.2	262.1	25.0	820.0
60	8/15/94	11:00	12:11	38.7	387.5	25.0	800.0
61	8/15/94	14:30	15:38	36.9	369.0	50.0	800.0
62	8/16/94	07:45	09:35	41.0	410.7	25.0	800.0
63	8/16/94	11:15	12:21	44.8	448.2	50.0	833.0
64[b]	8/16/94	14:49	17:10	N.A.	N.A.	25.0	805.0
65	8/18/94	07:35	10:05	33.8	338.2	25.0	836.0
66	8/18/94	12:40	14:00	34.0	340.5	25.0	655.0
67	8/19/94	07:35	08:30	60.0	300.0	25.0	805.0
68[c]	8/22/94	07:55	10:20	39.4	196.7	25.0	800.0
69	8/22/94	14:50	15 :53	40.2	400.7	100.0	800.0
70	8/23/94	07:55	08:50	42.6	426.5	25.0	809.0
71	8/23/94	13:55	15:08	40.5	400.7	100.0	802.0
72	8/24/94	07:45	08:45	25.6	256.6	25.0	800.0
73	8/24/94	13:00	14:00	24.0	240.8	25.0	804.0
74	8/25/94	07:30	08:36	38.9	389.5	25.0	800.0
75	8/25/94	10:10	11:35	30.2	302.4	100.0	809.0
76	8/25/94	12:45	13:50	50.0	378.4	100.0	906.0
77	8/25/94	15:15	16:15	49.0	298.8	100.0	800.0
78	8/26/94	07:40	08:50	49.0	200.7	25.0	800.0
79	8/26/94	10:10	10:55	49.0	401.1	50.0	800.0
80	8/26/94	12:25	13:26	49.0	411.3	100.0	800.0
81	8/26/94	14:55	15:31	96.0	377.7	75.0	800.0
82	8/29/94	07:40	08:55	96.0	407.5	25.0	800.0
83	8/29/94	12:30	13:30	99.5	192.4	75.0	800.0
84	8/29/94	14:30	15:40	99.0	355.4	100.0	800.0
85	8/30/94	07:30	08:50	30.9	309.1	25.0	800.0
86	8/30/94	11:05	11:50	90.0	246.8	50.0	800.0
87	8/30/94	13:05	14:00	90.0	310.4	25.0	800.0
88	8/31/94	07:37	08:35	65.9	304.5	25.0	800.0
89	8/31/94	10:13	11:00	48.4	268.2	50.0	800.0
90	8/31/94	12:30	13:28	98.5	335.4	50.0	800.0
Total Amount Processed				**3,841**	**27,638**		

Notes: a) Dry run, no nitrated cheesecloth introduced into the IADU.
b) Reprocessing of treatment residue generated during runs 1-55 to 800° C.
c) Processing of 39.4 g. of nitrated cheesecloth and reprocessing of treatment residue generated during run 66 to 800° C.