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CONNECTICUT COALITION AGAINST MILLSTONE

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March 2, 2005

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Chief
Rules and Directives Branch
Division of Administrative Services
Office of Administration
Mailstop T-6D59
U.S. Nuclear Regulatory Commission
Washington DC 20555-0001

Re: Millstone Nuclear Power Station/Draft Environmental Impact Statement

Dear Sirs:

The Connecticut Coalition Against Millstone submits herewith preliminary comments concerning the draft Environmental Impact Statement (EIS) which the NRC staff has prepared in support of relicensing of Millstone nuclear reactors Units 2 and 3 to extend their terms to the years 2035 and 2045 respectively. These comments will be supplemented with a separate filing with attachments.

The Coalition strongly opposes Millstone relicensing.

The data available to the U.S. Nuclear Regulatory Commission in its environmental review establishes a clear link between Millstone's radiological and chemical discharges to the environment and major health effects in the surrounding community.

The data reviewed by the NRC is alarming.

The data strongly suggests – and indeed does so almost to a certainty – that Dominion Nuclear Connecticut, Inc. is operating and will continue to operate the Millstone Nuclear Power Station in violation of NRC regulations requiring limiting doses to the public of 15 millirems per year to any organ.

SISP Review Complete

FRIDS = ADM-03

Case = RL Ench (RLE)

Temp Letter = ADM-013

Put another way, the data strongly suggests that Dominion's Millstone daily operations exceed the permissible dose of radiation to the public and will continue to do so during the proposed relicensing period.

Based on Dominion's own reporting of radiation sampling in the environment, the Coalition believes the available data reviewed by the NRC for the years 2001, 2002 and 2003 prove that routine operations of Millstone are in violation of federal health standards and are illegal.

By its own admission, the NRC confined its review of Millstone radiological releases, for Environmental Impact Statement purposes, to the years 2001, 2002 and 2003. ("Radioactive Waste Management Systems and Effluent Control Systems 2.1.4," DEIS at 2-9) (No explanation is provided in the DEIS as to why the years 1970-2000 and the year 2004 – with the most current data – were excluded from review.)

The Annual Radiological Environmental Operating Report submitted by Dominion Nuclear Connecticut, Inc. to the NRC for the year 2001 – one of the few reports the NRC specifically identified that it had reviewed in its EIS procedure - contains the following information:

On September 19, 2001, a concentration of strontium-90 of 55.5 picoCuries per liter (pCi/l) was measured in a sample of goat milk taken from a location 5.5 miles north-northeast of the Millstone Nuclear Power Station. The uncertainty factor reported was plus or minus 5.3 pCi/L.

A concentration of 55.5 picoCuries per liter is an "extremely large concentration, close to twice the highest concentration measured in Connecticut pooled milk at the height of nuclear weapons testing in 1963 of 23 pCi/L," according to a report dated March 1, 2005 by Dr. Ernest J. Sternglass, Professor Emeritus of Radiological Physics at the University of Pittsburgh School of Medicine and an acknowledged pioneer in the field of the effects of low-level ionizing radiation on living cells. The report appears annexed hereto as Exhibit A.

Moreover, according to Dr. Sternglass, since the measured value is ten times as large as the measurement uncertainty, "this is an extremely significant result, with an astronomically small chance that it is a statistical fluctuation."

Put into perspective, an individual drinking two eight-ounce glasses of the strontium-90-contaminated goat milk on a daily basis would receive a maximum permissible dose of radiation – under NRC guidelines – within 30 days.

This assumes no other radiological contamination of the milk. However, strontium-90 never appears alone in the environment. When the radiological effects of identified concentrations of radionuclides also reported in the same goat milk sample - cesium-134, cesium-137, iodine-131, barium-140 and others – are considered, the effect is even more damaging and far less milk would need to be consumed over fewer days before the maximum permissible radiation dose established by federal law would be exceeded, according to Dr. Sternglass.

"The dose to bone or the bone marrow when other fission products are present is some 5 to 6 times greater than from strontium-90 alone, and the Dominion reports for goat milk show significant concentrations of other fission products, such as cesium-137, in significant concentrations," Dr. Sternglass states in his report, Exhibit A.

"Using the NRC NUREG 1.109 dose factor of 0.0172 mrem/pCi/l [millirem] from Table A-5, a mere 2.4 pCi/l daily intake results in the maximum permissible dose to any organ of 15 mrem per year set by NRC guidelines, 23 times the amount measured in a single liter," according to the Sternglass report.

Attached to Dr. Sternglass' report are measurements, reported to the NRC by Dominion, of strontium-90 in goat milk sampled at locations within 5 miles of Millstone during the years 2001, 2002 and 2003.

The reported samples of measurements show concentrations of 13 to 14 pCi/l on other days during the three-year period. According to Dr. Sternglass, these are also significantly high readings since strontium-90, concentrating in milk due to atmospheric nuclear weapons testing which ended in 1980, has declined to less than 1 pCi/l in areas far removed from any nuclear reactors.

Since the samples are collected by Dominion only twice a month, it is unknown whether actual concentrations on other days exceeded the levels reported.

In 1997, Millstone's previous owner, Northeast Utilities, persuaded the NRC to permit it to discontinue sampling for strontium-90 in its air filter monitoring program. As the 1997 Annual Radiological Environmental Operating report states:

Section 4.5 Air Particulate Strontium (Table 5)

Table 5 in past years was used to report the measurement of Sr-89 and Sr-90 in quarterly composited air particulate filters.

These measurements are not required by the Radiological Effluent Monitoring Manual (REMM) and have been discontinued. Previous data has shown the lack of detectable station activity in this media. This fact, and the fact that milk samples are a much more sensitive indicator of fission product existence in the environment, prompted the decision for discontinuation. In the event of widespread plant related contamination or special events such as the Chernobyl incident, these measurements may be made.

Strontium-90 is among the most deadly byproducts of nuclear fission. Once ingested, its highly-energetic electrons damage and cause mutations in nearby cells. Exposure to low levels of strontium-90 and other bone-seeking radioactive chemicals routinely released by nuclear power plants does not merely increase the risk of bone cancer or leukemia, but it weakens the immune defenses provided by the white cells of the blood that originate in the bone marrow. See Declaration of Ernest J. Sternglass (August 8, 2004) submitted to the NRC in In the Matter of Dominion Nuclear Connecticut, Inc., Docket No. 50-336-LR, 50-423-LR, ASLBP No. 04-824-01-LR, annexed hereto as Exhibit B.

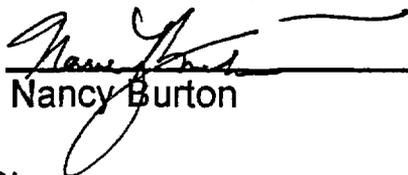
"As recently shown in the 2003 report by the European Committee on radiation Risk, numerous epidemiological and laboratory studies have shown that the risk of cancer and other diseases produced by local internal doses to critical organs from fission products that are inhaled or ingested have been underestimated by extrapolation from high external doses by factors of hundreds to thousand of times," according to the Sternglass report, Exhibit A.

"This explains why it now appears that releases from nuclear plants, often acting synergistically with other environmental pollutants, are a major neglected reason for the recent rise of illness and deaths both among newborns and the elderly observed in the U.S. in the last two decades, as also discussed in the ECRR report," according to Dr. Sternglass. Id.

"For these reasons, it is my professional opinion that the Millstone Nuclear Plant should not be relicensed," Dr. Sternglass stated. In his report, Exhibit A.

The Coalition has previously submitted, in these and the related Atomic Safety and Licensing Board proceedings, documentation from Joseph Mangano and Michael Steinberg which links the Millstone radiological effluent releases – including strontium-90 - to significant negative health consequences in the community. These documents are incorporated by reference herein.

**CONNECTICUT COALITION
AGAINST MILLSTONE**



Nancy Burton

Please address correspondence to:
Nancy Burton
147 Cross Highway
Redding Ridge CT 06876
Tel. 203-938-3952

03/01/2005 11:05 4120010201

Exhibit "A"

Memorandum to: Nancy Burton
Date: 03/01/05
From: Ernest J. Sternglass, Ph. D.
Subject: Millstone Relicensing

I have recently had the opportunity to examine the levels of radioactivity in goat milk samples reported by Dominion Nuclear Connecticut, Inc. in their Annual Radiological Environmental Operating Reports and found that highly significant concentrations of carcinogenic fission products were measured, indicating that the Millstone nuclear plant continues to represent a major health hazard to the people of the area.

Thus, in the enclosed copy of Table 8 of the Report for the year 2001, a concentration of 55.5 picoCuries per liter (PCI/L) of milk of Strontium-90 was reported for Location 22 for the sample measured on September 19, 2001, with an uncertainty of plus or minus 5.3 PCI/L. This is an extremely large concentration, close to twice the highest concentration measured in Connecticut pooled milk at the height of nuclear weapons testing in 1963 of 23 PCI/L, as can be seen from the enclosed Figure 6-1 prepared by the Dominion Company for the period 1961 to 1993. Moreover, since the measured value is ten times as large as the measurement uncertainty, this is an extremely significant result, with an astronomically small chance that it is a statistical fluctuation.

To put this into perspective, using the NRC NUREG 1.109 dose factor of 0.0172 mrem/PCI from Table A-5, a mere 2.4-PCI daily intake results in the maximum permissible dose to any organ of 15mrem per year set by NRC guidelines, 23 times the amount measured in a single liter.

Moreover, since strontium-90 has a physical half-life of 28 years, it must have been present for a number of days that month. In fact, only 16 days at the measured concentration of 55 PCI/L are sufficient to reach the permissible dose.

As the enclosed samples of measurements show, concentrations of 13 to 14 PCI/L were found on other days, again significantly higher than the measurement uncertainty of 1-2 PCI/L.

Moreover, as discussed in the United Nations UNSCEAR reports, the dose to bone or the bone marrow when other fission products are present is some 5 to 6 times greater than from Sr-90 alone, and the Dominion Reports for milk show significant concentrations of other fission products, such as Cesium-137, again significant concentrations.

The high concentrations of Sr-90 and other isotopes measured clearly exclude the possibility that they are due to past nuclear bomb-tests. No other sources of Sr-90 exist other than the fission of Uranium, so the measured values represent releases from Millstone.

Exhibit "A"

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The high concentrations of Sr-90 and other isotopes measured clearly exclude the possibility that they are due to past nuclear bomb-tests. No other sources of Sr-90 exist other than the fission of Uranium, so the measured values represent releases from Millstone.

As recently shown in the 2003 report by the European Committee on Radiation Risk, numerous epidemiological and laboratory studies have shown that the risk of cancer and other diseases produced by local internal doses to critical organs from fission products that are inhaled or ingested, have been underestimated by extrapolation from high external doses by factors of hundreds to thousands of times. This explains why it now appears that releases from nuclear plants, often acting synergistically with other environmental pollutants, are a major neglected reason for the recent rise of illness and deaths both among newborns and the elderly observed in the U.S in the last two decades, as also discussed in the ECRR report.

For these reasons, it is my professional opinion that the Millstone Nuclear Plant should not be relicensed.

Ernest J. Sternglass, Ph. D.
Professor Emeritus of Radiological Physics
University of Pittsburgh School of Medicine

Home address:
University Square #2
4106 Fifth Ave.
Pittsburgh, PA 15213

HILLSTONE POINT 2001

TABLE 8
GOAT'S MILK
(PCL/L)

LOCATION	COLLECTION DATE	SR-89		SR-90		I-131		CS-134		CS-137		BA-140	
		(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)		
22	04/11/01	.	.	.	.	0.01	0.26	-0.1	2.1	5.7	2.7	-1	3
22	04/25/01	.	.	.	.	0.12	0.23	-3.2	3.2	4.5	4.0	+2	4
22	05/02/01 A	.	.	.	.	-0.27	0.34	-0.6	3.2	5.4	3.0	4	5
22	05/09/01	.	.	.	.	0.02	0.26	1.4	3.0	7.0	4.0	-1	5
22	05/23/01	.	.	.	.	0.07	0.23	0.4	3.7	9.6	5.2	4	5
22	06/13/01	.	.	.	.	-0.06	0.29	-1.6	4.5	13.2	6.8	-5	6
22	06/29/01	2.5	4.1	13.2	1.5	0.02	0.23	-2.4	3.2	15.3	4.9	0	5
22	07/11/01	.	.	.	.	0.00	0.17	-5.5	3.7	15.6	5.2	3	3
22	07/25/01	.	.	.	.	0.06	0.13	0.2	2.6	10.0	4.3	+4	4
22	08/08/01	.	.	.	.	-0.02	0.04	-0.1	3.1	21.9	4.9	-1	3
22	08/22/01	.	.	.	.	0.29	0.32	-0.1	2.5	28.4	4.5	-3	4
22	09/05/01	.	.	.	.	-0.04	0.11	1.6	2.0	14.9	4.5	0	3
22	09/19/01	5.2	11.1	15.5	15.3	0.04	0.23	2.2	4.2	12.6	5.2	1	6
22	10/10/01	.	.	.	.	0.07	0.26	0.9	3.2	67.1	7.6	-1	4
24C	04/25/01	.	.	.	.	0.15	0.22	2.3	3.5	5.0	3.9	2	3
24C	05/09/01	.	.	.	.	-0.03	0.19	-1.5	1.9	4.6	2.4	-2	4
24C	05/23/01	.	.	.	.	0.17	0.20	1.2	3.0	7.3	4.1	0	4
24C	06/13/01	.	.	.	.	0.15	0.30	3.3	3.1	11.0	4.9	-1	4
24C	06/29/01	-0.7	3.7	5.9	1.2	-0.01	0.16	2.5	3.4	4.0	3.9	1	6
24C	07/11/01	.	.	.	.	0.40	0.46	1.2	2.5	4.3	2.8	-1	4
24C	07/25/01	.	.	.	.	0.03	0.12	-0.1	2.9	7.2	3.6	-1	6
24C	08/08/01	.	.	.	.	0.04	0.10	1.3	2.6	3.5	3.3	1	4
24C	08/22/01	.	.	.	.	0.26	0.31	-0.7	3.1	5.9	3.7	6	4
24C	09/05/01	.	.	.	.	0.04	0.24	-1.1	2.9	11.4	4.3	-2	5
24C	09/19/01	1.0	3.1	3.7	1.2	0.04	0.11	-0.7	2.8	6.0	4.4	-1	4

PASTURE GRASS, HAY OR FEED WAS SAMPLED AS A SUBSTITUTE FOR UNAVAILABLE GOAT MILK.

STRONTIUM ANALYSES ARE COMPOSITES OF ALL MILK SAMPLED FROM A GIVEN LOCATION DURING THE QUARTER.

A: SPECIAL SAMPLE TAKEN TO MONITOR HIGHER THAN NORMAL STATION RELEASE OF IODINE (SEE SECTION 4.13).

B: SINGLE SAMPLE FOR THE QUARTER WAS NOT ANALYZED FOR SR89/90 DUE TO LAB DATA ENTRY ERROR.

TABLE 8
GOAT MILK
(PCI/L)

LOCATION	COLLECTION DATE	K-40		SR-89		SR-90		I-131		CS-134		CS-137		EA-140		LA-140	
		(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)
21	06/19/02	1041	84	4.7	9.8	1.29	0.87	0.53	0.51	-1.2	2.9	2.4	3.1	-1.7	5.3	-2.0	6.1
	07/11/02	1790	170					0.13	0.26	-5.3	3.9	5.6	4.9	4.1	5.9	4.7	6.8
	07/24/02	1660	130					0.04	0.14	-3.0	3.4	1.6	3.7	-2.8	5.4	-3.2	6.2
	08/07/02	1660	130					0.08	0.34	-0.5	3.3	3.7	4.2	1.3	4.8	1.5	5.6
	08/14/02		A					0.05	0.19		A		A		A		
	09/04/02	931	59					0.28	0.53	1.5	1.7	2.9	2.0	-0.6	2.9	-0.7	3.3
	09/25/02	1790	97	-5.0	3.3	0.99	0.97	0.63	0.71	-1.2	2.7	7.2	3.0	-0.7	4.8	-0.9	5.5
	10/09/02	583	61		C		C	-0.15	0.06	0.5	2.0	4.1	2.9	2.4	3.7	2.7	4.3
22	04/10/02	1740	110					0.04	0.21	1.2	2.5	-0.6	2.7	-2.7	3.7	-3.1	4.2
	04/24/02	1640	150					-0.03	0.06	1.8	3.5	5.0	4.1	-0.5	6.1	-0.6	7.0
	05/08/02	1880	140					0.20	0.35	2.2	5.4	-0.3	4.0	-0.6	6.9	-0.7	7.5
	05/22/02	1790	130					0.24	0.49	-0.2	3.8	5.4	3.9	1.6	4.5	1.8	5.2
	06/05/02	1760	140					0.06	0.25	-0.8	3.5	15.4	5.3	4.6	5.0	5.3	5.8
	06/19/02	1620	120	8.6	6.2	5.80	4.20	0.68	0.70	-0.9	2.9	4.0	4.5	1.8	4.1	2.1	4.7
	07/10/02	1910	130					0.06	0.25	0.6	2.7	17.3	4.7	0.5	3.2	0.6	3.7
	07/24/02	1680	110					0.01	0.13	0.6	2.7	17.3	4.7	0.5	3.2	0.6	3.7
	08/07/02	1420	130					0.68	0.66	1.4	3.3	14.7	5.2	0.4	5.4	0.5	6.2
08/21/02	1380	130	6.4	6.3	1.80	1.10	0.06	0.38	-0.2	3.3	12.3	4.7	-0.8	3.7	-0.9	4.3	
24C	04/24/02	1270	130					0.07	0.12	4.5	5.9	2.4	3.9	-2.5	5.2	-2.9	6.0
	05/08/02	1550	100					0.10	0.28	-1.6	2.6	3.8	2.9	1.1	4.1	1.2	4.7
	05/22/02	1830	130					0.15	0.42	-0.5	3.5	5.9	4.3	2.4	5.6	2.7	6.5
	06/05/02	1850	150					-0.02	0.14	0.2	3.6	-1.9	3.9	2.3	6.0	2.6	6.9
	06/19/02	1750	120	0.3	3.9	2.43	0.83	0.80	0.81	-2.7	3.0	13.5	4.3	0.3	3.9	0.3	4.5
	07/11/02	1580	160					0.07	0.25	3.2	4.3	2.3	4.3	-1.8	6.2	-2.1	7.1
	07/24/02	1650	120					0.01	0.11	0.4	2.6	1.2	3.3	1.0	3.9	1.1	4.5
	08/07/02	1470	110					-0.06	0.02	0.0	2.4	6.5	3.6	0.2	3.2	0.3	3.7
	08/21/02	1770	130					0.69	0.70	2.3	3.8	9.5	5.3	-2.5	4.7	-2.9	5.4
09/04/02		B					0.05	0.35		B		B		B			
09/25/02	1810	110	-6.1	5.0	14.30	21.70	0.68	0.69	-1.7	2.7	5.6	3.4	-4.1	5.5	-4.9	6.3	
10/09/02	1980	150	-15.6	9.4	1.77	0.83	0.03	0.33	-0.5	3.4	3.1	4.3	-1.8	4.8	-2.0	5.6	

PASTURE GRASS, HAY OR FEED WAS SAMPLED AS A SUBSTITUTE FOR UNAVAILABLE GOAT MILK.
STRONTIUM ANALYSES ARE COMPOSITES OF ALL MILK SAMPLED FROM A GIVEN LOCATION DURING THE QUARTER.

A: GAMMA ANALYSIS NOT PERFORMED DUE TO TECHNICIAN ERROR

B: GAMMA ANALYSIS NOT PERFORMED DUE TO LAB ERROR

C: STRONTIUM ANALYSIS NOT PERFORMED DUE TO LAB ERROR

TABLE 8
GOAT MILK
(PCI/L)

LOCATION	COLLECTION DATE	K-40		SR-89		SR-90		I-131		CS-134		CS-137		SR-140		LA-140	
		(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)
21	05/06/03	1695	94														
	05/21/03	1690	120					-0.01	0.21	1.6	2.3	7.0	3.4	0.0	3.0	0.0	3.5
	06/10/03	2930	100					0.17	0.34	-0.7	1.2	5.7	4.0	4.0	4.6	4.5	5.3
	06/26/03	1610	180	3.1	5.7	0.00	0.98	0.03	0.21	-0.5	2.6	1.5	2.3	-3.9	3.1	-4.5	3.6
	07/08/03	1690	120					-0.02	0.22	2.7	5.3	3.1	4.9	2.3	6.9	2.6	7.9
	07/22/03	1321	86					-0.10	0.04	0.5	3.3	3.7	3.2	-1.7	4.0	-1.9	4.6
	08/06/03	1420	110					0.46	0.50	1.3	2.5	2.7	2.4	-0.4	3.1	-0.5	3.6
	08/19/03	1730	85					0.45	0.48	2.7	3.2	3.4	4.0	-2.6	3.5	-3.0	4.1
	09/10/03	2070	140					0.45	0.55	1.7	1.8	3.9	2.0	-0.1	3.5	-0.2	4.0
	09/23/03	1470	150	3.4	5.5	0.6	1.1	0.00	0.11	-1.2	3.8	4.6	4.4	-0.4	5.7	-0.4	6.5
22	04/23/03	1700	140					-0.10	0.04	3.3	4.0	11.4	5.8	-2.8	5.6	-3.2	6.4
	05/06/03	2936	88					-0.04	0.16	-1.6	3.2	0.9	3.8	-0.5	4.8	-0.6	5.5
	05/21/03	1540	150					0.22	0.30	0.3	2.3	5.1	3.6	-4.3	3.4	-3.0	3.9
	06/10/03	1351	87					0.11	0.33	1.7	3.9	8.5	5.0	2.4	6.0	2.7	6.9
	06/24/03	1410	160	-0.2	5.7	9.2	1.2	-0.08	0.03	-1.2	2.5	14.0	3.5	0.4	3.3	0.4	3.8
	07/09/03	1770	110					0.14	0.35	0.9	4.2	1.1	4.2	0.7	5.3	0.5	6.3
	07/22/03	1530	130					0.07	0.15	0.1	2.8	21.7	4.4	1.0	3.7	1.1	4.2
	08/07/03	1220	89					0.09	0.28	-0.2	3.3	24.8	35.2	-0.4	4.5	-0.7	5.1
	08/19/03	1213	86	8	12	14.5	11.8	0.03	0.18	1.3	2.8	30.3	34.4	3.8	4.2	4.3	4.9
	09/09/03	2060	110					0.09	0.06	1.8	2.9	19.8	23.8	0.5	4.9	0.6	5.6
24C	05/22/03	1710	150					-0.08	0.03	1.5	3.6	5.5	3.9	3.6	6.2	-4.1	7.1
	06/11/03	1790	120					0.03	0.20	-1.7	3.3	7.3	4.1	-4.4	4.4	-3.1	5.1
	06/25/03	1700	190	-7.9	5.0	-1.5	1.1	0.12	0.25	1.1	4.9	-2.5	4.7	2.2	6.8	2.5	7.8
	07/09/03	1480	100					0.05	0.23	1.1	2.8	3.2	3.1	-2.6	3.5	-3.0	4.1
	07/22/03	1752	96					-0.04	0.02	1.7	2.5	3.6	2.8	2.5	3.4	2.9	3.9
	08/05/03	1840	120					0.36	0.45	1.0	3.0	2.7	3.3	-3.7	4.7	-4.3	5.4
	08/19/03	1946	67					0.03	0.28	-0.1	1.7	3.9	1.9	-0.2	3.3	-0.2	3.8
	09/09/03	2060	120					0.09	0.17	0.6	3.0	5.2	3.8	0.9	4.0	0.4	4.4
	09/23/03	1990	180	4.2	5.3	1.4	1.1	0.03	0.24	-0.3	4.6	-2.6	4.4	-3.3	5.2	-3.8	5.9
	10/03/03	2050	110					-0.20	0.07	0.6	2.9	2.2	2.6	-1.2	5.2	-1.4	6.0

PASTURE GRASS, HAY OR FEED WAS SAMPLED AS A SUBSTITUTE FOR UNAVAILABLE GOAT MILK
STRONTIUM ANALYSES ARE COMPOSITES OF ALL MILK SAMPLED FROM A GIVEN LOCATION DURING THE QUARTER

05/01/2006 13:24 412681625#

Figure 6-1
Strontium-90 in Milk

03/02/2005 10:34

4126816251

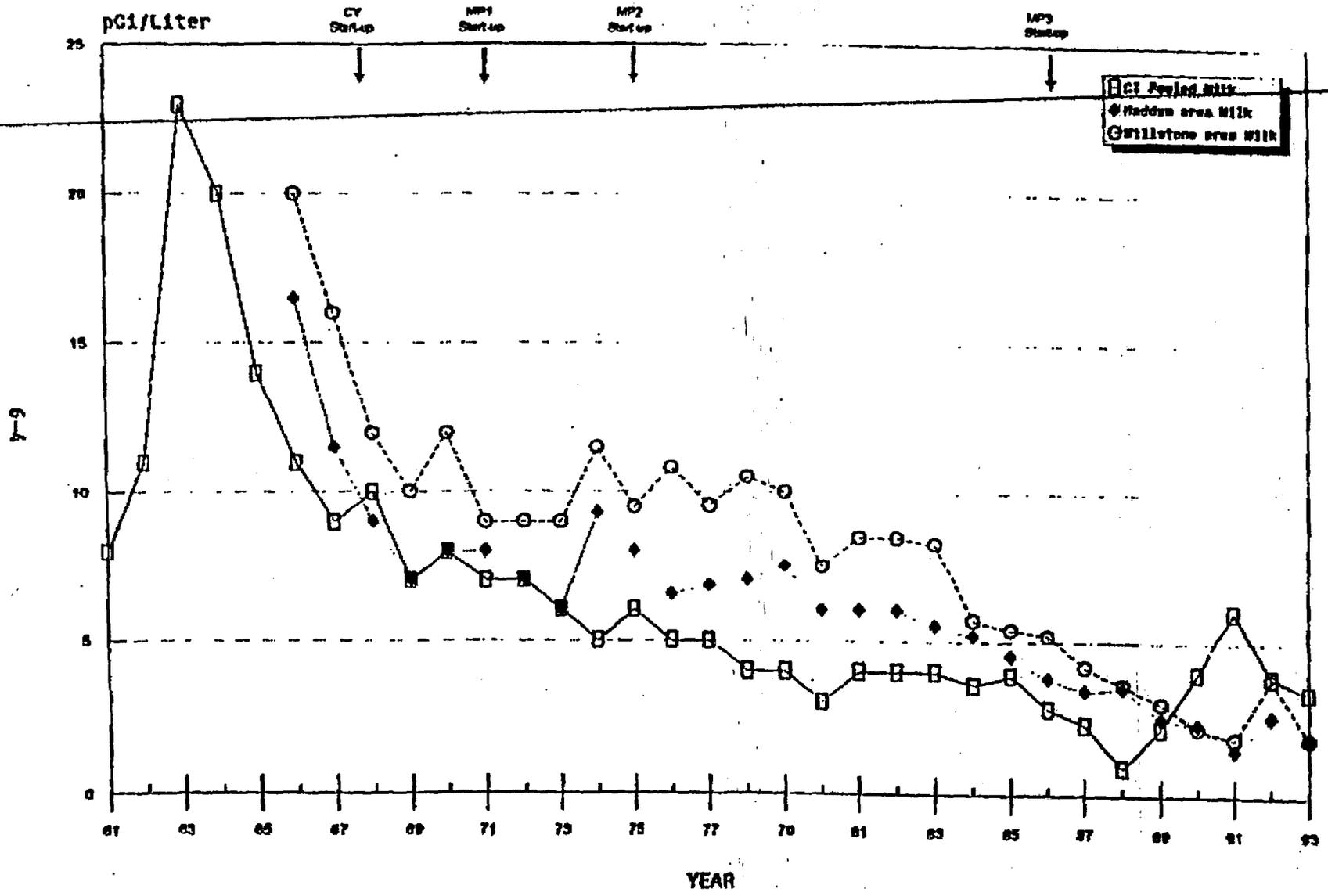


Exhibit "B"

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

DOMINION NUCLEAR CONNECTICUT, INC.: Docket Nos. 50-336-LR,
50-423-LR

(Millstone Nuclear Power Station,
Units 2 and 3)

: ASLBP No. 04-824-01-LR

DECLARATION OF ERNEST J. STERNGLOSS

I, Ernest J. Sternglass, do hereby declare as follows:

1. I am above the age of eighteen (18) years and I believe in the obligation of an oath.
2. I reside at 4601 Fifth Avenue in Pittsburgh, Pennsylvania, 15213.
3. I submit this declaration in support of Connecticut Coalition Against Millstone Intervention in the above referenced matter.
4. I am Professor Emeritus of Radiological Physics at the University of Pittsburgh School of Medicine and have written and published extensively in the area of low-level radiation and human health, and about the adverse effects of radioactive emissions from the Millstone Nuclear Power Station in particular.
5. I am the author of the book "Secret Fallout Low-Level Radiation from Hiroshima to Three-Mile Island" published by McGraw-Hill in 1981, of the review article "Environmental Radiation and Human Health" published by the University of California Press in 1972, and the article "Cancer Mortality Changes Around Nuclear Facilities in Connecticut" published in "Radiation Standards and Human Health: Proceedings of a Congressional Seminar February 10, 1978, by The Environmental Policy Institute in Washington DC. The facts and statements contained in these publications are incorporated by reference herein as references 1, 2 and 3 respectively.
6. I have published a series of papers on the effects of low-level environmental radiation on human health and development produced by nuclear weapons tests and reactor releases for the last

forty years, and have testified on this subject at hearings held by the U.S. Congress, the National Academy of Sciences, State Legislatures and U.S. Government Regulatory Agencies as an expert on this subject.

7. It is my professional opinion that the radioactive releases from the Millstone Nuclear Power Station since its startup in 1970 have caused and will continue to cause excess infant mortality, low birthweight, leukemia and cancer as well as increased rates of both chronic and infectious diseases in the towns around Millstone as well as in New London County and Connecticut as a whole.

8. According to the NRC publication "Radioactive Materials Released From Nuclear Power Plants" (NUREG /CR -2907), by 1987 Millstone had released a total of 32 Curies of radioactive Iodine and Particulates into the air which include the highly carcinogenic Strontium-90 and Iodine -131, together with 6.7 million Curies of Total Fission and Activation gases such as Xenon and Krypton, and the highest liquid releases of Mixed Fission and Activation Products of any nuclear plant in the United States, namely 581 Curies or 581 trillion picoCuries, the unit of concern in milk and drinking water.

9. In a single year, 1975, Millstone released a record high of 9.99 Curies of Iodine and Particulates into the air, more than twice as high as the 4 Curies released shortly after startup in 1971, together with 29.7 million Curies of Total Fission and Activation Gases, and 199 Curies of liquid Mixed Fission and Activation Products into Long Island Sound, also a record for all U.S. nuclear reactors.

10. Between startup of Millstone in 1970 and 1975, as shown in the 1978 Millstone report (3), cancer mortality rose 58% in Waterford where the reactor is located, 44% in New London 5 miles to the north-east, 27% in New Haven 30 miles to the west, 12% for the State of Connecticut as a whole, 8% in nearby Rhode Island, 7% in Massachusetts and 1% in New Hampshire, while it actually declined by 6% in the most distant New England state, Maine, following the pattern of Strontium-90 in the milk shown in the same report.

11. As shown in Table 9 of reference (3), while the Strontium-90 concentration in the milk declined for the U.S. as a whole between 1970 and 1975 from 8 picoCuries per liter to only 3 pCi/l, it rose from 9.8 in 1970 to a high of 15.8 in 1973 and 14.8 in 1974 near the Millstone Nuclear Plant, remaining at 10.7 by 1975. This is far in excess of the U.S. average of 3 pCi/l, ruling out any significant contribution to the local milk from bomb test fallout by France and China that continued until 1980.

12. As shown in Table 10 of reference (3) the calculated yearly radiation dose to bone of a child due to the excess Strontium-90 within 10-15 miles of the plant in excess of the yearly dose for the U.S. rose from 33 millirem per year in the first full year of operation to 204 mrem/yr by 1974, nearly three times the normal background level of 70 mrem/yr in Connecticut.

13. These doses due to Strontium-90 alone may be compared with the 15 mrem/yr to any organ permitted under current NRC regulations, the 2 mrem produced to bone marrow in a typical chest X-ray of a child, and the 80 mrem/yr to a developing fetus found to produce a doubling of the rate of childhood leukemia in the studies of Dr. Alice Stewart cited in Reference 7 of reference (3) for exposure in the mother's womb to X-rays in the first three months of pregnancy.

14. These considerations, later supported by the more recent studies of Strontium-90 measured in baby teeth together with effects on cancer incidence and infant mortality as reported by Mangano submitted in the present case and referred to here as reference (4) provide overwhelming evidence for the existence of a causal relationship between the abnormally high levels of Strontium-90 in the milk and the pattern of cancer changes at various distances from the Millstone plant.

15. The existence of a direct causal relationship between Strontium-90 released from nuclear reactors and an increased risk of cancer is very strongly supported by the finding described by Mangano (4) that baby teeth of children diagnosed with cancer have close to double the concentration of Strontium-90 than children born the same year and in the same area. This finding has led to a lawsuit having been filed in Florida against the Florida Power and Light company by the family of a child with a very high Strontium-90 tooth concentration seeking compensation, a suit which a federal judge ruled to be of sufficient merit to go to trial in 2005, despite efforts of the defendant to have it dismissed (5).

16. As pointed out in reference (3), this conclusion is still further supported by the fact that the types of cancer that rose most strongly in the Connecticut area near the Millstone Nuclear Plant are exactly those that have been found to be most sensitive to radiation in earlier studies by national and international standard setting organizations, namely those that increased the most by 1975, such as respiratory cancers (37%), breast cancer (12%), and pancreatic cancer (32%).

17. Likewise, further support for a causal relationship of nuclear plant releases and adverse health effects is provided by the fact cited by Mancuso et al. (5) cited in reference (1) that cancer deaths showed a much greater rise in women than in men, namely 17% for white women and only 11% for

white males. This same difference between males and females was found by Mancuso and his co-investigators for atomic workers at the Hanford Nuclear Plants exposed to low doses of both internal exposures to critical organs due to inhaled and ingested radioactive elements similar to those released by Millstone over a period of years, together with protracted external exposures from gamma rays produced by fission products accumulated on the ground, rather than to very short X-ray exposures used in diagnostic procedures.

18. A renewed rise in infant mortality in the six towns nearest Millstone took place after a sharp decline by 18% when all three units had been shut down for most of 1996-97 as described in Table 9 of the 2004 report by Mangano (4), with a smaller decline of 3.1% in 1998-99 relative to 1994-95, followed by a rise of 8.8% in 2000-01. This is very strong evidence indicating that even the much smaller releases from the two remaining PWR type of reactors continue to adversely affect the health of the newborn so that there can be no safe operation of any existing type of nuclear plant for the developing children on whom the future of our nation depends.

19. The much greater risk to human health from radioactive gases and particles that are inhaled or ingested and concentrate in certain critical organs such as the bone marrow or in hormone producing glands such as the pituitary gland targeted by the highly radioactive daughter product of Strontium-90, the element Yttrium-90 that has different chemical properties and leaves the bone to concentrate in soft tissues. This results in very high local doses to both the bone marrow and the critical hormone producing glands over long periods of time that greatly exceed the whole-body dose and result in cancer and other adverse effects on health hundreds to thousands of times greater than had been expected by a linear extrapolation to low doses of the risk from short external exposures such as received by the survivors of Hiroshima and Nagasaki or individuals exposed to medical X-rays that do not concentrate in specific organs, as described in the ECRR report (6).

20. It is important to note that exposure to low levels of Strontium-90 and other bone seeking radioactive chemicals routinely released by nuclear plants that resemble Calcium do not merely increase the risk of bone cancer or leukemia, but they weaken the immune defenses provided by the white cells of the blood that originate in the bone marrow. As a result the rate of cancer development all over the body normally held in check by white cells is increased, and the defenses against infectious diseases such as influenza, pneumonia and AIDS are lowered, increasing both total and infant mortality due to all causes combined as discussed in references (1)(2)(3) and (6).

21. Unfortunately for the protection of human health, the operators of nuclear plants such as Millstone are no longer required to measure Strontium-90 in the milk, the soil, the water and other

environmental samples, nor does the government measure bone concentrations of this element after 1982, and milk concentrations of this critical element each month in a series of cities across the nation since 1990. Thus, presently the operators of nuclear reactors only need to measure gamma ray emitting elements such as Cesium-137 that can be more easily and cheaply measured than Strontium-90 that emits only short range electrons that cannot penetrate the Geiger counters used for gamma rays, and which requires more costly laboratory procedures for each sample.

22. As recently brought out in the ECCR report (6), the reason why the risk of low protracted exposures due to inhaled or ingested radioactive chemicals is some 100 to 1000 times greater than the same dose due to short exposures is that for the low doses given over a long period the damage by free-radicals of oxygen dominate over direct damage to the DNA and cell membranes. This leads to a dose-response curve that rises extremely rapidly for very small doses and then flattens out at high doses, thus causing the error made by a linear extrapolation to zero dose used to establish the existing safety standards for permitted releases from nuclear plants.

23. Thus, the ECRR report states in paragraph 10 of its executive summary "that the present cancer epidemic is a consequence of exposure to global atmospheric weapons fallout in the period 1959-63 and that more recent releases of radioisotopes to the environment from the operation of the nuclear fuel cycle will result in significant increases in cancer and other types of ill health (Emphasis added).

24. Thus, in the concluding paragraph of the executive summary, it says that it is "the committee's belief that nuclear power is a costly way of producing energy when human health deficits are included in the overall assessment" and that "the environmental consequences of radioactive discharges must be assessed in relation to the total environment, including both direct and indirect effects on all living systems."(6).

25. Although the most serious airborne radioactive releases so far have occurred from the operation of Unit I which was a Boiling Water Reactor (BWR) permanently closed in 1996, studies described in references (1) and (2) have found similar increases in infant mortality, low birthweight and cancer around Pressurized Water Reactors (PWR) such as Shippingport near Pittsburgh and Indian Point near New York City. Therefore, it is to be expected that a twenty year renewal of the operating licenses for Millstone Units 1 and 2 would further increase the adverse effects on human health and their associated cost in health care, as well as the damage to wildlife, birds and fish that have been rising alarmingly in recent years.

26. This further increase of damage to human health and the environment is not only due to the short-lived radioactive elements such as Iodine-131, but also due to the long half-life of many of the radioactive chemicals routinely released by nuclear plants such as the 28 years it takes for the activity of Strontium-90 to decrease by half. Thus, it is very likely that continued operation of the Millstone Nuclear Plant will further increase the rates of cancer, low birthweight, infant mortality and chronic diseases such as hypothyroidism, diabetes, and other diseases related to immune and hormonal system damage as these elements accumulate in the underground water table from which wells draw their water, making it impossible to safely protect the public.

27. The unexpectedly great risk to the life and future health of the newborn due to very small doses of radiation to critical organs has just been further supported by a study of the incidence of premature births leading to underweight infants as reported in the April 28, 2004 issue of the Journal of the American Medical Association (7). This study revealed that the very small dose due to scattered radiation to the thyroid in the neck of the mother produced by just one or two dental X-rays during the first three months of pregnancy, approximately 40 millirem each, significantly increased the risk of premature birth and low birth weight. This in turn is known to increase infant mortality as well as producing a greater danger of mental and physical problems for infants who survive as a result of recent advances in neonatal care, but at huge emotional cost to the family and rising health care costs to society.

28. In the light of current knowledge of the unanticipated serious adverse effects on human health of extremely small doses of prolonged environmental radiation exposures to Strontium-90 and other fission products as described above, it is my professional opinion that the Millstone 2 and 3 reactors would need to end all radiation releases in order to meet public health requirements for safety, and that therefore they should not be granted license renewals to continue operations during the proposed twenty year renewal period without demonstrating that this objective can be achieved.

I hereby declare the foregoing to be true and accurate to the best of my knowledge, information and belief under penalty of perjury.

Ernest J. Stenglass
Ernest J. Stenglass

Dated: August 8, 2004

LIST OF REFERENCES

- 1) Ernest J. Sternglass, "Secret Fallout: Low-Level Radiation from Hiroshima to Three Mile Island" (McGraw - Hill, New York, 1981) Available on the website www.radiation.org.
- 2) Ernest J. Sternglass, "Environmental Radiation and Human Health", pp.145-216, Proceedings of the Sixth Berkeley Symposium on Mathematical Statistics and Probability: Effects of Pollution on Health", Edited by M. L. Lecam, J. Neyman El. Scott, University of California Press, Berkeley and Los Angeles, 1972.
- 3) Ernest J. Sternglass, "Cancer Mortality Changes Around Nuclear Facilities in Connecticut", pp. 174-212, "Radiation Standards and Human Health: Proceedings of a Congressional Seminar", February 10, 1978 published by the Environmental Policy Institute, Washington, DC.
- 4) . Joseph J. Mangano, "Risks of Cancer And Other Diseases From The Operation Of The Millstone Nuclear Plant," August 5, 2004, Radiation and Public Health Project, New York, NY.
- 5). Finestone vs. FLP, Case Number 03-140040-CIV-COHN/LYNCHC
- 6) Philippe P. Huel et al. "Antepartum Dental Radiography and Infant Low Birth Weight", Journal of the American Medical Association, Volume 291, No.16, April 28, 2004, pp. 1987-1993.
- 7) . "Health Effects of Ionizing Radiation Exposure at Low Doses for Radiation Protection Purposes: Recommendations of the European Committee on Radiation Risk", Edited by Chris Busby with Rosalie Bertell, Inge Schmitz - Feuerhake, Molly Scott Cato and Alexei Yablokov, Published for the ECRR by Green Audit Press, Castle Cottage, Aberystwyth, SY 23iDZ, United Kingdom. (2003) Website: www.euradcom.org 2003.