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U. S. Nuclear Regulatory Commission
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Washington, D. C. 20555-0001

Edwin I. Hatch Nuclear Plant
Assessment of Results of Augmented Radiological
Environmental Monitoring Program for the Years 2000 through 2007

Ladies and Gentlemen:

By letter to the NRC dated January 7, 1987, Georgia Power Company (GPC) provided a description of an augmented Radiological Environmental Monitoring Program (REMP) that was initiated following release of radioactive water from the spent fuel storage pools at the Edwin I. Hatch Nuclear Plant (Hatch) to an onsite swamp in December 1986. Accordingly, the enclosed provides the latest summary of the program results for the years 2000 through 2007. The summary indicates that radioactivity levels in the swamp have continued to decrease. Biennial monitoring of the swamp will continue with the next written report to be issued to the NRC in April 2018.

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,


J. M. Godfrey

JMG/MBL/daj

Enclosure: Assessment of Results of Augmented Radiological Environmental
Monitoring Program for the Years 2000 through 2007

cc: Southern Nuclear Operating Company
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U. S. Nuclear Regulatory Commission
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Edwin I. Hatch Nuclear Plant

Enclosure

**Assessment of Results of Augmented Radiological
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On December 3 and 4, 1986, an event occurred at the Hatch Nuclear Plant (HNP) in which radioactive water from the spent fuel storage pools (SFSP) was released into the onsite swamp east of the cooling towers. As a result of this event, Georgia Power Company (GPC) initiated an augmented Radiological Environmental Monitoring Program concerning the swamp on December 15, 1986. This program, as described in a letter to the NRC dated January 7, 1987, calls for a periodic assessment of the program's results and any appropriate modifications to the program (including termination) as a result of the assessment.

Past assessments of the results of this program were provided to the NRC by letter as given below.

<u>Period</u>	<u>Date of Letter</u>
12/15/86 through 1987	March 31, 1988
1988	April 3, 1989
1989 – 1991	March 31, 1992
1992 – 1994	March 28, 1995
1995 – 1999	March 3, 2000

This report provides the program's results for the years 2000 through 2007, an assessment of such results, and program modifications as a result thereof.

The program's current commitment calls for biennial collection of muck samples at locations A, PL-2, PL-3, MBC and a background location for gamma isotopic analysis. All of the sampling locations, except for the background location, are shown in Figure 1. The annual collections were made on September 5, 2000, September 10, 2001, September 9, 2002, September 22, 2003, September 12, 2005, and September 4, 2007 (NOTE: sampling frequency changed from annually to biennially per the previous report made on March 3, 2000). Three samples were collected at location A and two at each of the other locations. The muck samples are so called because generally they are composed of substantial quantities of root and other organic material, as well as mud and sediment. Usually, each of the sampling locations are underwater for a few weeks or so each year due to flood conditions. All of the laboratory analyses were performed at the GPC Environmental Laboratory (EL) in Smyrna, Georgia.

Location A is situated in the swamp pond adjacent to the point where the water from the SFP entered the swamp. Locations PL-2 and PL-3 lie along the plant's eastern property line. Location PL-2 lies on the left bank of Bay Creek. Bay Creek provides a drain for the swamp; the mouth of Bay Creek is about three-quarters of a mile east of the plant's eastern property line. Location MBC lies along the right bank of Bay Creek adjacent to its entry into the Altamaha River.

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The background location, like the swamp, lies in the floodplain of the Altamaha River but is positioned about 0.8 miles upstream of the plant's discharge and on the opposite side of the river.

The average manmade radionuclide activity at each sample location from 1987 through 2007 is provided in Table 1. Plots of the annual averages of the activities for Co-60, Cs-134, and Cs-137 are presented in Figure 2, Figure 3, and Figure 4, respectively. No other manmade radionuclides have been detected in samples from the onsite swamp since 1989. During this reporting period, only Cs-137 and Co-60 were identified. Cesium-134 (which has a 2.1 year radiological half-life) has not been identified since 1999 at location A and has not been found since 1990 in the other sampling locations.

The activities found in the samples collected at location A continue to dominate those collected elsewhere. Table 1 and Figure 2 show a general reduction in the Cs-137 activity levels at location A as a result of decay and weathering over the past 20 years. Cobalt-60 activity at location A showed a similar reduction for the first 10 years. However, for the past 10 years, the reduction rate seems to have slowed down which implies that the remaining Co-60 may be fixed in the swamp muck and may be decreasing solely by radioactive decay. Figure 2 has a decay line plotted to show how the Co-60 would have decreased (since 1987) if decay was the only removal process.

Due to the migration of radioactive material through the swamp and the inconsistent dispersion of contamination, the activity levels deep in the swamp (locations PL-2, PL-3 and MBC) are somewhat variable especially for the longer lived isotopes such as Cs-137 (radiological half-life of 30.2 years).

Sample collection and analysis of the onsite swamp will continue biennially with the next written report to be issued in April 2018.

Table 1

**Average Activity of Manmade Radionuclides Found in Muck Samples Collected at Select Locations
1987 through 2007 (pCi/kg dry)**

Location/Nuclide	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2005	2007
Background																			
Cs-137	342	369	708	280	418	428	335	452	302	172	170	178	178	132	178	174	204	128	163
Eu-154	0	0	0	0	0	72	0	0	0	0	0	0	0	0	0	0	0	0	0
A																			
Mn-54	1684	183	513	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fe-59	430	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Co-58	270	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Co-60	6202	3628	4627	2567	1312	1733	961	835	549	570	1100	322	455	317	243	270	196	249	312
Zn-65	3118	631	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sb-125	658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cs-134	10892	3642	3153	1400	576	718	326	229	79	83	0	0	64	0	0	0	0	0	0
Cs-137	19813	10708	12790	7667	5010	9763	4073	3855	2310	2767	1610	1580	5897	1538	1405	2754	1654	1130	1360
PL-2																			
Co-60	0	27	0	0	49	0	0	0	0	0	0	0	0	0	0	0	87	0	0
Cs-134	194	67	0	145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cs-137	1457	927	558	1450	1205	916	582	650	318	93	211	394	230	249	293	223	240	182	434
PL-3																			
Mn-54	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cs-134	340	91	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cs-137	1488	862	76	870	967	288	128	134	507	0	0	0	54	0	34	37	63	29	177
MBC																			
Mn-54	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Co-60	68	34	0	34	48	70	90	134	43	0	131	110	111	0	0	*	0	0	0
Zn-65	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cs-134	331	224	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cs-137	807	556	419	280	298	304	377	266	260	290	193	232	221	133	89	158	208	92	78

* One sample showed no detectable activity and the other sample showed 1967 pCi/kg-dry which is thought to be an erroneous value.

Note: Periods for which no detectable measurements were observed are listed in the table as zero.

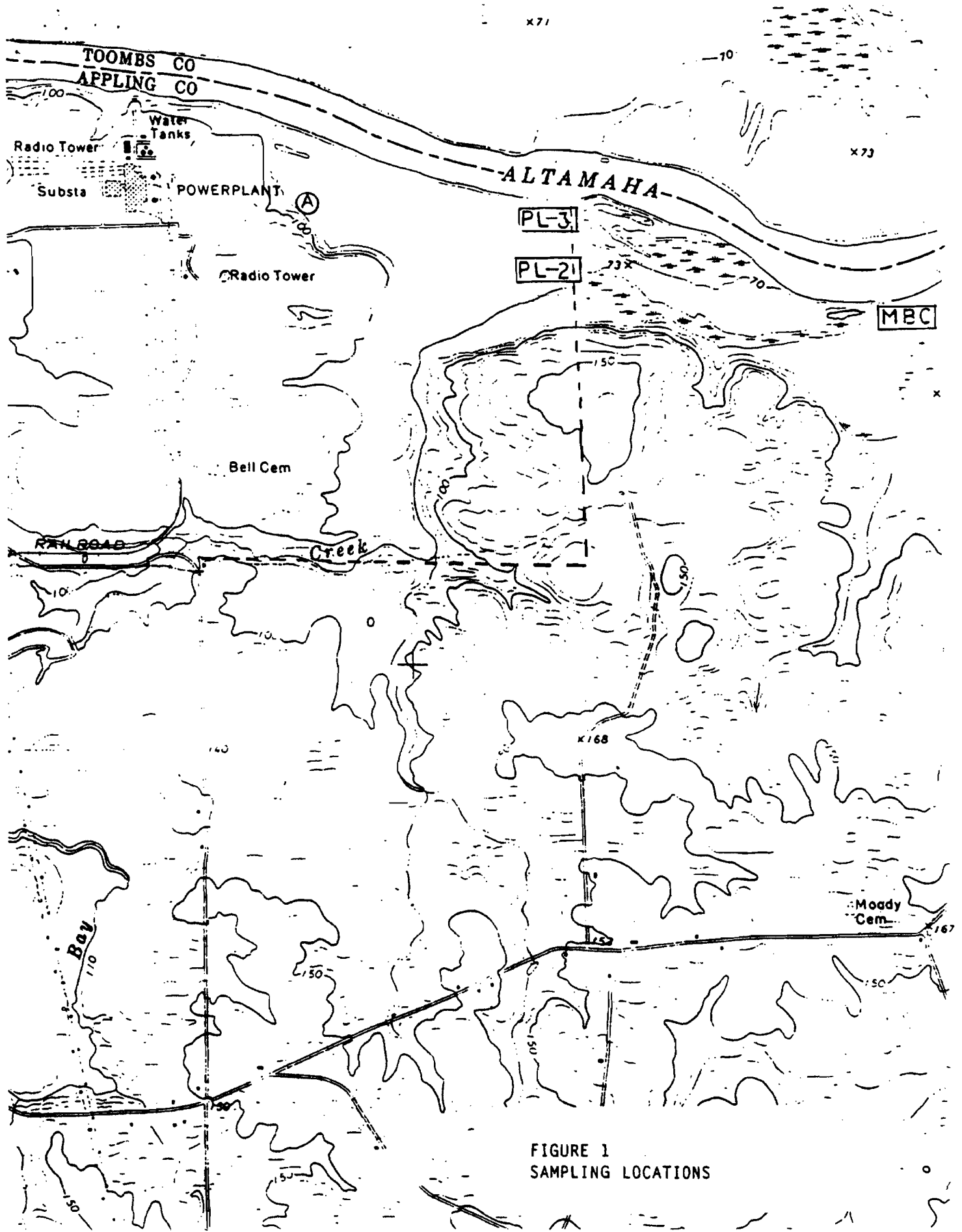
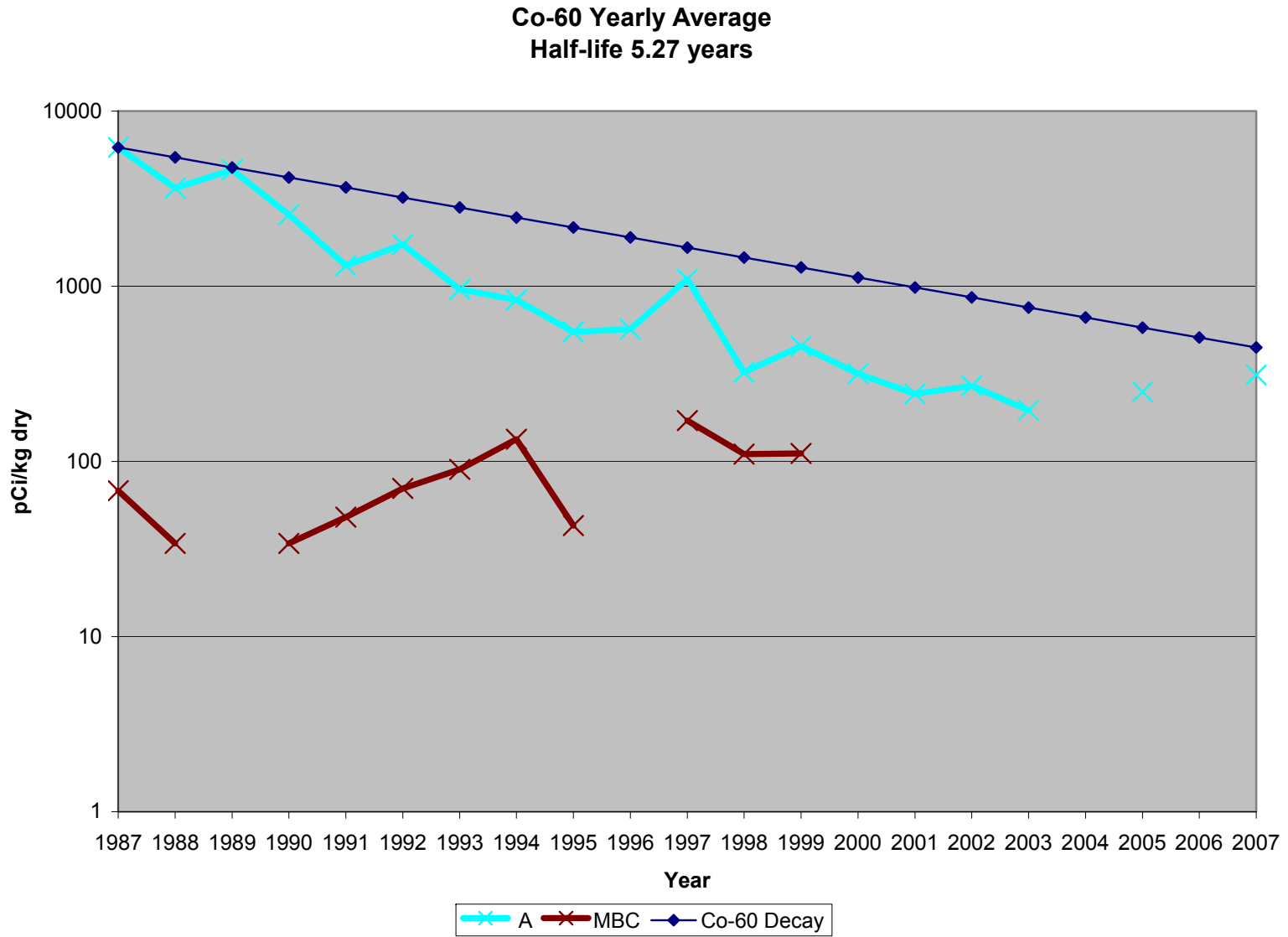


FIGURE 1
SAMPLING LOCATIONS

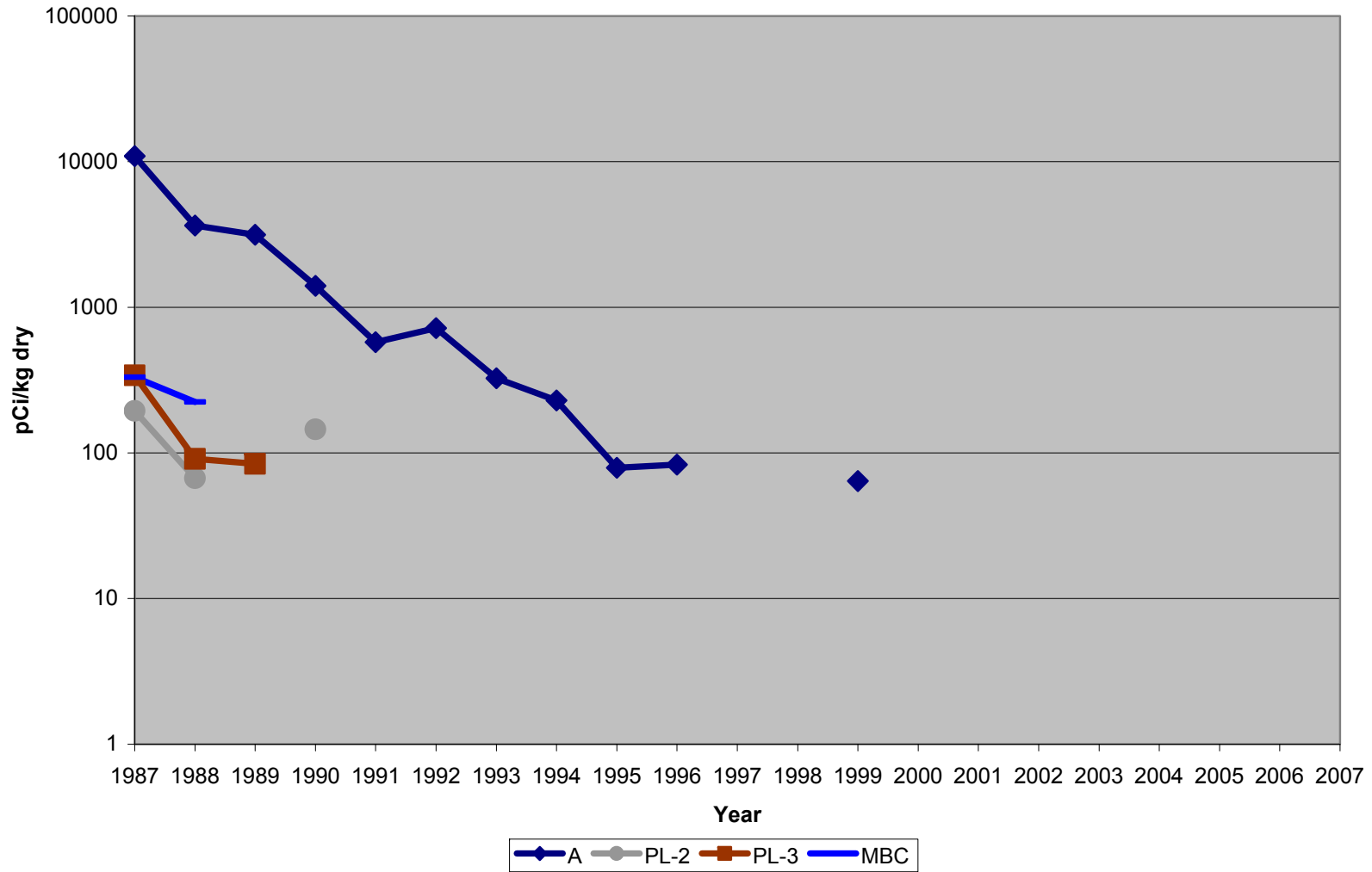
FIGURE 2



Note: Zero cannot be plotted on a log scale and appears as a blank point on the figure.

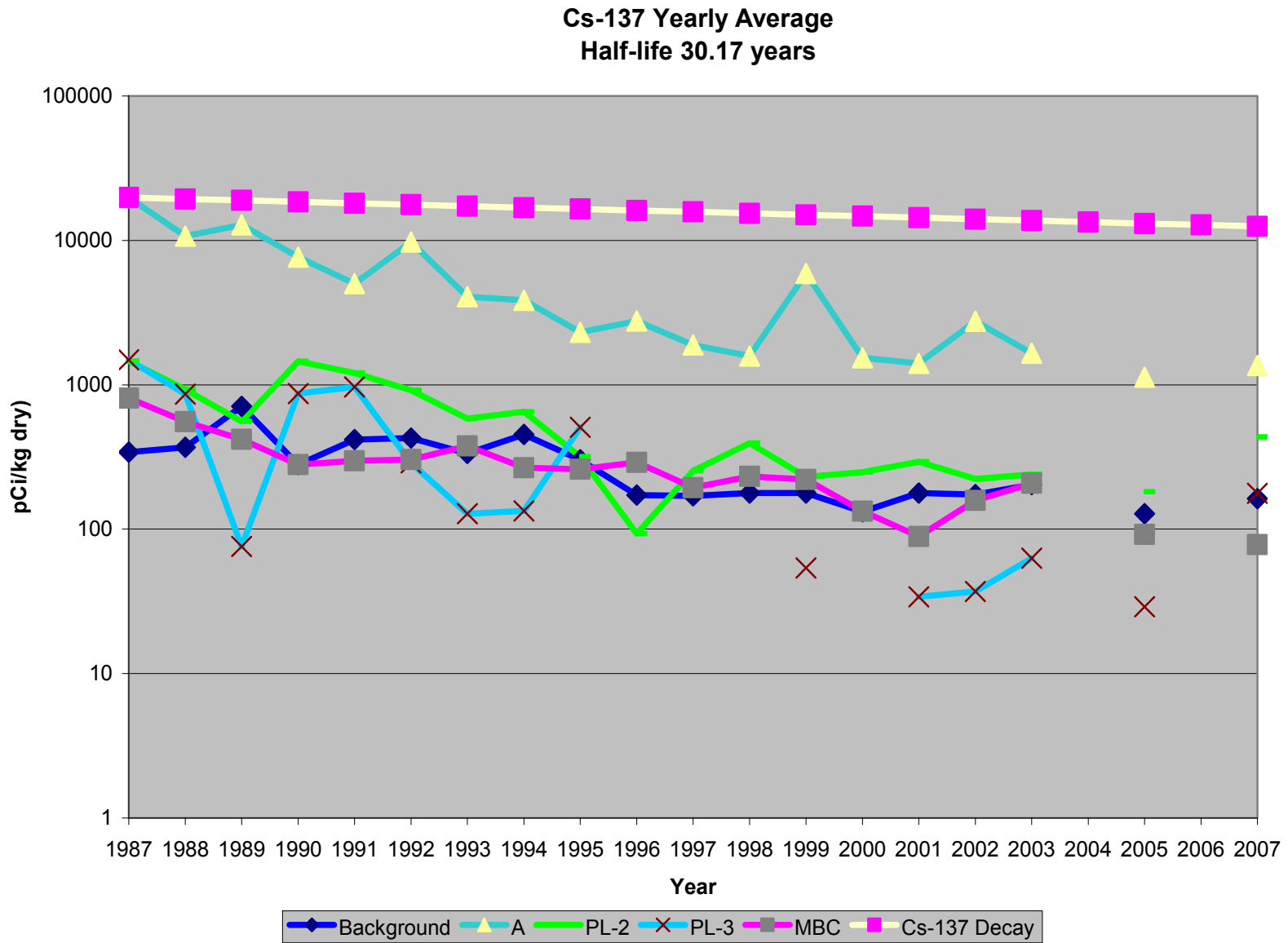
FIGURE 3

**Cs-134 Yearly Average
Half-life 2.06 years**



Note: Zero cannot be plotted on a log scale and appears as a blank point on the figure.

FIGURE 4



Note: Zero cannot be plotted on a log scale and appears as a blank point on the figure.