

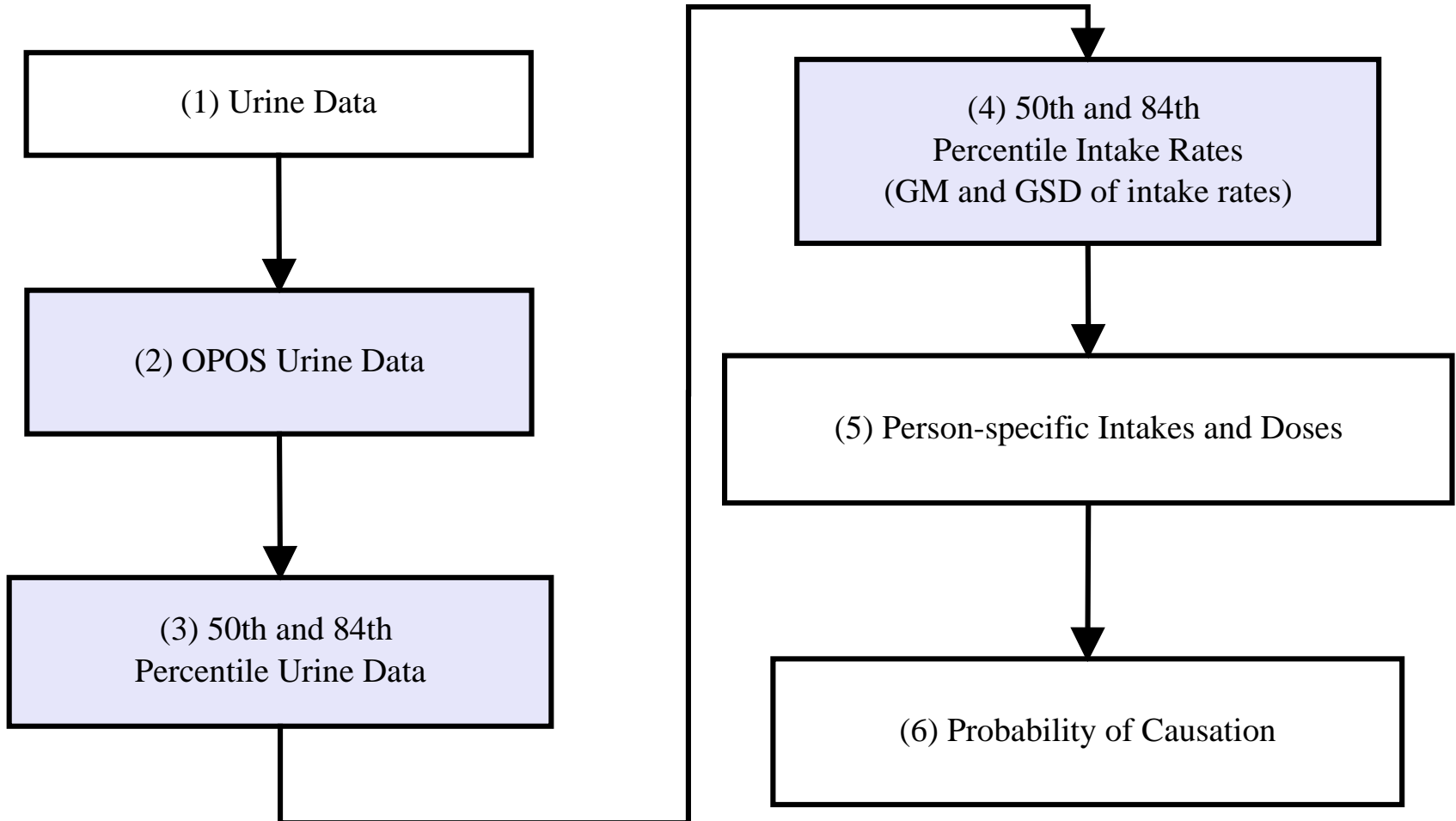
# Use of Co-worker Data in Dose Reconstruction: Savannah River Site Example

**James W. Neton, PhD, CHP**  
Associate Director for Science

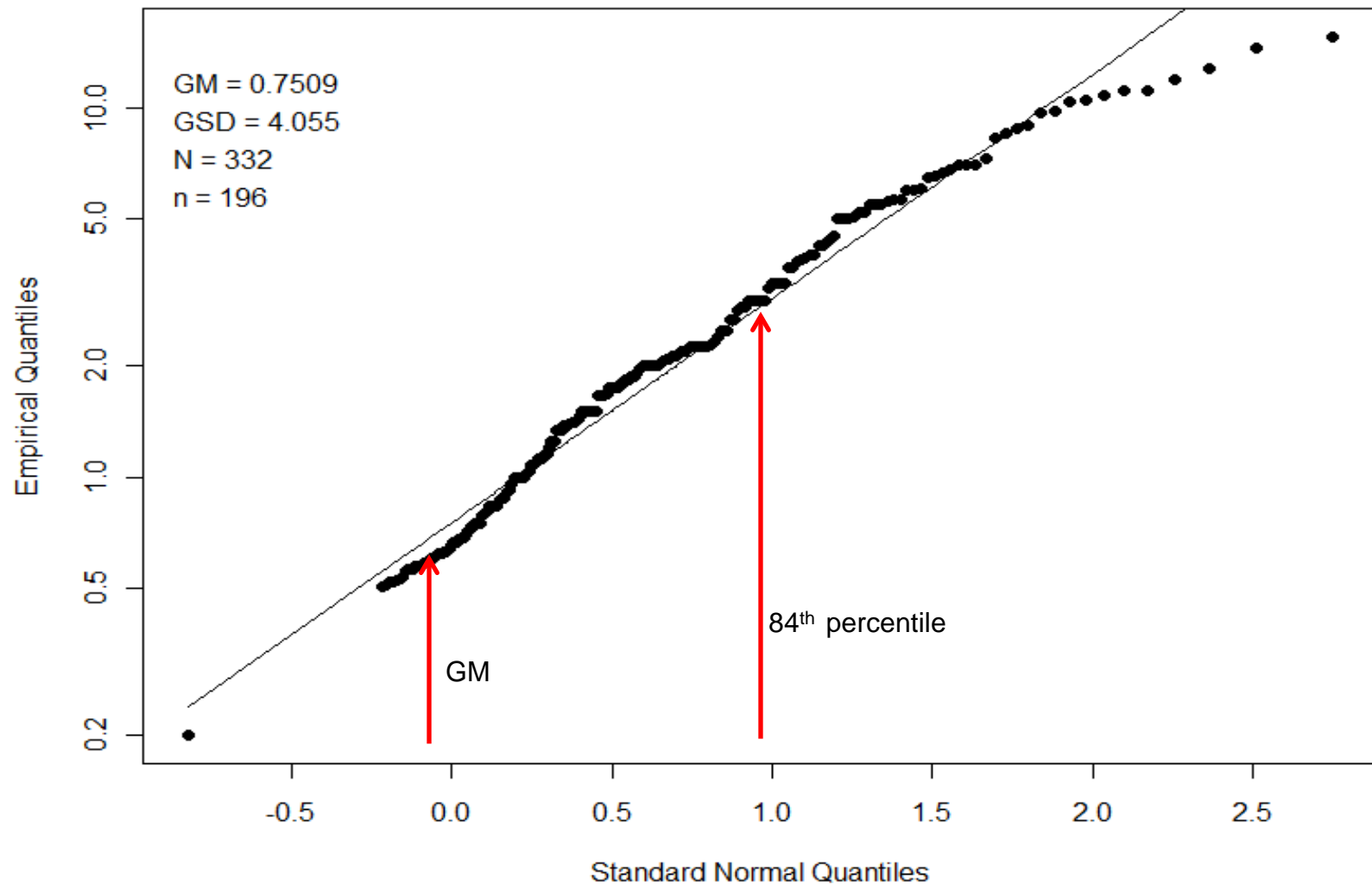
Division of Compensation Analysis and Support

November 2014  
Redondo Beach, CA

# Summary of Internal Co-worker Model Calculations

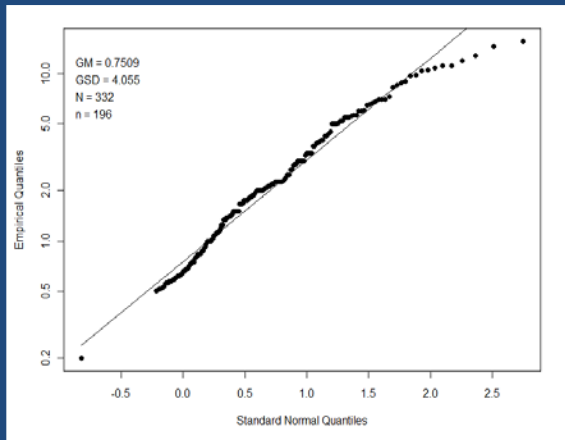


# Bioassay Distribution for a Single Year

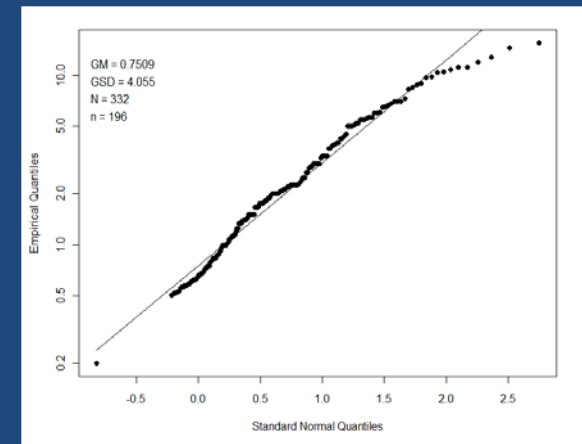


# Generate Distribution for Each Year

1955



2007

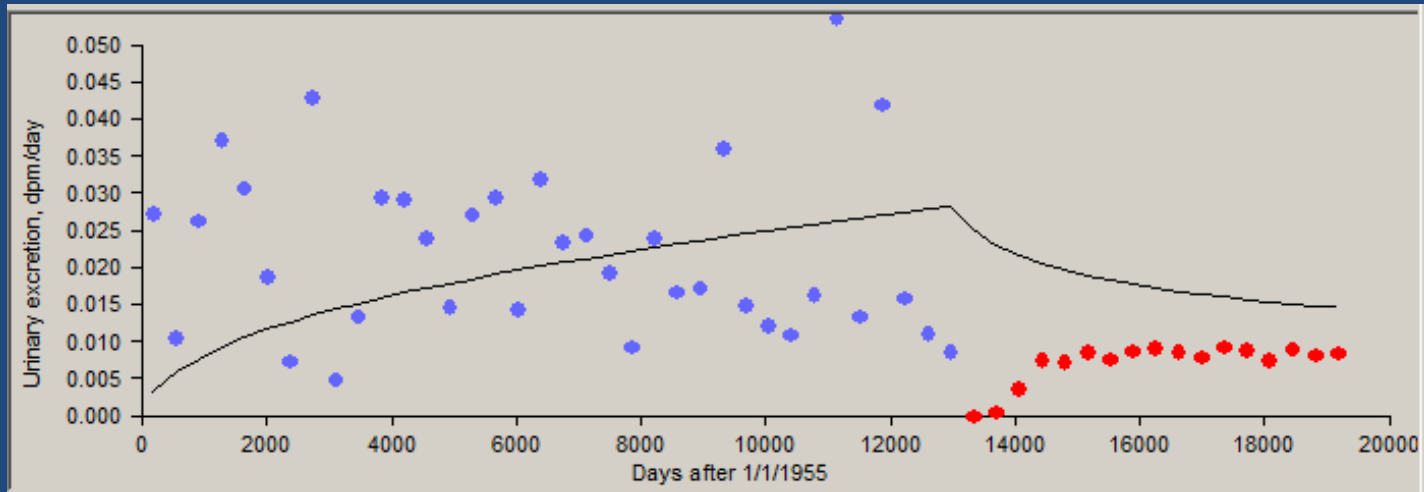


# SRS Plutonium Urinalysis Data

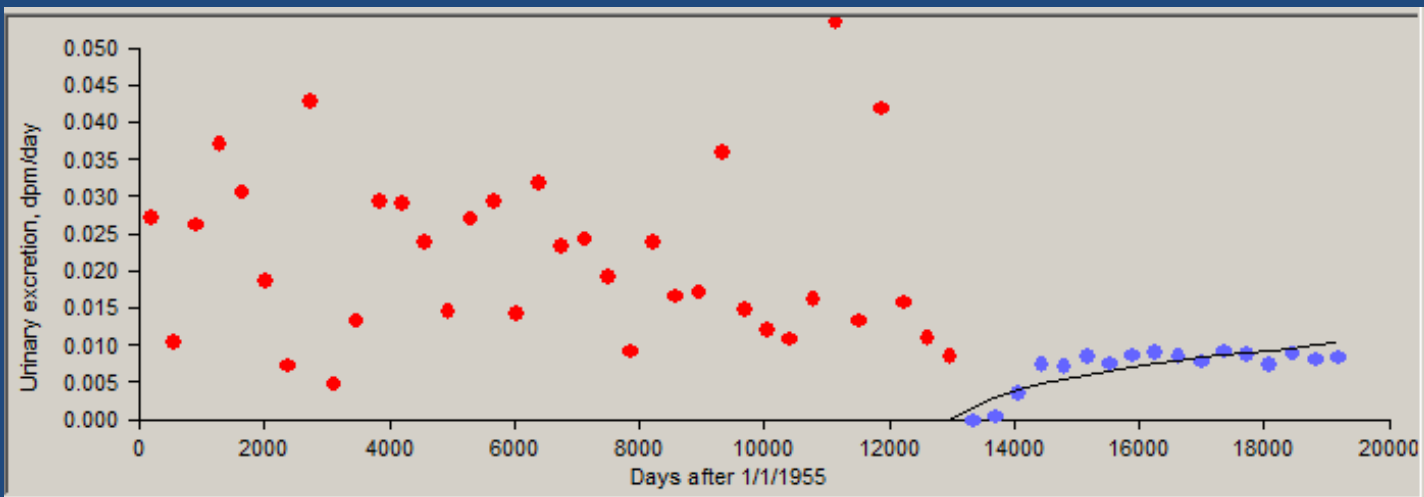
Table A-3. 50th- and 84th-percentile urinary excretion rates of plutonium gross alpha, 1955 to 2007 (dpm/d).

Effective bioassay date	50th percentile	84th percentile	No. of employees
7/1/1955	0.0273	0.068	203
7/1/1956	0.0106	0.050	314
7/1/1957	0.0263	0.056	312
7/1/1958	0.0371	0.061	286
7/1/1959	0.0307	0.085	337
7/1/1960	0.0188	0.080	350
7/1/1961	0.0074	0.028	367
7/1/1962	0.0430	0.073	39
7/1/1963	0.0049	0.028	338
7/1/1964	0.0134	0.054	327
7/1/1965	0.0295	0.060	414
7/1/1966	0.0291	0.064	376
7/1/1967	0.0240	0.068	355
7/1/1968	0.0147	0.053	384
7/1/1969	0.0272	0.134	279
7/1/1970	0.0295	0.121	266
7/1/1971	0.0144	0.055	339
7/1/1972	0.0320	0.091	358
7/1/1973	0.0235	0.073	356
7/1/1974	0.0244	0.076	369
7/1/1975	0.0194	0.073	341
7/1/1976	0.0093	0.054	394
7/1/1977	0.0240	0.077	389
7/1/1978	0.0168	0.071	260
7/1/1979	0.0173	0.034	357
7/1/1980	0.0360	0.078	312
7/1/1981	0.0150	0.054	408
7/1/1982	0.0122	0.043	406
7/1/1983	0.0109	0.048	296
7/1/1984	0.0163	0.055	267

## Savannah River Pu Coworker Model (Type M)

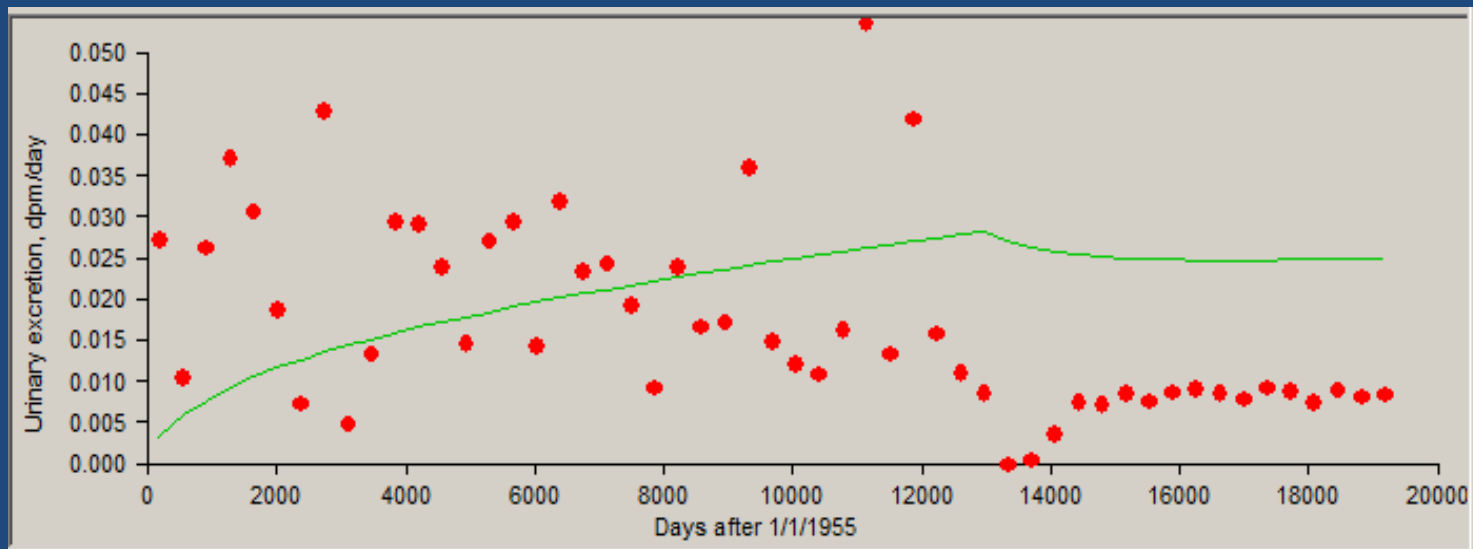


Predicted plutonium bioassay results calculated using IMBA-derived plutonium intake rates (line) compared with bioassay results (dots), 50th percentile, 1955–1990, type M.



Predicted plutonium bioassay results calculated using IMBA-derived plutonium intake rates (line) compared with bioassay results (dots), 50th percentile, 1991–2007, type M.

## Savannah River Pu Coworker Model (Type M) –cont.



Predicted plutonium bioassay results calculated using IMBA-derived plutonium intake rates (line) compared with bioassay results (dots), 50th percentile, all intake periods, type M.

### Summary of plutonium type M intake rates (dpm/d) and dates

Years	50%	84%	GSD	Adj GSD	95%
1955–1990	1.77	5.103	2.88	3.00	10.8
1991–2007	0.930	2.542	2.73	3.00	5.67