## Rulemaking1CEm Resource

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**Sent:** Tuesday, January 21, 2014 8:52 AM
**To:** Rulemaking1CEm Resource
**Cc:** RulemakingComments Resource
**Subject:** PR-51 Waste Confidence
**Attachments:** Comment of Kevin Kamps-6.pdf

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**COMMENT#: 00931**

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Re: Docket ID No. NRC-2012-0246

# Fax Cover Sheet

**From:** Kevin Kamps

**To:** NRC Nuclear Waste Confidence Directorate, & Secretary US NRC

**Date:** 12/20/13

**Re:** NUREG-2157, WC DGEIS

**# of pages:** Cover sheet (1) + cover letter (2) + pamphlet (2, legal-sized) + diagram (1) = 6 total

**Notes:**

Dec. 2012 (Updated Nov. 2013) ROUTINE RADIOACTIVE RELEASES FROM U.S. NUCLEAR POWER PLANTS pamphlet

Public Comment Re: Docket ID No. NRC-2012-0246, WC DGEIS, NUREG-2157

Dec. 20, 2013

Dear NRC Nuclear Waste Confidence Directorate,

Please find attached a double-sided pamphlet written (in Dec. 2012, and updated in Nov. 2013) by Beyond Nuclear board member Kay Drey of St. Louis, MO, entitled "ROUTINE RADIOACTIVE RELEASES FROM U.S. NUCLEAR POWER PLANTS."

I submit it as public comment on NRC's Waste Confidence Draft Environmental Impact Statement, because whether re: impacts on Groundwater (Section E.2.2.1), Surface Water (Section E.2.2.2), Soils (Section E.2.2.3), or Public Health (Section E.2.2.4), as summarized in Section E.2.2.5 on Page E-19, NRC has determined, incredibly, that the impact of radioactivity leakage from high-level radioactive waste storage pools is "SMALL."

We beg to differ. This pamphlet, while focused on "routine radioactive releases," also touches on "leaks" – which, because they happen so often, unfortunately, could be referred to as "routine" at nuclear power plants – although there is nothing "routine" or "small" about them, in terms of their impacts on the environment and human health.

As shown in the diagram published by NRC that is featured on the cover of the pamphlet, radioactivity, once leaked from a high-level radioactive waste storage pool, can and will "cycle" back through the ecosystem and food chain (bio-concentrating there), to harm humans (with the most concentrated, and thus harmful, doses, as we sit at the top of the food chain).

I have also attached a diagram of the human body, prepared by Russell Hoffmann, that shows where in the human body various radioactive poisons lodge, and concentrate, and do their primary damage.

Given NAS's affirmation for decades, in its seven Biological Effects of Ionizing Radiation (BEIR) reports, that any exposure to ionizing radioactivity carries a health risk for cancer, and these risks accumulate over a lifetime, I cannot understand how NRC has determined that radioactivity leakage from pools will have a SMALL impact on people and the environment!

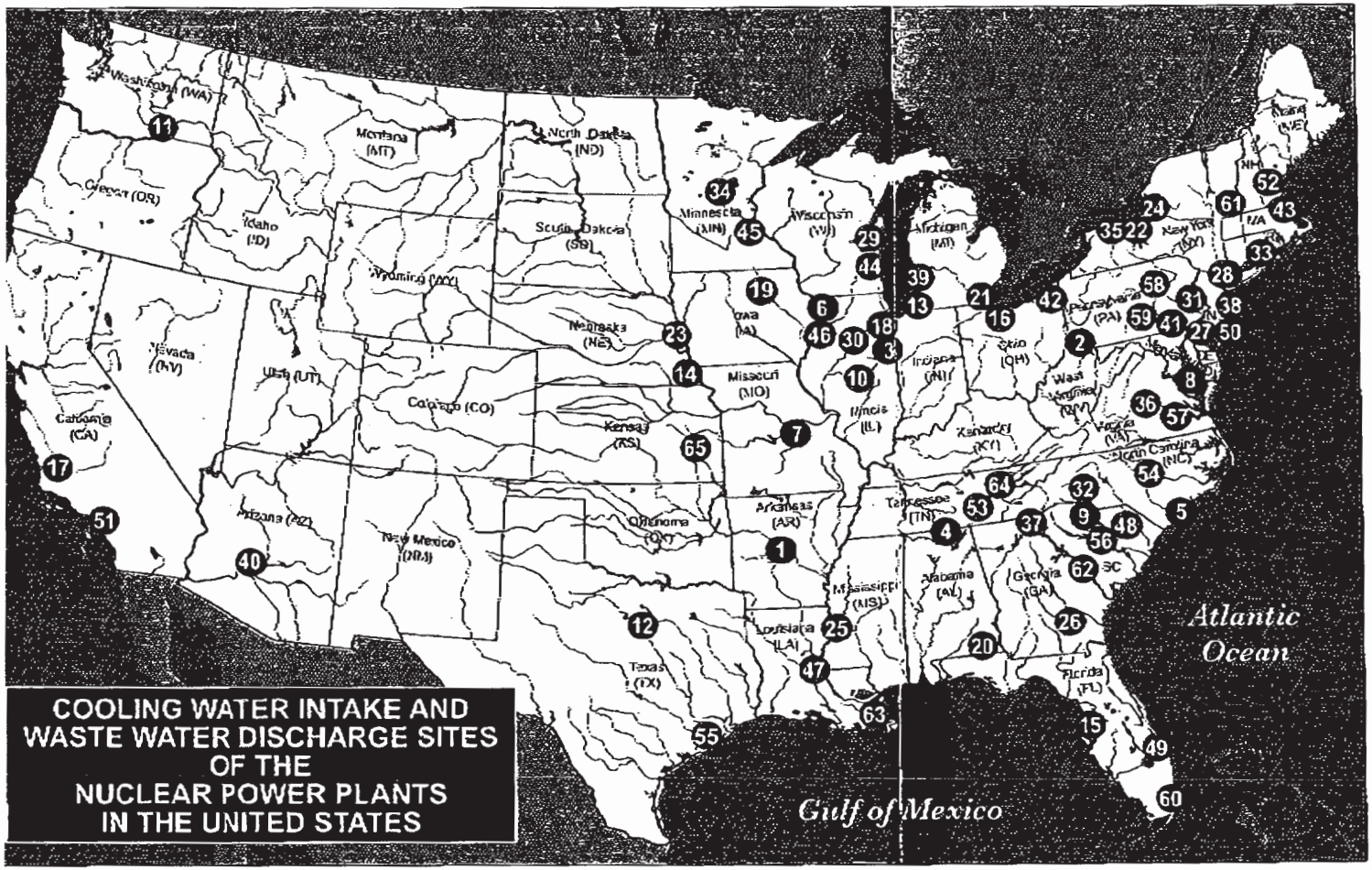
Please note that this ""ROUTINE RADIOACTIVE RELEASES FROM U.S. NUCLEAR POWER PLANTS" pamphlet, on its flipside, includes a map of the U.S., showing atomic reactor sites, and the surface waters into which their pools either already do leak or have leaked (as documented in NRC's Table E-4 on Page E-20, at Hatch in GA, Indian Point in NY, Palo Verde in AZ, Salem in NJ, San Onofre in CA, Seabrook in NH, and Watts Bar in TN; as documented by David Lochbaum of UCS, in his comments to this proceeding, at Yankee Rowe in MA, as well as Brookhaven National Lab on Long

Island, NY), or else could yet leak someday. The NRC WC DGEIS, as at Table E-4, currently lacks specific information, as to which surface waters pools have leaked into, are yet leaking into, or could someday leak into.

Thank you.

Sincerely,

Kevin Kamps
Radioactive Waste Watchdog, Beyond Nuclear
6930 Carroll Ave., Ste. 400
Takoma Park, MD 20912




**North Anna 1 & 2 (VA)**
Lake Anna, North Anna River, Pamunkey River, York River, Chesapeake Bay

**Oconee 1, 2 & 3 (SC)**
Lake Keowee, Savannah River

**Oyster Creek (NJ)**
Barnegat Bay of Atlantic Ocean

**Palisades (MI)**
Lake Michigan

**Palo Verde 1, 2 & 3 (AZ)**
Groundwater plus Phoenix sewage water from 35 miles away provide the cooling water. Waste water is evaporated; saturated sludges are shipped to a radioactive waste dump.

**41. Peach Bottom 2 & 3 (PA)**
Conowingo Pond, Susquehanna River, Chesapeake Bay

**42. Perry (OH)**
Lake Erie

**43. Pilgrim (MA)**
Cape Cod Bay of Atlantic Ocean

**44. Point Beach 1 & 2 (WI)**
Lake Michigan

**45. Prairie Island 1 & 2 (MN)**
Mississippi River

**46. Quad Cities 1 & 2 (IL)**
Mississippi River

**47. River Bend (LA)**
Mississippi River

**48. H. B. Robinson 2 (SC)**
Lake Robinson, Black Creek

**49. Saint Lucie 1 & 2 (FL)**
Atlantic Ocean

**50. Salem 1 & 2 (NJ)**
Delaware River

**51. San Onofre 2 & 3 (CA)**
Pacific Ocean

**52. Seabrook (NH)**
Atlantic Ocean

**53. Sequoyah 1 & 2 (TN)**
Chickamauga Lake, Tennessee River

**54. Shearon Harris (NC)**
Harris Lake, Buckhorn Creek, Cape Fear River

**55. South Texas Project 1 & 2 (TX)**
Colorado River, Gulf of Mexico

**56. V. C. Summer (SC)**
Monticello Reservoir, Broad River

**57. Surry 1 & 2 (VA)**
James River, Chesapeake Bay

**58. Susquehanna 1 & 2 (PA)**
Susquehanna River, Chesapeake Bay

**59. Three Mile Island (PA)**
Susquehanna River, Chesapeake Bay

**60. Turkey Point 3 & 4 (FL)**
Biscayne Bay of Atlantic Ocean

**61. Vermont Yankee (VT)**
Connecticutt River

**62. Vogtle 1 & 2 (GA)**
Savannah River

**63. Waterford 3 (LA)**
Mississippi River

**64. Watts Bar (TN)**
Watts Bar Lake, Tennessee River

**65. Wolf Creek (KS)**
Coffey County Lake, Neosho River

**UPDATE!!**
**REACTORS ARE CLOSING!!**
**99 OPERATING REACTORS**
**AT 61 SITES**

1. **Arkansas One 1 & 2 (AR)**
   Dardanelle Reservoir, Arkansas River
2. **Beaver Valley 1 & 2 (PA)**
   Ohio River
3. **Braidwood 1 & 2 (IL)**
   Braidwood Lake, Kankakee River
4. **Browns Ferry 1, 2 & 3 (AL)**
   Tennessee River
5. **Brunswick 1 & 2 (NC)**
   Cape Fear River, Atlantic Ocean
6. **Byron 1 & 2 (IL)**
   Rock River
7. **Callaway (MO)**
   Missouri River
8. **Calvert Cliffs 1 & 2 (MD)**
   Chesapeake Bay
9. **Catawba 1 & 2 (SC)**
   Lake Wylie, Catawba River
10. **Clinton (IL)**
    Clinton Lake, Salt Creek
11. **Columbia (WA)**
    Columbia River
12. **Comanche Peak 1 & 2 (TX)**
    Squaw Creek Reservoir, Brazos River
13. **Donald C. Cook 1 & 2 (MI)**
    Lake Michigan
14. **Cooper (NE)**
    Missouri River
15. ~~**Crystal River 3 (FL)**~~
    ~~Gulf of Mexico~~
16. **Davis-Besse (OH)**
    Lake Erie
17. **Diablo Canyon 1 & 2 (CA)**
    Pacific Ocean
18. **Dresden 2 & 3 (IL)**
    Kankakee River
19. **Duane Arnold (IA)**
    Cedar River
20. **Joseph M. Farley 1 & 2 (AL)**
    Chatahoochee River
21. **Fermi 2 (MI)**
    Lake Erie
22. **James A. FitzPatrick (NY)**
    Lake Ontario
23. **Fort Calhoun (NE)**
    Missouri River
24. **R. E. Ginna (NY)**
    Lake Ontario
25. **Grand Gulf (MS)**
    Mississippi River
26. **Edwin I. Hatch 1 & 2 (GA)**
    Altamaha River
27. **Hope Creek (NJ)**
    Delaware River
28. **Indian Point 2 & 3 (NY)**
    Hudson River
29. ~~**Kewaunee (WI)**~~
    ~~Lake Michigan~~ (closing in 2013)
30. **LaSalle 1 & 2 (IL)**
    LaSalle Lake, Illinois River
31. **Limerick 1 & 2 (PA)**
    Schuylkill River
32. **McGuire 1 & 2 (NC)**
    Lake Norman, Catawba River
33. **Millstone 2 & 3 (CT)**
    Niantic Bay of Long Island Sound
34. **Monticello (MN)**
    Mississippi River
35. **Nine Mile Point 1 & 2 (NY)**
    Lake Ontario

36.

37.

38.

39.

40.

**PLANNED**
**RELEASES**
**from**
**uclear Plants**
**into Air,**
**ater, and Soil**

**IT DOES**
**NOT**
**TAKE AN**
**CCIDENT**

The vent on top of the Reactor Building at the Callaway 1000-megawatt pressurized water reactor.

Water discharge area at the Pallisades nuclear power plant on Lake Michigan. Note the flow from four big ejection outlets.

Economically feasible filtering technologies **do not exist** for some major reactor products, such as radioactive hydrogen (tritium) and noble gases, such as rypton (that becomes rubidium, and then strontium) and xenon (that becomes sium). Some liquids and gases are retained temporarily in tanks so that the orter-lived radioactive materials can break down before the batch is released to environment.

The Nuclear Regulatory Commission relies upon self-reporting and computer deling by each reactor's operator in an attempt to track radioactive releases and ir projected dispersion. A significant portion of the environmental monitoring data extrapolated — **it's virtual, not real.**

• **Any exposure to radiation increases the risk** of damage to tissues, cells, A and other vital molecules, potentially causing genetic mutations, cancers, kemias, birth defects, and reproductive, cardiovascular, endocrine, and immune tem disorders.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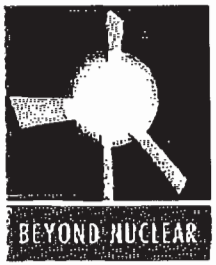
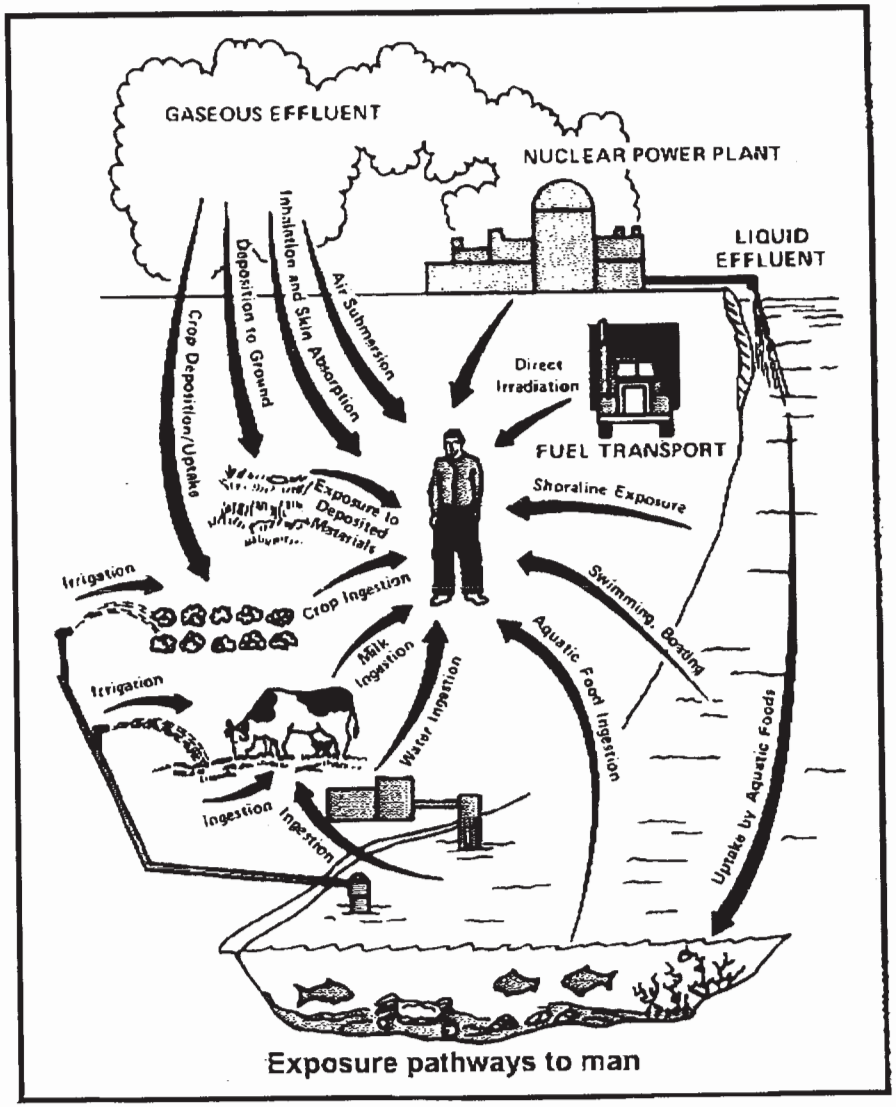





# ROUTINE RADIOACTIVE RELEASES FROM U.S. NUCLEAR POWER PLANTS




Exposure pathways to man

**↑A DIAGRAM PUBLISHED IN 1977 BY THE U.S. NUCLEAR REGULATORY COMMISSION**

1. Every nuclear power reactor dumps radioactive water, scatters radioactive particles, and disperses radioactive gases as part of its routine, everyday operation. It doesn't take an accident. Federal regulations permit these radioactive releases.

2. Radioactivity is measured in curies. An average operating nuclear power reactor will have about 16 billion curies in its reactor core. This is the equivalent long-lived radioactivity of at least 1,000 Hiroshima bombs. In contrast, a large medical center, with as many as 1,000 approved laboratory areas in which radioactive materials are used, may have a combined inventory of only about two curies.

3. Many of a reactor's byproducts give off radioactive particles and rays for enormously long periods --- described in terms of "half-lives." For example, iodine-129 has a half-life of about 16 million years; technetium-99 = 211,000 years; and plutonium-239 = 24,000 years. Xenon-135, a noble gas, decays into cesium-135, an isotope with a 2.3 million-year half-life. Radioactive materials give off hazardous radioactivity for at least ten half-lives.

4. A reactor's fuel rods, pipes, tanks and valves can leak. Mechanical failure and human error can also cause leaks. As a nuclear plant ages, so does its equipment --- and leaks generally increase.

5. **Liquid releases:**

a. Some contaminated water is intentionally removed from the reactor's cooling system to reduce the amount of radioactive and corrosive chemicals that damage valves and pipes. This water is filtered and then either recycled back into the cooling system or released into the environment.

b. A typical 1000-megawatt pressurized water reactor (with a cooling tower) takes in about 20,000 gallons of river, lake or ocean water per minute for cooling; circulates it through a 50-mile maze of pipes; returns about 5,000 gallons per minute to the same body of water; and releases the remainder to the atmosphere as vapor. A similar reactor without a cooling tower can take in as much as one-half million gallons per minute. The discharge water is contaminated with radioactive isotopes in amounts that are not precisely tracked and are potentially biologically damaging.

c. Government regulations allow radioactive water containing "permissible" levels of contaminants to be released to the environment. Permissible does not mean safe. Detectors at reactors are set to allow radioactive water to be released, unfiltered, if below the "permissible" legal levels.

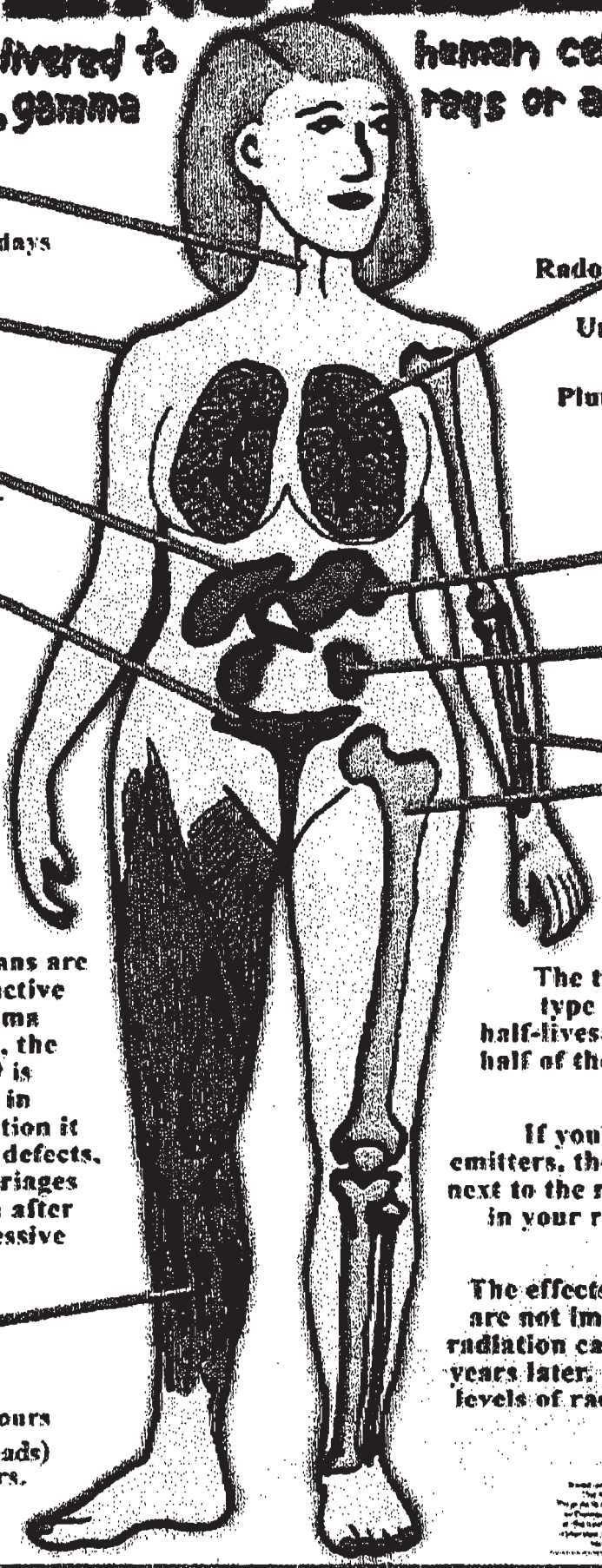
6. **Gaseous releases:**

Some radioactive gases, stripped from the reactor cooling water, are retained in decay tanks for days before being released into the atmosphere through filtered rooftop vents. Some gases leak into the power plant buildings' interiors and are released during periodic "purges" or "ventings." These airborne gases contaminate not only the air, but also fall out upon soil and water.

7. Radioactive releases from a nuclear power reactor's routine operation often are not fully detected or reported. Accidental releases also cannot be completely verified or documented.

# IONIZING RADIATION

(radiation delivered to human cells from beta rays, x-rays, gamma rays or alpha particles)



## THYROID

**Iodine-131**
beta (gamma), 8 days

## SKIN

**Sulfur-35**
beta, 87 days

## LIVER

**Cobalt-60**
beta (gamma), 5 yrs.

## OVARIES

**Iodine-131**
gamma, 8 days

**Cobalt-60**
gamma, 5 yrs.

**Krypton-85**
gamma, 10 yrs.

**Potassium-42**
gamma, 12 hours

**Cesium-137**
gamma, 30 yrs.

**Plutonium-239**
alpha, 24,000 yrs.

**The reproductive organs are attacked by all radioactive isotopes emitting gamma radiation. In addition, the deadly Plutonium-239 is known to concentrate in the gonads. The radiation it emits can cause birth defects, mutations and miscarriages in the first generation after exposure and/or successive generations.**

## MUSCLE

**Potassium-42**
beta (gamma), 12 hours

**Cesium-137 (and gonads)**
beta (gamma), 30 yrs.

## LUNGS

**Radon-222 (and whole body)**
alpha, 3.8 days

**Uranium-233 (and bone)**
alpha, 162,000 yrs.

**Plutonium-239 (and bone)**
alpha, 24,000 yrs.

**Krypton-85**
gamma, 10 yrs.

## SPLEEN

**Polonium-210**
alpha, 138 days

## KIDNEYS

**Ruthenium-106**
gamma (beta) 1 yr.

## BONE

**Radium-226**
alpha, 1620 yrs.

**Strontium-90**
beta, 28 yrs.
and more.

**The times listed next to the type of ray emitted are the half-lives: how long it takes for half of the radioactive material to break down.**

**If you ingest alpha and beta emitters, they set up permanently next to the marrow of your bones, in your reproductive organs or elsewhere.**

**The effects of ionizing radiation are not immediate. Exposure to radiation can cause cancers many years later. Exposure to very low levels of radiation can be equally dangerous over time.**