


Nuclear Waste
in
Tennessee


TN's Leadership Role as Radioactive Waste Disposer for the Nation

In the year 2000 (the last year that the NRC compiled these numbers in a state by state comparison) Tennessee sent 58.6% of the materials that were disposed at the 3 landfills in the U.S. licensed to receive radioactive materials . Add the radioactive materials that were incinerated and land - filled and Tennessee received at least 75% of the nation's low-level radioactive waste.

HOW AND WHY ARE WE GETTING "LOW-LEVEL" RADIOACTIVE WASTE IN OUR SOLID WASTE LANDFILLS?

The N-Waste Disposal

- Many older nuclear reactors and weapons facilities have been closed.
- The home states want to get rid of their waste.

•Tennessee, the VOLUNTEER state, has licensed nuclear processors that reduce the bulk of waste, but not its radiation.

BSFR Program is Born

Decades ago TDEC entered into agreements with the nuclear industry to create the *Bulk Survey For Release* program. (Note that the name does not include the words nuclear or radioactive.).

TDEC's SECRECY

TDEC held no public hearings to inform the people, local officials, or the TN legislature of their nuclear agreement. The BSFR program would still be secret if the national nuclear watchdog NIRS had not reported it, and then it was publicized in news stories on Channel 4 television in Nashville.

SPEEDY PROCESSING

Unlike the NRC and other states, TN does not analyze incoming waste on a case-by-case basis. TDEC stands alone among the state regulators in the extent to which they have reduced the "regulatory burden" on companies that produce, process and/or dispose of radioactive waste.

How does Tennessee Department of Environment & Conservation Measure & Monitor Radiation Levels in Tennessee's Landfills?

ANSWER: BY TRUST

source TDEC

- **Processors bringing Radioactive Waste into Tennessee are responsible for monitoring the levels of radiation from point of source—i.e. self-monitoring**

- **Private processors decide which nuclear materials can be reclassified from licensed radioactive waste to regular trash that goes to our municipal landfills—more self-monitoring. TDEC occasionally inspects the paper work.**

Where does Rad Waste come from?

- Only 20% of the low level radioactive waste that goes into TN landfills is generated from within the state.
- Waste from decommissioned reactors and other sources comes to TN for processing and burial from as far away as California, Michigan, Connecticut, Washington state, New York and others. Some has come from Canada, Mexico and Brazil, perhaps other countries.

The state receives 1 ½ cents per pound for all radioactive waste that goes to processors.

AMOUNTS OF Rad Waste in 2004-2006

38,343,961 lbs in 3 years

2004

- North Shelby 3,677,876
- South Shelby 0
- Carter Valley 0
- Chestnut Ridge 0
- Middle Point (from Impact 165,858)

2005

- North Shelby 9,823,073
- South Shelby o
- Carter Valley 7,481,581
- Middle Point (Impact 10,130,000)

2006

- North Shelby 1,302,663
- South Shelby 966,937
- Carter Valley 3,261,010
- Chestnut Ridge 191,194
- Middle Point 1,343,769

  (Impact 590,570; Toxco 753,199)

POUNDS of Rad Waste 2007-09

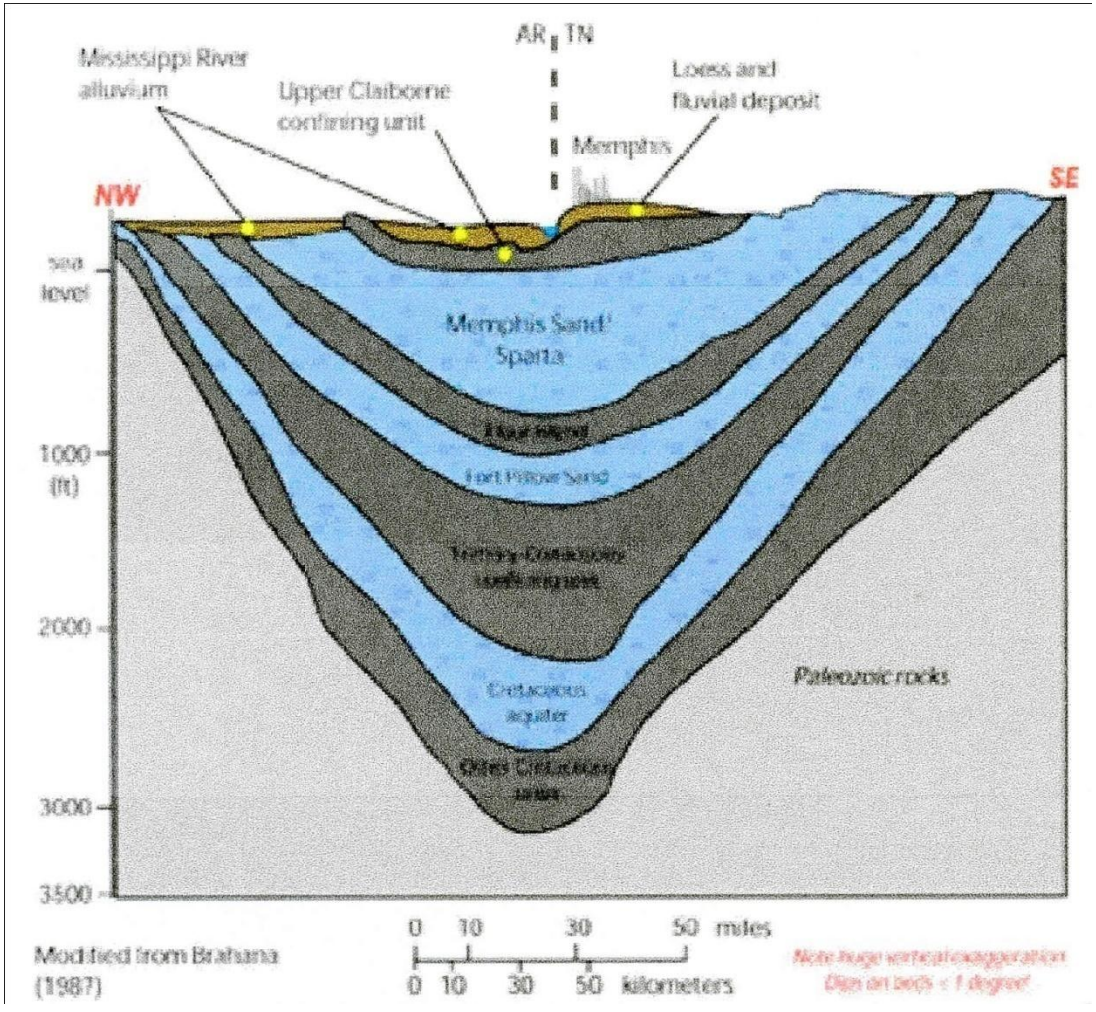
Landfill	2007	2008	2009
North Shelby	2,000,000	180,000	179,000
South Shelby	530,000	850,000	1,770,000
Middle Point	400,000	0	0
Chestnut Ridge	1,300,000	890,000	1,861,000
Carters Valley	495,000	140,000	150,000
	4,725,000	2,060,000	3,960,000

TOTAL FOR 3 YRS: 10,745,000 pounds

Shelby County

- **North Shelby County Landfill has received the most radioactive waste of any landfill in TN, over 17 Million Pounds in 6 years.**
- **The city of Memphis depends upon an underground aquifer for its drinking water.**
- **If the drinking water is contaminated, the health and welfare of 670,000 people will be threatened. Memphis is the largest city in Tennessee.**
- **Memphis lies on an earthquake fault. Even a minor earthquake might damage those landfills and pollute the water.**

Memphis Aquifer



Types of Radioactive Waste

High-Level waste does not go into landfills. It sits in casks and cooling pools on the reactor sites.

The U.S. has no middle level classification. What is classified as Mid-Level waste in Europe is called "Low-Level" in the U.S.

"Low-Level" Radioactive Waste does not mean "low risk." "Low-level" waste includes the same atoms as high level waste-- plutonium, cesium, strontium, and iodine-- but in lower concentrations.

Kinds of Low-Level Waste

Class A—lowest level

Class B—higher level

Class C—highest level

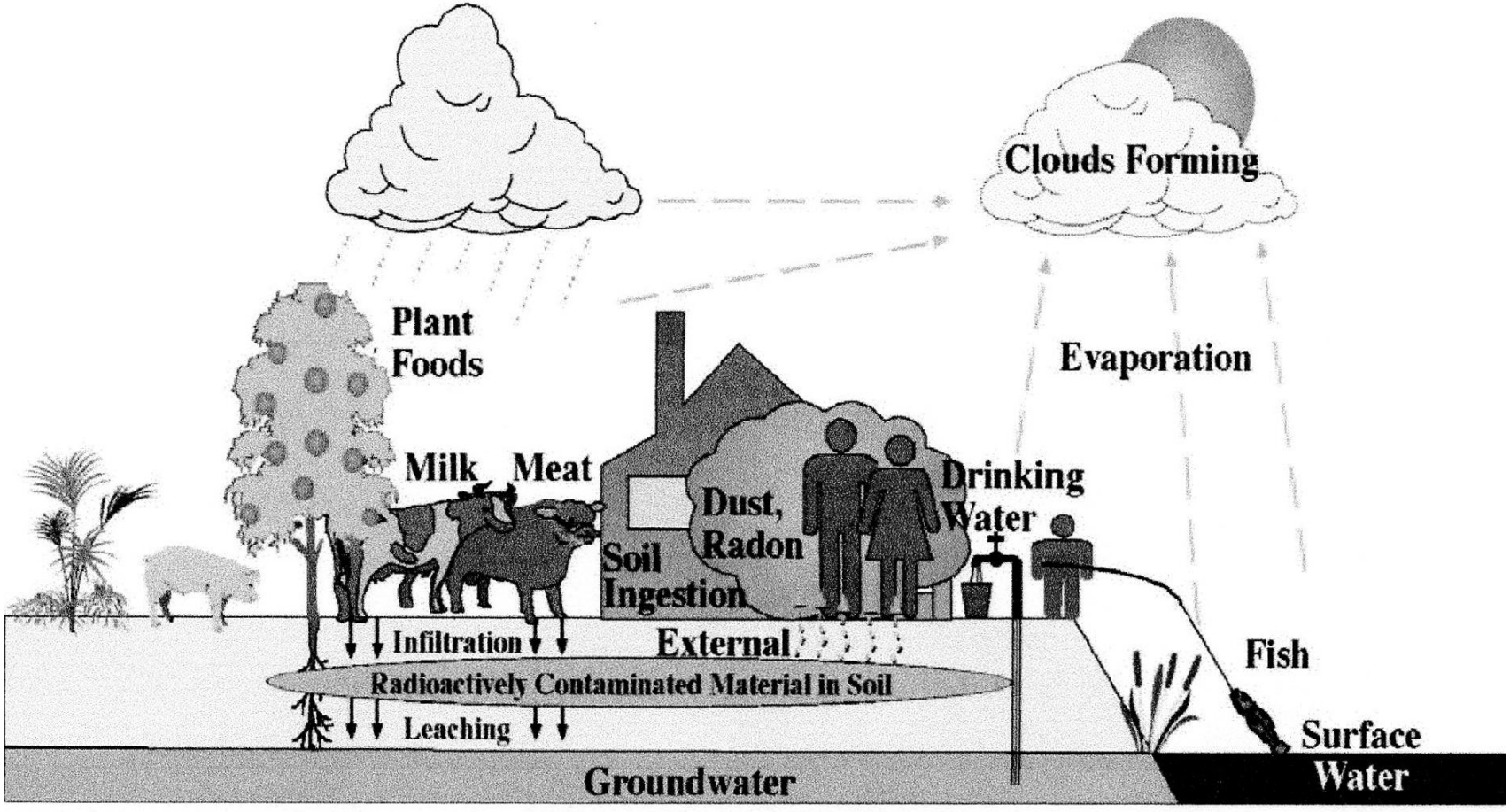
Greater that Class C

Landfill Facts

- Municipal landfills were never intended for radioactive waste
- LINER LIFE IS 30 YEARS; radiation lasts for thousands of years or more.
- Eventually most if not all landfills leak.
- Once radioactive material is buried, the state does no further checking on the contents. Leachate is not checked for radiation.

Logic would suggest that if you keep adding more of something to a heap, the total amount would become greater. According to TDEC, this logic does not apply to radioactive waste. No matter how much is added, it all amounts to 1 millirem of exposure per year, forever and ever.

The Fantasy of RESRAD MAN



RESRAD is a computer model designed to estimate radiation doses and risks from RESidual RADioactive materials.

REALITY--Middle Point Landfill in Walter Hill, Tennessee, on Stones River

Middle Point and Water Plant

DANGERS of Radioactive Waste

sources: EPA & physicians

- **INGESTED RADIATION, whether breathed in from the air, or consumed through drinking water, or from foods grown on contaminated land, is far more toxic to living creatures than external radiation.**
- **Radiation ACCUMULATES in the body. The doses we take in, whether from natural or man-made sources, accumulate over our lifetimes and damage our cells. Cancer can take 50 years to develop, or much less.**

There is no such thing as a safe dose, no matter how small.

BEIR VII REPORT of the National Academy of Sciences: Study of the health risks from exposure to low levels of Ionizing Radiation

- The committee concludes that the higher the dose, the greater the risk.
- In case of exposure of fetuses in the womb, increased incidences of cancer can be detected at low doses.
- Cells do not necessarily have to be hit directly by a radiation track for the cell to be affected, damaging the cell's DNA.
- The committee concludes that the preponderance of information indicates that there will be some risk, even at low doses.

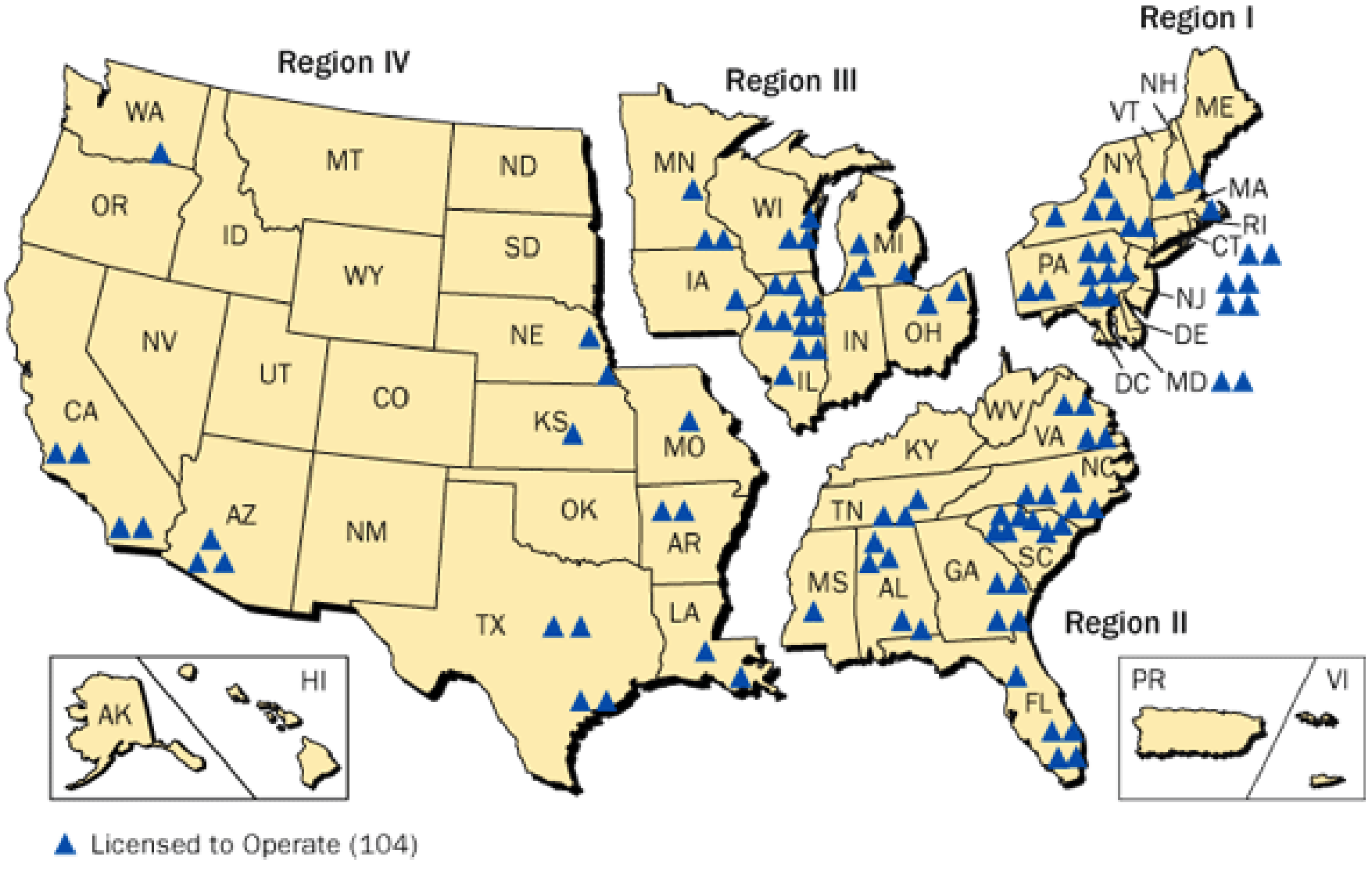
ANOTHER EXPERT OPINION

"There is no safe level of exposure and there is no dose of radiation so low that the risk of a malignancy is zero."--Dr. Karl Morgan, from Oak Ridge, dubbed the father of Health Physics

TN Radioactive Waste Facilities

- EnergySolutions at Oak Ridge and Memphis
- Studsvikand StudsvikRACE at Erwin and Memphis
- Impact at Oak Ridge
- PermaFix at Kingston and Oak Ridge
- Nuclear Fuel Services at Erwin
- Philotechnics at Oak Ridge
- Bionomics at Oak Ridge
- Aerojet at Jonesborough

Many of the 104 operating US nuclear power reactors are now contracted to send their nuclear waste to Studsvik in Erwin &/or Memphis.



Processors in TN that Heat Treat Radioactive Waste

- EnergySolutions in Oak Ridge- 2 incinerators
- DSSI PermaFix in Kingston- radioactive and mixed waste boiler, processes PCBs
- Studsvik in Erwin-- pyroprocessing
- IMPACT in Oak Ridge – pyroprocessing
- Duratek metal melt in Oak Ridge
- TOXCO metal melt in Oak Ridge
- Aerojet oxidizer in Jonesborough (metallic uranium chips)

IMPORTATION OF FOREIGN WASTE

- **ENERGY SOLUTIONS wants to IMPORT 1,000 tons of radioactive waste from Germany to burn in Oak Ridge. This will open the door to Europe's "LOW LEVEL" RADIOACTIVE WASTE coming to our state.**

- **ENERGY SOLUTIONS withdrew its application to import 20,000 tons of rad waste from Italy, but it is reworking the application. The original plan was to burn, melt and otherwise process in Tennessee these materials from decommissioned nuclear plants.**

ABOUT INCINERATORS

1) **Older incinerators tend to be more polluting than are newer ones that have more processes for cleaning out pollutants.**

   The EnergySolutions incinerators that will burn German waste are over 20 years old.

2) **When incinerators stop and start up again, they emit large amounts of dioxin, a potent carcinogen.**

   EnergySolutions says they will clean out their incinerators before and after each burn of German waste.

Facts about Incineration

- Incineration produces toxic and carcinogenic substances such as dioxins, furans, particlate matter, heavy metals such as lead and mercury.
- When considering the impact of an incinerator, it is necessary to consider the collective impact of incinerators in the region.
- Oak Ridge has 4 incinerators within fairly close proximity.
- To our knowledge, NO environmental impact study has been ever been done.

The incinerators at Oak Ridge have burnt radioactive waste since the late 1980s. Small particles can travel great distances.

Of the 25 cities in the U.S. most polluted by Year-Round Particle Pollution, Knoxville-Sevierville-LaFollette, TN, ranked 21st in the nation in 2010. (source: American Lung Association)

For other facts on incineration see printed "Incineration: A Factsheet "

Bringing Higher Level Waste to Tennessee

Two Tennessee processors want to bring higher level Class B and C radioactive waste to TN from nuclear reactors in 36 states.

EnergySolutions would lower the classification by blending with less concentrated Class A waste in Oak Ridge.

Studsvik would cook these radioactive resins for significant volume reduction in Erwin, TN.

Erwin

Erwin, TN, is home to both Nuclear Fuel Services and Studsvik.

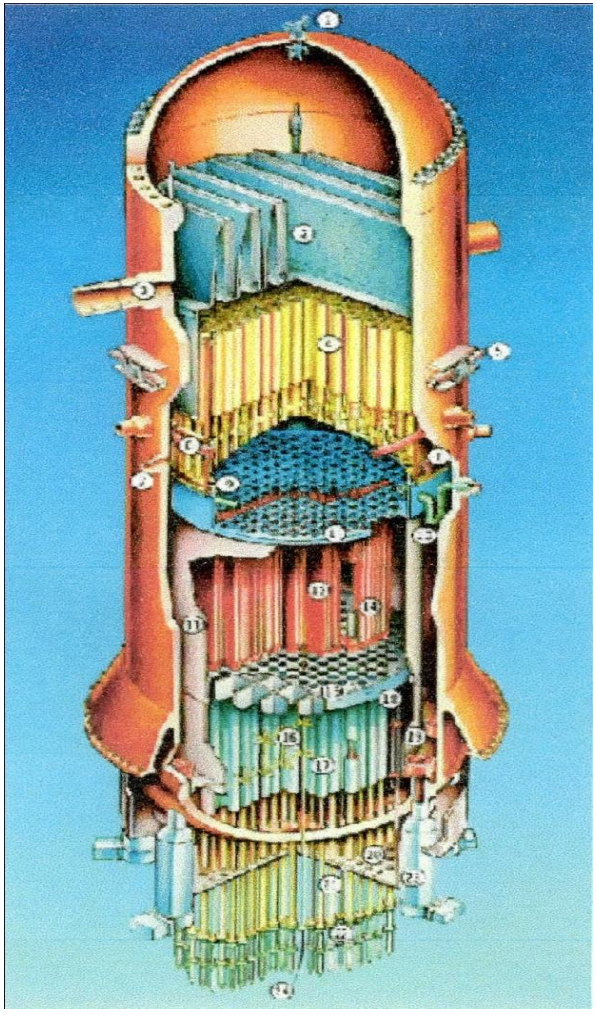
A study released on Nov. 11, 2010, shows the troubled Nuclear Fuel Services in Erwin is apparently discharging enriched uranium into the Nolichucky River. Uranium was found up to 45 miles down river from the plant.

PRESIDENT'S ISLAND IN MEMPHIS

RADIOACTIVE STEAM GENERATORS

The Studsvik facility on President's Island in Memphis is the only place in the U.S. where radioactive steam generators from pressurized water reactors are taken for processing or dismantling. These units are up to 70 feet tall and weigh as much as 800 tons. These must be taken apart, piece by piece to separate the parts that are highly radioactive. These contain a significant amount of plutonium and other dangerous radionuclides. Much of the material deemed to be "extremely low level" by Studsvik will end up in the North or South Shelby landfills.

Intestines of Steam Generators that go to Memphis



FEDERAL EEOC VIOLATIONS

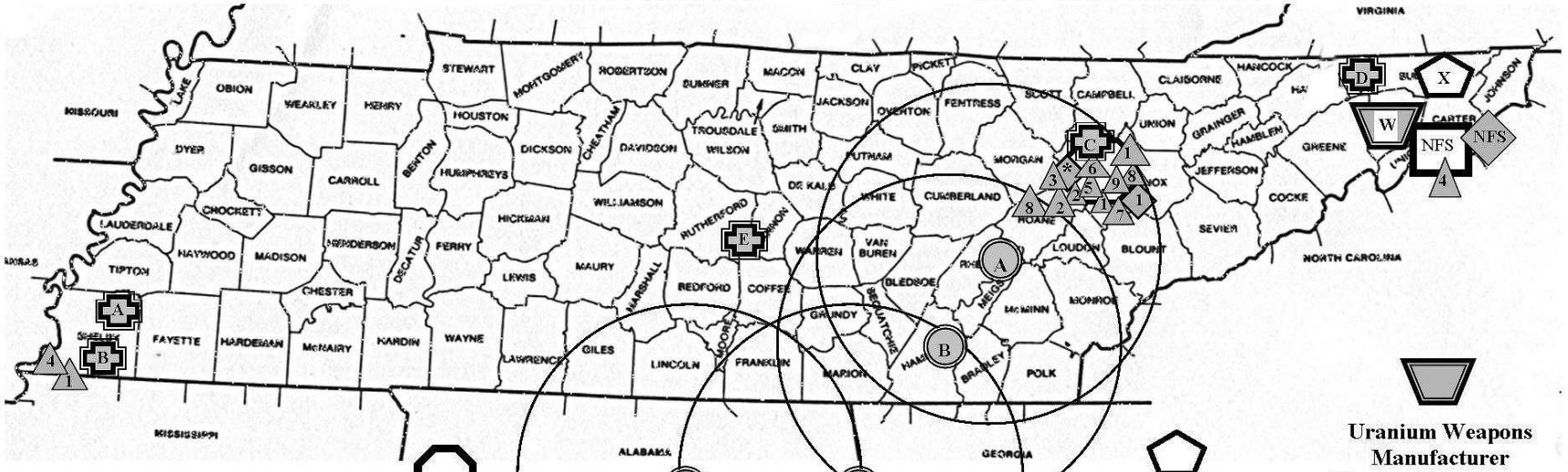
RACE (Radiological Assistance Consulting and Engineering) in Memphis, purchased by Studsvik, agreed in January of 2010 to pay a $650,000 fine to settle claims by the Federal Equal Employment Opportunity Commission. It had intentionally exposed African-American employees to higher levels of radiation than those faced by white workers.

TDEC has taken NO ACTION.

PUBLIC PARTICIPATION

- The nuclear industry in Tennessee has been a high risk enterprise with low visibility.
- The Secret City has spawned a secret industry.
- The Division of Radiological Health has no control board and INADEQUATE OVERSIGHT.
- The Division of Radiological Health does not allow meaningful public participation.
- The DRH needs to make documents available to the public in electronic form. Their website is inadequate.

Nuclear in Tennessee



TVA Nuclear Plants
- A. Watts Bar (2 units)
- B. Sequoyah (2 units)
- C. Bellefonte proposed (2)
- D. Browns Ferry (3 units)

(with 50 mile radius zone)

DOE Weapons Complex Oak Ridge

N-Waste Incinerators
1. Energy Solutions
* DOE
W Aerojet

Municipal Landfills Accepting N-Waste
- A. BFI -Millington, Shelby County
- B. BFI - South Shelby County
- C. Waste Mgmt. Inc. - Heiskell, Anderson Cty.
- D. BFI - Carter Valley, Hawkins County
- E. Rutherford County - banned

Nuclear Fuel Services (Erwin)

Uranium Munitions Storage
X - Holston Army

Uranium Weapons Manufacturer
W - Aerojet

N-Waste Processors
1. EnergySolutions
2. PermaFix
3. Impact
4. Studsvik
5. Toxco
6. Unitech
7. Philotechnics
8. Bionomics

Editorial Cartoon: Nuclear Waste

You can't see it, smell it, taste it, or feel it.

Clay Bennett, Washington Post Writers Group, April 1, 2010