

“SNF (Spent nuclear fuel) is more vulnerable to sabotage or accidents during transportation compared to storage since fewer security personnel and fewer engineered barriers are available. Consequences due to sabotage or accidents are also higher during transport since the waste may be near population centers.”

From TCEQ's Assessment of Texas's High Level Radioactive Waste Storage Options, March 2014



Halting High-Level Radioactive Waste Threats

July 2016

SEED Coalition – Karen Hadden, karendhadden@gmail.com

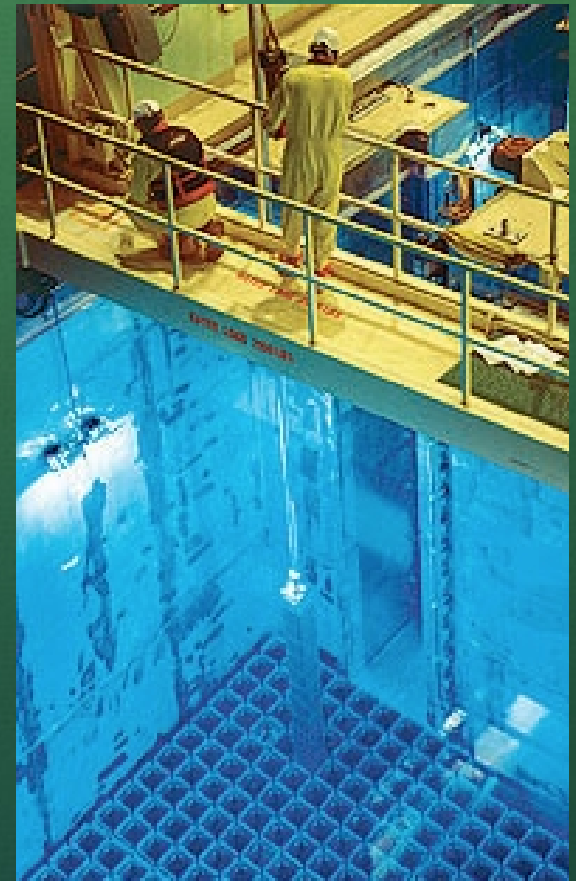
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Former State Representative Lon Burnam, lonburnam@gmail.com

NoNuclearWasteAqui.org

What is High-Level Radioactive Waste?

- High-level radioactive waste is highly irradiated, so-called “spent” fuel, that is removed from nuclear reactor cores
- High-level radioactive waste — irradiated fuel — becomes millions of times more radioactive than the original fuel after it’s been in the reactor. It still contains about 97% of the original Uranium.
- Irradiated fuel rods cool off in a spent fuel pool, typically for 5 – 10 years, after having been in the reactor. The radioactive waste can then go into dry cask storage.



BWR/6 FUEL ASSEMBLIES & CONTROL ROD MODULE

- 1.TOP FUEL GUIDE
- 2.CHANNEL
FASTENER
- 3.UPPER TIE
PLATE
- 4.EXPANSION
SPRING
- 5.LOCKING TAB
- 6.CHANNEL
- 7.CONTROL ROD
- 8.FUEL ROD
- 9.SPACER
- 10.CORE PLATE
ASSEMBLY
- 11.LOWER
TIE PLATE
- 12.FUEL SUPPORT
PIECE
- 13.FUEL PELLETS
- 14.END PLUG
- 15.CHANNEL
SPACER
- 16.PLENUM
SPRING



High-Level Radioactive Waste = High Risk

- NRC: An unshielded person standing a meter away from irradiated fuel that has already cooled for 10 years would be immediately incapacitated and die within a week.
- Dr. Arjun Makhijani- There will be about 100,000 metric tons of irradiated fuel generated by existing U.S. reactors by the time they cease operating.
- Would collectively contain roughly 1000 metric tons of plutonium. If separated, the plutonium would be enough for 120,000 nuclear bombs.



Irradiated Fuel from Nuclear Power Reactors

Contains:

- Uranium-235, Uranium-237, Uranium-238
- Plutonium isotopes – like Plutonium-239
- Many other isotopes – including Strontium-90

If the Strontium-90 in the US irradiated fuel inventory was diluted and spread uniformly, it would contaminate the entire world's fresh water supply to about 60 times the U.S. drinking water standard. – Dr. Arjun Makhijani, IEER

Nuclear Waste Policy Act

The Nuclear Waste Policy Act of 1982 says:

- DOE has responsibility for siting and constructing a geologic repository for high level radioactive waste
- EPA sets protection standards
- NRC licenses the repository

The NRC has been licensing reactors since the late 1970's on the untested (according to the NRC itself) assumption that disposal of irradiated fuel in bedded salt would have zero solid fission product releases.

A 1983 National Research Council study showed that this assumption could be wrong, specifically for bedded salt and also for all other repositories reviewed.

Yucca Mountain was to be the geologic repository

- The selection of and standard setting process for the Yucca Mountain site in Nevada was poor.
- When the site couldn't meet the proposed standard, a new standard was mandated, instead of a new site.
- \$15 billion has been spent, but President Obama halted further development of Yucca Mountain. The site has never opened.
- Deaf Smith County in Texas was a candidate for a repository before Yucca Mountain was chosen, but farmers and ranchers in the Panhandle fought the proposal due to concerns about water contamination.

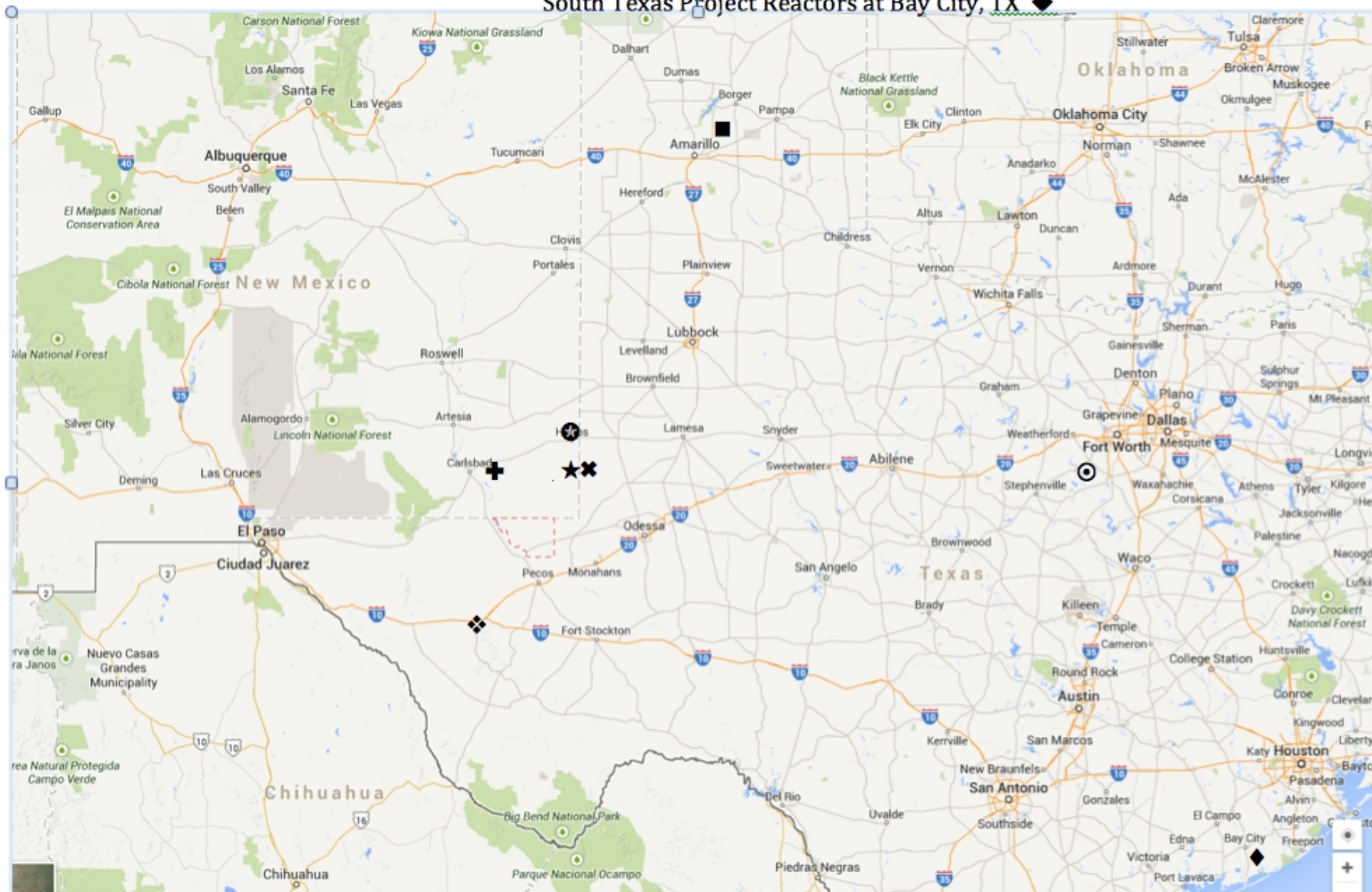
Blue Ribbon Commission (BRC) on America's Nuclear Future

Comprised of nuclear power advocates, the BRC issued a report on January, 26, 2012 after two years of review. They recommended:

- A “consent-based” approach to siting future nuclear waste storage and disposal sites. Trying to force it on unwilling communities hasn’t worked.
- That nuclear waste management be transferred to an organization independent of the DOE.
- Making sure that the \$750 million per year being paid into the Nuclear Waste Fund be used as Congress initially intended.

Waste Control Specialists (WCS) ✕
AFCI Proposed Site ✧
Eddy Lea Alliance Proposed Site (ELEA) ⬠

Urenco USA/ LES ★ uranium enrichment, Lea County, Eunice, NM
WIPP site + 26 miles SE of Carlsbad, NM
Comanche Peak Nuclear Reactors ⊙
Pantex Plant ■ - nuclear weapons assembly & disassembly, Amarillo
South Texas Project Reactors at Bay City, TX ◆



Waste Control Specialists

Existing Site - Andrews County



There are 3 “Low-Level” Radioactive Waste Facilities at the site:

- “Low Level” Radioactive Waste #11 – Texas Legislature greatly expanded its capacity
- Byproduct Waste #9 - already full; very hot weapons waste from Fernald, Ohio
- Federal Waste #10 - federal reactor and weapons waste; facility is open. Now has over 100 WIPP site TRU waste barrels – including potentially exploding containers similar to those that caused a release in New Mexico of plutonium and americium
- Also has a RCRA site – that can accept 2000 types toxic, explosive, corrosive wastes – and now accepts some “low-level” radioactive waste at the same location.

TCEQ Study Produced March 2014



Assessment of Texas's High Level Radioactive Waste Storage Options

<http://www.documentcloud.org/documents/1100389-tceq-assessment-of-texas-high-level-radioactive.html>

WCS wants high-level radioactive waste for their nuclear empire

Waste Control Specialists (WCS) –filed an application for a Consolidated Interim Storage License on April 28, 2016, which they would locate at their existing “low-level” radioactive waste site in Andrews County. It’s on the New Mexico border, just across from the town of Eunice

WCS has an ever-expanding license:

- In 2013, the Texas Legislature tripled the allowable low-level radioactive waste volume, while decreasing financial assurance from \$136 million to \$86 million.
- WCS is now licensed to take Depleted Uranium (DU); they are seeking a license for Greater Than Class C waste; they are now the favored site for DOE mercury too.
- A RCRA facility at the site accepts hazardous, corrosive and explosive waste.
- Barrels of radioactive waste similar to those that exploded at the WIPP site are now stored at the WCS site.

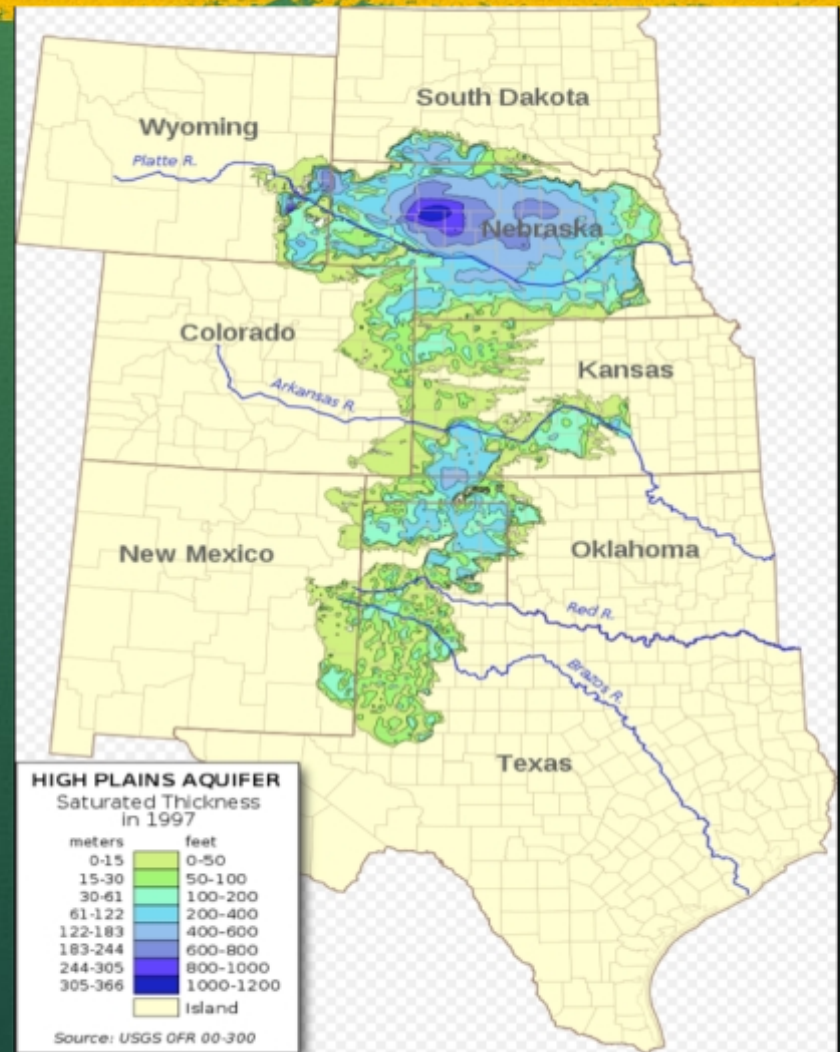


WCS: Donations lead to Less Stringent License Requirements

- WCS ' huge lobbying teams tend to get whatever they want – wherever they go. They donate extensively - to state and Congressional campaigns around the country, and Texas Supreme Court judges. Rick Perry's #2 all-time donor.
- Radioactive waste must be kept dry for safety reasons – but recently 27% of WCS' monitoring wells had water in them, based on SEED Coalition analysis of monthly water reports
- A license amendment now lets waste be buried even if standing water is present nearby
- There is a curie limit, but WCS has begun taking radioactive decay into account – lessening the curies considered to be present
- WCS is trying to do away with counting curies entirely by going to a “risk-based” approach instead

Ogallala Aquifer: Water Contamination Risks

- The Dockum Aquifer and the OAG are water bodies known to be at the Waste Control Specialists site. OAG = Ogallala, Antlers, Gatuna
- WCS says the Ogallala is 6 miles to the north of their waste and that water would never go in that direction.
- The Ogallala (High Plains Aquifer) lies beneath 174,000 square miles, beneath 8 states – providing drinking water and water for irrigation.
- State aquifer maps used to show the aquifer at the WCS site, until the maps were changed by the Texas Water Development Board.
www.TexasNuclearSafety.org
- WCS geologists admit that there's no physical / geological barrier between the site and the aquifer



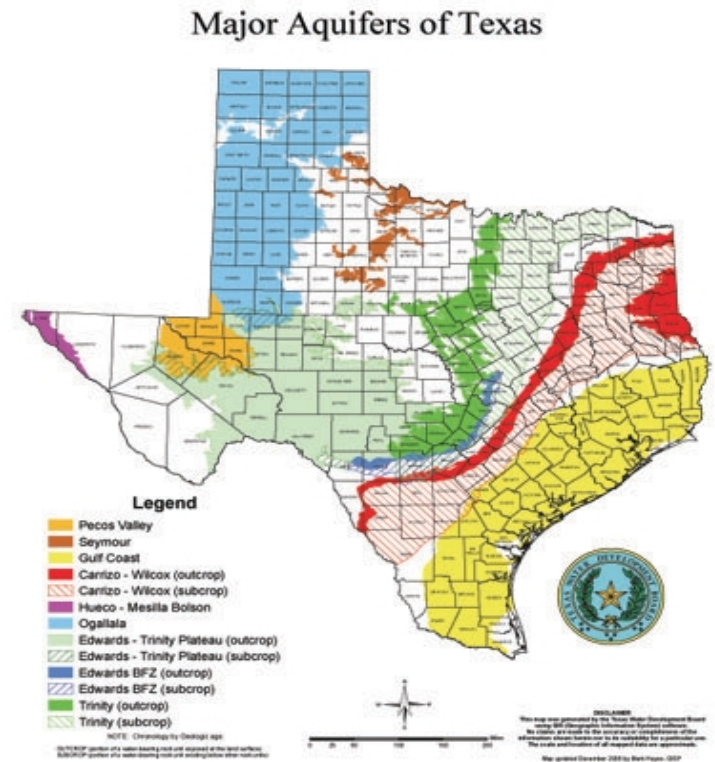
Changing Ogallala Aquifer map

Texas Water Development Board Map – Major Aquifers of Texas

1994 Map



2006 Map



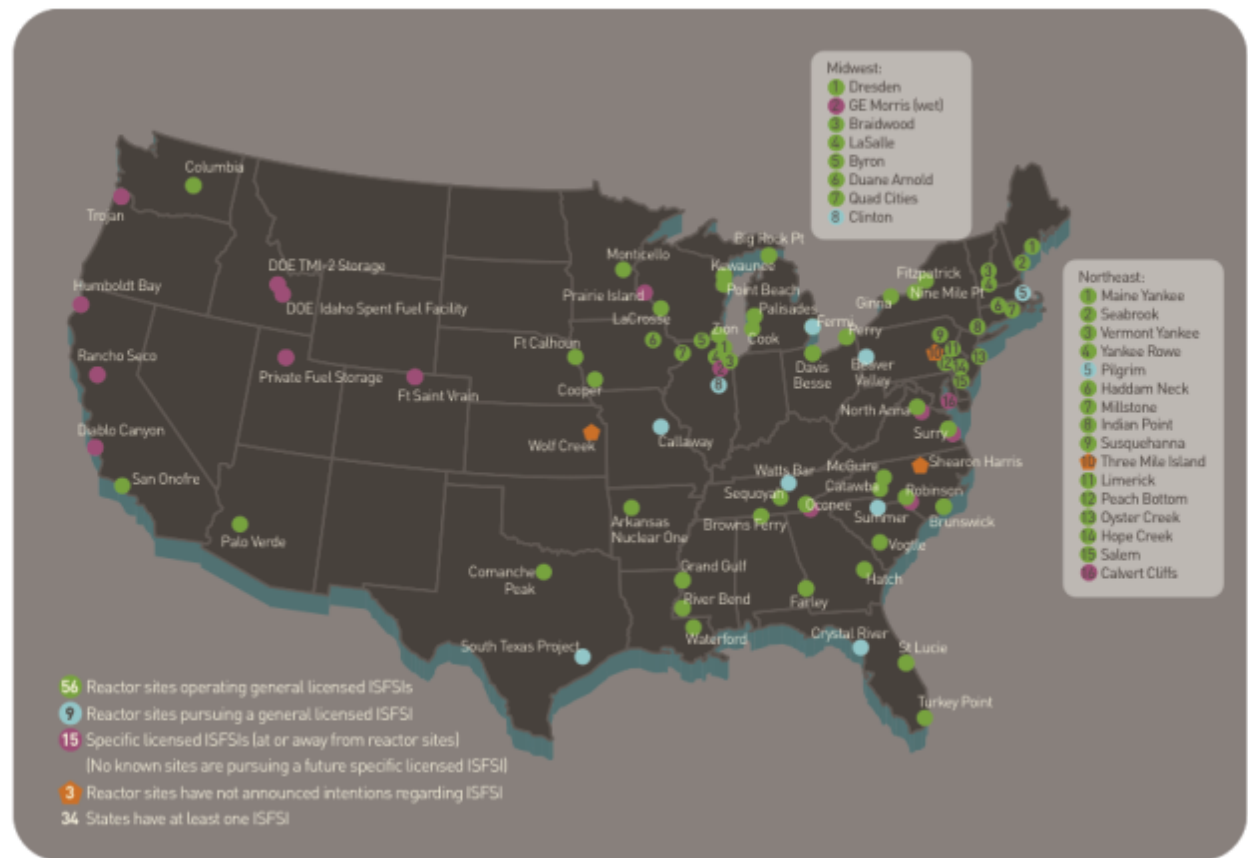
Based on previous maps, the WCS site appeared to sit atop the Ogallala Aquifer, but the map was changed by the Texas Water Development Board, and the aquifer boundary moved further north. The Ogallala, the nation's largest aquifer, is shown in blue / violet on these maps.

Dry Cask Storage is being done onsite - There's No Need to Move High-Level Radioactive Waste

After initial cooling, irradiated fuel is removed from reactor fuel pools and stored on site in dry casks. Most reactor sites are already licensed to do so. The waste can remain for 60 years after a reactor is decommissioned, depending on the site.

There's no need to transport waste just to store it at a different site.

U.S. Independent Spent Fuel Storage Installations



Transporting Radioactive Waste = High Level Risks

- DOE calculated the accident risk for trucks to Yucca Mountain. For 53,000 trips – 53 accidents were likely. If even one had a radiation release, it could be disaster
- Train transport risks were calculated to be 1 accident per 10,000 trips – meaning there would be at least one.
- Even a small radiation release from a serious accident could contaminate 42 square miles of land
- Clean up costs could exceed \$620 million in a rural area, in an urban area, it could cost up to \$9.5 billion to raze and rebuild the most heavily contaminated square mile

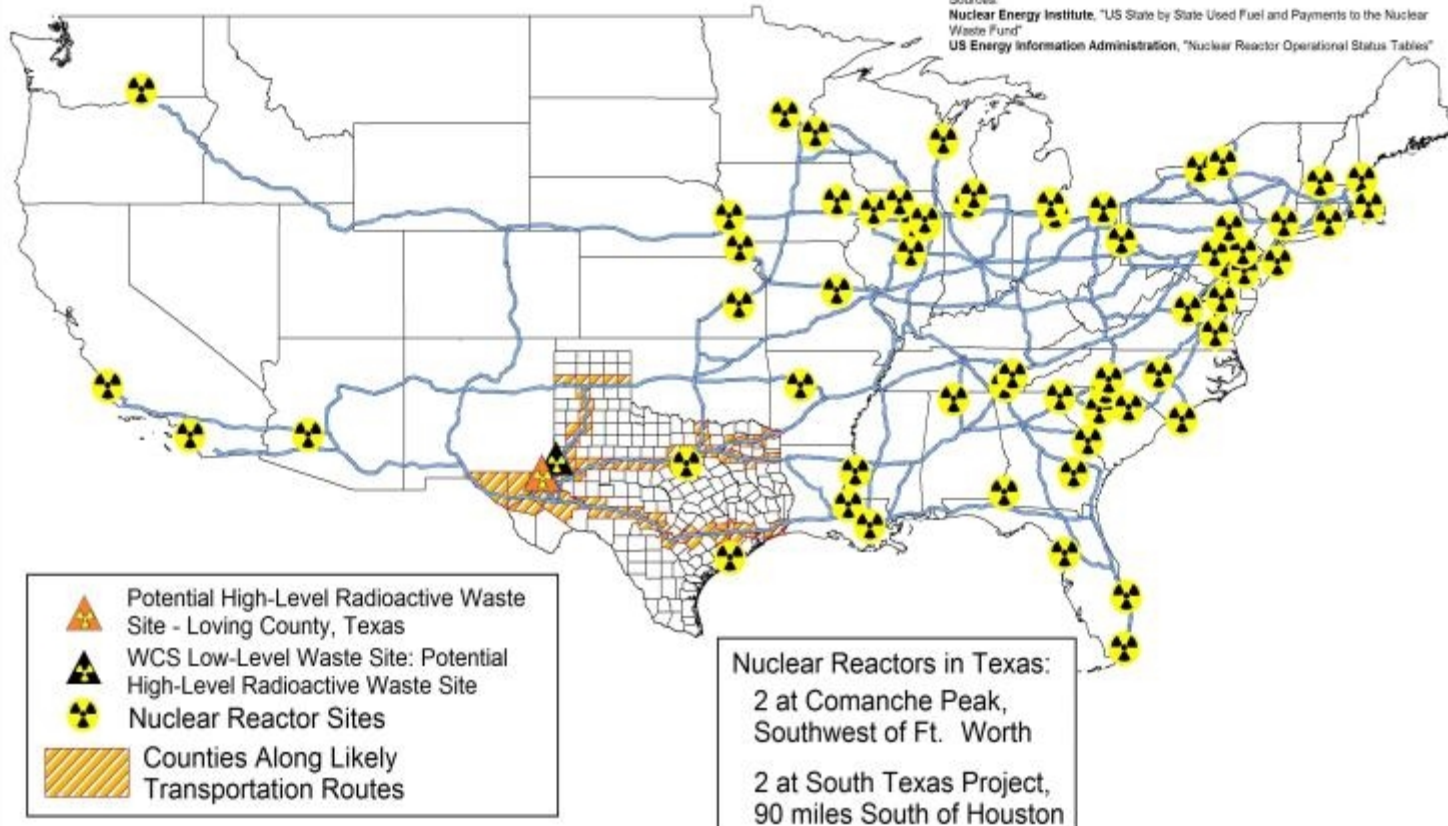
Likely U.S. Transportation Routes

Likely Routes for Transport of High-Level Radioactive Waste to Texas

Nuclear Reactors West of Texas: 6
Nuclear Waste in Metric Tons of Uranium: 6,070

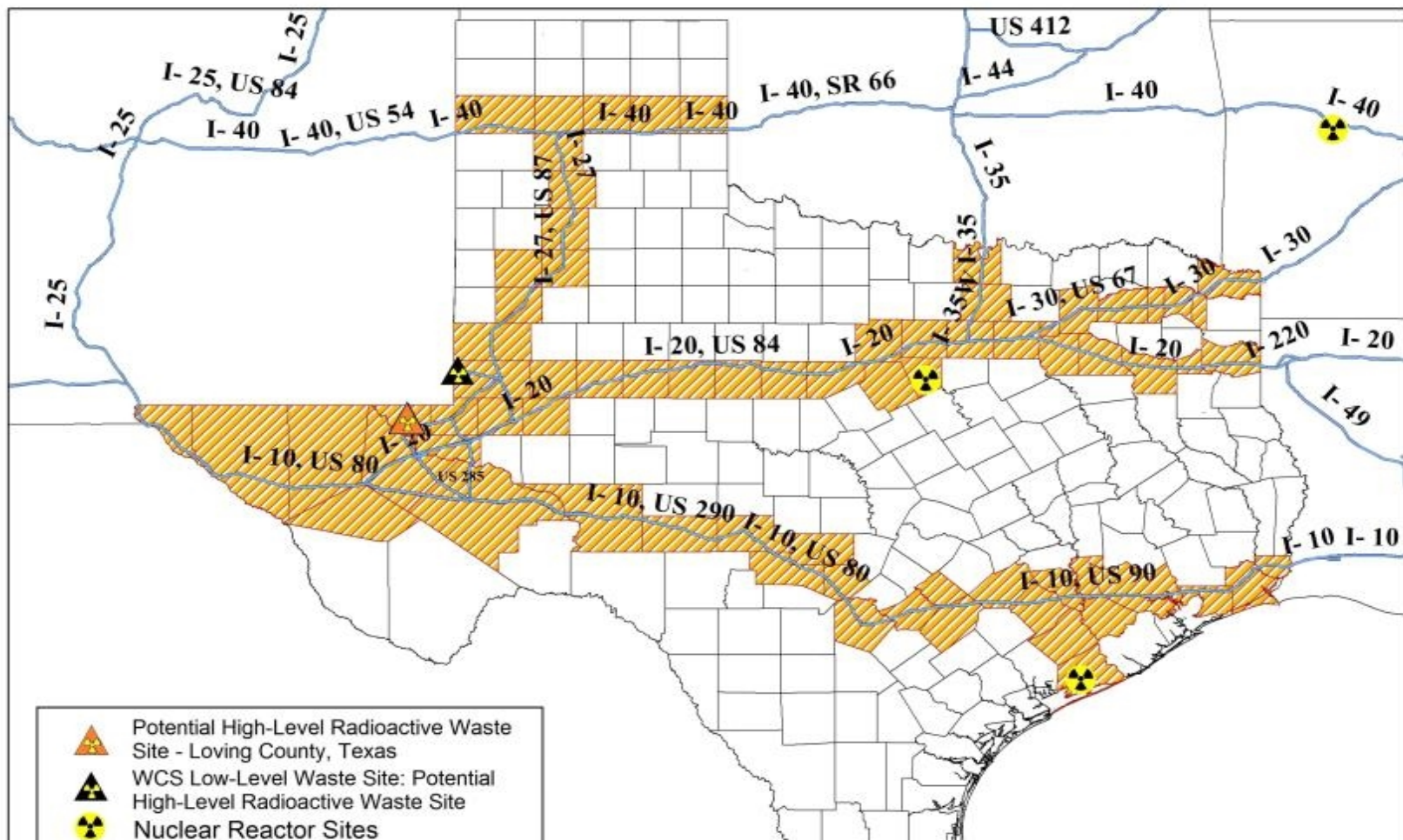
Nuclear Reactors East of Texas: 90
Nuclear Waste in Metric Tons of Uranium: 63,410

Sources:
Nuclear Energy Institute, "US State by State Used Fuel and Payments to the Nuclear Waste Fund"
US Energy Information Administration, "Nuclear Reactor Operational Status Tables"



Likely Transportation Routes in Texas; WCS Says Transport would be by train, not trucks

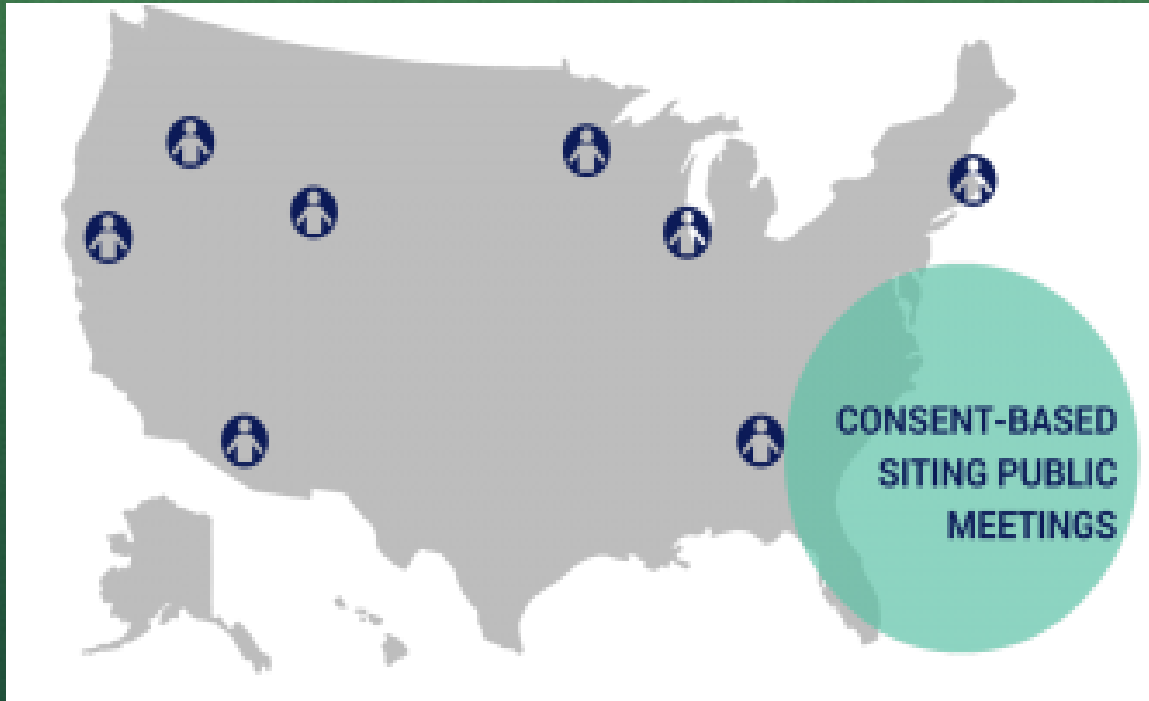
Texas



Centralized Storage Increases Risks

- There's no geologic repository in place and no proposed location for one. Shipping waste for storage, and then later shipping again to a repository – whether to Texas or elsewhere, doubles the number of trips, increasing risks to everyone on the roads, rails and waterways of the nation.
- Terrorist risks would increase if high level waste is shipped on highways, railways and waterways. It is now guarded at reactor sites, but moving it introduces new circumstances.
- Creating any consolidated storage site just means that there's one more site to secure. Others will still need security for many years to come.

DOE Consent-Based Siting Hearings – Everywhere but Ground Zero



Chicago – 3/29
Atlanta – 4/11
Sacramento – 4/26
Denver – 5/24
Boston – 6/2
Tempe – 6/23
Boise – 7/14
Minneapolis – 7/21

Comment period –
through June 15, 2016

<http://energy.gov/ne/consent-based-siting>

HALT THE IMPORTATION OF HIGH-LEVEL RADIOACTIVE WASTE TO TEXAS / NEW MEXICO

- Consolidated storage isn't needed, it would increase risks and waste time and money.. Don't allow unnecessary high-level radioactive waste transport on highways and railways throughout the country.
- Oppose funding of pilot high level radioactive waste pilot programs and NRC licensing of a consolidated storage facility. <http://www.nrc.gov/waste/spent-fuel-storage/licensing.html>
- Insist that “consent” decisions include counties and cities along the transportation route, such as Dallas/Ft. Worth, Houston and San Antonio.
- Pass resolutions: “Therefore be it resolved, that _____ County, Texas does not support or consent to transport of high-level radioactive waste on our highways and railways or the consolidated storage or disposal of high-level radioactive waste in Texas or New Mexico.”
- Send resolutions and comments to DOE:
<http://energy.gov/ne/articles/departments-energy-hosting-first-eight-consent-based-siting-public-meetings>