

BRIEF HISTORY OF WIPP

INTERGOVERNMENTAL MEETING

11/20/2019

By: John Heaton

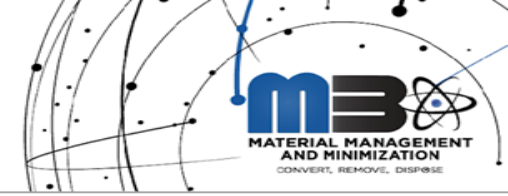
Some slides attribution: Roger Nelson

HOW DID WE COME TO FEAR NUCLEAR POWER?



How did we come to fear nuclear power? SHUTTERSTOCK

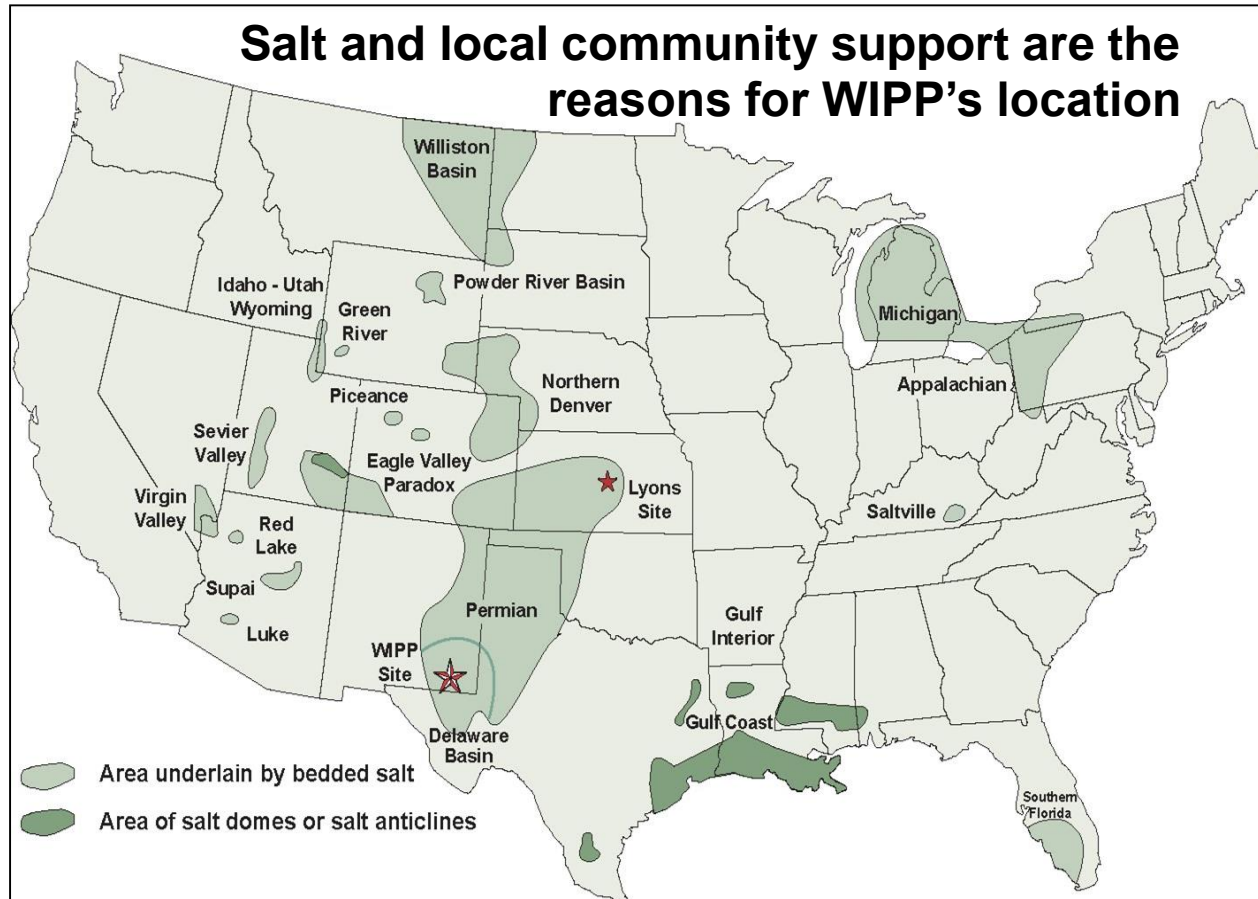
The US Government Asked the National Academy of Science the Best Way to Isolate Radioactive Waste



Roger Nelson

“The great advantage is that no water can pass through salt. Fractures are self healing....”

National Academy of Sciences, 1957



NAS 1957* Recommendation

- Stable geology (~250 million years)
- Lack of water
- Easy to mine
- Self-healing fractures
- Salt is impermeable
- Salt “creep” will encapsulate the waste
- High thermal conductivity

*Context: based on an aqueous HLW stream from separating Pu and U

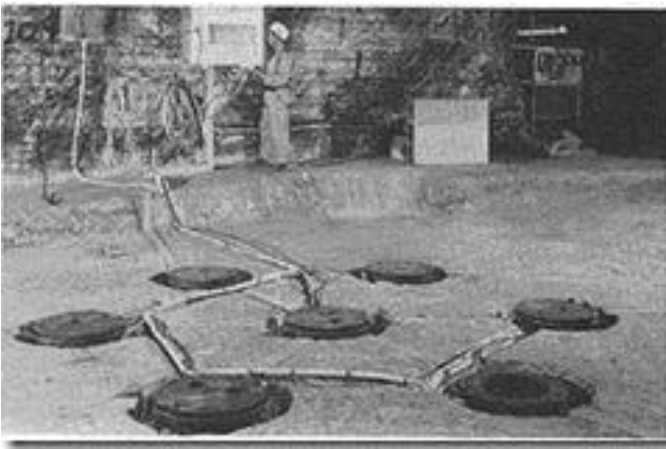
Project Salt Vault – Lyons, Kansas

1963-1970

AEC begins to implement NAS recommendations at a commercial salt production mine

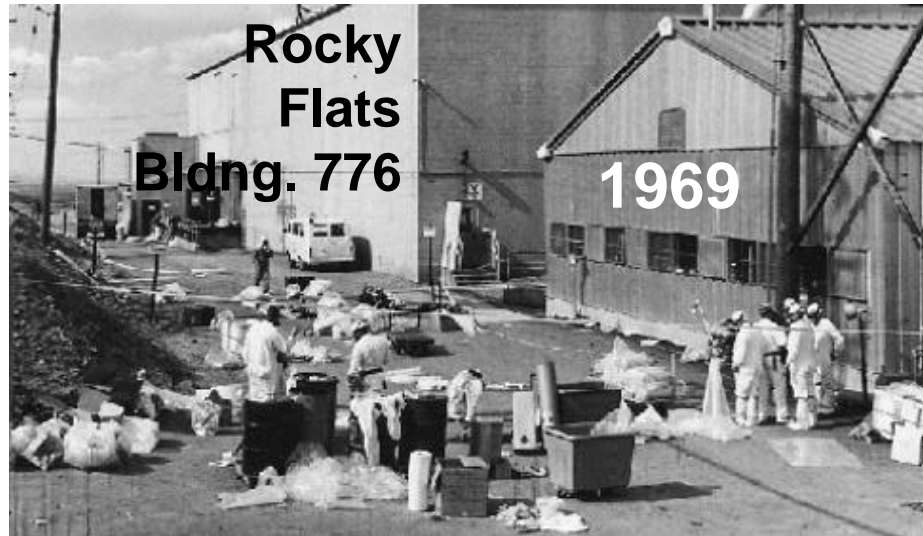


Seven sealed canisters containing 14 spent fuel assemblies from Exp. Test Reactor in Idaho (~5 kw each)



- **Modeling and laboratory experiments were confirmed by the in-situ demonstration**
- No measurable radiolytic or excessive structural effects in the salt were observed
- No hot cells used - maximum quarterly worker dose <2 mSv (principally to hands)
- All spent fuel removed and returned to Idaho 1967
- AEC announced plan for a national repository at Lyons in 1970

In the Mean Time, Events Turned Towards Carlsbad



Major fire at AEC Plutonium pit plant

Local Politics in Kansas Force AEC to Terminate Plans for a National Repository Near Lyons

ALBUQUERQUE JOURNAL November 7, 1971

AEC, Kansas Battle Over Nuclear Dump Site

TOPEKA, Kan. (UPI) — There's a small war brewing between the State of Kansas and the Atomic Energy Commission over an abandoned salt mine near the town of Lyons.

The Atomic Energy Commission (AEC) wants to use the mine for the disposal of solid nuclear waste from nuclear power plants in operation around the country. It has authorized the site would be chosen to handle all commercial nuclear waste.

through the end of the century. Congress has authorized a five-year AEC lease of the salt mine.

Kansas Gov. Robert B. Docking and two Kansas congressmen oppose the AEC, claiming it has not taken sufficient safety precautions and agreed the Lyons site not be approved until all safety questions are answered. Congress has not authorized AEC dumping on the site until a special safety advisory panel approves. Docking has called AEC officials arrogant.

That there are safety questions is underlined by the fact that Dr. Frank Pittman, director of the AEC's waste management and transportation division, says the Kansas Geological Survey has been asked to study other possible sites in Kansas.

"This is because there are several new uncertainties at the Lyons site that might affect the future use of it as a repository," he said.

Pittman said one problem is clearing up and plugging gas and water at the site which present a potential problem because of water seepage. He said another is a solution-mining technique used in an adjacent mine which might affect the repository.

The commission also is exploring possible sites in Oklahoma, Texas and Louisiana.

The commission also is attempting to persuade in two applications for new nuclear power plants in Michigan and Vermont because of the effect such plants might have on the Kansas site. Also opposed is the Kansas chapter of the Sierra Club.

The attitude of many Kansans was summed up in a letter from Gov. Docking to President Jimmy Carter, which read in part:

"To date, AEC officials, for the most part, have treated concerns of Kansas in a patronizing manner. They have attempted to dismiss our con-

- All fire recovery wastes shipped to Idaho for burial or storage
- Idaho Governor threatens to stop US nuclear Navy fuel supply system unless waste is immediately removed
- **AEC begins new urgent site selection in bedded salt**
- **Carlsbad City leaders recognize possible economic opportunity as local potash mining declines**

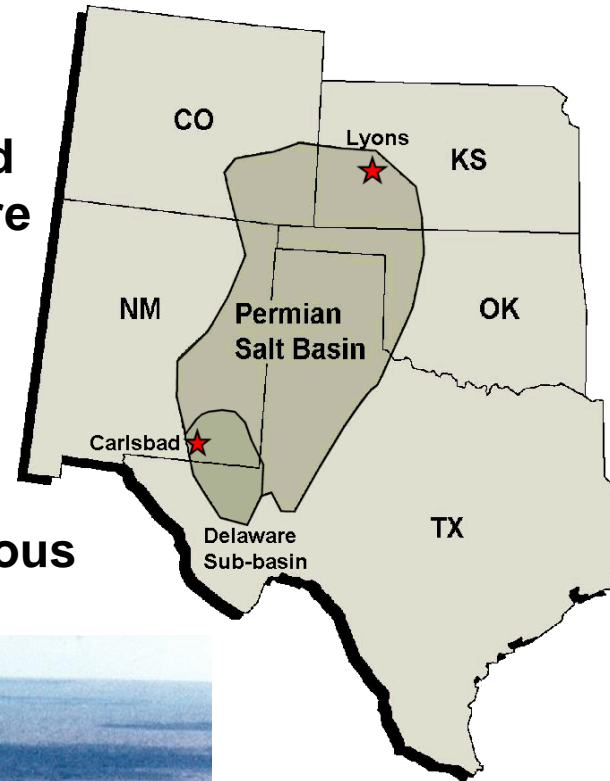


AEC Commissioner, Glenn Seaborg commits to removing all Plutonium waste from Idaho by 1980

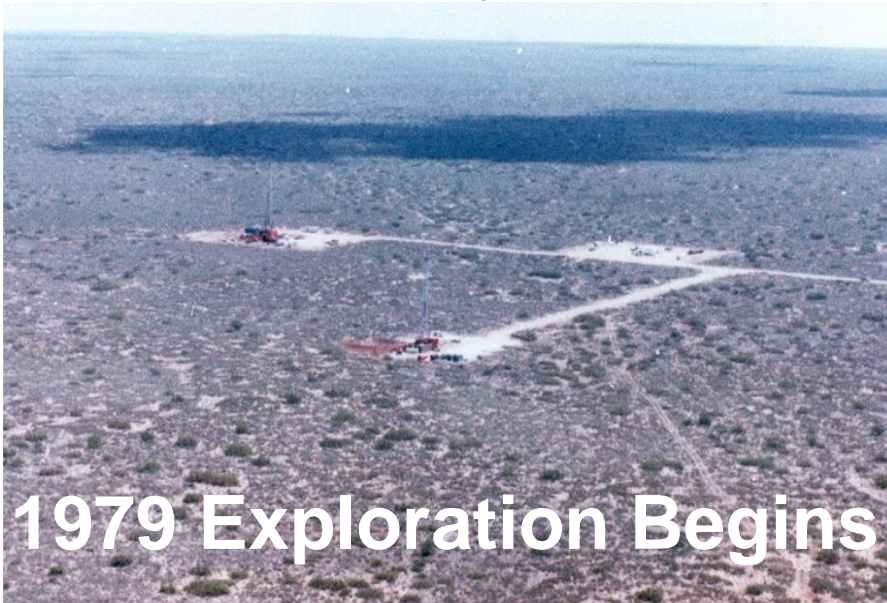
Carlsbad Sites Begin Extensive Investigation

Local city leaders learn of problems at Lyons (1972), and actively pursue AEC to explore nearby potash district for candidate sites

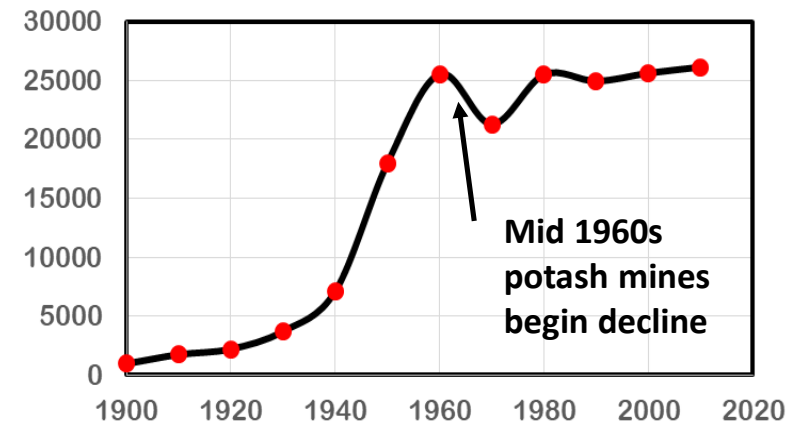
- Existing mining workforce
- Vast uninhabited area
- Citizenry okay with hazardous extraction industry



Delaware Basin turns out to be deepest and thickest (>1000 meters), but nearby oil production and potash mining still make site selection controversial



Carlsbad Population



The next step was authorization and Funding

Congress passes the *DOE National Security and Military Applications of Nuclear Energy Authorization Act of 1980.*

Authorized and funded DOE to construct WIPP and to seek New Mexico endorsement to operate a R&D facility to demonstrate safe disposal of radioactive waste from U.S. defense activities and programs (weapons development waste).

- Divided weapons production waste disposal from commercial power production waste disposal in the US.

Substantial and sustained influence by both local and state politicians to proceed. Economic impact (jobs) drove influence but “good science” demanded at every step!



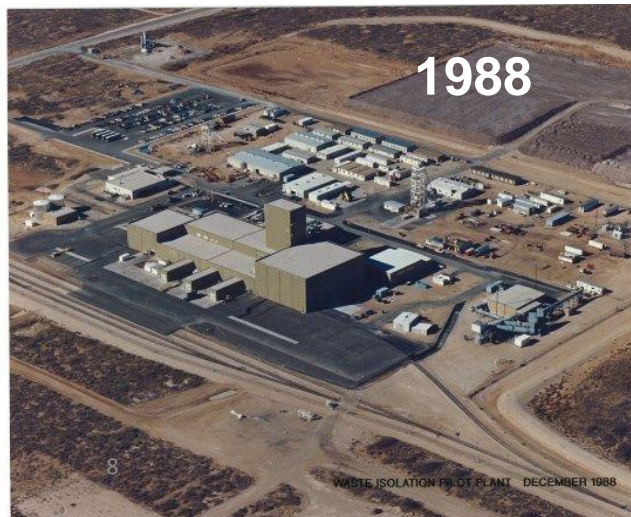
December 29, 1979



New Mexico
Senator
Pete
Domenici

WIPP Facility Was Completed Before Disposal Regulations Were Established

Anti-WIPP sentiment in Northern New Mexico built up in proportion to construction progress



State Attorney General Jeff Bingaman negotiates a legal agreement called the **Cooperation and Consultation Agreement** between DOE and NM State that limits waste characteristics and amount that can be emplaced in WIPP (also prohibits HLW/SNF).

Contact Handled Waste Shipping Container

Roger Nelson

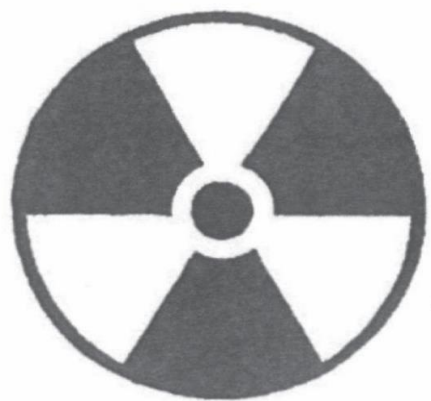
- Licensed by NRC: 1989
- Extensive testing
- Multiple payload options
- Double containment
- ~3 m³ capacity
- 12,500 lbs (5700 kg)



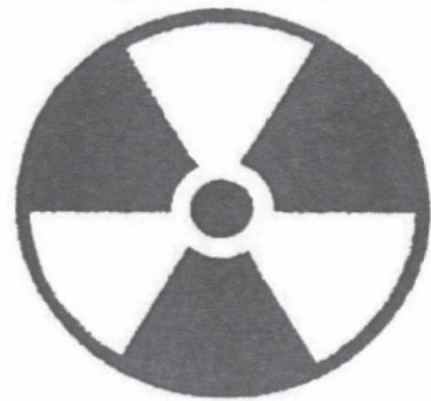
Type B



TRUPACT-II



ANOTHER BUSINESS



AGAINST WIPP

Concerned Citizens for Nuclear Safety

The WIPP Land Withdrawal Act of 1992 Created a Regulatory Process to Open WIPP

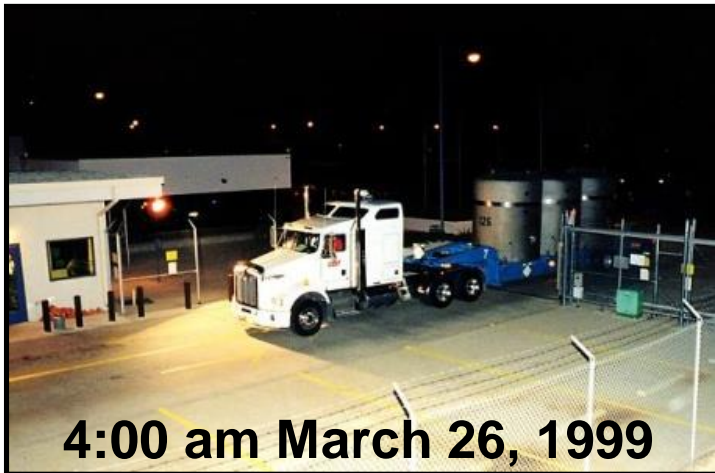
- **LWA recognized Cooperation and Consultation Agreement with New Mexico, and codified most of those requirements**
- **Established EPA as the licensing authority, and required DOE to seek hazardous waste permit from the State of New Mexico**
- **Required NRC licensing of all shipping packages to WIPP**
- **Established 15 years of economic assistance for New Mexico, primarily in the form of road building funds**
- **Provided funding and assistance related to transportation for other States and Tribes along shipping corridors**
- **Set aside 16 square miles around the completed facility for WIPP development**
- **Exempted TRU mixed waste disposal from Land Disposal Restrictions**

The WIPP Land Withdrawal Act Removed Distrust over DOE Self-Regulation



Seven More Years Required to Begin Disposal Operations

- EPA took 4 years to promulgate the safety case criteria that the repository would be required to meet
- DOE submitted the WIPP License Application in 1996, and EPA approved the safety case in 1998.
- The State of New Mexico issued a Hazardous Waste Facility Permit in 1999
- WIPP was no longer a R&D Project



4:00 am March 26, 1999





1980's
Santa Fe
New Mexico



Transuranic (TRU) waste



- TRU waste generated during production of nuclear weapons at DOE facilities
- Includes surplus separated Plutonium
- **>3700 Bq/g ($t_{1/2} > 20$ years)**
- **alpha emitting isotopes ($> \sim 1$ ppm Pu)**
- Two types of TRU waste
 - Contact-Handled (< 2 mSv/hr)
 - Remote-Handled (> 2 mSv/hr < 10 Sv/hr)
- Legacy inventory $\sim 700,000$ drum equivalent

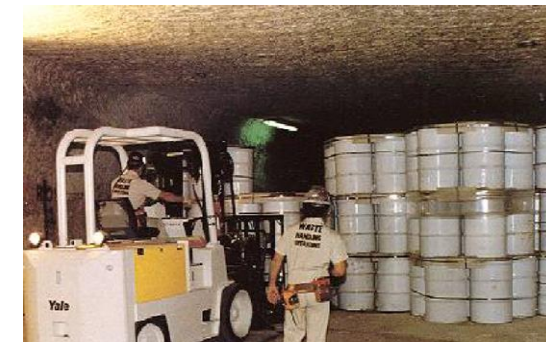
The WIPP Mission



Characterization



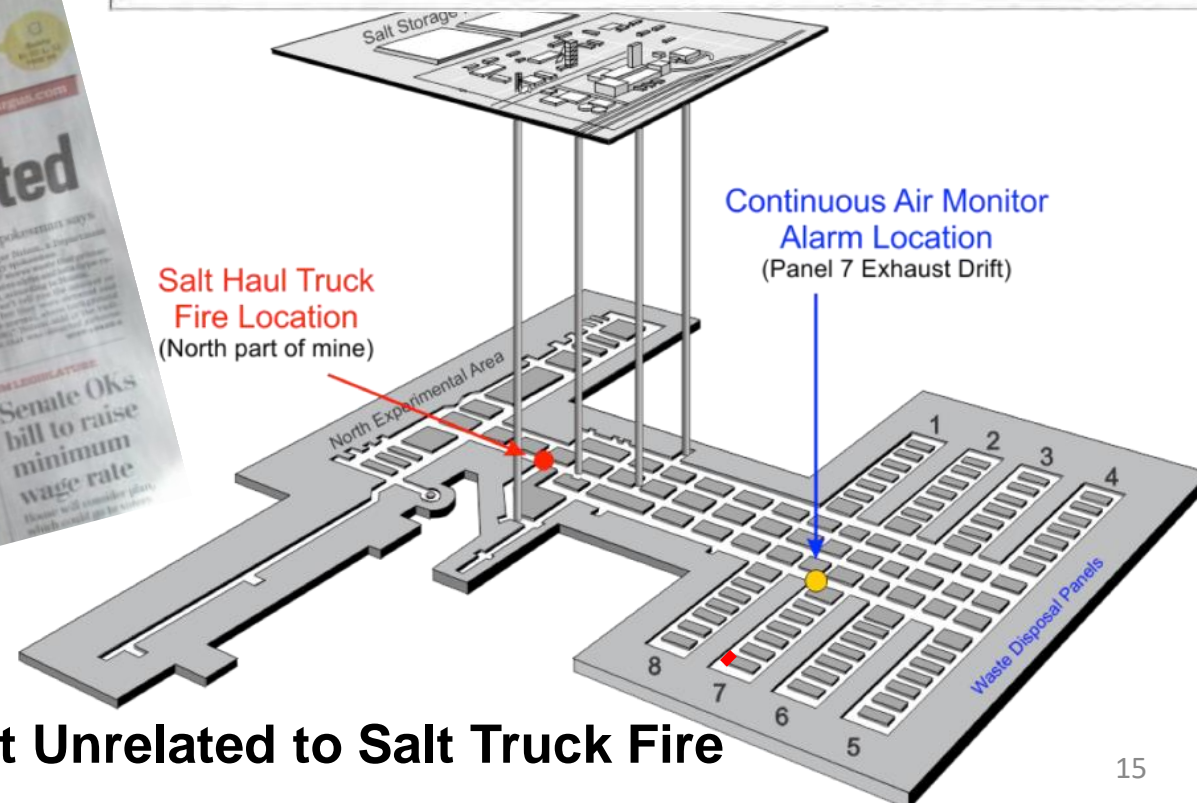
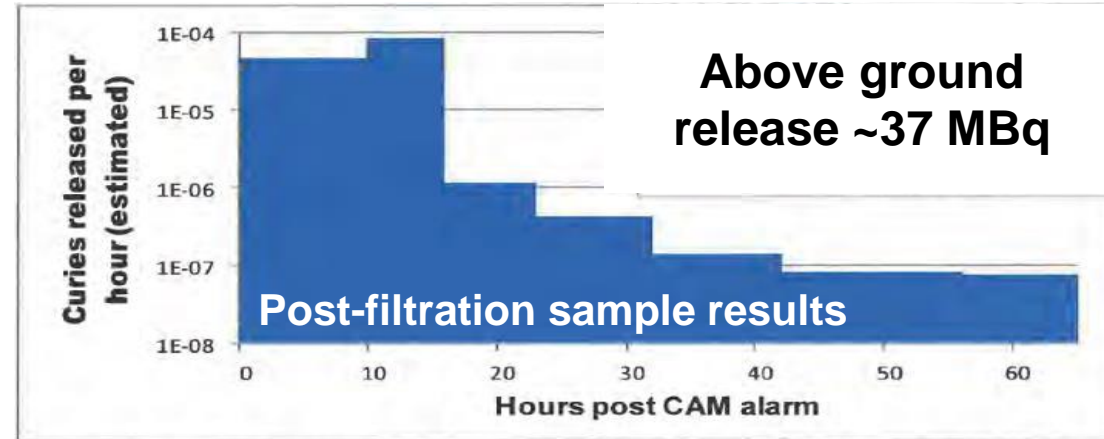
Transportation



Disposal

February 14th Radiation Release 9 days Later After Fire

Roger Nelson



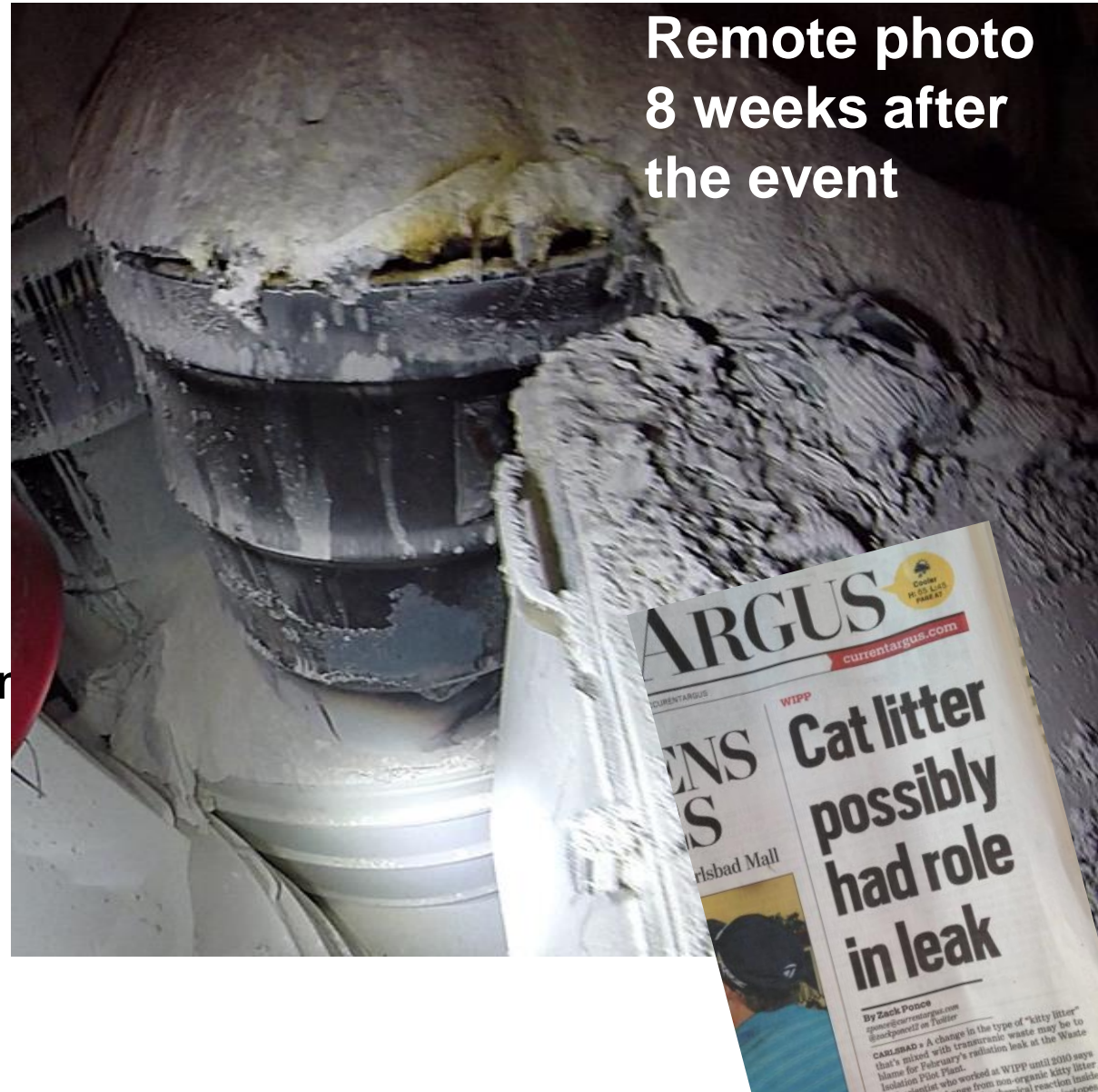
Radiological Release Event Unrelated to Salt Truck Fire

Improper Waste Treatment and Packaging at LANL Caused a Single Drum to Burst

Accident Investigation Board found that a saturated metal nitrate salt waste stream was mixed with an organic neutralizer and an organic absorbent before packaging.

Restart Efforts Required more than 3 years

- Decontamination
- Supplemental ventilation measures
- Introduced treatment and packaging changes at all DOE sites



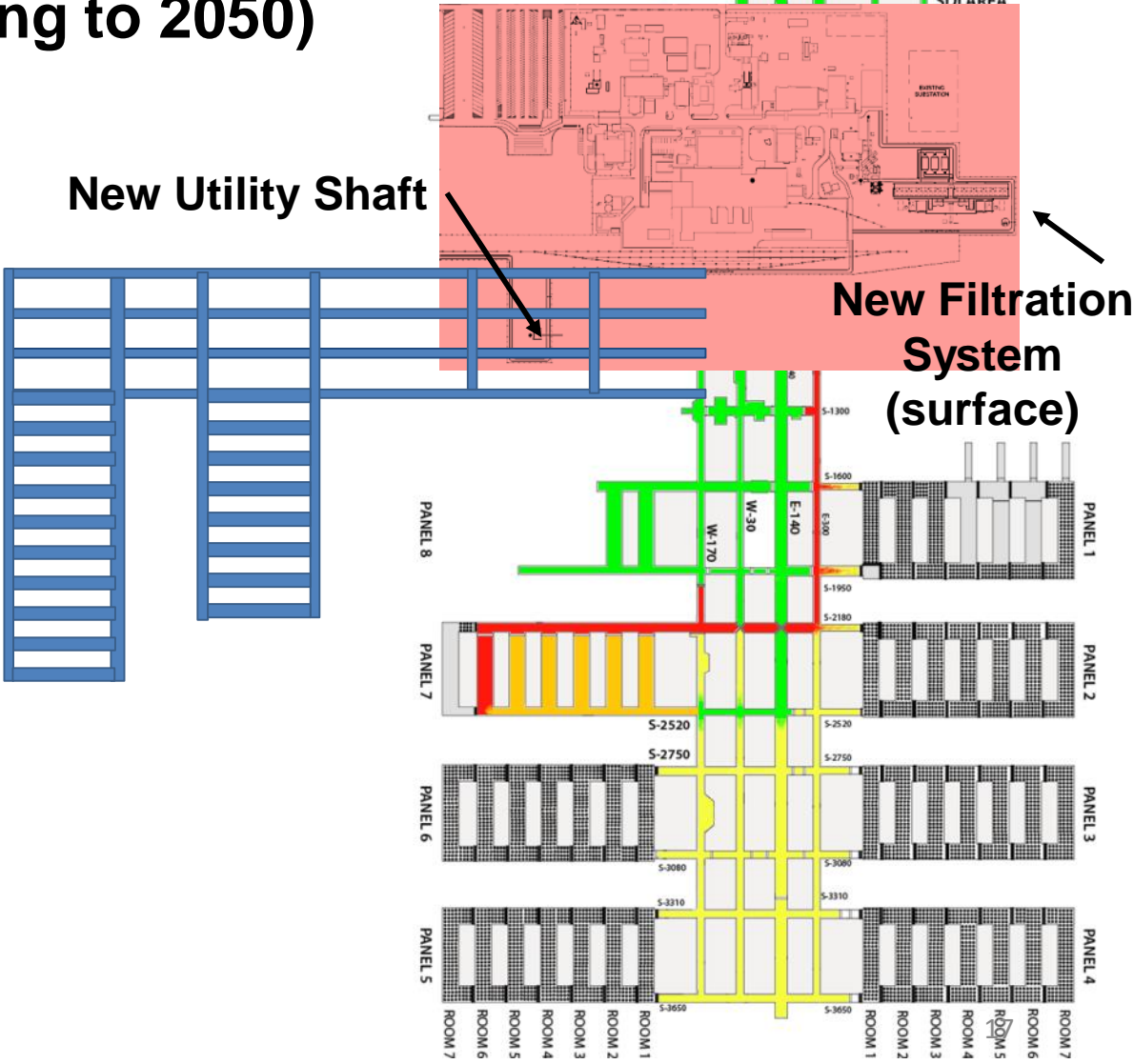
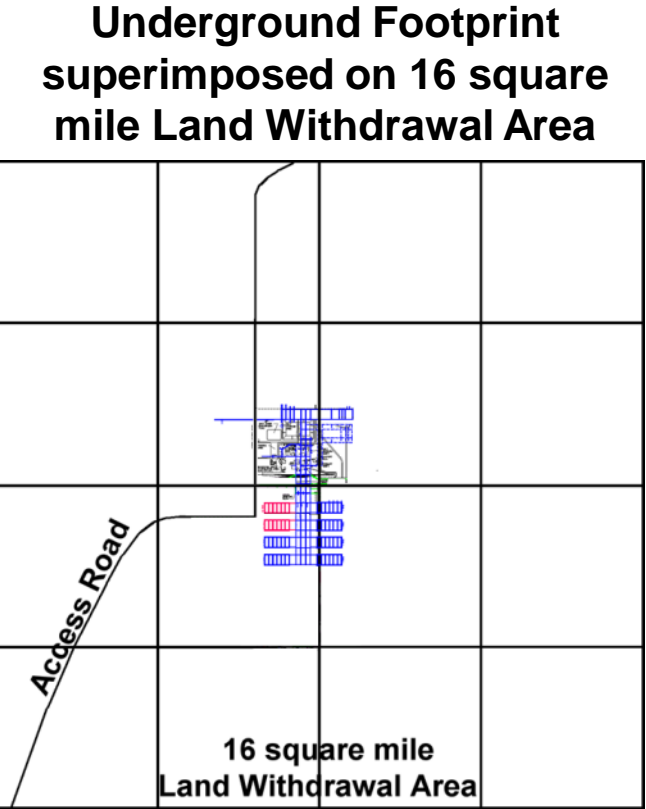
Remote photo
8 weeks after
the event

Future Waste Capacity in Planning Stages

Roger Nelson



One Possible Space Increment Option (Lifecycle Planning to 2050)



NOTHING

Scoping meeting on Holtec held in Hobbs

Curtis C. Wynne, Hobbs News-Sun Published 10:33 a.m. MT July 20, 2018



Buy Photo

(Photo11: Jessica Onsurez Current-Argus)



HOBBS, N.M. — When it's about radioactivity or nuclear power, it's going to be controversial.

Thursday's meeting of the New Mexico Legislature's interim Radioactive and Hazardous Materials Committee in Hobbs was no exception when rail transportation of spent nuclear fuel was discussed.



Editorial: NM, Holtec track records bury storage site worries

BY ALBUQUERQUE JOURNAL EDITORIAL BOARD
Tuesday, May 29th, 2018 at 12:02am

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TWEET

LINKEDIN

There are two ways to look at the proposal to license an interim storage facility in southeast New Mexico for the nation's spent nuclear fuel from power plants:

For New Mexico, a poor minority-majority state, is once again destined to be the dumping ground for dangerous items no other state will take, and those items

CHANGES



THANK YOU

WIPP WOULD HAVE
NEVER HAPPENED
WITHOUT THE
COMMUNITY