

Presentation to the

**Radioactive and Hazardous Materials Committee of the New Mexico Legislature**

# **Unprecedented weapons production mission at LANL threatens regional decline, loss of autonomy: what can this committee do?**

Greg Mello, Los Alamos Study Group, November 12, 2021

*Only he who knows the empire of might and knows how not to respect it is capable of love and justice...Thus it is that those to whom destiny lends might, perish for having relied too much upon it.*

Simone Weil

*We do not believe any group of men adequate enough or wise enough to operate without scrutiny or without criticism. We know that the only way to avoid error is to detect it, that the only way to detect it is to be free to inquire. We know that in secrecy error undetected will flourish and subvert.*

Robert Oppenheimer

*A new generation will have to be taught a new way of harmony, mutual respect, common interest, and love for each other and the planet.*

Herman Agoyo, Ohkay Owingeh



## Prior testimony to this committee:

- [September 9, 2020](#)
- [August 15, 2018](#)

## For further background see also:

- [LANL pit production: fifth failure in progress](#), presentation, Sep 30, 2021
- [How deep a 'pit' will Biden dig at LANL?](#), editorial, *Los Alamos Reporter*, Sep 29, 2021
- [Plutonium warhead factory under construction near Santa Fe](#), advertisement, *Santa Fe Reporter*, Sep 29, 2021; [similar ad](#), *Albuquerque Journal*, Sun, Sep 19, 2021
- [Plutonium expenses based on FY22 Congressional Budget Request](#), worksheet, Aug 24, 2021
- [NNSA proposes new plutonium processing facility at LANL](#), press release, Aug 11, 2021
- [Bulletin 281: LANL pit production: fifth failure in progress](#), Jul 16, 2021
- [Third power line proposed for Los Alamos; environmental assessment process starting](#), press release, Apr 19, 2021
- [NNSA pit production strategy: no clear goals, plans, or likelihood of success](#), briefing, Oct 1, 2020

# Key Takeaways (I)

- The title of this portion of the present hearing refers to “resumption” of plutonium pit (plutonium warhead core) production. **Pit production is not being “resumed.” It is being enormously expanded, to an unprecedented degree, in:**
  - Cost: \$18 billion (B) over FY20 to FY30, not including *other* expanding Pu missions
  - Personnel: will require 4,000 full-time equivalent (FTE) operational staff, plus subcontractors.
  - Risks to workers: crowded conditions in old facilities designed for R&D and prototyping; 24/7 production plus construction; schedule pressures; mixed construction, production workers, & scientists; inadequate training of new personnel; no external regulation
  - Risks to surrounding communities: drastic curtailment of legacy waste shipments, potential nuclear and hazardous materials releases from unsafe facilities and practices, traffic accidents
  - Management complexity, as LANL frequently attests in public briefings
  - Physical scale: involving multiple new buildings – including new nuclear facilities needed to prosecute the pit mission in safer and more adequate facilities
  - Resource use (direct and indirect): increased use of electricity & water, impacts on open space
  - Community impacts: traffic, housing, sprawl, negative fiscal impacts, visual degradation
  - Political impacts, with likely losses in regional autonomy, identity, democracy, and sovereignty

## Key Takeaways (II)

- Transport of TRU waste and nuclear materials is fairly safe, radiologically speaking. There's no data to suggest danger. (Spent nuclear fuel is a very different matter.)
- Inquiring about transportation safety may be helpful in understanding the (much) bigger picture.
- Airborne nuclear risks from LANL to faraway communities are minimal to nonexistent. Nearby risks (e.g. to homes) are higher. Risks to San Ildefonso Pueblo lands abutting current waste storage and disposal sites in TA-54 are especially significant, with no end to this situation in sight.
- Cultural impacts can be greater than health physics understands, e.g. in views, in underground contamination, and in other damage to cultural and sacred landscapes. Some damage is irreparable.
- Pit production and other industrial plutonium missions badly damage the legacy TRU waste shipping mission and may render it infeasible not just for a few years but forever. It almost goes without saying that LANL is a permanently contaminated site. “Cleanup” will not be possible in many cases.
- NNSA seeks to construct a large new plutonium facility at LANL in which to conduct additional plutonium missions – at this time, surplus plutonium oxidation, but this mission may change.
- Once started in unsafe old facilities, NNSA will attempt to construct new facilities to retain the pit mission and other plutonium missions. Some of these new facilities have been announced; some have not. The full potential scope of the LANL plutonium missions is not known, or bounded.

# Key Takeaways (III)

- NNSA and LANL are not really sure how to make this mission work at LANL, and in northern New Mexico. Stated plans continually change and do not seem entirely realistic in some cases, especially as regards: worker transportation; safe operations and nuclear material “choreography” in crowded facilities on a 24/7 basis; construction of new nuclear facilities; and (runaway) costs.
- There is no transparency for tribal, state, or local governments about these plans, nor to citizens.
- The nature of LANL is changing. For the most part LANL is not a “lab” any more. Scientists and engineers are now a distinct minority.
- LANL is the greatest institutional consumer of resources and the greatest producer of greenhouse gases in northern NM apart from power plants and the fossil fuel industry. LANL’s operations completely fail DOE sustainability guidelines. LANL is a dirty lab with no real plans to improve.
- The few jobs LANL creates will not touch roughly 90% of the poverty in northern New Mexico, although they will increase inequality. LANL does not bring useful economic development. If it did, you’d see it by now.
- Pit production is the largest project in the history of NM by far. At \$18 B, it is more than 15x the cost of the Manhattan Project in NM (\$1.14 B) and more than the construction of all the interstate highways put together. [Sentence updated late 2021:] It is 10x NM’s expected part of the new money in the recent infrastructure bill (48% of \$3.7 B).

# Recommendations (I)

- Demand transparency for the State, tribes, local governments and citizens. Go around NNSA and LANL, which have never been and will never be candid. For example, request the:
  - *LANL Integrated Strategy* (annual iterations? FY20 is available);
  - *LANL Site Plan* (annual iterations?);
  - *Independent Assessment of the Plutonium Strategy of the NNSA* (Institute for Defense Analyses, 2019);
  - Critical Decision Zero (CD-0) documents for the “Pit Disassembly and Processing Project;”
  - CD-1 documents for the Los Alamos Plutonium Pit Production Project (LAP4);
  - LANL “Master Asset Deep Dive” planning documents; and
  - LANL transportation, utilities, and housing plans; records of LANL’s and NNSA’s engagement with private parties to realize these plans.

Some of these documents can be requested from the White House as well as congressional committees. Unclassified plans should be supplied in full and in redacted form for public release.

- Request a pause to authorizations and appropriations pending release, to the State, of these and any other plans pertaining to the future of northern and central New Mexico, and pending subsequent public meetings regarding these plans (next slide).

## Recommendations (II)

- Demand that NNSA conduct public meetings once these plans are available to interested parties, engaging with the White House and congressional committees for leverage to make this happen.
- Send a delegation from this committee to Washington to meet with President Biden to demand a pause in current plans until democratic processes are in place to publicly review whether these plans are in the best interests of tribes and New Mexico citizens and governments.
- Obviously, this committee cannot conduct any oversight or conduct any other function relative to this huge project unless it has these plans. Oral presentations and vague slide presentations, especially if conducted in secret, are entirely inadequate for a project of such historic magnitude.
- Do not settle for offers to conduct a new Site-Wide Environmental Impact Statement (SWEIS) as long as progress continues on this project. DOE NEPA practice is to offer project “scenarios” which obscure what is actually going on while providing legal cover for new projects later. Proceeding with projects during NEPA analysis is fundamentally contrary to NEPA in any case.
- There may be other ways to acquire transparency as regards these programs but I do not see them right now. I recommend choosing the most straightforward and open actions, those which bring as much of the truth of the situation into the full light of day as possible, as soon as possible, prior to irreversible federal commitments.
- What’s key is to realize that you do have ample political power, and you could use it.

# W88 Warhead for Trident D-5 Ballistic Missile

**1. The "Primary"**  
Two-point, hollow-pit, fusion-boosted high explosive implosion

**2. The "Secondary"**  
Spherical, all-fissile, fusion-boosted radiation implosion

**3. Radiation Case**  
Peanut-shaped, channels x-rays from primary to secondary

**4. Channel Filler**  
Plastic foam plasma generator

**5. Booster Gas Cannister**  
Periodic replacement as tritium gas decays

**High Explosive Lens**  
Two lenses drive primary implosion

**Plutonium-239 Pit**  
Beryllium-reflected hollow pit

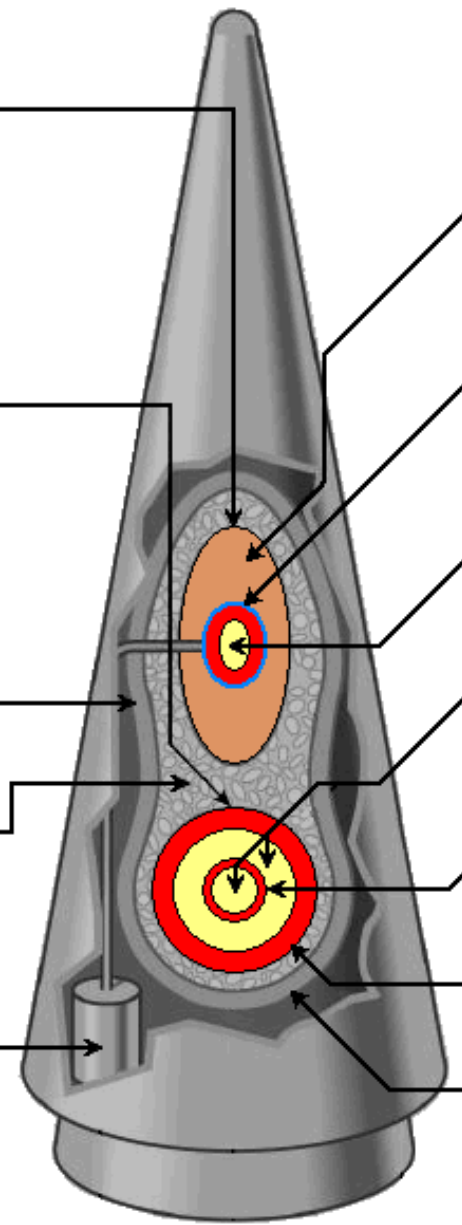
**Tritium & Deuterium**  
Booster gas, fusion makes neutrons

**Lithium-6 Deuteride**  
Lithium becomes tritium, fusion makes neutrons

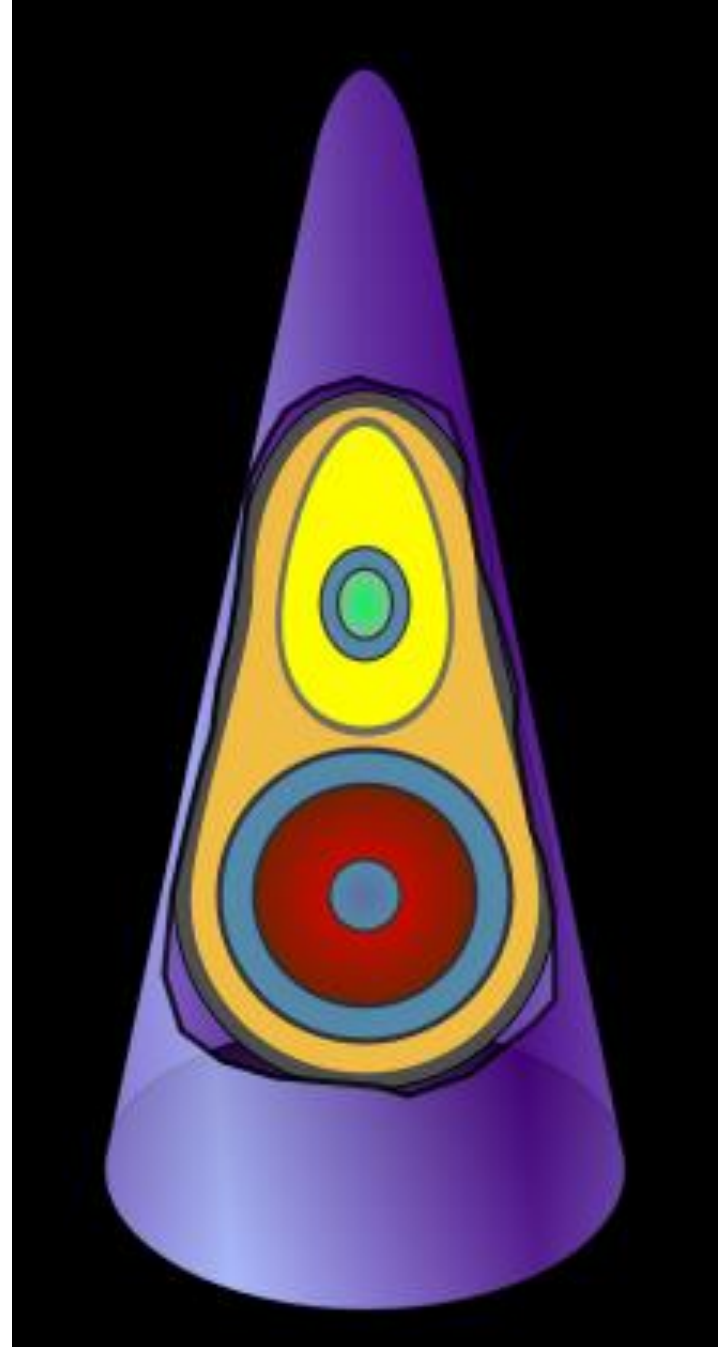
**Uranium-235 "Sparkplug"**  
Starts tritium generation and fusion in the secondary

**Uranium-235 "Pusher"**  
Heat shield, tamper, and fission fuel (fission by all neutrons)

**Uranium-238 Case**  
Fission by fusion neutrons only



Sources for illustrations: Wikipedia





# Pit production is a new mission for LANL.

Industrial plutonium pit production is a brand-new mission for LANL, [recommended](#) for the very first time on 5/10/18, placed in [statute](#) on 8/13/18, and detailed in twin NEPA decisions ([here](#) and [here](#)) on 9/2/20.

Until then, the LANL pit program had always been an “interim” “plutonium sustainment” program of strictly limited scale ( $\leq 20$  pits/year), operating on a single work shift, with relatively modest cost ( $\sim \$200$  million/year).

The FY97 National Defense Authorization Act (NDAA) (signed 9/23/96) required a report on plans to produce plutonium pits at scale ([p. 418](#)). Pending those plans and a future decision based on them, DOE chose LANL for “development and demonstration work” ([p. 11](#)). The decision to limit pit production at LANL to a technology “sustainment” level was repeated [multiple times](#), and any decision regarding capacity larger than 20 ppy postponed [multiple times](#), until Sep. 2, 2020.

Subsequently, a capital project called the “Los Alamos Plutonium Pit Production Project” (LAP4) received the [formal go-ahead](#) (“CD-1”) on April 28, 2021. Although it is the centerpiece of the pit effort, its limited scope ([p. 204](#)) and current high-end cost estimate of [\\$3.9 B](#) show it is but a fraction of the total pit production effort, which reliable sources tell us LANL has estimated to cost \$18 B over the current decade.

At present, LANL has no actual pit production capacity at all, beyond making developmental pits. In FY23, NNSA (meaning LANL, in the 2020s) is [required](#) to make one actual “War Reserve” pit, in FY24 10 pits, in FY25 20 pits, and in FY26 30 pits, which is the minimum rate LANL is required to maintain after that date. Upon information and belief, neither NNSA nor LANL expect to be able to exceed the 30 ppy *minimum* annual rate at LANL for the foreseeable future. This may translate to an *average* rate in the vicinity of 41 ppy ([pp. 23, 51](#)).

# LANL pit production is a gigantic program.

- For cost comparisons with past construction in New Mexico, see next slide. Only construction of all of New Mexico's interstate highways *combined* approaches (but does not reach) its financial scale.
- Its cost is \$18 B / \$3.7 B or 4.9x the size of the new federal infrastructure bill spending in New Mexico.
- It involves hiring at least 2,000 additional LANL staff members plus hundreds of construction subcontractors. Upon information and belief, thousands of personnel at LANL are currently working on this project.
- It exceeds the capacity of the LANL site itself, leading to the acquisition of more than 200,000 sq. ft. of office and laboratory space outside LANL. LANL must also construct several new buildings to conduct this mission, including new nuclear facilities for handling, storing, and processing plutonium.
- Its commuter needs exceed regional road capacity, leading LANL to propose a fleet of coach-class buses to bring 2,000 to 3,000 workers to the site daily from locations across central and northern NM.
- LANL's temporary and permanent housing needs exceed accessible housing. LANL is negotiating with at least three Pueblos to establish new trailer parks ("man camps") for temporary workers.
- LANL has sought, and we believe will seek again, a new high bridge over White Rock Canyon with connecting highways through the Caja del Rio to Hwy 599 and I-25.
- Not strictly due to pit production, LANL seeks a new power line through the Caja del Rio.
- Pit production will greatly increase production of TRU waste at LANL, badly impeding legacy cleanup.

**New Mexico's largest public infrastructure investments in relation to LANL pit production capital and operations this decade, FY2020 – FY2030 (now \$18 billion: ~4x growth in 3 yrs)**

**(Costs best available; Engineering News Record cost index used early years, CPI later)**

Project	Year	Cost Then (\$M)	Cost in 2021 (\$M)	% LANL pit project
Elephant Butte Dam, NM	1916	5.2	262	1.5%
(Golden Gate Bridge, CA)	1937	35	1,003	5.6%
San Juan Chama Diversion	1964	>35	>321	>1.8%
Cochiti Dam, NM	1975	94.4	406	2.3%
LANL TA-55 PF-4	1978	75	251	1.4%
I-40 + I-25 + I-10 highways, NM (treated here as one project)	1956-1995	~7.4 M/mile, 2006 dollars	Ballpark 9,207	51%
Big I Interchange, Albuquerque	2001	290	455	2.5%
San Juan Chama drinking water project, Albuquerque <a href="#">u</a>	2008	280	334	1.9%
Railrunner Heavy Rail Extension to Santa Fe (incl. track lease)	2008	~400	~477	2.7%
LANL DARHT (very approximate)	~2008	~ 400	~477	~2.7%
SNL MESA Complex	2008	516.5	616	3.4%
Current cost of 4kW PV kit, 780,000 NM households @ ~\$7,000			5,460	30%
Additional 5,000 teachers @\$60,000/yr for 10 years			3,000	16.6%

**This could be refined further but the details are immaterial to the larger point.**

**Make no mistake, this is to be a huge expansion, politically dominating all others. It is 10x the “[new money](#)” (48% of \$3.7 B over 10 years) in NM investment expected from the new Biden infrastructure bill.**

**It will dominate our politics, attitudes, and institutions, and limit future possibilities in myriad ways. It will define the region.**

# NNSA and LANL seek new nuclear facilities, including plutonium facilities

## 34 NA Pit Disassembly and Processing, LANL

PARS ID / DOE Project Number:	1201	TBD
CE or PME / Project Owner:	Turk, D.	Halse, J.
PM Analyst:	Barker, P.	
FPD / Certification:	Not Assigned	
Current CD / Date Approved:	CD0	07/09/2021
CD-0 Cost Range, Low-High:	\$1,000.0M	\$3,400.0M
CD-1 Cost Range, Low-High:		
CD-4 Date Range, Low-High:	09/30/2031	09/30/2035
Last Peer Review Date:		
Next CD / Next CD Planned Date:	CD1	09/30/2023

On July 9th, 2021, the Project Management Executive (PME) approved Critical Decision (CD)-0, Approve Mission Need, with a rough order-of-magnitude (ROM) cost range of \$1B to \$3.4B and a completion schedule range of FY 2031 to FY 2035.

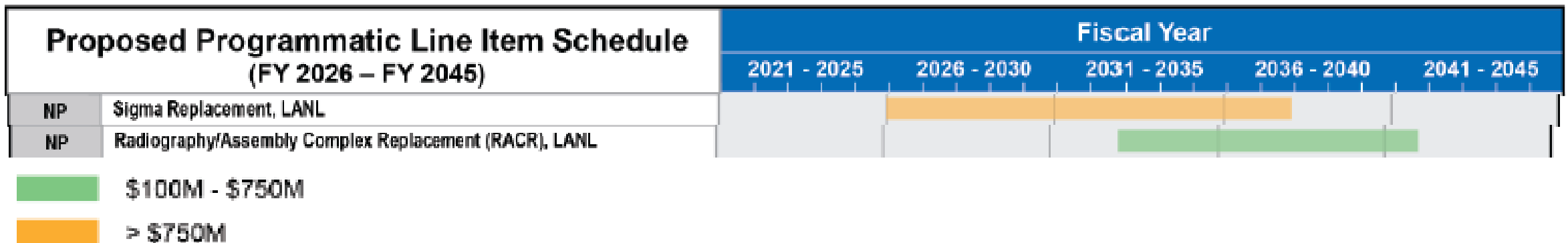
This building is NOT in LANL's \$18 B pit production budget. It is likely to be much more expensive than shown, given recent cost inflation in similar cases. Nominally oriented toward the surplus plutonium mission, this could easily change after the project begins.

## 35 NE Versatile Test Reactor (VTR) INL

PARS ID / DOE Project Number:	1158	21-E-200
CE or PME / Project Owner:	Turk, D.	

The integrated project team (IPT) anticipates completion of the final Environmental Impact Statement (EIS) by October 2021. Negotiations with the selected Design/Build contractor continue with award of the design portion.

From NNSA plans [here](#), p. 98. These two proposed nuclear facility projects would support pit production.



**PF-4 was built in 1978 for R&D, not production. It is crowded, inside the building and out, requiring round-the-clock production to reach even 20 ppy.**



**Seismic “demand” has increased x3 horizontally and x6 vertically since it was built (Keilers, NNSA, 2014).**

**DNFSB will discuss PF-4 safety issues today.**

**No one knows when or how PF-4 will fail. Hopefully not too many people will be hurt.**

**Los Alamos Study group photograph, April 2021, looking S (from 12,000 ft).**

**PF-4 is close to residences.**



# Safety: “In the sober light of day, what the hell are they thinking?”

(Senior federal official, describing the safety aspect of pit production plans at LANL to me, 10/26/21)

## Program pressures create unsafe conditions.

- Recent accidents have been serious; others, potentially serious. See [here](#) for a small window into evolving issues.
  - “The PF-4 overflow [of water into the inner ventilation system, a glovebox, floors, and the basement] paused the mission and represents a serious conduct of operations failure,” [LA-UR-21-27999, p. 13](#).
  - “[LANL's improperly stored nuclear safes raise larger concerns](#),” *Santa Fe New Mexican*, 11/1/21.
- Decades of past practices, captured in complicated, crowded, hardware in a contaminated facility containing tons of plutonium, must be changed. Cultural transformation may be even harder. LANL is trying to become a factory.
- Now and henceforth, work must be done through the night, which is inherently dangerous, as well as the day.
- A demographic transition is underway. Half of LANL’s staff has  $\leq 5$  yrs tenure. Many operators are newly-trained.
- Construction and installation of new equipment for new activities must be done alongside existing program work.
- As noted, the facility itself is crowded. There are specific design and capacity limitations that affect production work.

## LANL has a long track record of safety problems.

- [1,600 DOL-certified fatalities at LANL through mid-July 2015](#); likely 2,000 by now if the previous annual rate applies.
- 17,668 claims have been filed, of which 7,430 (42%) have been paid, representing 6,927 unique workers. Claims paid total \$1.292 B for LANL as of this week (see DOL EEOICP [here](#)).

# LANL foresees large increases in energy and resource consumption. Not even considering contamination and nuclear waste, LANL is a dirty lab.

- LANL is expected to double its energy use over the coming decade.
- LANL will fail to meet DOE goals for energy efficiency.
- LANL will fail to meet DOE goals for water use efficiency.
- LANL is unlikely to conduct any climate change vulnerability assessment, despite DOE guidelines.
- LANL may build an on-site 10 MW solar field but if so this would provide only 4% of its needs by 2031.
- More than half of LANL's electricity currently derives from coal-fired generation. There are no clear commitments to renewable energy in future, only to power purchase agreements meeting vague criteria.
- NNSA is proposing a \$300 million "Electrical Power Capacity Upgrade" project at LANL ([p. 365](#)), including a new 115 kV transmission line across the Caja del Rio. LANL consumes 80% of the energy supplied to the Los Alamos Power Pool (LAPP).
- Back-of-envelope calculations suggest LANL commuting entails very roughly 175 million road miles per year. With deliveries, etc. ~200,000,000 vehicle-miles/year might be a good guess.
- We can be sure LANL is the largest single cause of greenhouse gas emissions in a wide region.
- For references and more see: [LANL releases 2021 "Site Sustainability Plan" for "rapidly changing and growing mission"](#), 2/24/21 and ["Third power line proposed for Los Alamos,"](#) 4/19/21.




**LANL's pit production will make no difference to the U.S. nuclear deterrent.**



**Shown: part of the Savannah River Plutonium Processing Facility in SC**

# 2026

 **PIDAS** (Perimeter Intrusion Detection and Assessment System)

 **Repurposed**

 **Future**

 **Potential Retaining Walls**



**When completed, SRPPF can make all the pits required.**

# Questions?

Thank you for your time and attention.