Town Hall: LANL's plans for plutonium pit production and weapons expansion, Sept. 17, 2019

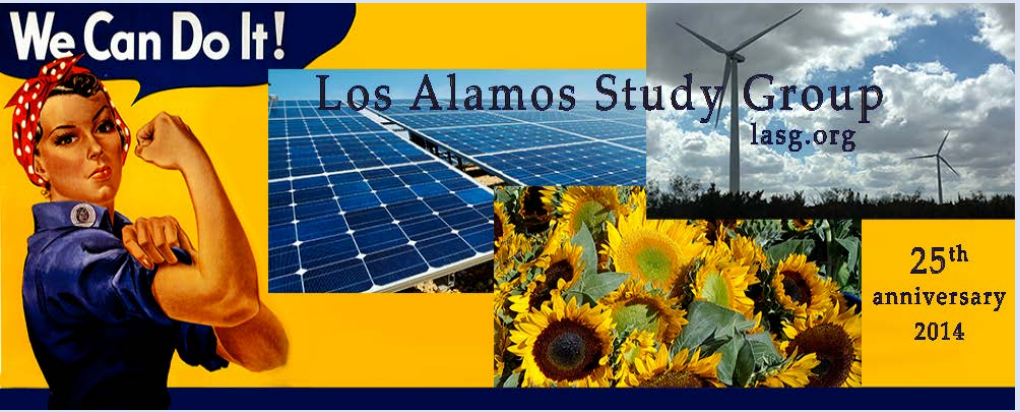
Ending enchantment?

"I am become death, destroyer of worlds."

Bagavat Gita, recalled by Robert Oppenheimer at the Trinity Test, July 16, 1945

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

Simone Weil, "The Iliad, Poem of Might"



To subscribe to the Study Group's main listserve send a blank email to lasg-subscribe@lists.riseup.net

Los Alamos Study Group
2901 Summit Place NE
Albuquerque, NM 87106
www.lasg.org, 505-265-1200

Write if you would like to be part of our activist network. We have retired our Facebook page. Twitter: @TrishABQ; Blog: Remember Your Humanity

An Overview of Los Alamos National Laboratory

Dr. Kelly Beierschmitt

Deputy Laboratory Director Operations

August 23, 2019

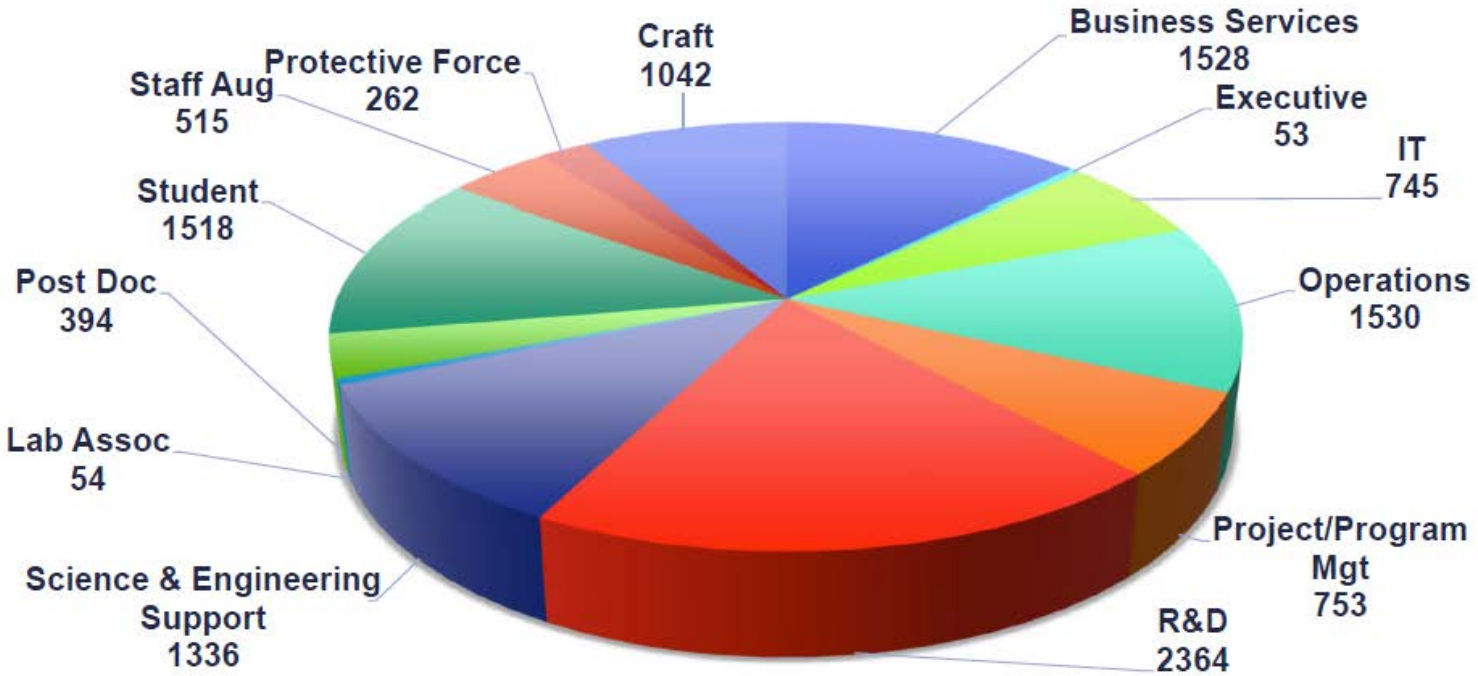
LA-UR-18-25587

Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

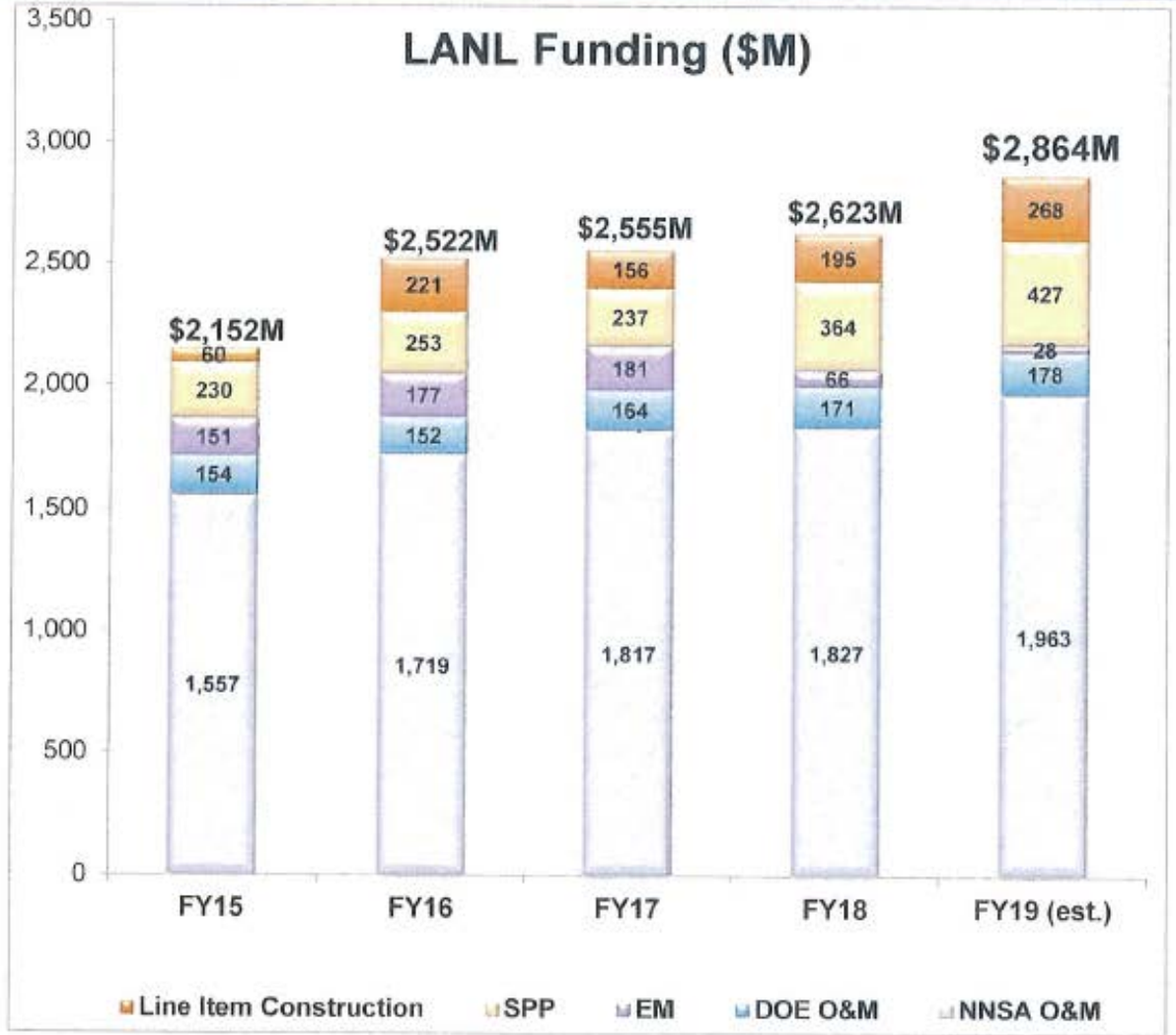
~~12,094~~ People: Our strengths are the diversity and quality of our employees

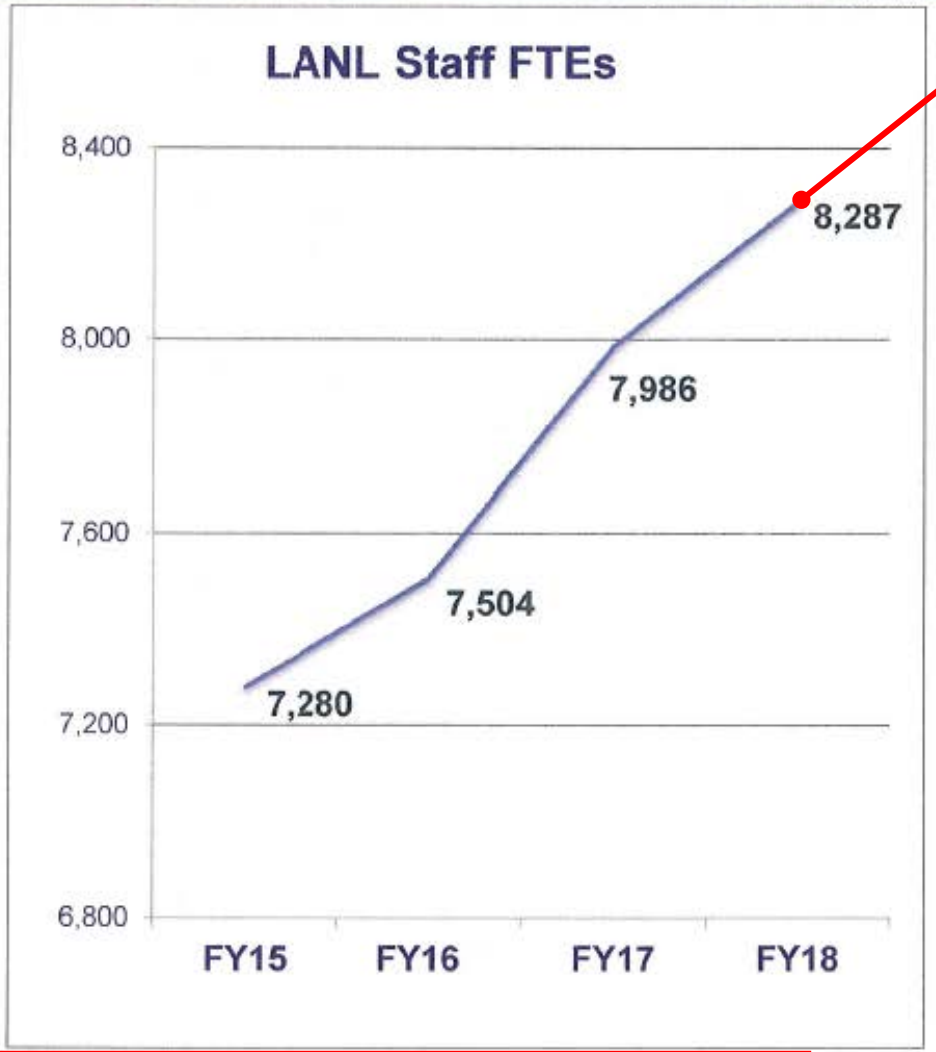
Los Alamos NATIONAL LABORATORY EST. 1943

This slide, presented 3 weeks ago, is apparently more than a year old. According to LANL's web site, LANL now has 12,752 employees.



The Lab has a steady budget and a growing staff





8,762

(from LANL's web site 9/16/19)

FY19

[Does not include all EM, which is $220 M in FY19. LANL is now a $3.06 B/year operation.]

Significant Growth Projected over the next five years

Subcontractor Forum 2019

August 8, 2019

Los Alamos
NATIONAL LABORATORY
EST. 1943

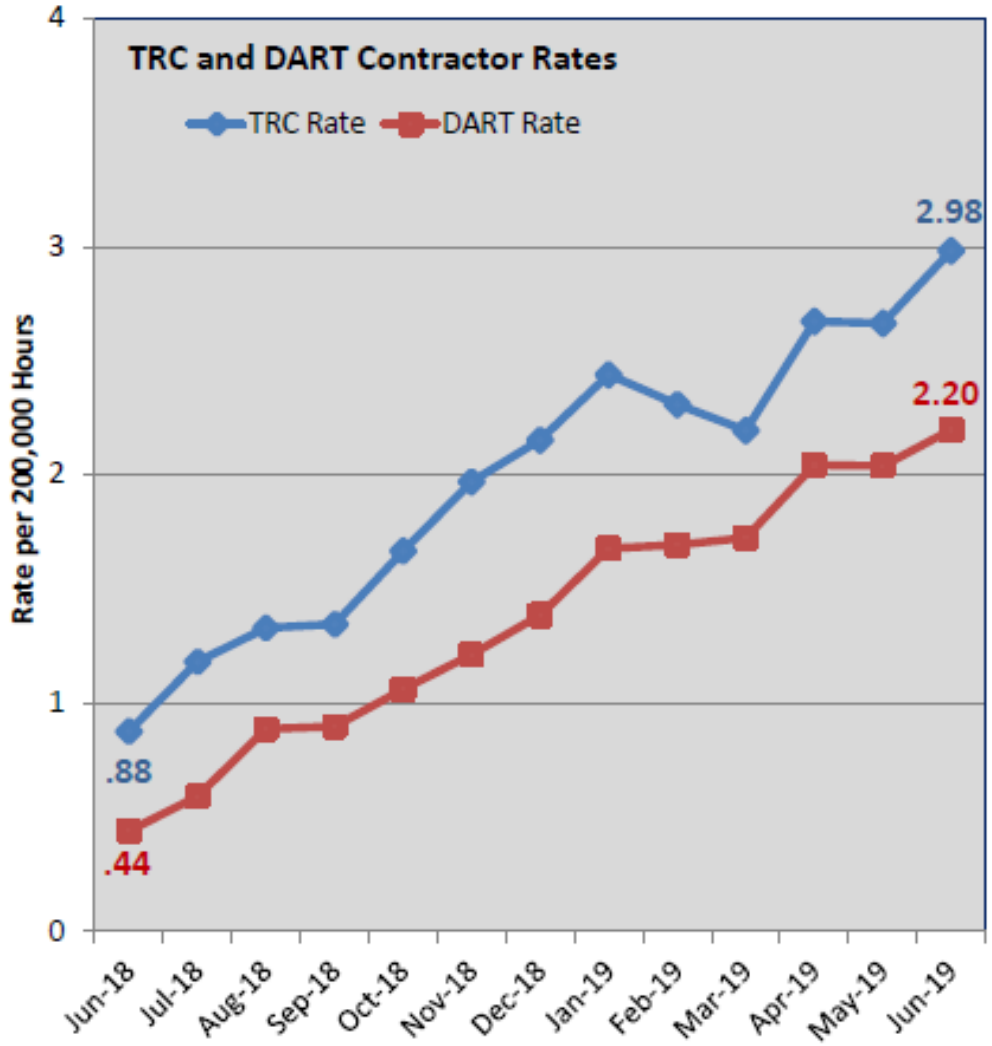
NNSA

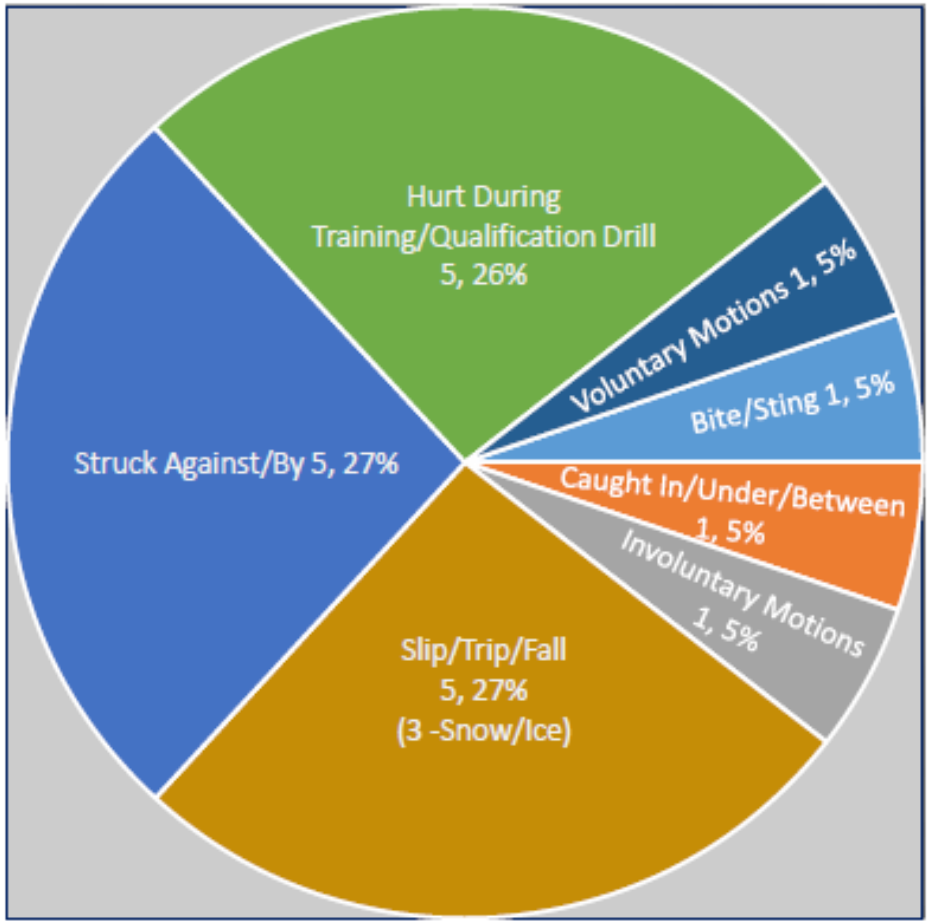
Managed by Triad National Security, LLC for the U.S. Department of Energy's NNSA

LA-UR-19-27583

We expect to be executing at least $5.5 billion dollars in construction over the next five years and $2.5 billion in subcontracting labor and materials

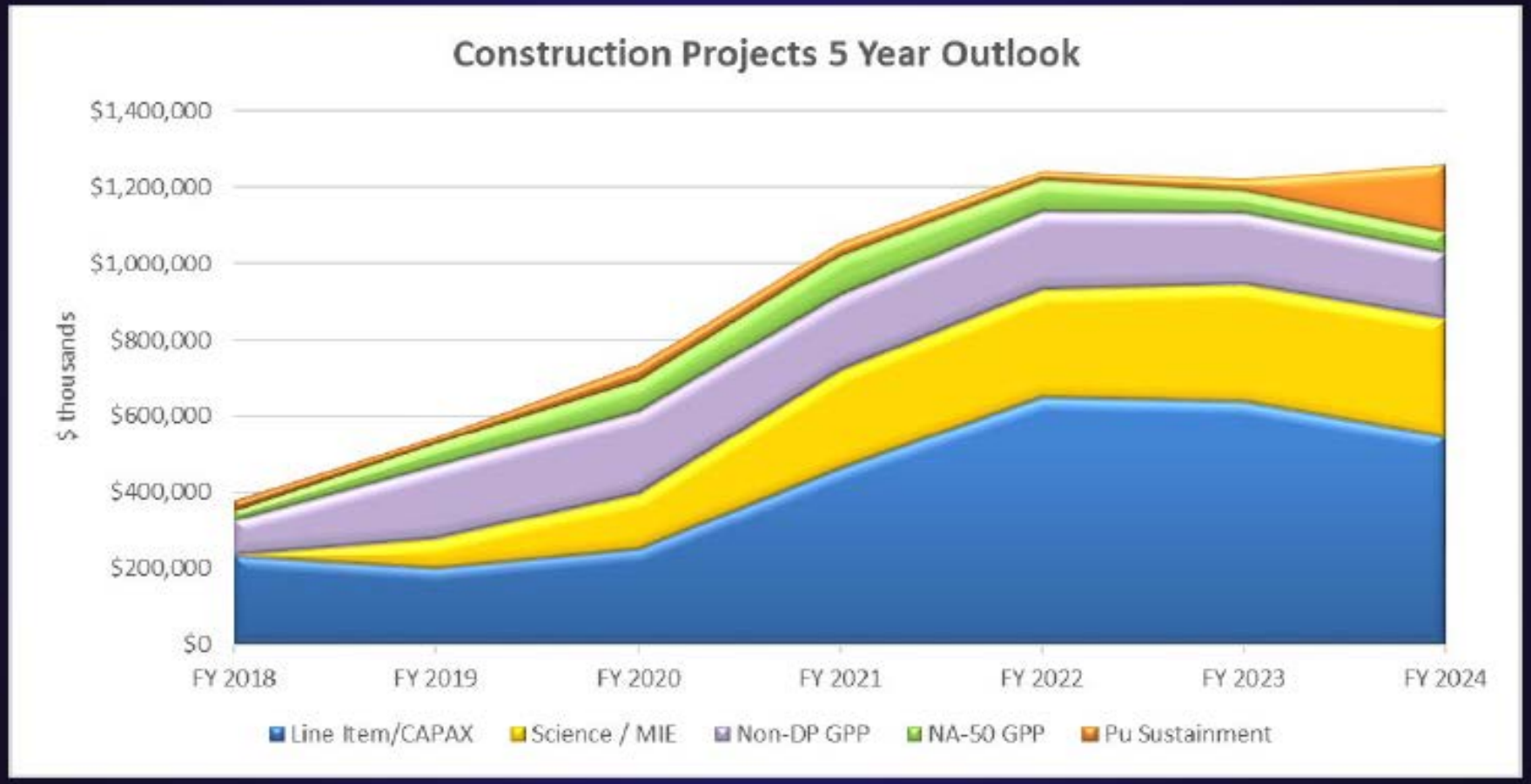
19 Recordable Subcontractor Injuries – July 2018 thru June 2019





We have to do better – but how?

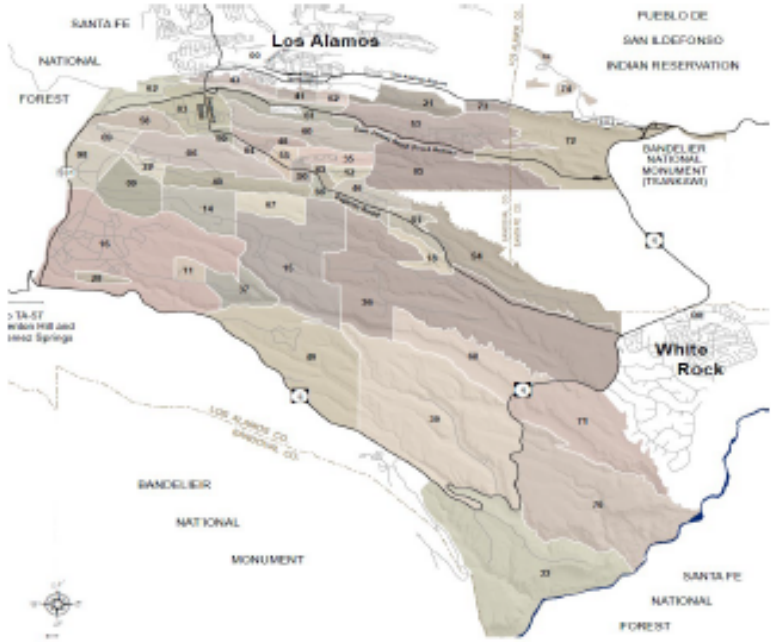
LANL Future Workload Supports a New Strategy



- TEC of all projects = $11.2B thru FY30
- $5.5B performed in FY20 to FY24 window

Infrastructure Portfolio – By The Numbers

941 Buildings
40 Sq. Miles
49 Technical Areas
Elevation 7,500 ft.



Legacy of under-funded maintenance investment
~$1B in existing maintenance and repair needs
Regional craft resource challenges

Property Assets – **1,392**

Real Property Buildings, Trailers, Transportables – **854**
(7,897,179 sq. ft.)

Real Property OSFs - **500**

Leased Assets – **38**
(362,756 sq. ft.)

RTBF # of Assets. - **294**
(2,604,116 sq. ft.)

SS # of Assets. – **1,098**
(5,655,819 sq. ft.)

11,738 Staff, Guard Force, Contractors, Students, Craft Workers & Post Docs

16.9B	$	RPV
8.2M	SQ FT	Gross

2 Fire Stations

268 Miles primary and secondary roads

219 Parking Lots

894,555 Sq. Yds. Pavement Surface

32 Miles Primary Electrical Lines

168 Miles Secondary Electrical Lines

55 Miles Natural Gas Distribution Lines

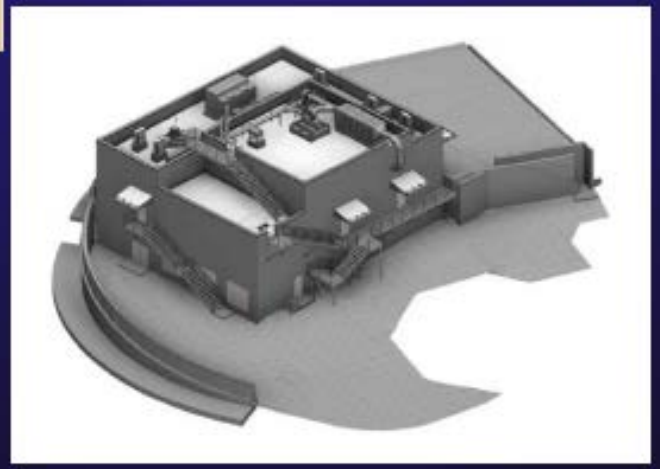
112 Miles Water Distribution Lines

14 Miles Steam Distribution Lines

63 Miles Waste Water Lines

What is Coming

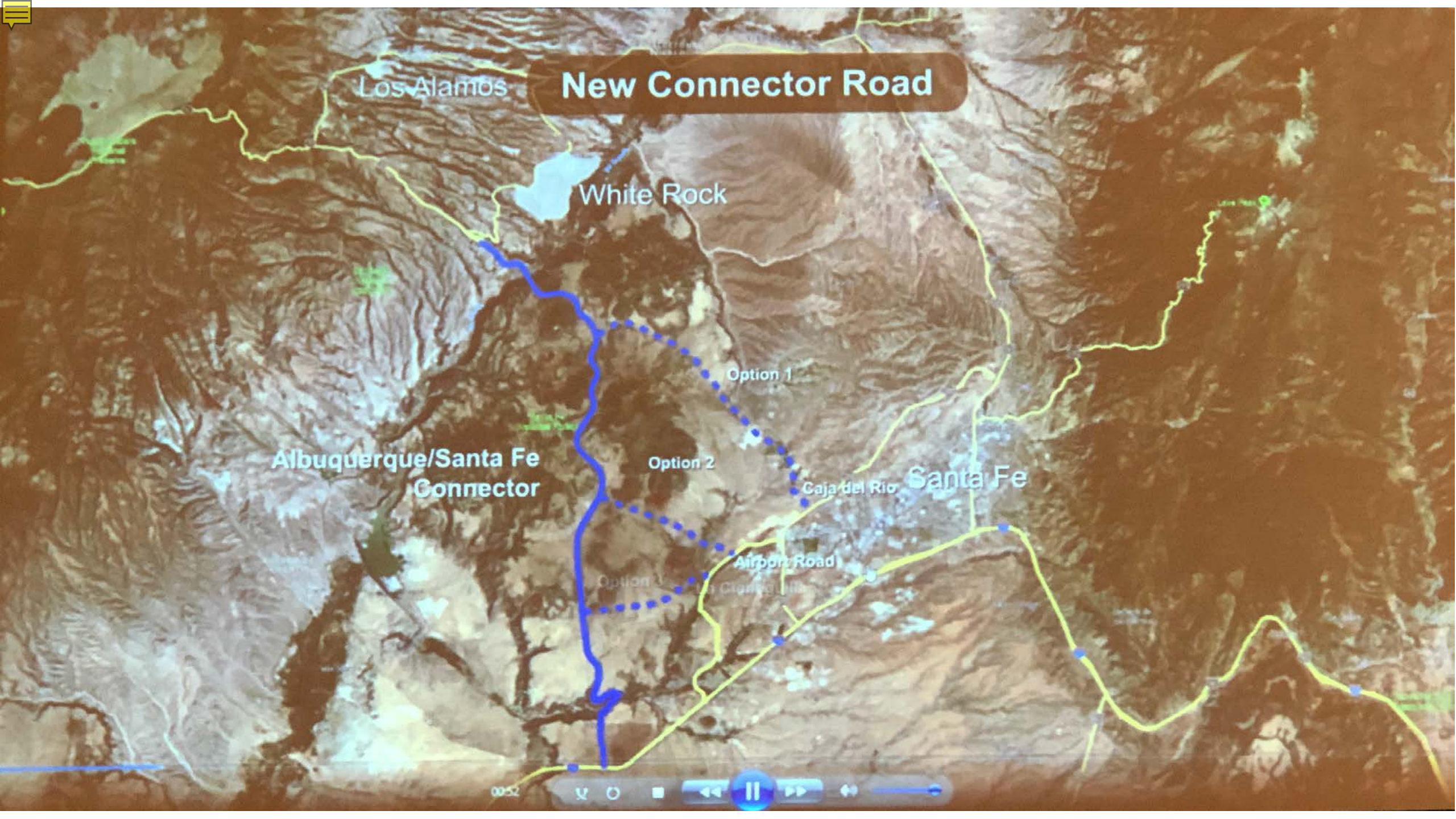
- D&D / Facility Upgrades (PF-4, RLUOB)
- New Buildings (Parking Structure, Training Center, Offices, Cafeteria, Liquid Waste Treatment Facility, Integrated HE Facility)

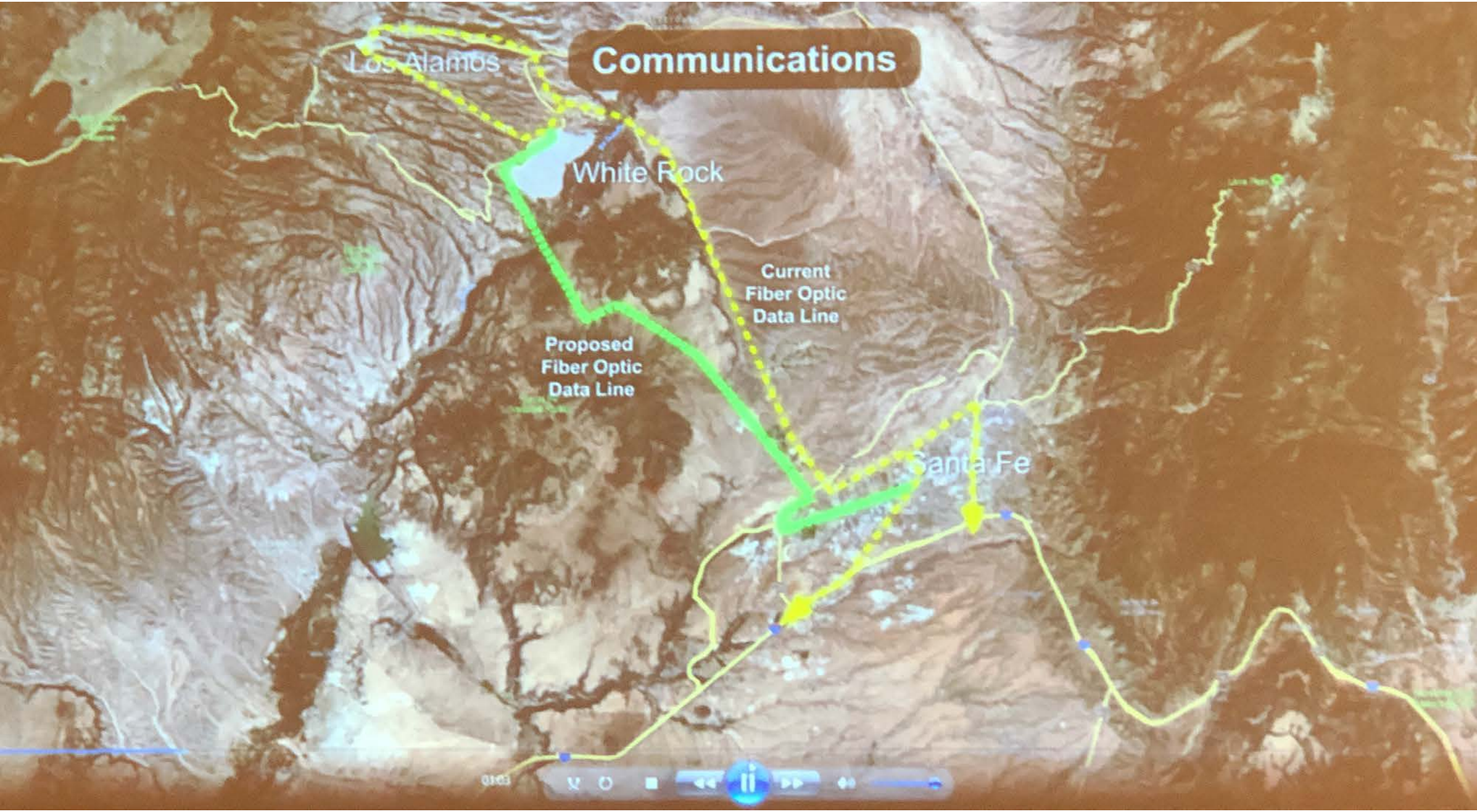


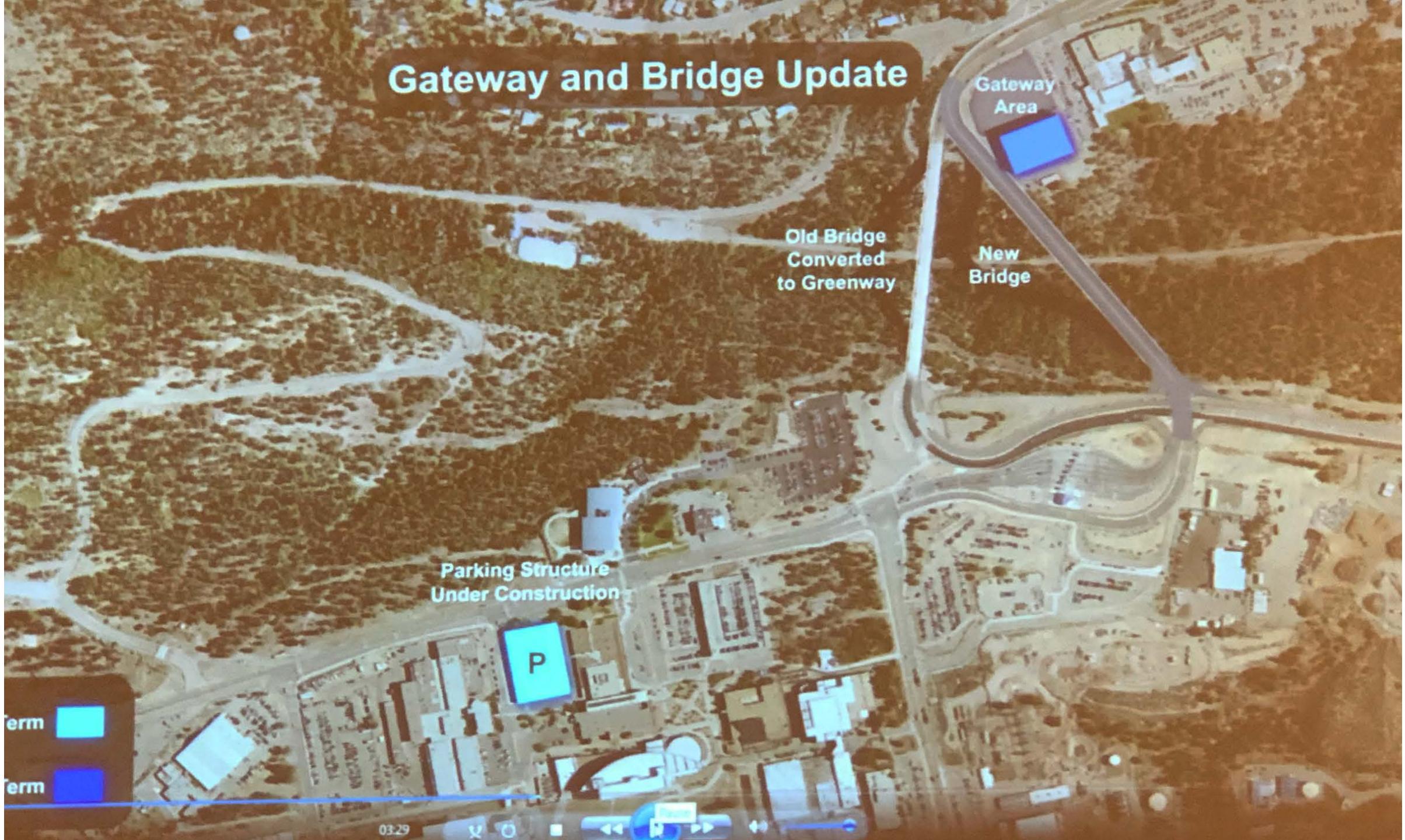
Los Alamos Study Group, artist's conception of proposed plutonium modules

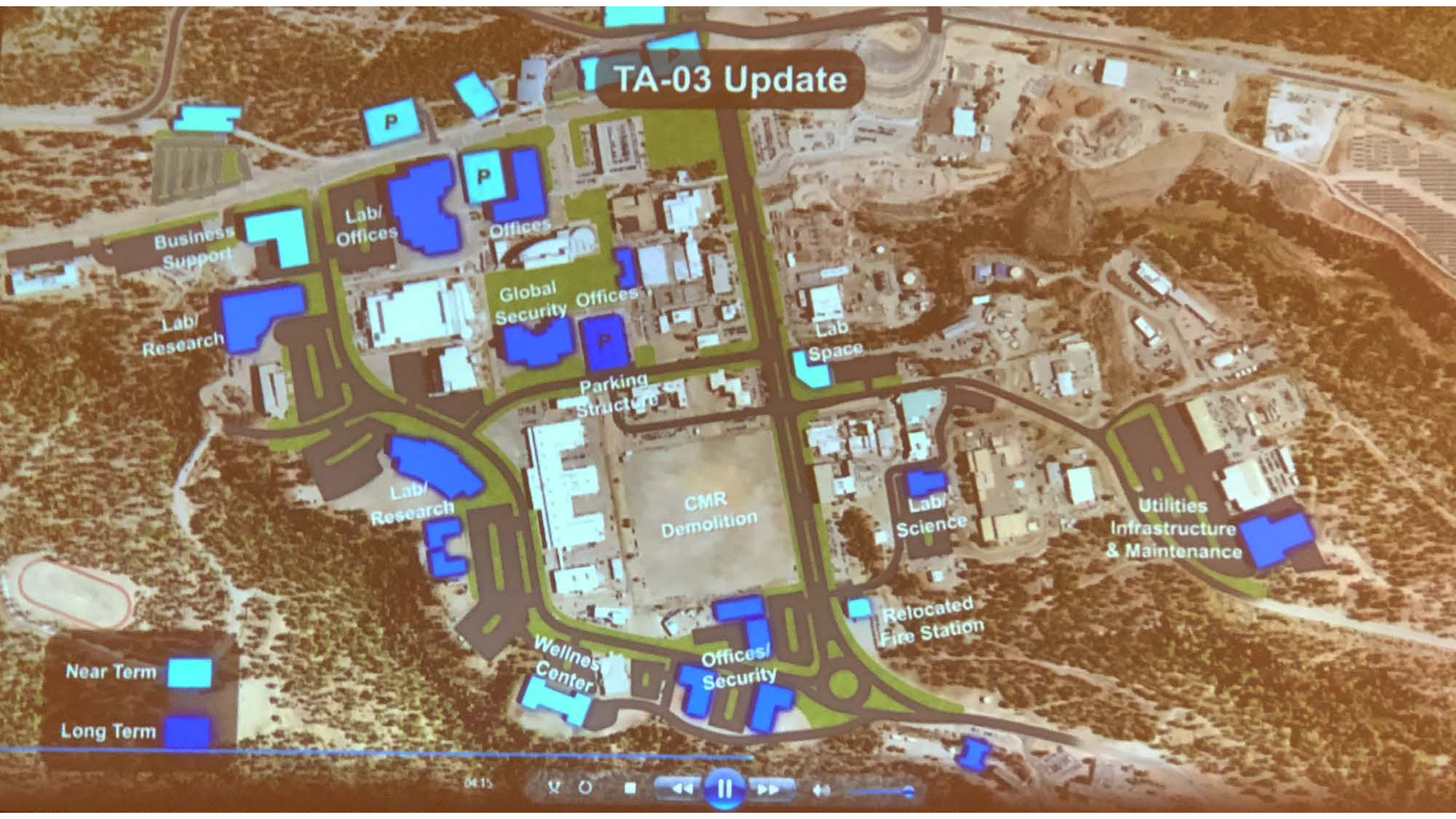
Why do some of us say that industrial pit production is virtually impossible at LANL?

- Isolation
- Dissected topography, e.g. at TA-55
- R&D culture
- Institutional arrogance
- Unconsolidated sediments
- Seismicity
- Aging facilities (PF-4); decrepit, unsafe facilities (Main Shops); unknown status (Sigma)
- RLUOB
- Negative social attributes of New Mexico
- Lack of qualified workforce, low educational attainment of population
- Local opposition


New Connector Road
Los Alamos
White Rock
Option 1
Albuquerque/Santa Fe
Connector
Option 2
Caja del Rio
Santa Fe
Airport Road


Communications
Los Alamos
White Rock
Current
Fiber Optic
Data Line
Proposed
Fiber Optic
Data Line
Santa Fe


Gateway and Bridge Update
Gateway Area
Old Bridge Converted to Greenway
New Bridge
Parking Structure Under Construction
P
erm
erm
03:29

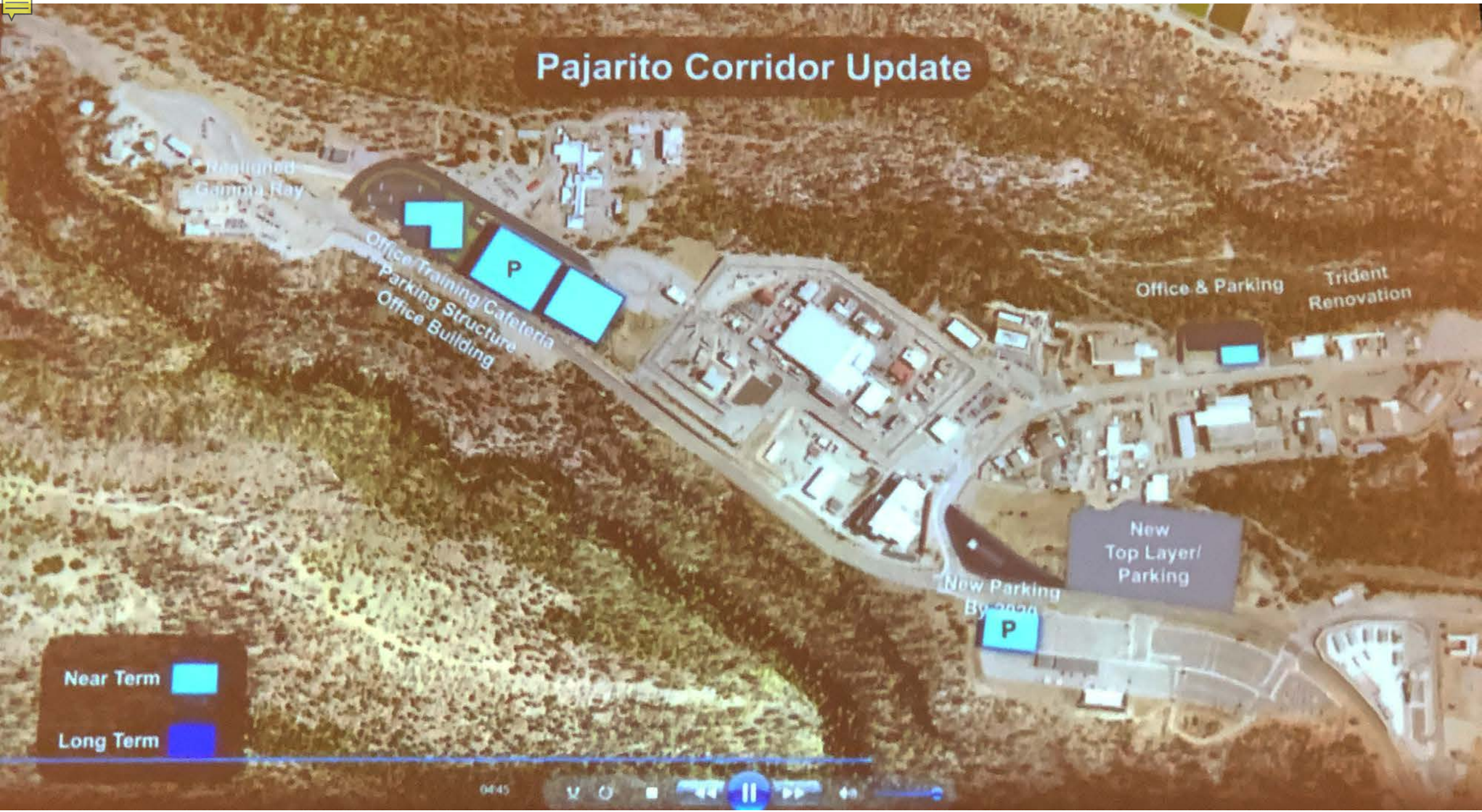

TA-03 Update
Business Support
Lab/ Offices
Offices
Global Security Offices
Lab/ Research
Parking Structure
Lab Space
Lab/ Research
CMR Demolition
Lab/ Science
Utilities Infrastructure & Maintenance
Relocated Fire Station
Wellness Center
Offices/ Security
Near Term
Long Term


Research Park Update
Research Park Building 2 & 3 with Badging
New Bypass Road
Parking Structure
Research Park Building 4
Parking Structure
Research Park Building 5
New Parking
Near Term
Long Term

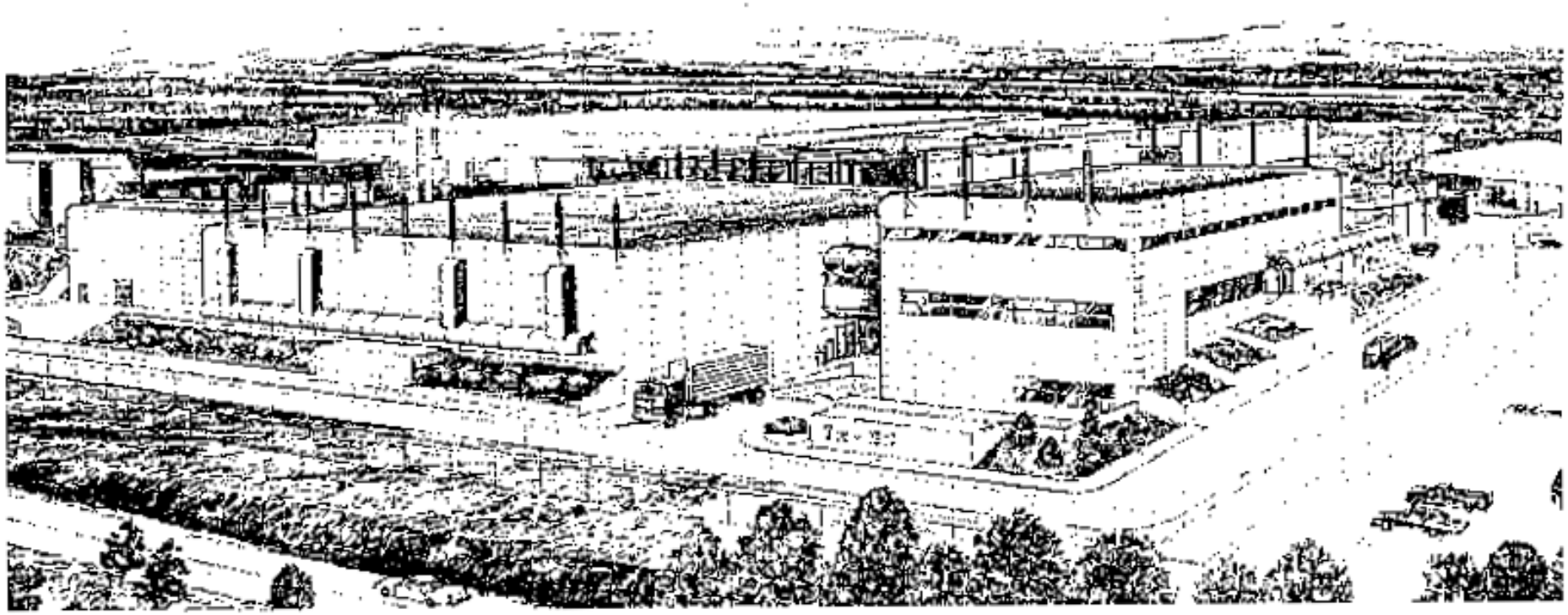

Shipping/Receiving Complex
EAST JEMEZ ROAD
DEPARTMENT OF ENERGY
BANDELIER NATIONAL MONUMENT (TSANKAWI)
Turning and De-Cell Lanes
Focused Traffic Intersection LANL / Public Vehicles Turning
Distribution 95,000 S.F.
Dog Kennel
Office Building 22,000 S.F.
Fleet Storage 197± Spaces
NEW MEXICO 4
PUEBLO DE SAN ILDEFONSO INDIAN RESERVATION


Future Campus Update
Near Term
Long Term


Future Land Transfer


Pajarito Corridor Update
Office/Training/Cafeteria
Parking Structure
Office Building
P
Office & Parking
Trident
Renovation
New
Top Layer/
Parking
P
Near Term
Long Term

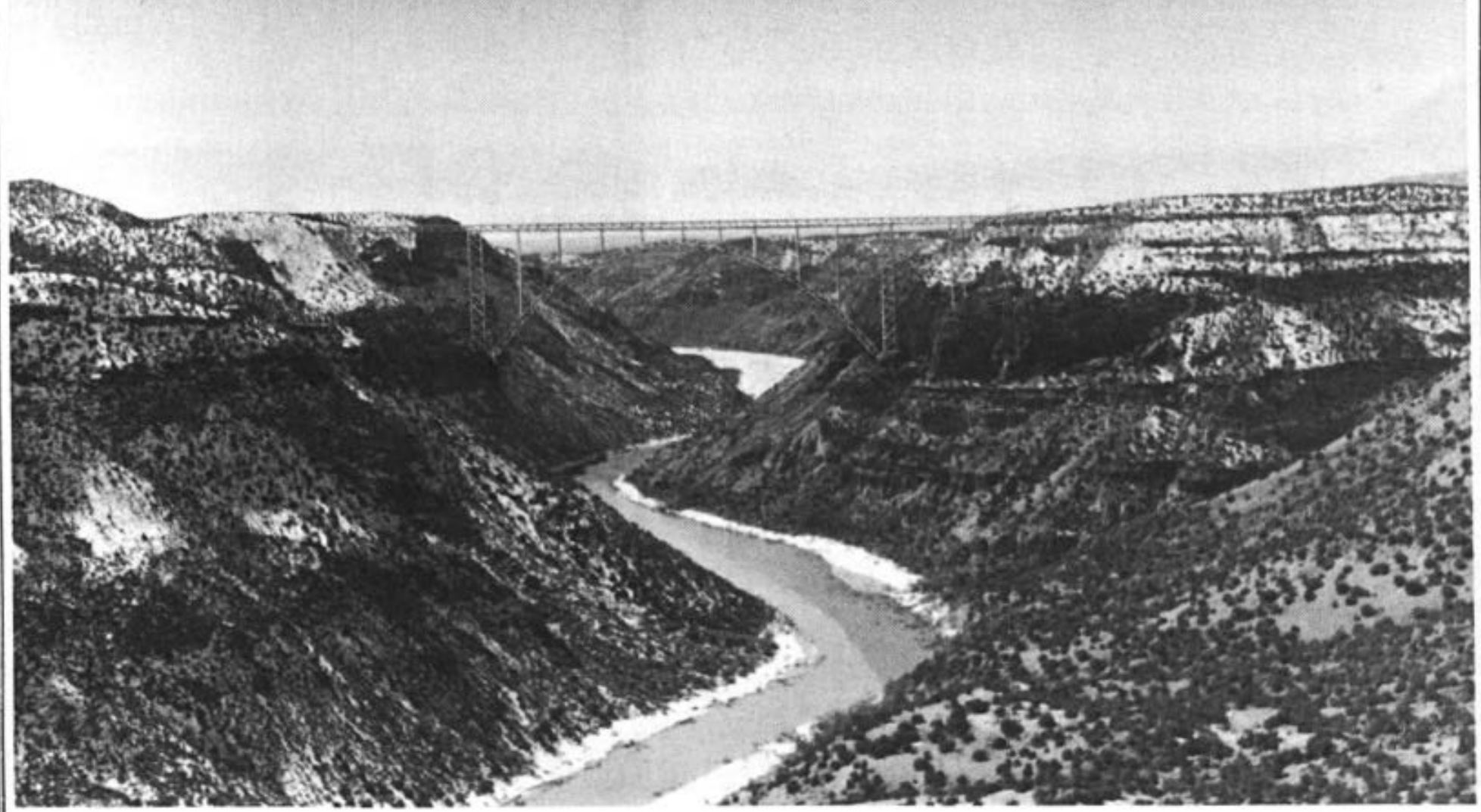
Special Nuclear Materials Research and Development Laboratory Replacement Project at Los Alamos National Laboratory



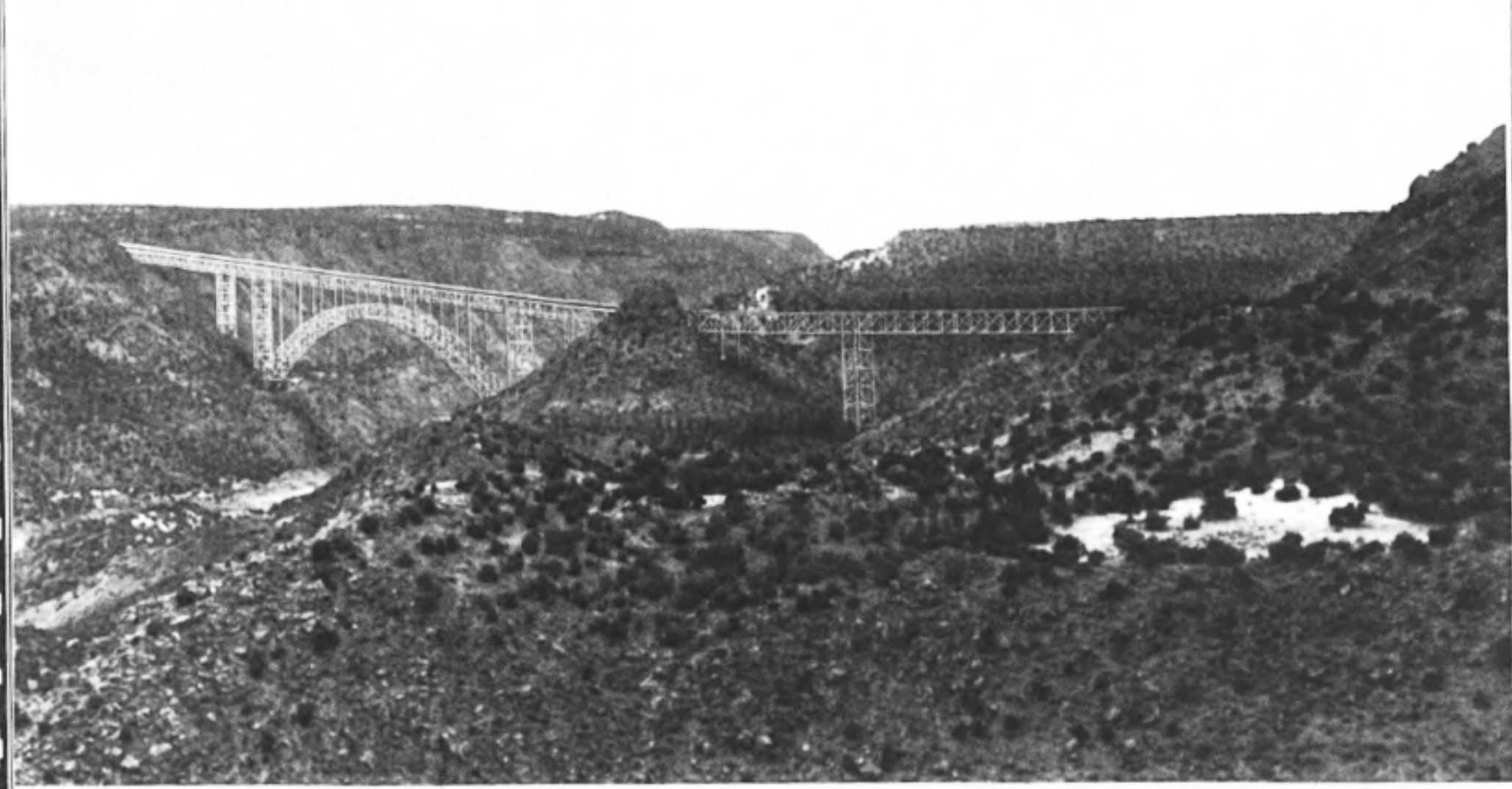
Architectural rendering of the Special Nuclear Materials Research and Development Laboratory Replacement Project.

RLUOB = Radiological Laboratory/Utility/Office Building
CMRR NF = Chemistry and Metallurgy Research Replacement Nuclear Facility
LLUOB = Light Laboratory/Utility/Office Building

Figure S-3.4.1.7—TA-55 Site Plan Showing the Proposed



SANTA FE- LOS ALAMOS CORRIDOR STUDY	MONTOSO PEAK ALTERNATE STEEL TRUSSED ARCH VIEW TOWARD SOUTHWEST FROM LOS ALAMOS NATIONAL LABORATORY–TECHNICAL AREA 33	EXHIBIT II-7



SANTA FE- LOS ALAMOS CORRIDOR STUDY	CHINO MESA ALTERNATE STEEL TRUSSED ARCH VIEW TOWARD SOUTHWEST FROM LOS ALAMOS CO. PARK IN PAJARITO ACRES	EXHIBIT II-9

June 2019

THE ECONOMIC IMPACT OF LOS ALAMOS NATIONAL LABORATORY

Prepared for Los Alamos National Labs

Prepared by Jeffrey Mitchell, Ph.D. and John Betak, Ph.D.

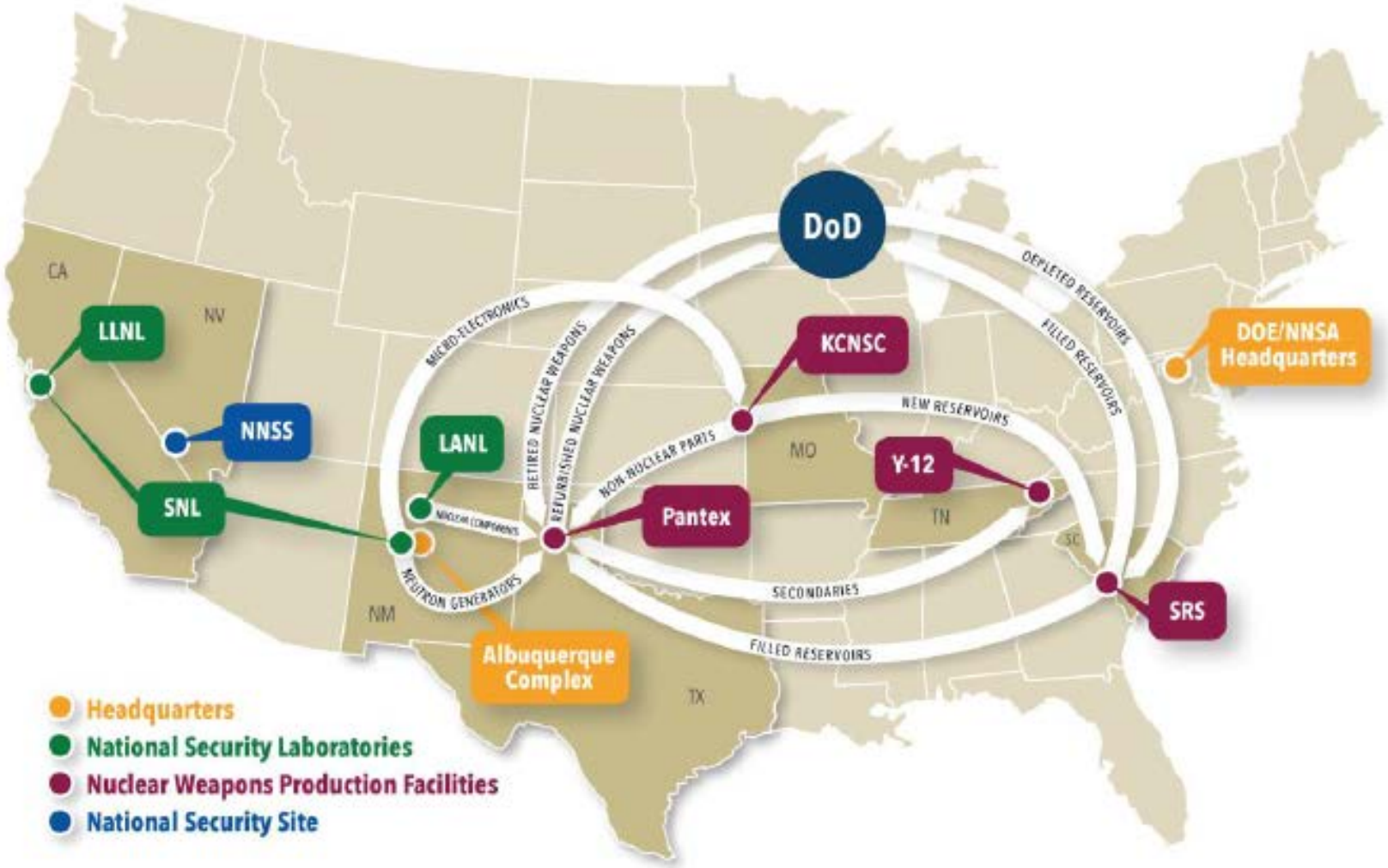
BUREAU OF BUSINESS & ECONOMIC RESEARCH

"The fiscal impact for the northern region, on the other hand, is mixed…jurisdictions that are primarily bedroom communities for LANL employees depend on smaller property tax revenues while funding costly services to working households."

New Mexico's largest public infrastructure investments				
In relation to LANL capital projects (LCPs) planned, FY2020 – FY2030 ($13 billion)				
(Costs are best available; dates mostly at completion)				
Project	Year	Cost Then ($M)	Cost in 2019 ($M)	Percent LCPs
Elephant Butte Dam, NM	1916	5.2	262	2%
(Golden Gate Bridge, CA	1937	35	1,003	8%)
San Juan Chama Diversion	1964	>35	>321	>2%
Cochiti Dam, NM	1975	94.4	406	3%
LANL TA-55 PF-4	1978	75	251	2%
I-40 + I-25 + I-10 highways, NM (treated here as one project)	1956-1995	~7.4 M/mile, 2006 dollars	Ballpark 9,207	71%
Big I Interchange, Albuquerque	2001	290	455	4%
San Juan Chama drinking water project, Albuquerque	2008	280	334	3%
Railrunner Heavy Rail Extension to Santa Fe (incl. track lease)	2008	~400	~477	4%
LANL DARHT (very approximate)	~2008	~ 400	~477	~4%
SNL MESA Complex	2008	516.5	616	5%

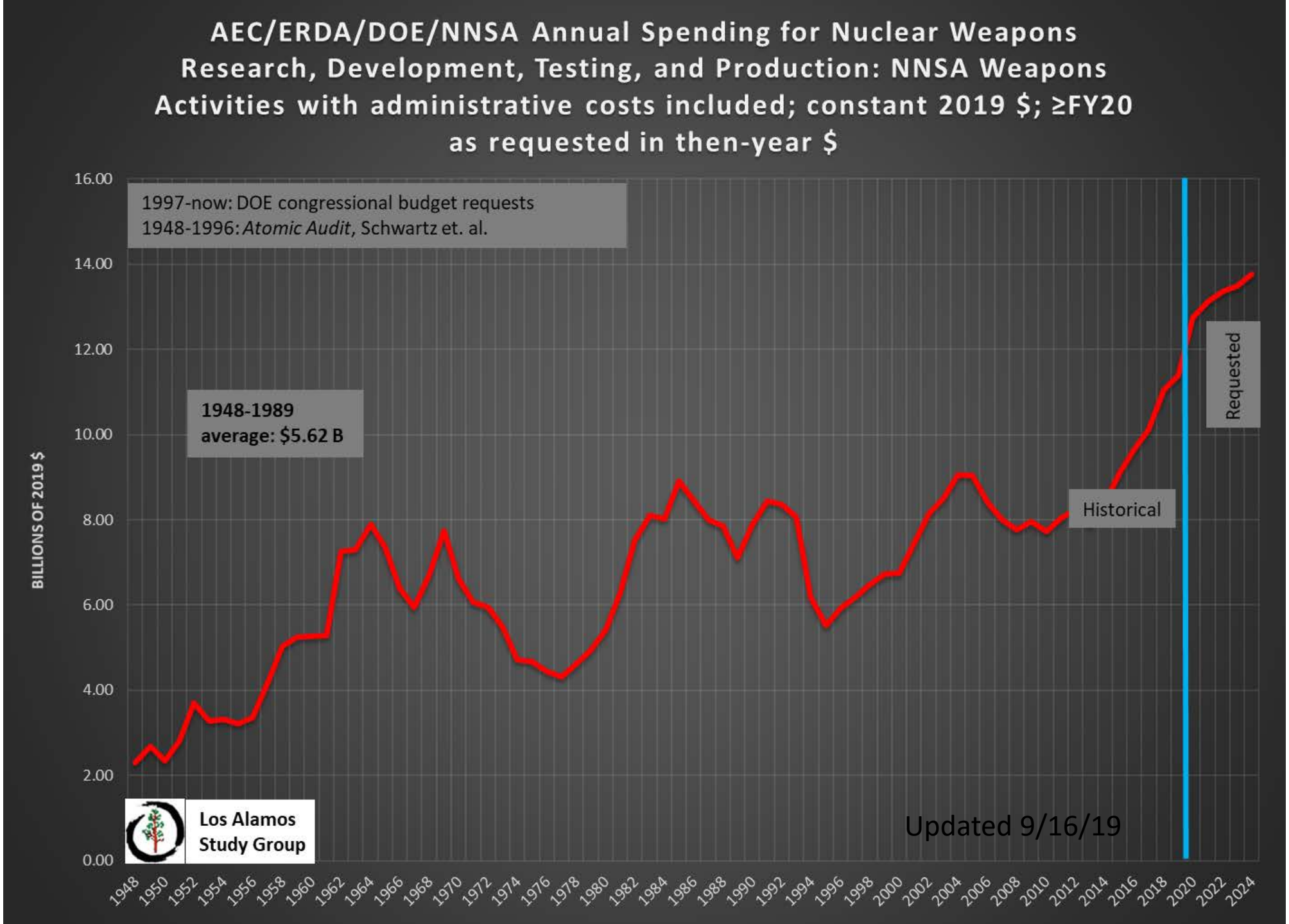

Welcome to New Mexico
America's Nuclear Weapons Colony
www.lasg.org


Stockpile Stewardship: How do we sustain the nuclear deterrent
501835
B61 12
SERIAL 020970
B83
US Air Force
Strategic Bomb
B61



DoD = Department of Defense
KCNSC = Kansas City National Security Campus
LANL = Los Alamos National Laboratory
LLNL = Lawrence Livermore National Laboratory
NNSS = Nevada National Security Site
Pantex = Pantex Plant
SNL = Sandia National Laboratories
SRS = Savannah River Site
Y-12 = Y-12 National Security Complex

Figure 1–4. Site nuclear weapon product flow


AEC/ERDA/DOE/NNSA Annual Spending for Nuclear Weapons Research, Development, Testing, and Production: NNSA Weapons Activities with administrative costs included; constant 2019 $; ≥FY20 as requested in then-year $
1997-now: DOE congressional budget requests
1948-1996: Atomic Audit, Schwartz et. al.
1948-1989 average: $5.62 B
Historical
Requested
BILLIONS OF 2019 $
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
1948 1950 1952 1954 1956 1958 1960 1962 1964 1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020 2022 2024
Los Alamos Study Group
Updated 9/16/19

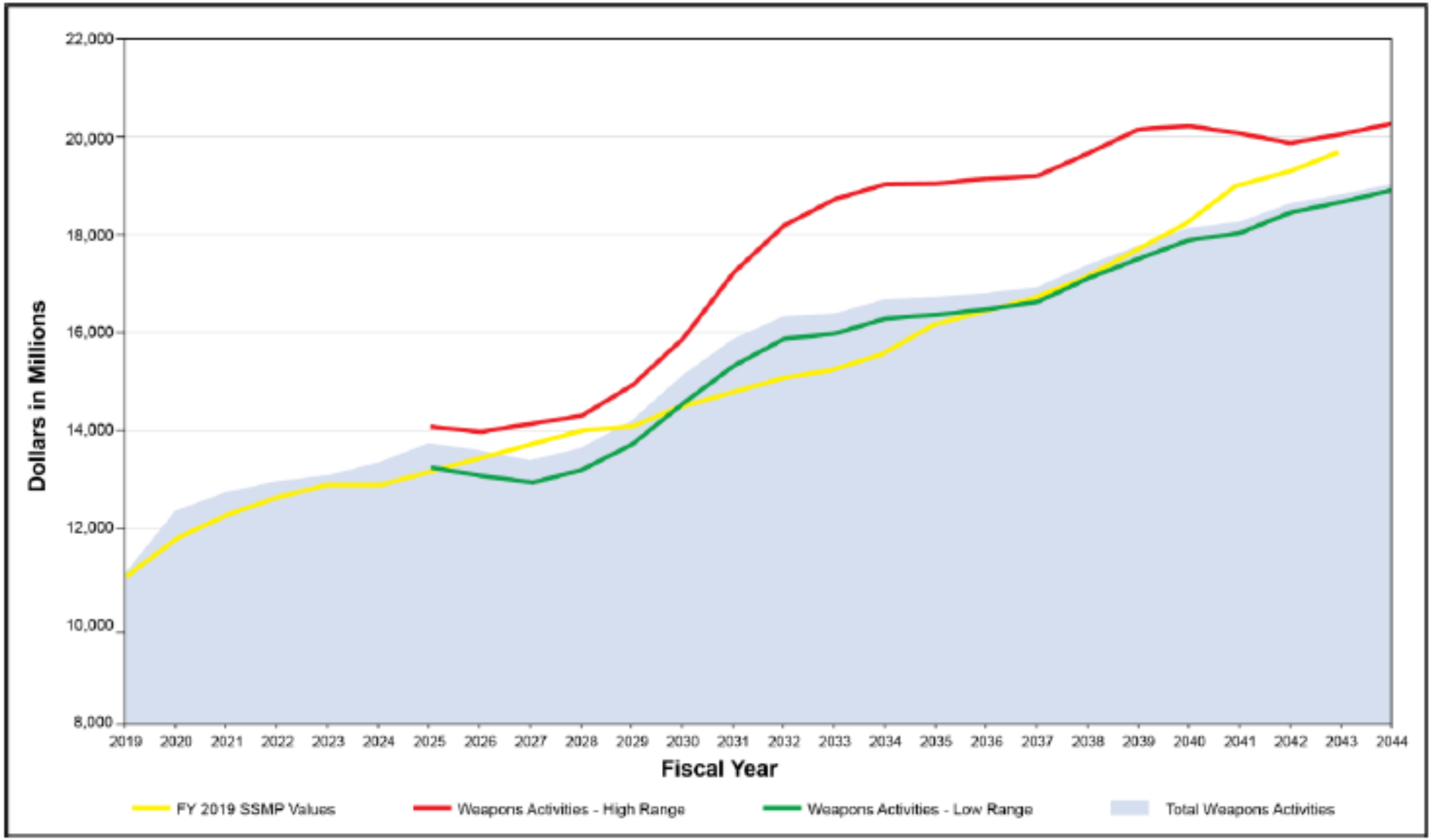
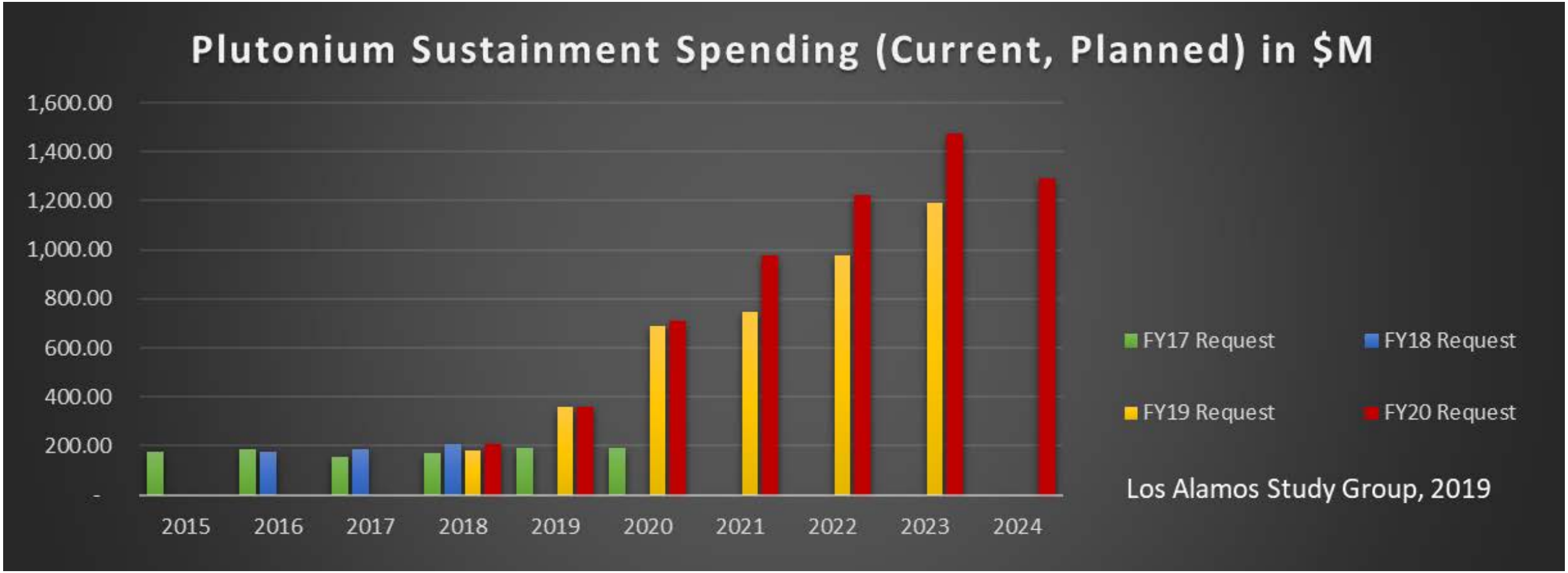
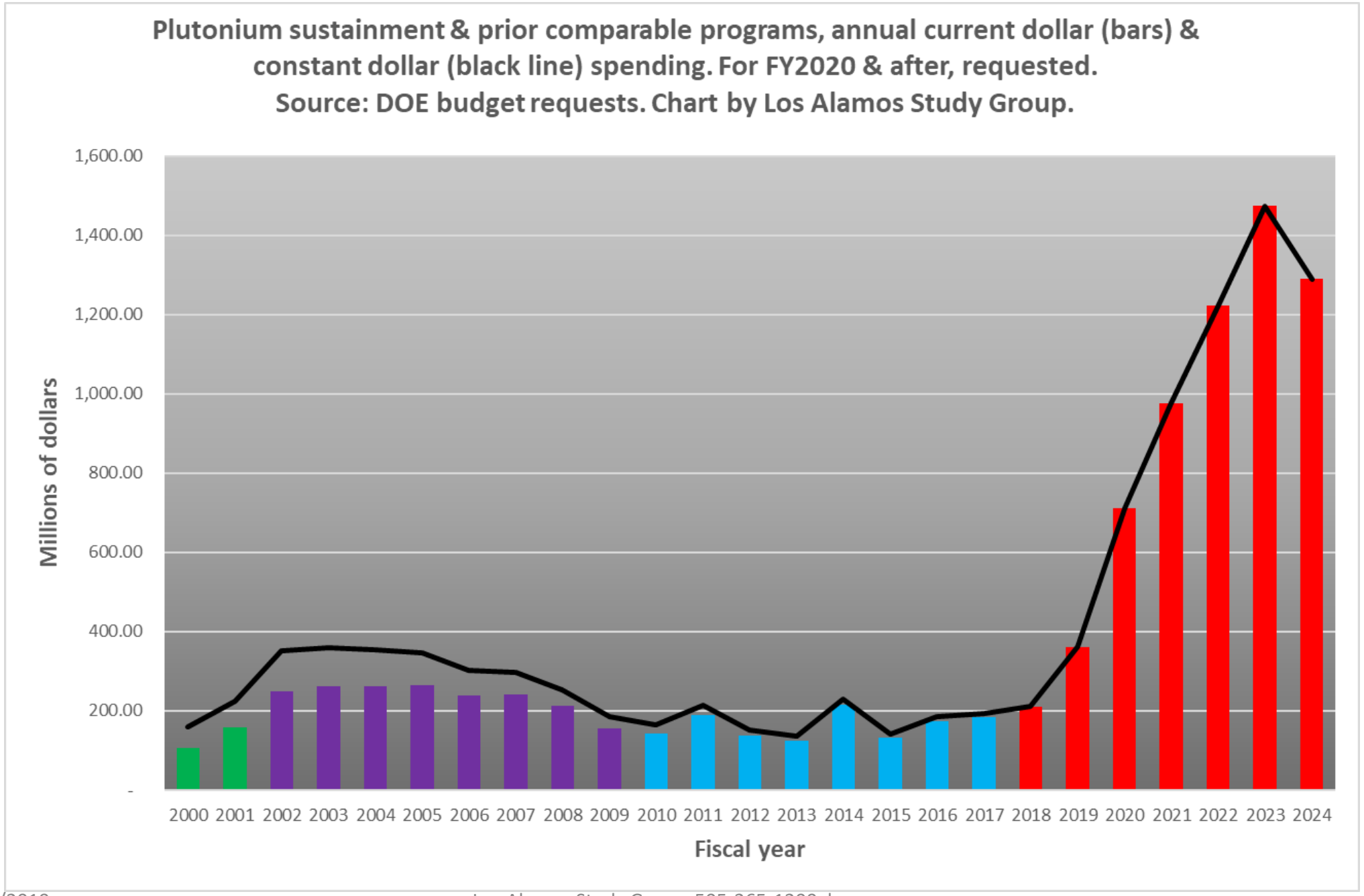


Figure 8–29. Projected out-year budget estimates for DOE/NNSA Weapons Activities in then-year dollars with high- and low-cost estimates


Plutonium Sustainment Spending (Current, Planned) in $M
1,600.00
1,400.00
1,200.00
1,000.00
800.00
600.00
400.00
200.00
-
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
FY17 Request
FY18 Request
FY19 Request
FY20 Request
Los Alamos Study Group, 2019


Plutonium sustainment & prior comparable programs, annual current dollar (bars) & constant dollar (black line) spending. For FY2020 & after, requested.
Source: DOE budget requests. Chart by Los Alamos Study Group.
Millions of dollars
1,600.00
1,400.00
1,200.00
1,000.00
800.00
600.00
400.00
200.00
-
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
Fiscal year

UNITED STATES DEPARTMENT OF ENERGY
NATIONAL NUCLEAR SECURITY ADMINISTRATION
Office of Cost Estimating and Program Evaluation (CEPE)

Surplus Plutonium Disposition
Dilute and Dispose Option
Independent Cost Estimate (ICE) Report

April 2018

OFFICIAL USE ONLY – CONTRACTOR PROPRIETARY

CEPE
Cost Estimating and Program Evaluation

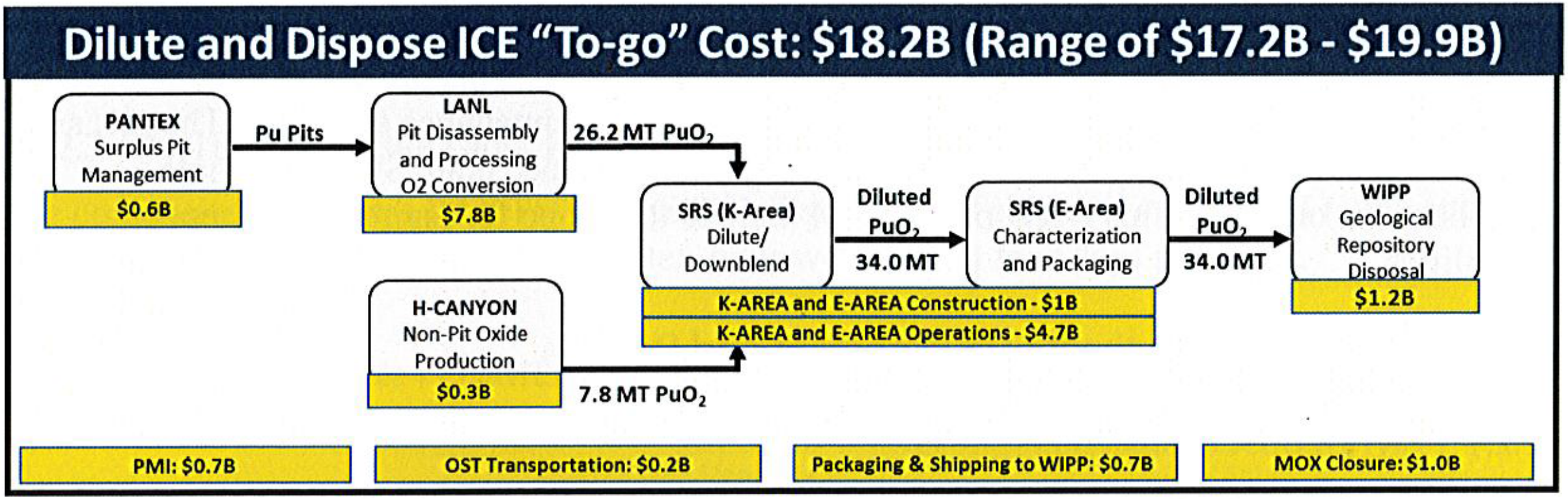
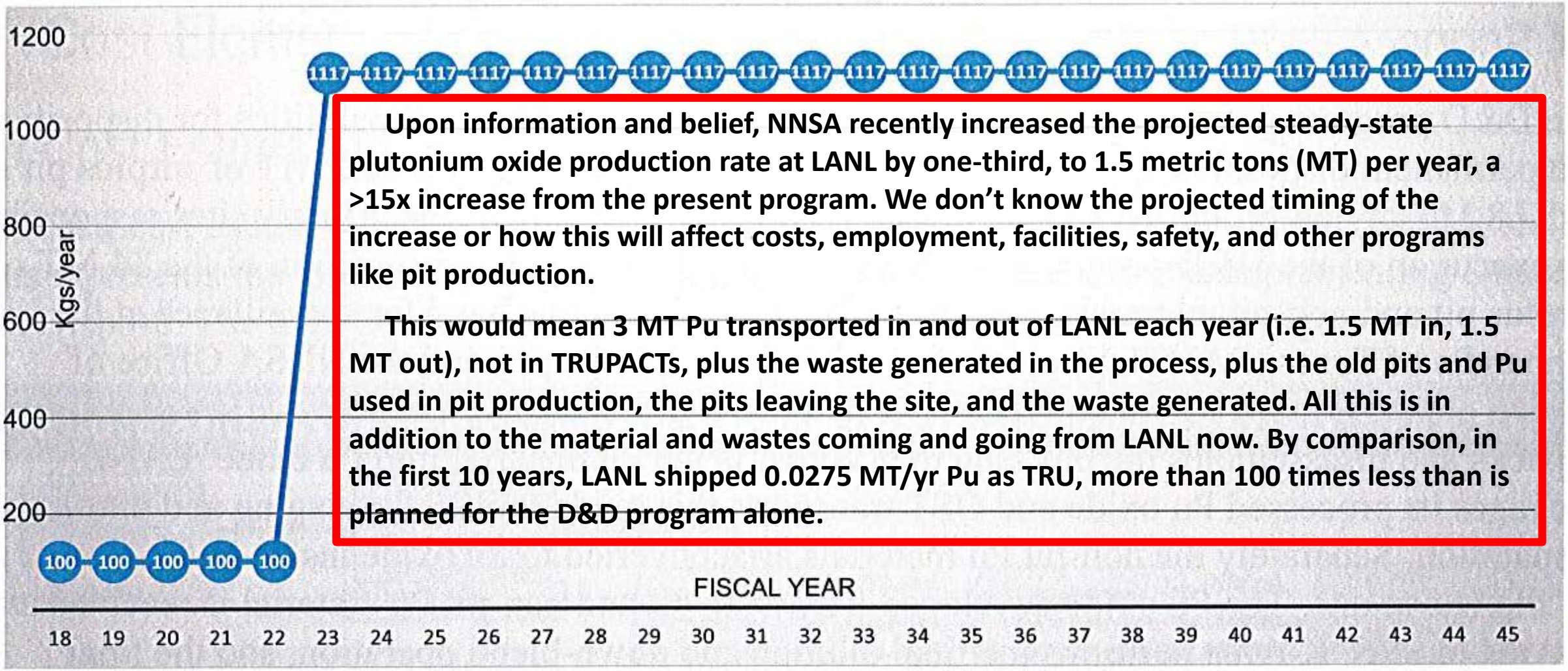


Figure 6 – Dilute and Dispose Cost Breakdown by Site and Operation

NM: $9 billion (49%), including $7.8 billion at LANL, including $2.4 billion in facilities

Scope Area	Category	Sub-Category	Cost	
		Cost Summary	Base Year 2017 ($M)	Then Year ($M)
LANL	LANL Operations	LANL Variable Cost	$ 1,604	$ 3,283
		LANL Fixed Cost	$ 990	$ 2,026
		LANL Spares Cost	$ 26	$ 54
		Total LANL Operations Cost	$ 2,620	$ 5,363
	LANL Facilities	Total LANL Facilties Cost	$ 1,206	$ 2,387
	LANL Totals	**LANL Totals**	**$ 3,826**	**$ 7,750**



Upon information and belief, NNSA recently increased the projected steady-state plutonium oxide production rate at LANL by one-third, to 1.5 metric tons (MT) per year, a >15x increase from the present program. We don't know the projected timing of the increase or how this will affect costs, employment, facilities, safety, and other programs like pit production.

This would mean 3 MT Pu transported in and out of LANL each year (i.e. 1.5 MT in, 1.5 MT out), not in TRUPACTs, plus the waste generated in the process, plus the old pits and Pu used in pit production, the pits leaving the site, and the waste generated. All this is in addition to the material and wastes coming and going from LANL now. By comparison, in the first 10 years, LANL shipped 0.0275 MT/yr Pu as TRU, more than 100 times less than is planned for the D&D program alone.

Figure 2 – LANL Oxidation Throughput Table (Ramp up to 1117 Kgs per year)


SPEED
LIMIT
65
E29632

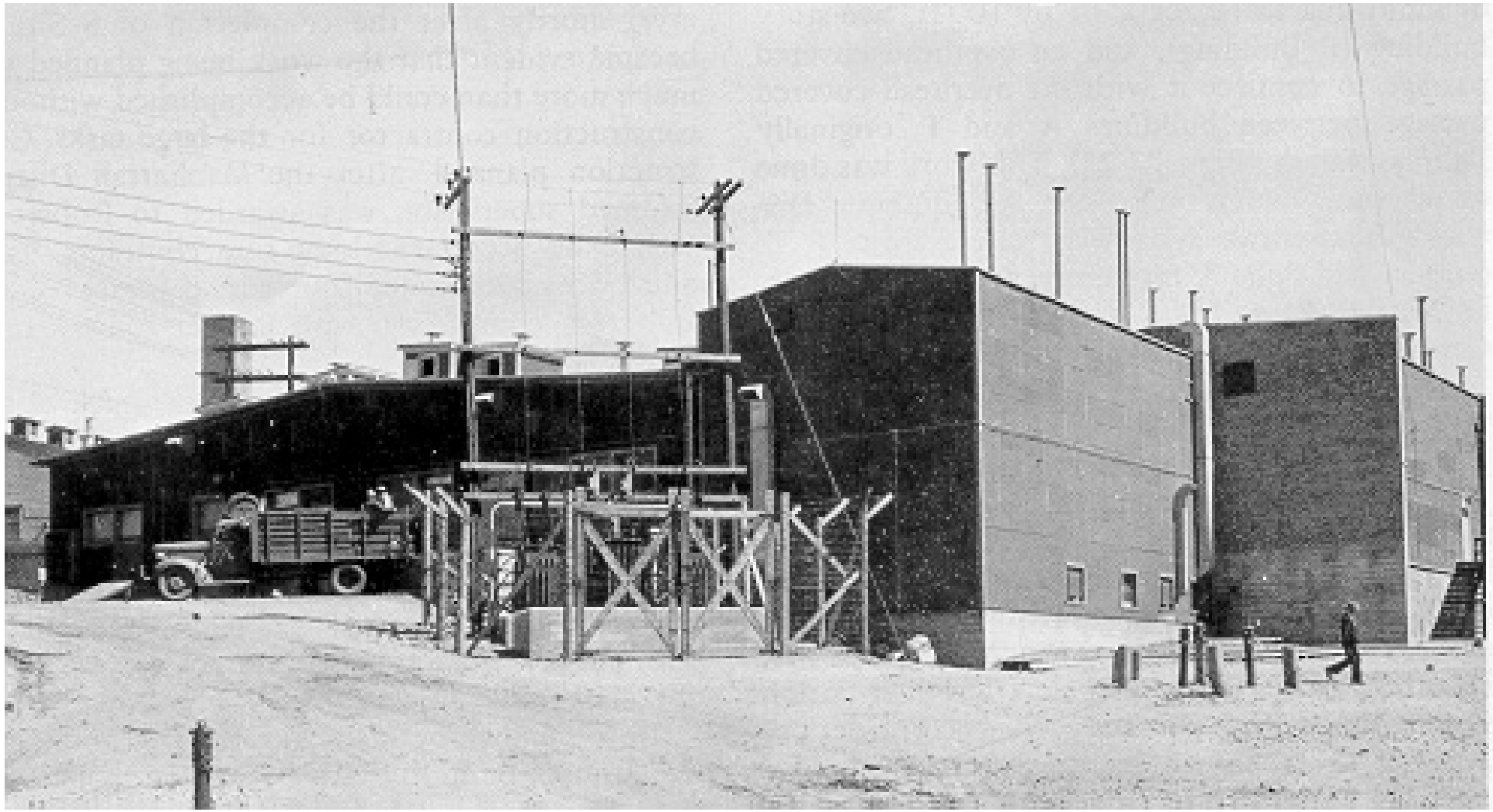

EXIT 160
NORTH
Tesuque Village
Opera Drive
Ar Monte Sereno
1/2 MILE
EXIT ONLY
Atlas
E29613

High confidence: NNSA modeling of new-pit production requirement, complex W87-like WR pits (most demanding), single shift (*AoA*, p. 13)

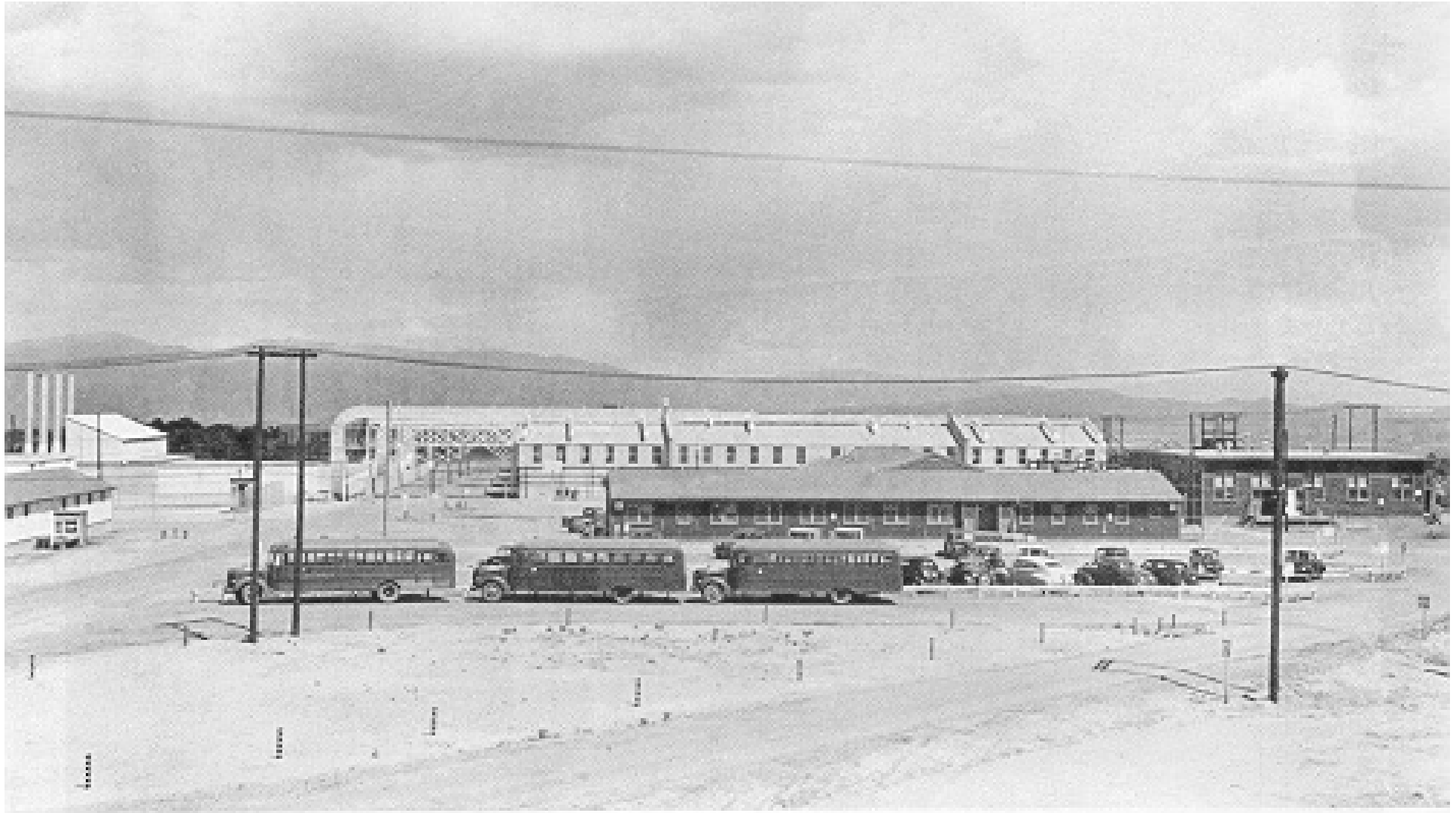
Table 2–4. Model results

	30 Pits Per Year	50 Pits Per Year	80 Pits Per Year
Confidence level %	96%	97%	93%
Lowest throughput, units	8	20	30
Average throughput, units	41	84	103
Highest throughput, units	75	143	158
Sample Size, years	7,500	7,500	7,500

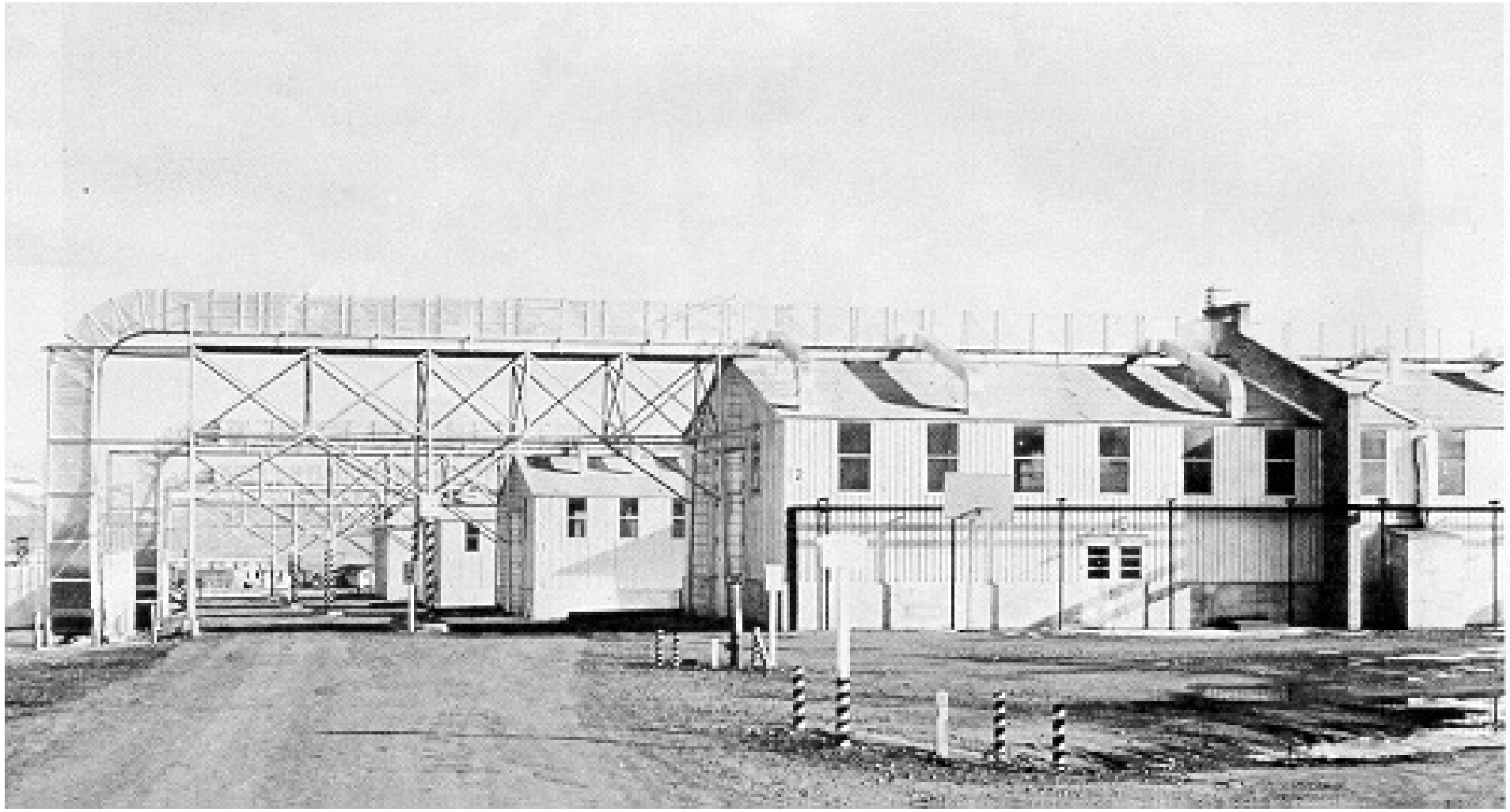
"30" + "50" → average 125 ppy; simpler pits → higher ppy; double shift → ~ 2x single



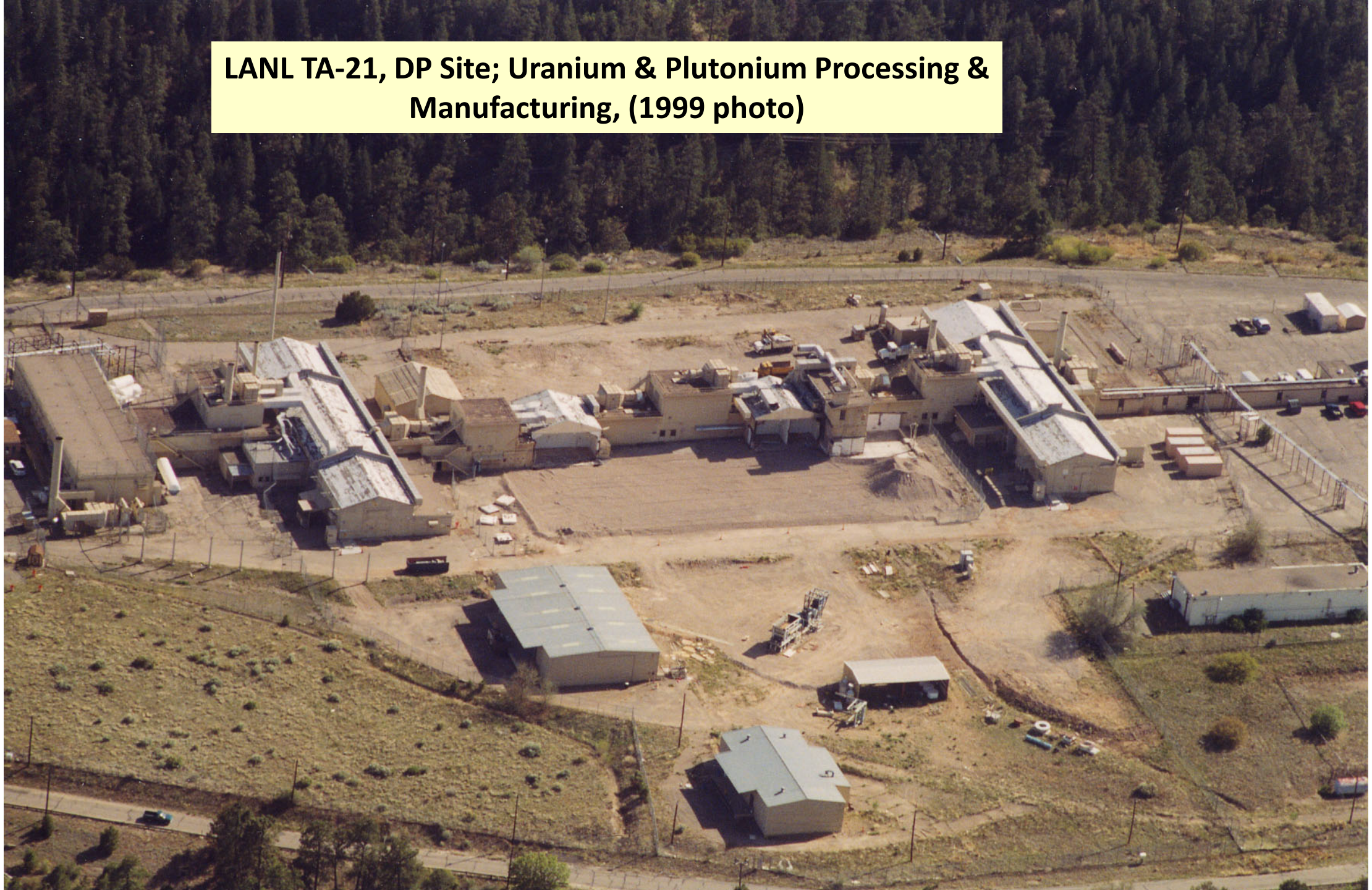
Building D, Los Alamos, circa 1944

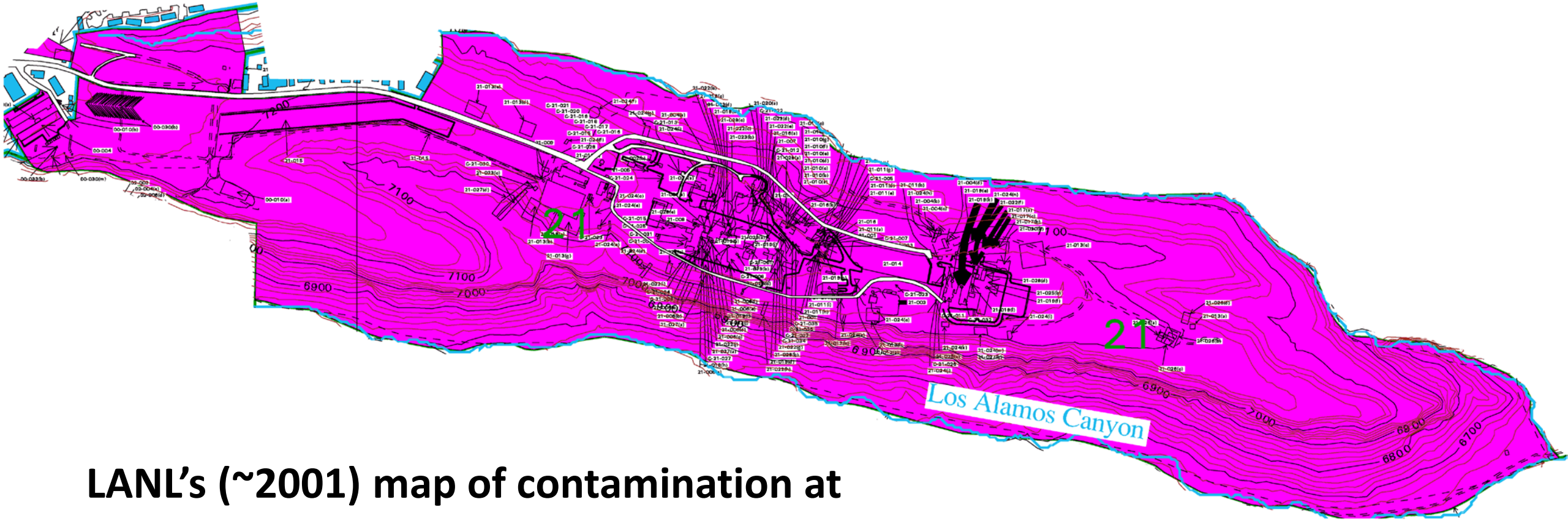


DP Site (“D Prime”), TA-21, which replaced D Building. The Rocky Flats before Rocky Flats.



DP Site (TA-21); plutonium manufacturing in foreground


LANL TA-21, DP Site; Uranium & Plutonium Processing & Manufacturing, (1999 photo)



LANL's (~2001) map of contamination at TA-21, DP Site, LANL's former pit production and plutonium (etc.) processing site.

Main issues NNSA faces w pit production

- Lack of solid mission need
- Bad conceptual design (esp. the “modules”)
- igh and uncertain cost
- Recurrent poor facility management
- Long project duration (construction ends F27)
- Recurrent poor project management
- Numerous fiscal “time bombs” in DOE and USA
- Competition for funds in government (DoD, others!)
- Instability of contract, work compatibility issues
- Poor morale; hiring & retention issues; bad location

Is there a window of practical, safe pit production at LANL's PF-4? It is unlikely. (Los Alamos Study Group, 18 May 2019)

Year	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Needed TA-55 and TA-50 infrastructure tests, analysis, and upgrades, not all-inclusive																						
Column testing, seismic analysis; could be fatal to PF-4 operation as HC II Nuclear Facility; analysis may also limit MAR	(DNFSB WSR 12/28/18)			Necessity, feasibility, scope, and duration of possible PF-4 alterations are unknown at present				If needed, design and construction of a greenfield PF-4 replacement could begin in ~2022, with 30 ppy ops in ~2035. There is no room for a PF-4 replacement at TA-55. A separate 30 ppy production facility could not be built at TA-55 without massive disruption & risk. See other slides.														
PC-3 fire suppression system upgrade	(DNFSB WSR 1/4/19)							PF-4 replacement, which is unlikely to be possible for a number of reasons, would be vastly expensive (>$10 B).														
Internal firewall upgrade to 2 hours	(DNFSB WSR 1/4/19)																					
PC-3 active ventilation, fire alarm upgrade	(DNFSB WSR 1/4/19)																					
Fire water loop integrity	(DNFSB WSR 1/4/19)																					
CMRR subproject REI2	(DOE CBR)																					
CMRR subproject PEI1	(DOE CBR)																					
CMRR subproj. PEI2 (to Pu Pit Prod. Project, PPP)	(DOE CBR) Scope, cost, & duration of Pu Pit Proj. (PPP) unknown; purpose is to take LANL from 10 to 30 ppy so duration shown accordingly																					
CMRR subproj. RC3 (to PPP)																						
TA-55 Reinvest. Project III	Duration: >2024 (CBR) by ~2 yrs (estimate)																					
TRU liquid waste (TA-50)	Duration unclear but >2024 (CBR)																					
War reserve (WR) pit production expected (pits per year, ppy)																						
1	(funded by Pu Sustainment Ops)				X																	
10						X																
20	(funded by Pu Pit Production Project, scope TBD)						X															
30 (average)								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
≥30 (NNSA: 41 average)	Infeasible (AoA p. 2)	We believe multi-shift production would lead to fairly prompt and repeated pauses and shut-downs due to single-point failures and overwhelmed chokepoints. Inadequate and inappropriate facilities, management, training, and institutional culture would be exposed. Existing PF-4 missions would be threatened, as would worker and public safety. Recovery could be difficult and might not be successful.																				
≥50 (NNSA: 84 average)	Infeasible (AoA p. 2)																					
≥80 (NNSA: 103 average)	Infeasible (AoA p. 2)																					
Cumulative WR pits (theoretical, 30 ppy average)					1	11	31	61	91	121	151	181	211	241	271	301	331	361	391	421	451	481
Model (heuristic only): probability of effective PF-4 end of life (EEOL) by given year assuming normal distribution, 10 year standard deviation																						
2039 est. EEOL (NNSA, FY2014 CBR p. WA-211)	.02	.03	.04	.04	.05	.07	.08	.10	.12	.14	.16	.18	.21	.24	.27	.31	.34	.38	.42	.46	.50	.54
2034 est. EEOL (assumed earlier EOL with 30 ppy)	.07	.08	.04	.04	.05	.07	.08	.21	.24	.27	.31.	.34	.38	.42	.46	.50	.54	.58	.62	.66	.69	.73

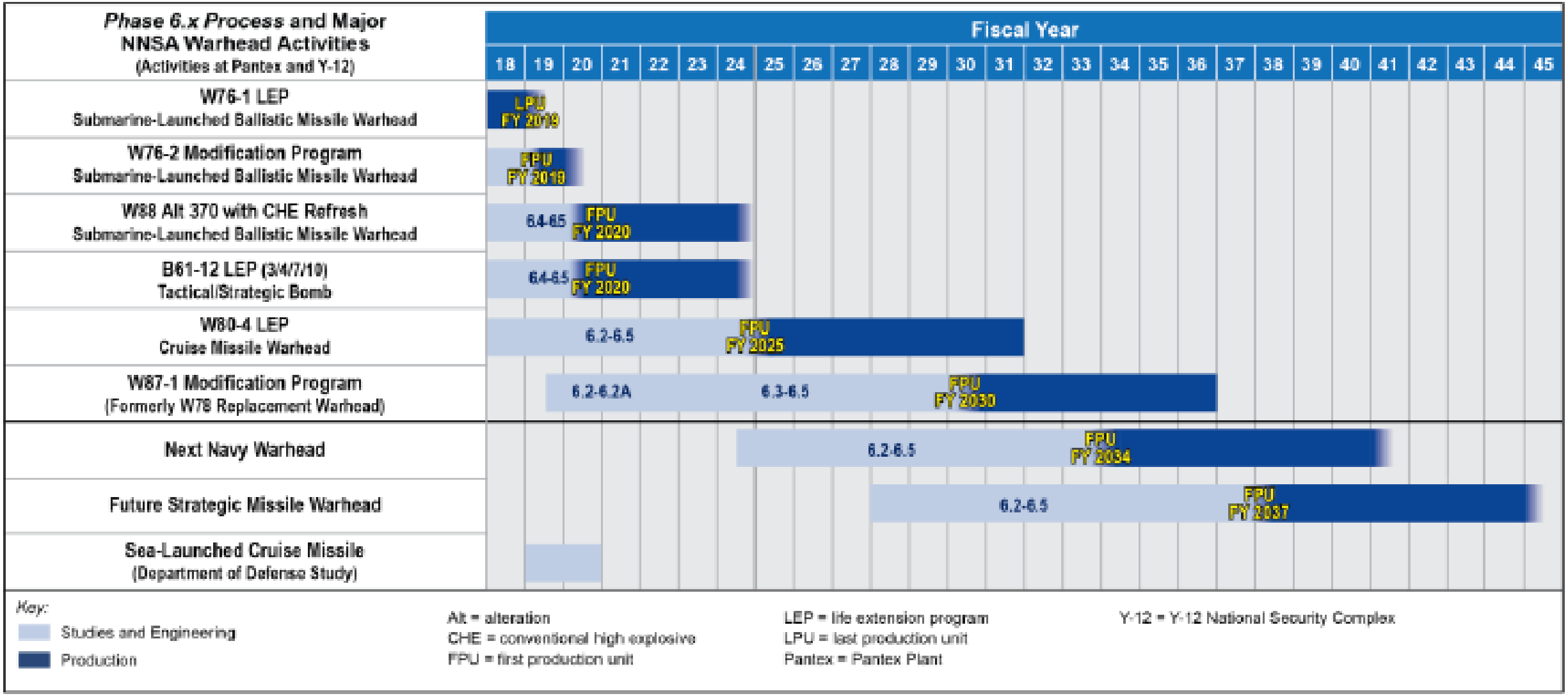
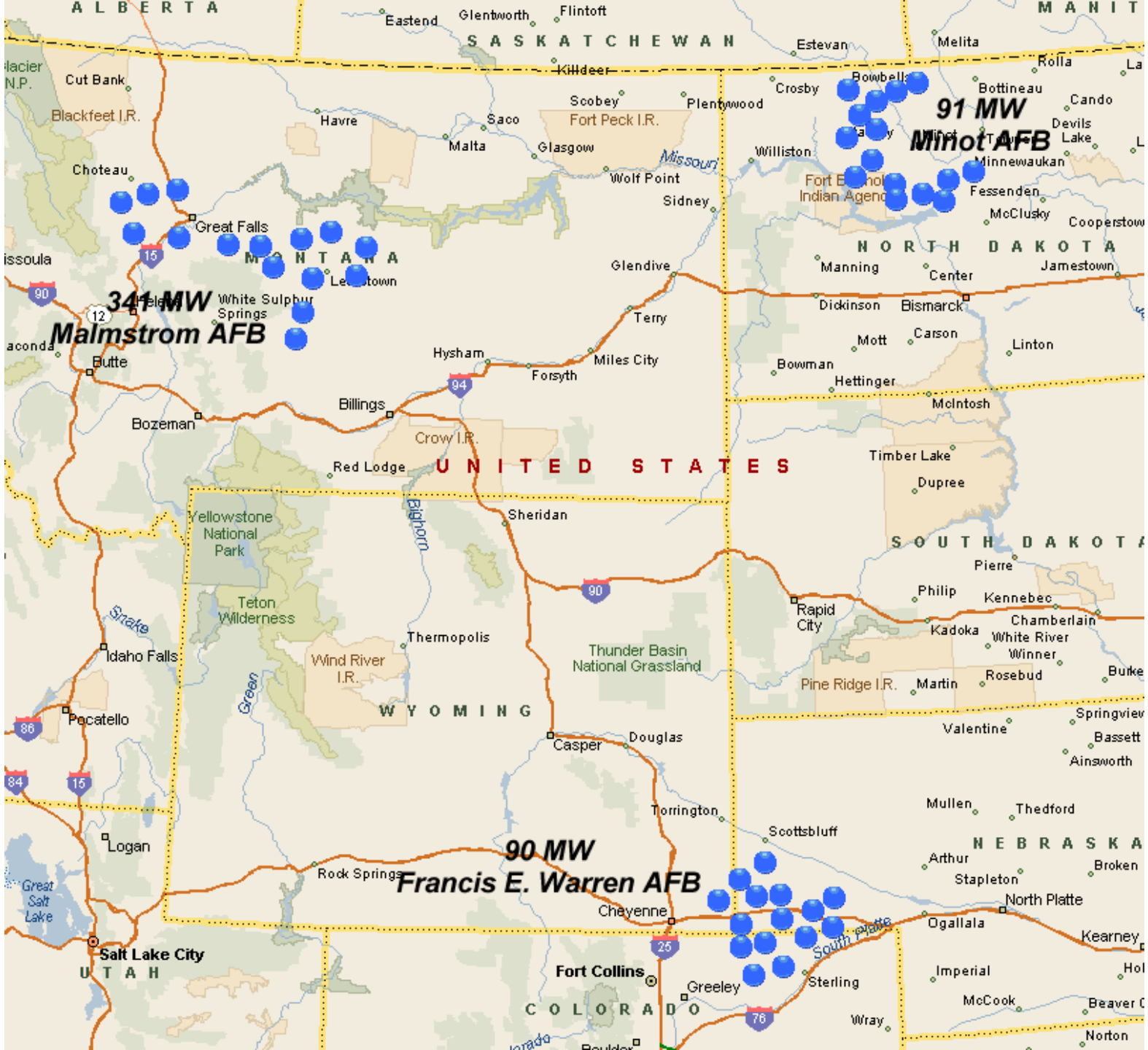


Figure 2–2. NNSA warhead activities[2]



For the coming decade at least, a talk about new pits is also a talk about intercontinental ballistic missiles (ICBMs), both the existing Minuteman III's and the planned Ground-Based Strategic Deterrent (GBSD), a roughly $80-140 billion program.

MM IIIs are deployed in 3 bases spread over 5 states. There are 150 silos at each base, divided into 3 wings of with 50 missiles apiece.

50 silos are in "warm standby," without missiles in them. Thus 400 missiles are deployed.

W87, shown here in (retired) MX missile configuration, circular error probable (CEP) is classified but < 400 ft. Yield is 330/475 kilotons (kt). It is pits for this warhead or a variant which LANL is tasked to make.

The US possesses ~ 540 W87s, in addition to ~780 W78s in Mark 12A RVs (CEP ~720 ft) for the same 450 Minuteman III missiles.

At present, at least 200 MM IIIs could be returned to multiple independent RV (MIRV) status, with 3 W78 warheads each.

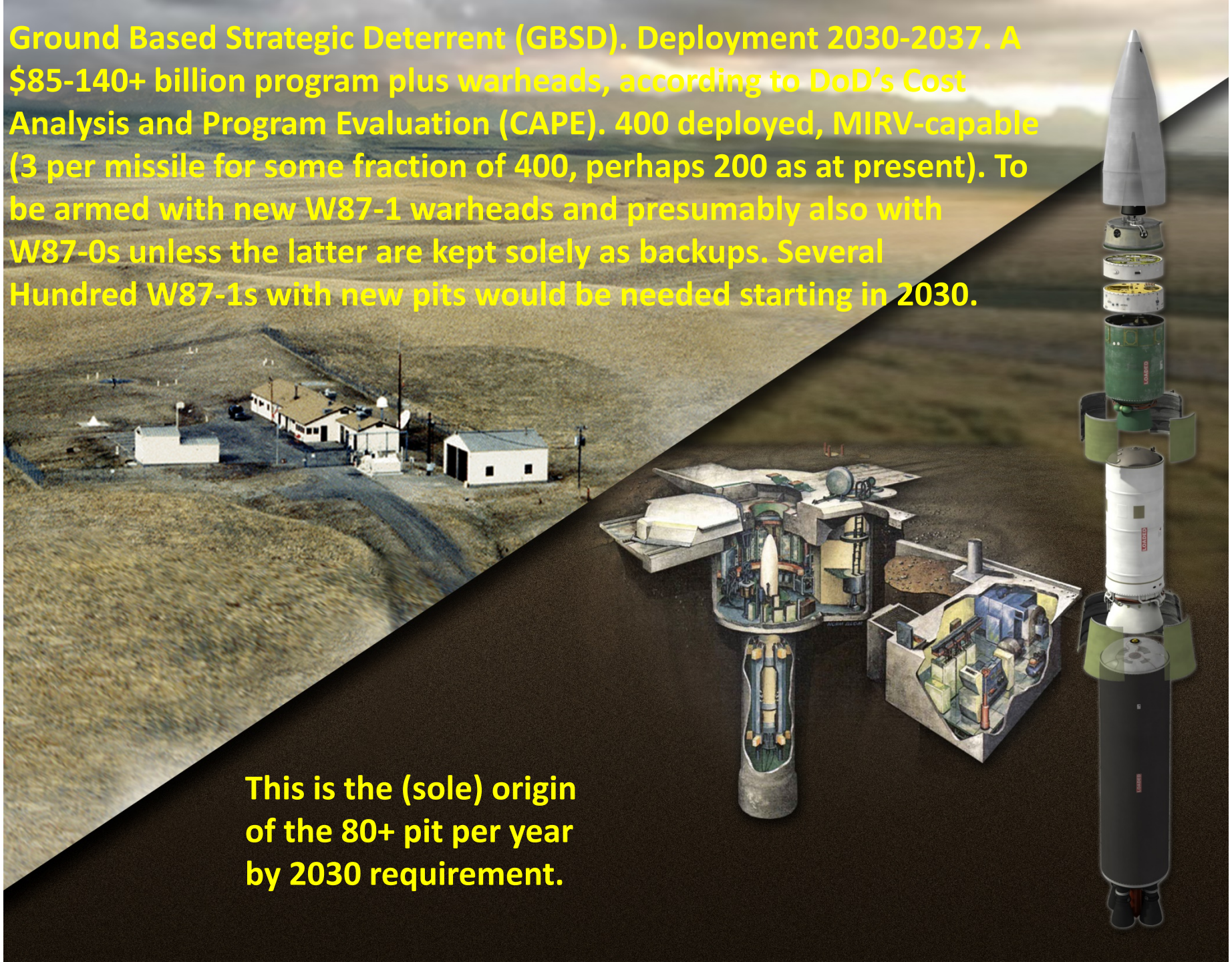
Mark 21/W87 on single RV MM III bus, the present deployment configuration.

This RV is too wide and heavy for MIRVing MM III.

MM III in operation.

Result.

Ground Based Strategic Deterrent (GBSD). Deployment 2030-2037. A $85-140+ billion program plus warheads, according to DoD's Cost Analysis and Program Evaluation (CAPE). 400 deployed, MIRV-capable (3 per missile for some fraction of 400, perhaps 200 as at present). To be armed with new W87-1 warheads and presumably also with W87-0s unless the latter are kept solely as backups. Several Hundred W87-1s with new pits would be needed starting in 2030.



This is the (sole) origin of the 80+ pit per year by 2030 requirement.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