# 2019 National Cleanup Workshop

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National Nuclear Security Administration
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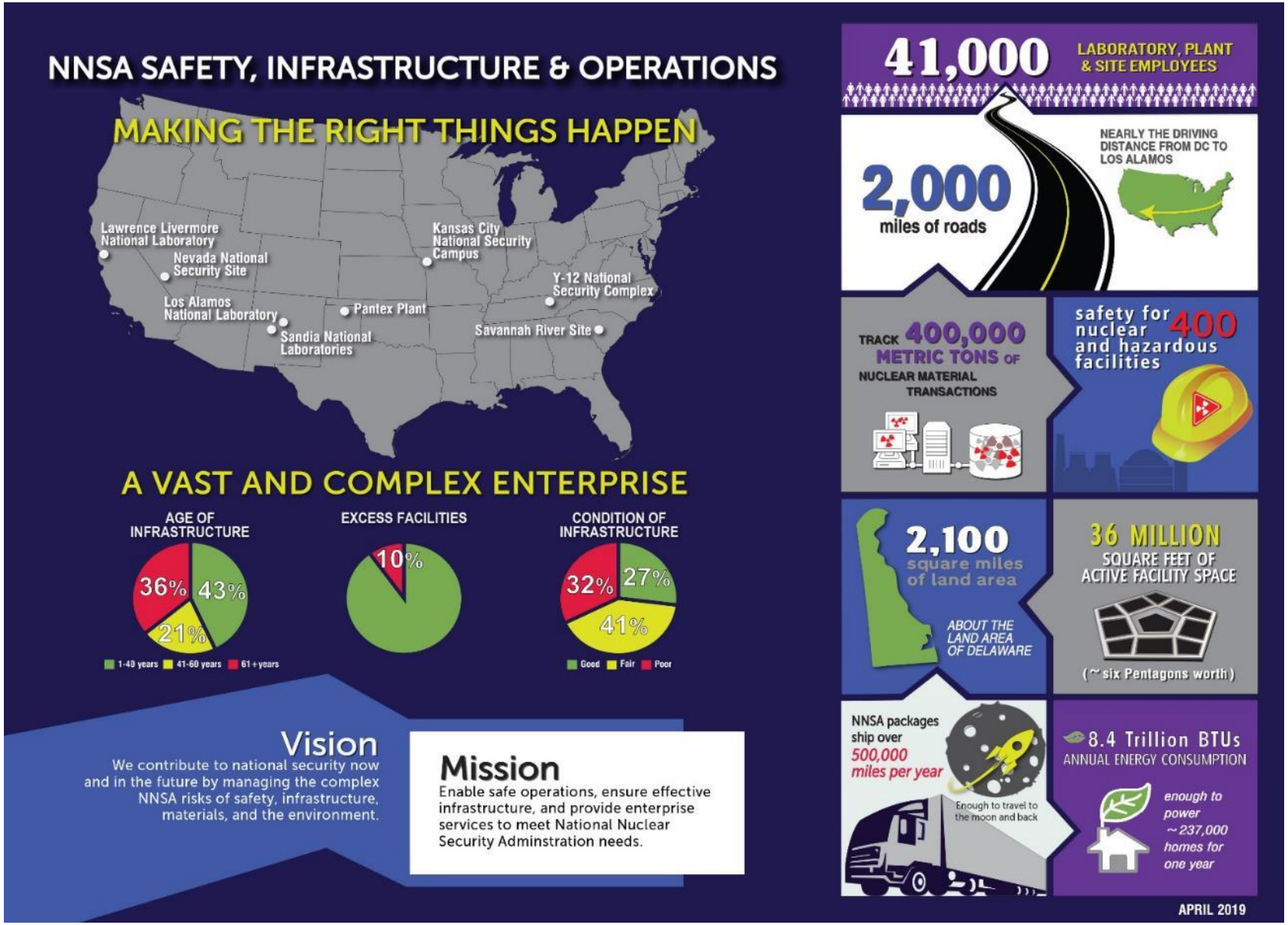
# OVERVIEW


NNSA SAFETY, INFRASTRUCTURE & OPERATIONS
MAKING THE RIGHT THINGS HAPPEN
Lawrence Livermore National Laboratory
Nevada National Security Site
Los Alamos National Laboratory
Sandia National Laboratories
Pantex Plant
Kansas City National Security Campus
Y-12 National Security Complex
Savannah River Site
A VAST AND COMPLEX ENTERPRISE
AGE OF INFRASTRUCTURE
36%
43%
21%
1-40 years
41-60 years
61+years
EXCESS FACILITIES
10%
CONDITION OF INFRASTRUCTURE
32%
27%
41%
Good
Fair
Poor
Vision
We contribute to national security now and in the future by managing the complex NNSA risks of safety, infrastructure, materials, and the environment.
Mission
Enable safe operations, ensure effective infrastructure, and provide enterprise services to meet National Nuclear Security Adminstration needs.
41,000
LABORATORY, PLANT & SITE EMPLOYEES
2,000
miles of roads
NEARLY THE DRIVING DISTANCE FROM DC TO LOS ALAMOS
TRACK 400,000 METRIC TONS OF NUCLEAR MATERIAL TRANSACTIONS
safety for 400 nuclear and hazardous facilities
2,100
square miles of land area
ABOUT THE LAND AREA OF DELAWARE
36 MILLION
SQUARE FEET OF ACTIVE FACILITY SPACE
(~six Pentagons worth)
NNSA packages ship over 500,000 miles per year
Enough to travel to the moon and back
8.4 Trillion BTUs
ANNUAL ENERGY CONSUMPTION
enough to power ~237,000 homes for one year
APRIL 2019

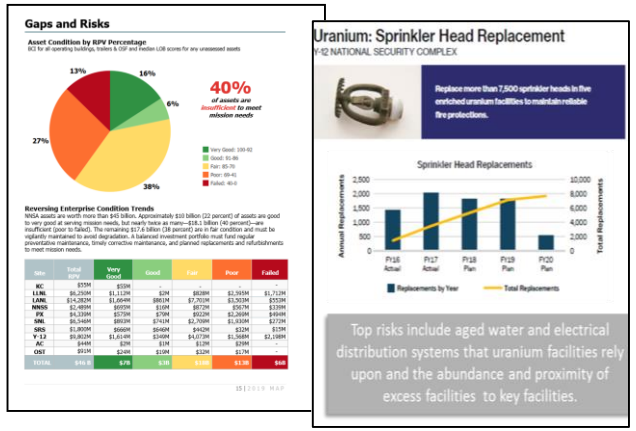
# INFRASTRUCTURE REVITALIZATION GOAL

A **science-based infrastructure stewardship** approach using risk-based, data-driven metrics to prioritize investments in order to enable the mission.

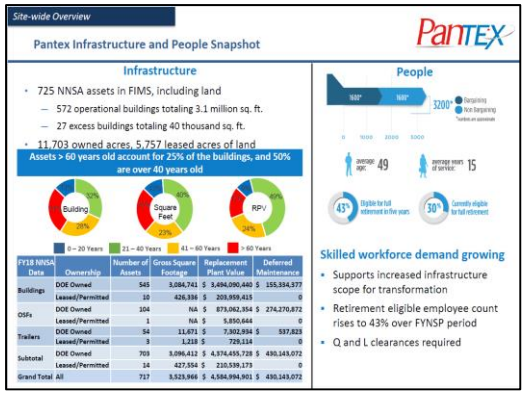
- **Tools**
  - BUILDER
  - Mission Dependency Index (MDI)
  - Enterprise Risk Management
  - Excess-Facility Risk Index
  - G2 Program Management System
  - Prioritization Methodologies

- **Planning**
  - Strategic Integrated Roadmap
  - SSMP Chapter 4
  - Master Asset Plan (MAP)
  - Deep Dives
  - CapAx
  - Area Plans
  - Disposition Strategic Plan

## Master Asset Plan



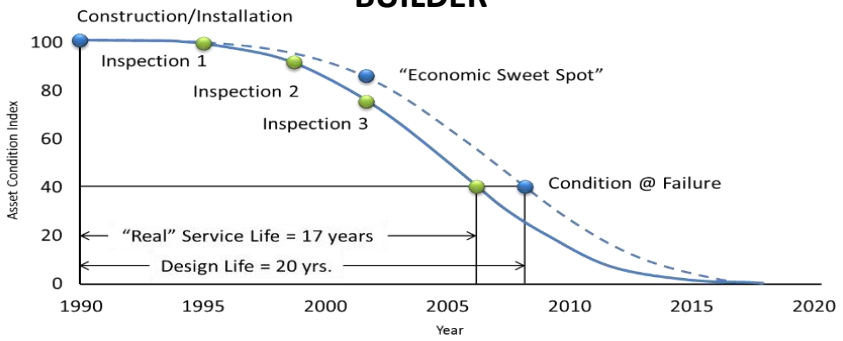

## Deep Dives



# TOOLS

A **science-based infrastructure stewardship** approach using risk-based, data-driven metrics to prioritize investments in order to enable the mission.

## BUILDER



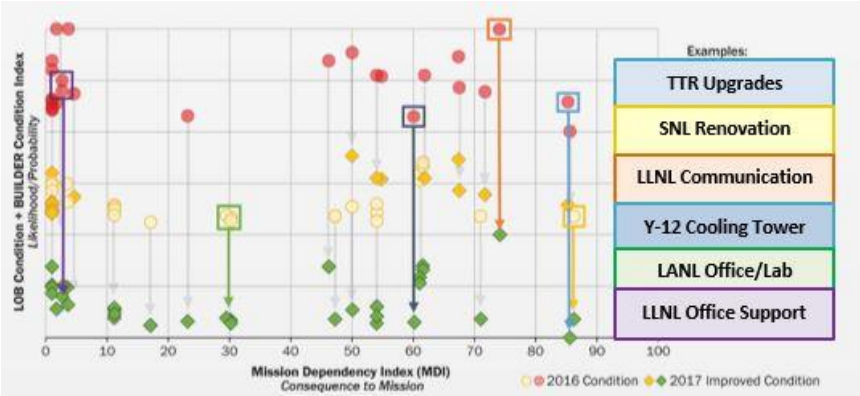

Measures likelihood of losing a facility

## Mission Dependency Index

| MDI | Site | Asset Name | Condition | Haz | RPV | GSF | Age |
|---|---|---|---|---|---|---|---|
| 100 | Y-12 | Production | 62 | 2 | $973.3M | 442.3k | 74 |
| 82 | Y-12 | Alpha 5 West | 86 | R | $97.6M | 70.0k | 52 |
| 62 | Y-12 | Production | 84 | 2 | $212.1M | 152.1k | 65 |
| 34 | Y-12 | DU Binary | 88 | 2 | $41.7M | 42.2k | 69 |
| 14 | Y-12 | Change Houses | 85 | 2 | $49.3M | 75.6k | 36 |

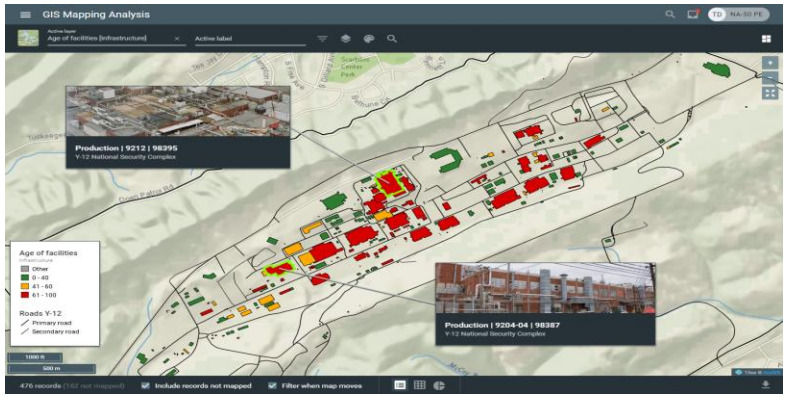
Measures mission impact if a facility is lost

## Enterprise Risk Management (ERM)




Highlights the risk posed by each asset and risk trending across the enterprise

## G2




Award-winning program management system and Program Management Plan (PMP)

# PLANNING

NNSA is using our **new tools to develop strategic and area plans** in order to drive prioritized, integrated infrastructure investments across the enterprise.

- **Prioritizing investments** with the greatest impact on mission via new tools
- Conducting **Deep Dives** at each site to better understand the long-term, requirements-based needs
- Publishing an annual **Master Asset Plan (MAP)** which is the integrated, NNSA-wide infrastructure strategic plan
- Developing detailed **Area Plans** to synchronize Maintenance, Recapitalization, Line-Item, and Leasing investments
- Increasing emphasis on timely **Disposition** of excess facilities to reduce mission risk, unencumber valuable site real estate, and save cost
- Emphasizing greater **project-level** planning prior to submission on funding

# PRIORITIZATION

A science-based infrastructure stewardship approach using risk-based, data-driven metrics to **prioritize investments in order to enable the mission**.

## Mission Dependency Index (MDI)

LANL Facilities

DARHT
MDI 99

EOC
MDI 47

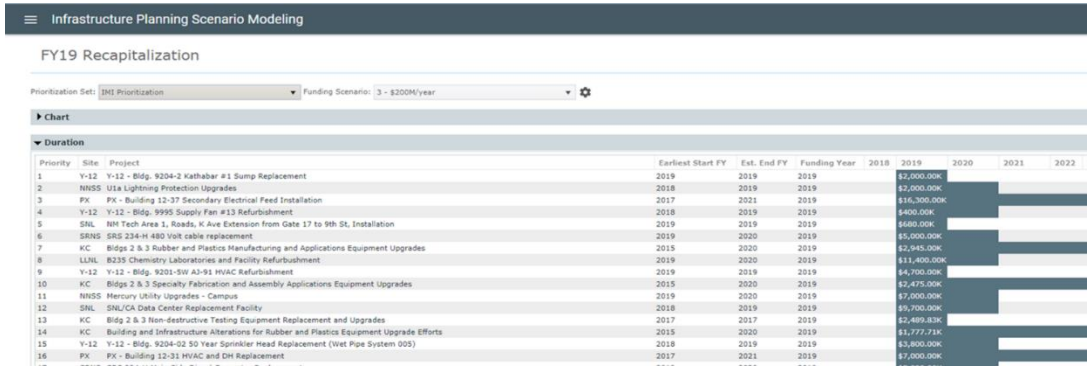
Otowi Building (Office Space)
MDI 13

## Maintenance Prioritization

MDI & BUILDER Standards & Policies

| Standard | | Policy | |
|---|---|---|---|
| **Level** | **CI** | **MDI** | **Building System** |
| Very High | 90 | 40-100 | Fire Protection |
| High | 80 | 1-39 | Fire Protection |
| | | 75-100 | Conveying |
| | | 75-100 | Roof |
| Medium | 70 | 1-74 | Roof |
| | | 40-74 | Conveying |
| Low/Default | 60 | 1-39 | Conveying |
| No repair/End of Life | 0 | 1-100 | Basement Construction |

## Recapitalization Prioritization

# NNSA Facility Disposition

- 2001 – 2013: Facilities and Infrastructure Recapitalization Program (FIRP) was NNSA's method for funding disposition
  - FIRP's focus on footprint and deferred maintenance reduction meant higher risk excess assets were not addressed
- In FY 2014, NA-50 reinvigorated direct funded disposition
  - 2014: $1.04M to disposition Y-12's 9744
  - 2015: $2.5M to disposition Y-12's 9808
  - 2015: $3M to disposition LANL's CASAs 2 and 3
  - Annual funding of ~$50M starting in 2017
  - NNSA has disposed of 5.7M GSF since 2014

9808 Before and After

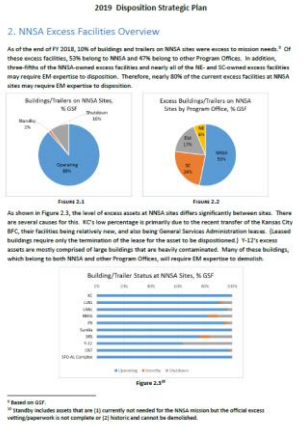
# Management Improvements

- NNSA is deploying new data-driven, risk-informed tools to create a science-based infrastructure stewardship model, which is being applied to facility disposition
- The tools include:
  - **Excess-facility Risk Index** – 1-100 score for excess facilities calculating the risk posed by structural and safety conditions; potential impact of contaminants; and proximity of the excess asset to workers, public, environmental receptors, and high importance facilities
  - **Disposition Strategic Plan** – annual plan laying out an integrated, enterprise-wide approach to address NNSA's aging Excess infrastructure reflecting the priorities documented in NNSA's Master Asset Plan

An ERI score of 70 – 100 indicates a High-Risk Facility

# DISPOSITION STRATEGIC PLAN

NNSA is using our new tools and authorities to develop strategic and area plans in order to drive **prioritized, integrated infrastructure investments** across the enterprise.


2019 Disposition Strategic Plan

2. NNSA Excess Facilities Overview

As of the end of FY 2018, 10% of buildings and trailers on NNSA sites were excess to mission needs.[1] Of these excess facilities, 53% belong to NNSA and 47% belong to other Program Offices. In addition, three-fifths of the NNSA-owned excess facilities and nearly all of the NE- and SC-owned excess facilities may require EM expertise to disposition. Therefore, nearly 80% of the current excess facilities at NNSA sites may require EM expertise to disposition.

Buildings/Trailers on NNSA Sites, % GSF

Excess Buildings/Trailers on NNSA Sites by Program Office, % GSF

FIGURE 2.1 FIGURE 2.2

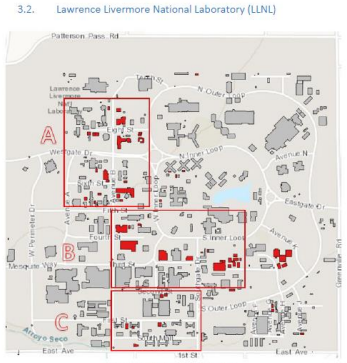
As shown in Figure 2.3, the level of excess assets at NNSA sites differs significantly between sites. There are several causes for this. KC's low percentage is primarily due to the recent transfer of the Kansas City BFC, their facilities being relatively new, and also being General Services Administration leases. (Leased buildings require only the termination of the lease for the asset to be dispositioned.) Y-12's excess assets are mostly comprised of large buildings that are heavily contaminated. Many of these buildings, which belong to both NNSA and other Program Offices, will require EM expertise to demolish.

Building/Trailer Status at NNSA Sites, % GSF

FIGURE 2.3[2]

[1] Based on GSF.

[2] Standby includes assets that are (1) currently not needed for the NNSA mission but the official excess vetting/paperwork is not complete or (2) historic and cannot be demolished.


3.2. Lawrence Livermore National Laboratory (LLNL)

Patterson Pass Rd

A

B

C

Greenville Rd

FIGURE 3.2.1 LLNL MAIN SITE OVERVIEW MAP

In FY 2018 and 2019, EM received $125 million to demolish building 280, Livermore Pool Type Reactor, and other excess facilities at LLNL. Building 280 is process contaminated with cracked reactor shielding and is one of LLNL's highest priorities for disposition. Other high-priority excess buildings in this area are the process contaminated building 175 (Mars E-Beam Facility), building 251 (Heavy Element Facility), and building 292 (Rotating Target Neutron Source). .

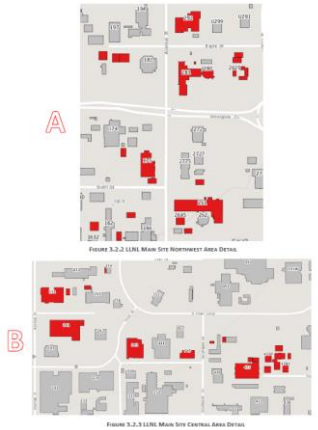

A

FIGURE 3.2.2 LLNL MAIN SITE NORTHWEST AREA DETAIL

B

FIGURE 3.2.3 LLNL MAIN SITE CENTRAL AREA DETAIL

## 4. NNSA Integrated Disposition Schedule

NNSA addresses risks through the Infrastructure and Operations budget, which includes Recapitalization, Maintenance and Repair, and Operations of Facilities, and through site indirect funds. The schedule below represents data from G2 as of the end of FY 2018, modified to incorporate some known changes. Gaps between funding years may indicate that planning, characterization, or risk reduction is taking place in advance of disposition funding. **The information below represents a strategic planning schedule based on currently available G2 data and does not constitute any definitive funding decisions.**

| # | Site Name | Project/Asset | ERI | # of Assets | GSF | Fiscal Year 20XX | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| 1 | KC | Bannister Federal Complex | 42 | 59 | 2,925,874 | | | | | O | | | | | | | | | | | | | |
| 2 | KC | Kirtland Ops NC-135 Site | 62 | 14 | 19,278 | | | | | O | | | | | | | | | | | | | |
| 3 | LLNL | Trailers 8710 and 2777 | | 2 | 1,954 | | | O | | | | | | | | | | | | | | | |
| 4 | LLNL | Trailer 2684, Cain | | 1 | 5,388 | | | | O | | | | | | | | | | | | | | |
| 5 | LLNL | B363 (SC) | 74 | 1 | 1,584 | | | | RR | O | | | | | | | | | | | | | |
| 6 | LLNL | B175 Mars E-Beam Facility* | 86 | 1 | 16,656 | | | | RR | RR | | | | | Δ | | | | | | | | |
| 7 | LLNL | B241 Pluto Project Testing & Fabrication* | 100 | 1 | 54,369 | | | | RR | RR | RR | | | | Δ | | | | | | | | |
| 8 | LLNL | B212 Accelerator & Remaining Foundation* | 82 | 2 | 3,770 | | | | RR | RR | RR | | | | | Δ | | | | | | | |
| 9 | LLNL | B343 Explosives & High Pressure Testing Fac* | 96 | 1 | 27,368 | | | | RR | | | | | | | Δ | | | | | | | |
| 10 | LLNL | B280 Complex: 280*, T2801, T2802, T2825 (EM) | 100 | 4 | 13,627 | | | | RR | | | | Δ | | | | | | | | | | |
| 11 | LLNL | B292 Rotating Target Neutron Source* | 96 | 3 | 26,528 | | | | RR | RR | RR | | | | | Δ | | | | | | | |
| 12 | LLNL | B251*/T2552 Heavy Element Facility | 100 | 2 | 33,228 | | | | RR | RR | RR | | | | | | Δ | | | | | | |
| 13 | LLNL | Building 221, Chemistry Facility | | 1 | 1,764 | | | | O | | | | | | | | | | | | | | |
| 14 | LLNL | Trailers and Mods | | 3 | 2,970 | | | | O | | | | | | | | | | | | | | |
| 15 | LLNL | Building 2679, HC Training Center | | 1 | 12,611 | | | | O | | | | | | | | | | | | | | |
| 16 | LLNL | T6424 and T6426 | | 2 | 2,490 | | | | | O | | | | | | | | | | | | | |
| 17 | LLNL | B435, B446, T4475 AVLIS* | 86 | 3 | 63,642 | | | | | RR | | | RR | RR | | | | Δ | | | | | |
| 18 | LLNL | B261 Z Division/NAI* | 74 | 1 | 52,655 | | | | | RR | | | | | | | | | | Δ | | | |
| 19 | LLNL | B243 Energy & Environment Lab* | 92 | 1 | 20,000 | | | | | RR | | | | | | | | | | | | | |
| 20 | LLNL | Excess Trailers & Mods | | 11 | 7,306 | | | | | O | | | | | | | | | | | | | |

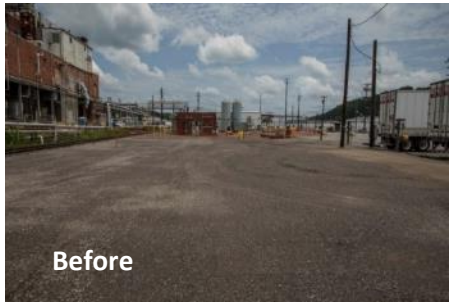
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| O | Disposition Complete | Δ | Planned Disposition Completion | * | Process-Contaminated | RR | Risk Reduction | (XY) | Non-NNSA Facility |
| | NA-50 Funded | | Indirect funded | | Funded by Other Program | | Ready for EM funded Disposition | | |

**Table 2.4 - High-Risk Excess Facilities on NNSA Sites**

| # | 2018 # | Program Office | Site | Property Name | GSF | Year Built | Excess Year | Est. Disposition Year | ERI |
|---|---|---|---|---|---|---|---|---|---|
| | Indicates current risk reduction or disposition preparation projects | | | | | | | | |
| | Indicates current direct funded demolition projects | | | | | | | | |
| 1 | 1 | NNSA | Y-12 | Alpha 5, Building 9201-05* | 612,842 | 1944 | 2008 | 2028 | 100 |
| 2 | 2 | NNSA | Y-12 | Beta 4, Building 9204-04* | 313,771 | 1945 | 2014 | 2025 | 100 |
| 3 | 1* | EM | LLNL | Livermore Pool Type Reactor, Building 280* | 5,469 | 1956 | 2007 | 2022 | 100 |
| 4 | 3 | NNSA | LLNL | Heavy Element Facility, Building 251* | 31,128 | 1956 | 2014 | 2026 | 100 |
| 5 | 4 | NNSA | LANL | Ion Beam Facility, Building 03-0016* | 56,259 | 1953 | 1999 | 2031 | 100 |
| 6 | 5 | NNSA | LANL | Lab/Office, Building 46-0001* | 29,069 | 1956 | 2010 | 2020 | 100 |
| 7 | 3* | EM | Y-12 | Building 9201-04, Alpha 4* | 510,218 | 1945 | 2016 | 2032 | 100 |
| 8 | 4* | NE | Y-12 | Building 9204-03, Isotope Separations* | 255,656 | 1945 | 2012 | 2036 | 100 |
| 9 | 5* | SC | Y-12 | Building 9201-02, Fusion Energy Building* | 324,448 | 1944 | 2015 | 2037 | 100 |
| 10 | 6* | SC | Y-12 | Building 9204-01, Fusion Energy-Eng. Tech* | 210,491 | 1944 | 2015 | 2038 | 100 |
| 11 | 6 | NNSA | Y-12 | Production, Building 9206* | 57,812 | 1944 | 2014 | 2030 | 96 |
| 12 | 7 | NNSA | LLNL | Rotating Target Neutron Source, Building 292* | 20,811 | 1979 | 2017 | 2025 | 96 |
| 13 | 8 | NNSA | Y-12 | Storage, Building 9720-22* | 12,712 | 1966 | 2014 | 2019 | 96 |
| 14 | 9 | NNSA | Y-12 | Warehouse/Industrial, Building 9720-17* | 4,314 | 1956 | 2014 | 2020 | 96 |
| 15 | 11 | NNSA | LLNL | Pluto Project Testing & Fabrication, Building 241** | 54,369 | 1960 | 2017 | 2027 | 92 |
| 16 | 7* | SC | Y-12 | Building 9207, Biology* | 256,660 | 1945 | 2000 | 2021 | 92 |
| 17 | 8* | SC | Y-12 | Building 9422, Helium Compressor Bldg. | 2,671 | 1980 | 2004 | 2038 | 92 |
| 18 | 10* | SC | Y-12 | Building 9207 Annex* | 8,108 | 1965 | 2000 | 2021 | 92 |
| 19 | 11* | SC | Y-12 | Building 9210, Mammalian Genetics* | 64,737 | 1945 | 2004 | 2021 | 92 |
| 20 | 13 | NNSA | LANL | Plastics Building 16-0306* | 19,639 | 1954 | 2009 | 2021 | 91 |
| 21 | 14 | NNSA | LANL | Rad Liquid Waste Disposal, Building 21-0157* | 4,227 | 1967 | 2009 | 2032 | 91 |
| 22 | 15 | NNSA | LLNL | Mars E-Beam Facility, Building 175** | 16,656 | 1980 | 2017 | 2023 | 86 |
| 23 | 12* | SC | LLNL | Fusion Research, Building 435* | 57,723 | 1960 | 2014 | 2026 | 86 |
| 24 | 13* | SC | Y-12 | Building 9767-06, Utilities* | 400 | 1967 | 2002 | 2021 | 86 |
| 25 | 14* | SC | Y-12 | Building 9767-07, Utilities* | 393 | 1968 | 2002 | 2021 | 86 |
| 26 | 16 | NNSA | Y-12 | Bag Filter System, Building 9828-01* | 557 | 1973 | 2015 | 2019 | 86 |
| 27 | 17 | NNSA | Y-12 | Bag Filter House, Building 9828-03* | 568 | 1973 | 2015 | 2019 | 86 |
| 28 | | NNSA | LANL | Hot Waste Pump House, Building 03-0154* | 400 | 1962 | 2015 | 2029 | 86 |
| 29 | | NNSA | LANL | Bunker 14-0005* | 358 | 1944 | 1994 | 2030 | 85 |
| 30 | | NNSA | LANL | Control Building 15-0027* | 560 | 1947 | 1992 | 2027 | 85 |
| 31 | 18 | NNSA | LLNL | Accelerator Facility, Building 212* | 3,770 | 1943 | 2017 | 2025 | 82 |
| 32 | 29 | NNSA | SRS | Manufacturing Building 232* | 71,966 | 1955 | 2013 | 2041 | 82 |
| 33 | 19 | NNSA | LLNL | Explosives & High Pressure Testing, Building 343** | 27,368 | 1960 | 2014 | 2025 | 82 |
| 34 | 15* | EM | Y-12 | Building 9213, Criticality Laboratory* | 23,635 | 1951 | 2016 | 2033 | 80 |
| 35 | 20 | NNSA | LANL | Ice House, Building 41-0004* | 21,960 | 1952 | 2010 | 2022 | 80 |
| 36 | 22 | NNSA | Y-12 | Tanker Transfer Station 9811-04* | 1,112 | 1989 | 2014 | 2019 | 74 |
| 37 | 24 | NNSA | Y-12 | Decon Shower Facility, Building 9983-HF* | 375 | 2004 | 2008 | 2020 | 74 |
| 38 | 25 | NNSA | LLNL | Z Division/NAI, Building 261* | 52,656 | 1954 | 2014 | 2028 | 74 |
| 39 | | NNSA | SRS | Pressure Testing Facility, Building 236* | 1,622 | 1966 | 2018 | 2022 | 74 |
| 40 | | NNSA | LANL | Lab Building 16-0460** | 12,405 | 1953 | 2010 | 2021 | 74 |

# New Authority

## PROCESS-CONTAMINATED DISPOSITION





Y-12 Building 9404-20



Y-12 9720-24 Demolition



LANL TA-16-0280

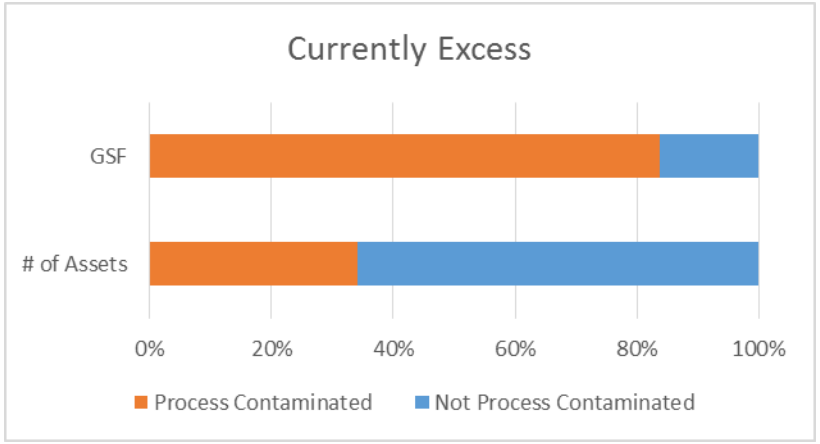


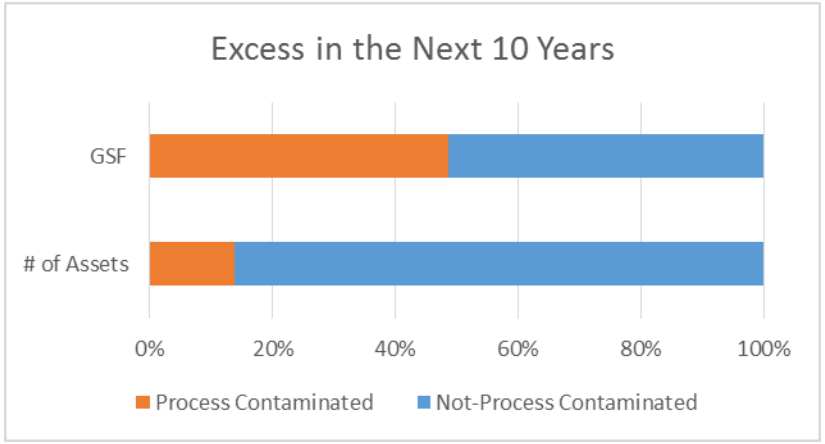
LANL TA-46-0001

- In FY 2018, NNSA received authority to disposition process-contaminated facilities under $50M to help:
  - Reduce risk to mission by disposing of small excess facilities near mission work
  - Freeing up prime real estate for NNSA to build new facilities on
- Most of these disposition projects are in the $2M to $3M range

# Disposition Next Steps

- Continue to stabilize and reduce risk at process-contaminated facilities until EM can address them
- Current excess on NNSA Sites
  - 3.5M GSF
  - 384 assets
  - 84% GSF process-contaminated
- Excess in the next 10 Years will add
  - 2.3M GSF
  - 413 facilities
  - >50% GSF process-contaminated



# CONCLUSION



- Data-Driven, Risk-informed Planning
- Real World Changes
- Increase in Resources, Support, and Authority
- Continuous Improvement
- Still More to Do

We did not get into the situation overnight
And we will not get out of it overnight.