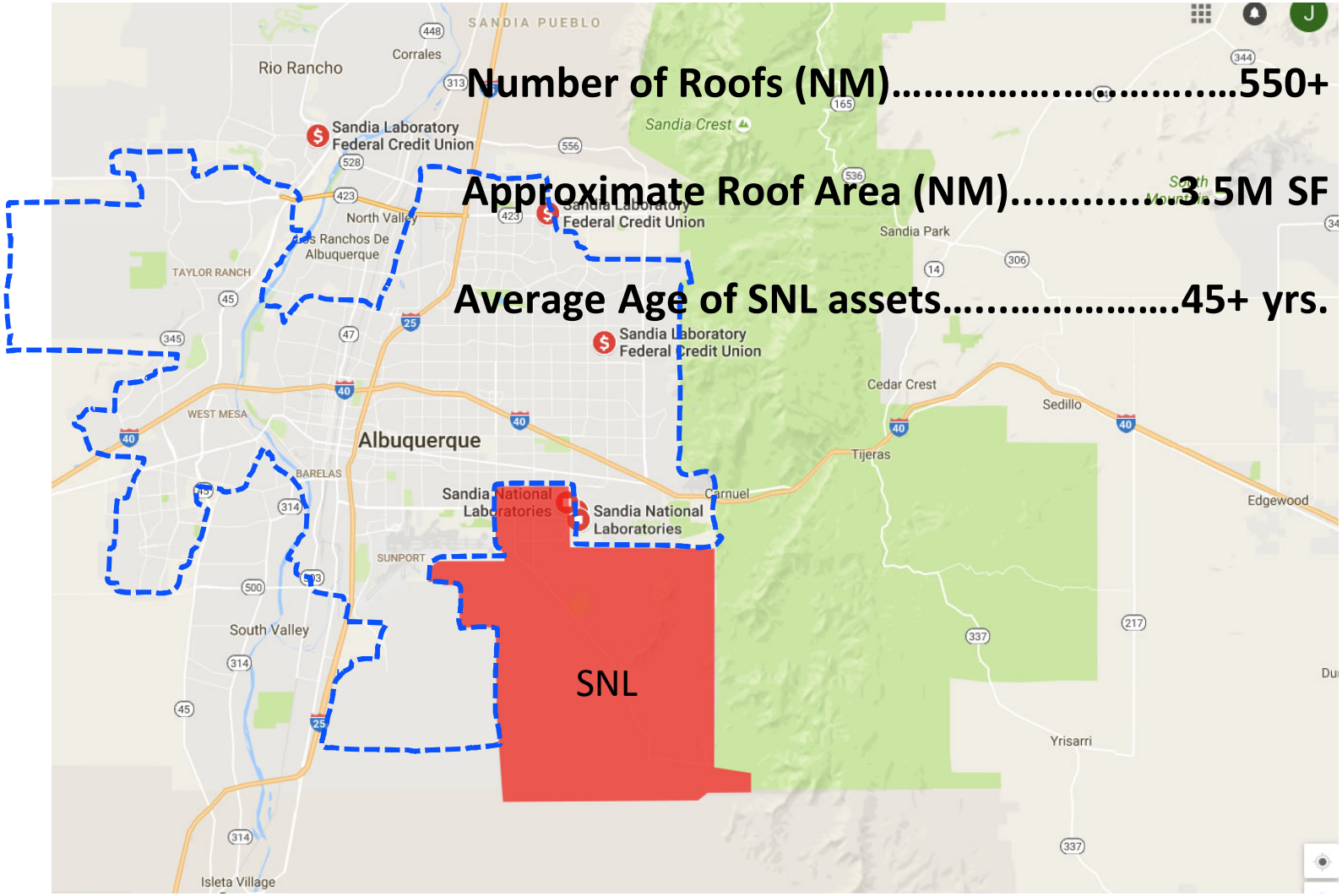
SAND2017-11237C

Sandia National Laboratories – Albuquerque, NM / Livermore, CA / Tonopah, NV / Kauai, Hawaii

Agenda

- FY17 Design/Construction
- Issues & Lessons Learned
- Deferred Maintenance Reduction
- FY18 Design/Construction
- FY19 Anticipated Construction
- Site Support Costs
- SNL-NM Initiatives and Outlook

Site Vicinity Map



FY17 Construction

RAMP .....51,500 SF total

- Building 868 – Systems Research Building
- Building 6588 – Annular Core Research Reactor
- Building 03-69 (TTR) – Med Clinic & Fire Department
- Building 03-51 (TTR) – Administration Building (coating, repairs)

INDIRECT FUNDING .....297,000 SF total

- Building 963 (phase I) – Strategic Defense Facility (Tech Area IV)
- Building 890 – Instrument System Lab
- Building 802 – Admin & Development Lab (FY17-18)
- Building 880 – Computing Test Field (FY17-18)

FY17 Design

RAMP.....227,500 SF total

- Building 870 – Neutron Generator Production Facility
- Building 983 – Particle Beam Fusion Lab
- Building 858EL – Mesa Micro-Fab East

INDIRECT FUNDING.....270,200 SF total

- Building 859
- Building 6590
- Building 981
- Building 809
- Building 6620
- Building 956
- Building 986
- Building 9939
- Building 6594
- Building 820
- Building 6530
- Building 518
- Building 6593
- Building 9984
- Building 801
- Building 864
- Building 829
- Building 831

Indirect funded projects at SNL…

SNL is a very “multi-mission” environment. As a result, we have always executed extensive indirect funded work. As a result of our cost accounting standards in the M&O contract we are prohibited from transferring indirect funds to RAMP.

In order to address the extensive roofing needs at SNL, we rely on a variety of funding sources to address our needs.

Building 868 (before)

Systems Research Bldg.

- Partially failed coating
- Inadequate support of conduits
- Many poor transition details without proper weather protection

Building 868 (after)

25,600 sf

- 80-mil fleece-back TPO
- Added metal coping to parapets
- Replaced conduit, pipe, and duct supports

Building 6588 (before)

Annular Core Research Reactor

- Severe weathering of existing roof coating
- Extensive equip/utilities on roof (some abandoned)
- SNL executed a utility relocation project prior to roofing activities

Building 6588 (after)

14,100 sf

- 80-mil fleece-back TPO
- Removed abandoned-in-place conduits, hatches, curbs, etc.
- New conduit, pipe, and duct supports

TTR 03-51

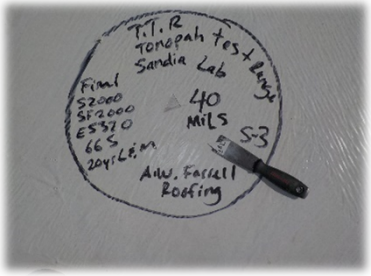
Admin Bldg

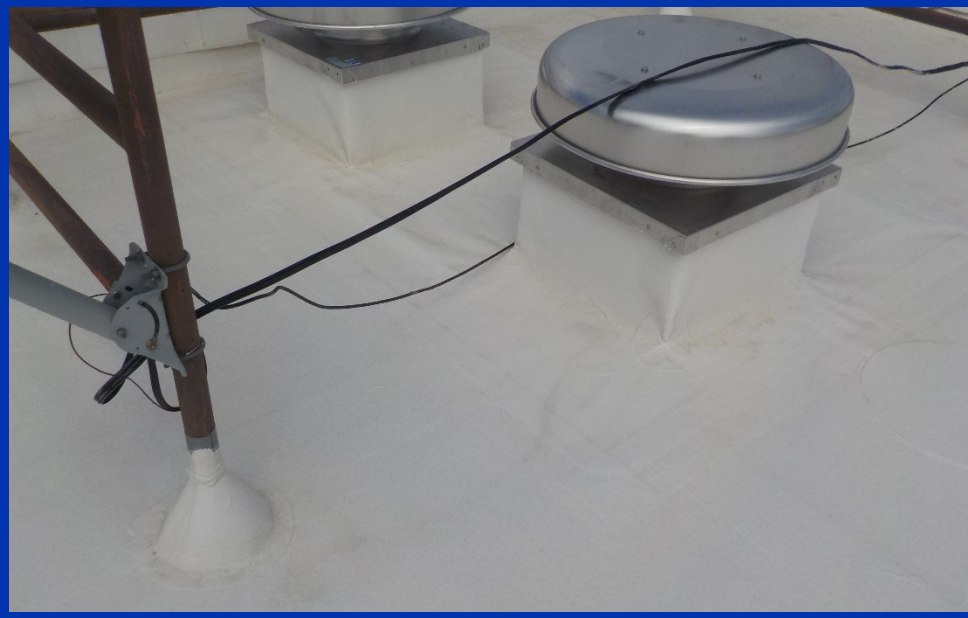
5,810 sf

After

Before

- Single-ply at end of life expectancy
- Opted for a life extension silicone coating





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TTR 03-69

Medical Clinic & Fire Dept. Bldg.

5,830 sf

Before

- Existing BUR – very leaky and past useful life
- Replaced with 80-mil TPO
- Had to replace a section of metal deck

After

Building 963 (ph II)

Strategic Defense Facility

24,200 sf

- 80-mil fleece-back TPO
- Removed abandoned-in-place conduits, hatches, curbs, etc.
- Replaced some gas piping as part of project

During

TPC: $3.5M

After

Building 890

Instrument System Lab

28,800 sf

Need project TPC

After

Before

- 80-mil fleece-back TPO (SNL standard)
- Replacement of parapet copings
- Removal of abandoned items

FY17 Construction Projects (Indirect)

Building 802

Admin & Development Lab

38,000 sf

Need project TPC

During

Before

- One of SNL's leakiest roofs
- 80-mil fleece-back TPO
- Issues with Firestone membrane (excessive rippling)
- Historic bldg. – necessitated unique overflow drain details
- Many roof walkways and obstructions

Building 880

Computing Test Field

206,000 sf

Need project TPC

After

Before

- Extensive leak history
- 80-mil fleece-back TPO (SNL standard)
- Extensive work to penthouses
- Poor drainage addressed
- New conduit, pipe, and duct supports

Issues/Lessons Learned

- Lack of anticipation on the 6588/6580 intersections and subsequent leaks on 6580
- Better coordination with SNL mechanical engineers regarding scope of work required for mechanical mods
- Significant problems with Firestone TPO has caused us to suspend its use at SNL
- Better coordination with SNL electrical engineers regarding scope of work for electrical mods (specifically conduits)
- SNL to turn PCR's & CO's around more quickly

DM – FY17 Projects

Building	Year Built	DM reduction
868	1951	$1,395,996
6588	1964	$840,336
890	1989	$1,473,905
963	1983	$1,758,600
802	1951	$429,152
880	1953	$153,871

FY18 RAMP (Design)

- Building 858S – Microelectronics Lab
- Building 6586 – Gamma Irradiation Facility
- Building 810 – Center for Nat'l. Security & Arms Cntrl.
- Building 821 – Nuclear Safeguard Security Lab
- Building 823 – Systems Research & Development
- Building 827 – Weapons Prod. Primary Standards Lab

FY18 RAMP (Construction)

- Building 878 – Process Development Lab
- Building 961 – Reactor Support Facility
- Building 858EL – Mesa Micro-Fab East

FY18 INDIRECT (Construction)

- Building 859
- Building 6590
- Building 981
- Building 809
- Building 6620
- Building 956
- Building 986
- Building 9939
- Building 6594
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- Building 864
- Building 829
- Building 831

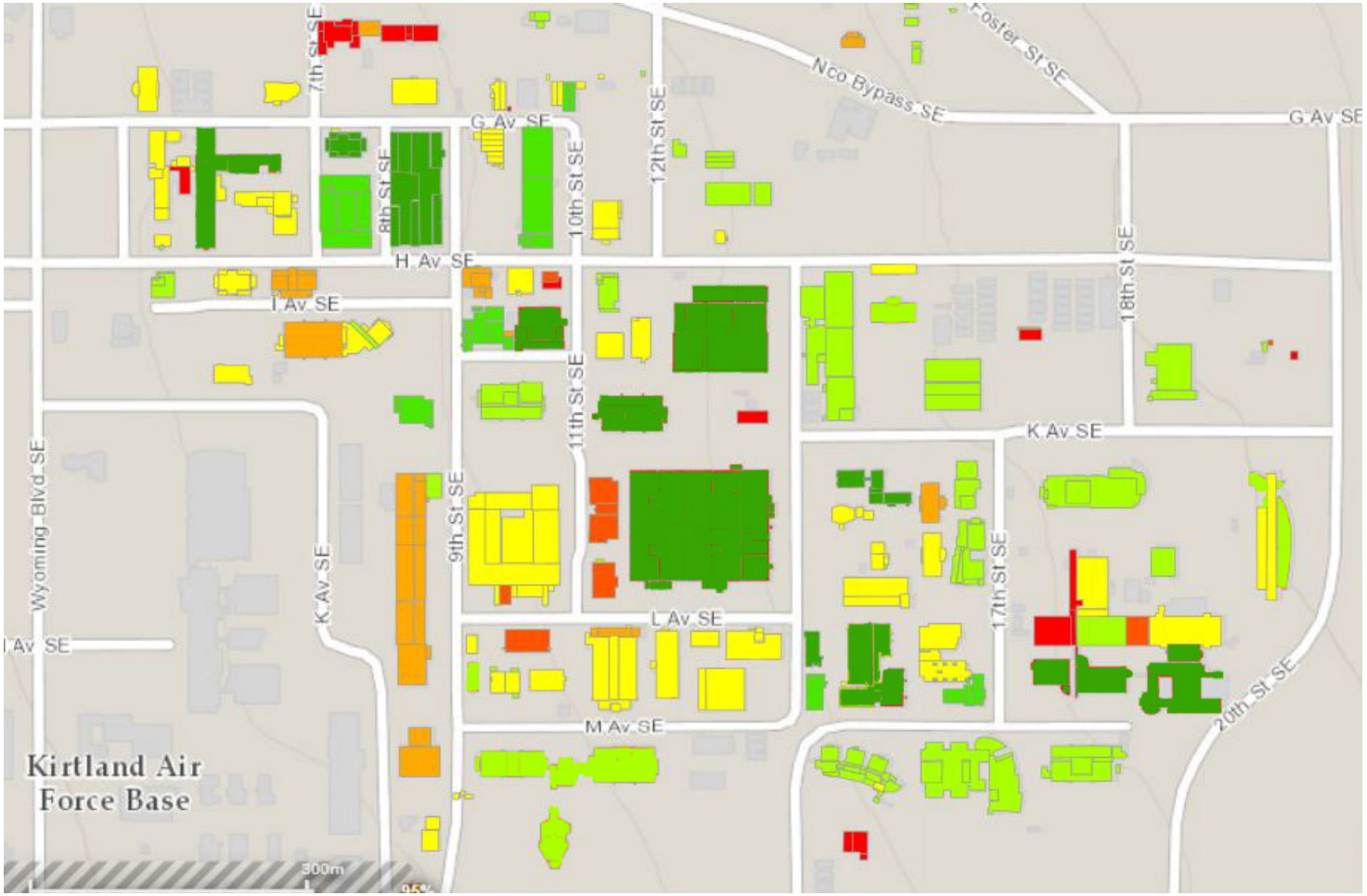
FY19 RAMP (Design)

- TBD

FY19 RAMP (Construction)

- Building 858EL – Mesa Micro-Fab East
- Building 870 – Neutron Generator Production Facility
- Building 983 – Particle Beam Fusion Lab
- Building 858S - Microelectronics Lab

TA-1; 3-4 yr. transformation



FY18

FY17

FY16

Recoating Projects

- $3.50-4.50 / SF…about 12-18% the cost of a new roof
- 10, 15, or 20 year warranties
- Silicone product that is unaffected by ponded water

Program Recommendations

- Need better partnering with Technical Assurance on designs
  - sites can only catch so much during review
  - would like to see more ownership of the design by T.A.
  - is T.A. using the pre-design checklist we assisted with?
  - T.A. site manager would benefit from always checking-in with SNL team when on site
- We are seeing better quality designs overall from past years
- Year-end summary of projects & costs for each site?

FY17 Construction Costs (SNL/NM1)

RAMP …….51,500 SF total

- Building 868 – Systems Research Building
- Building 6588 – Annular Core Research Reactor

Cost/SF = approx. $44/SF per NM 1 award?

Site	Construction Costs
SNL-NM	
SNL-NM 1	$2,285,000
SNL-TTR	
SNL-TTR Base Bid	$325,810
SNL-TTR 1 Bid Alt	$170,080

SNL-NM construction dollar site split award per Ron Schultz 1/17/17

Thanks!

We've had a productive year and we could not have done it without your support. Thanks RAMP and Technical Assurance!

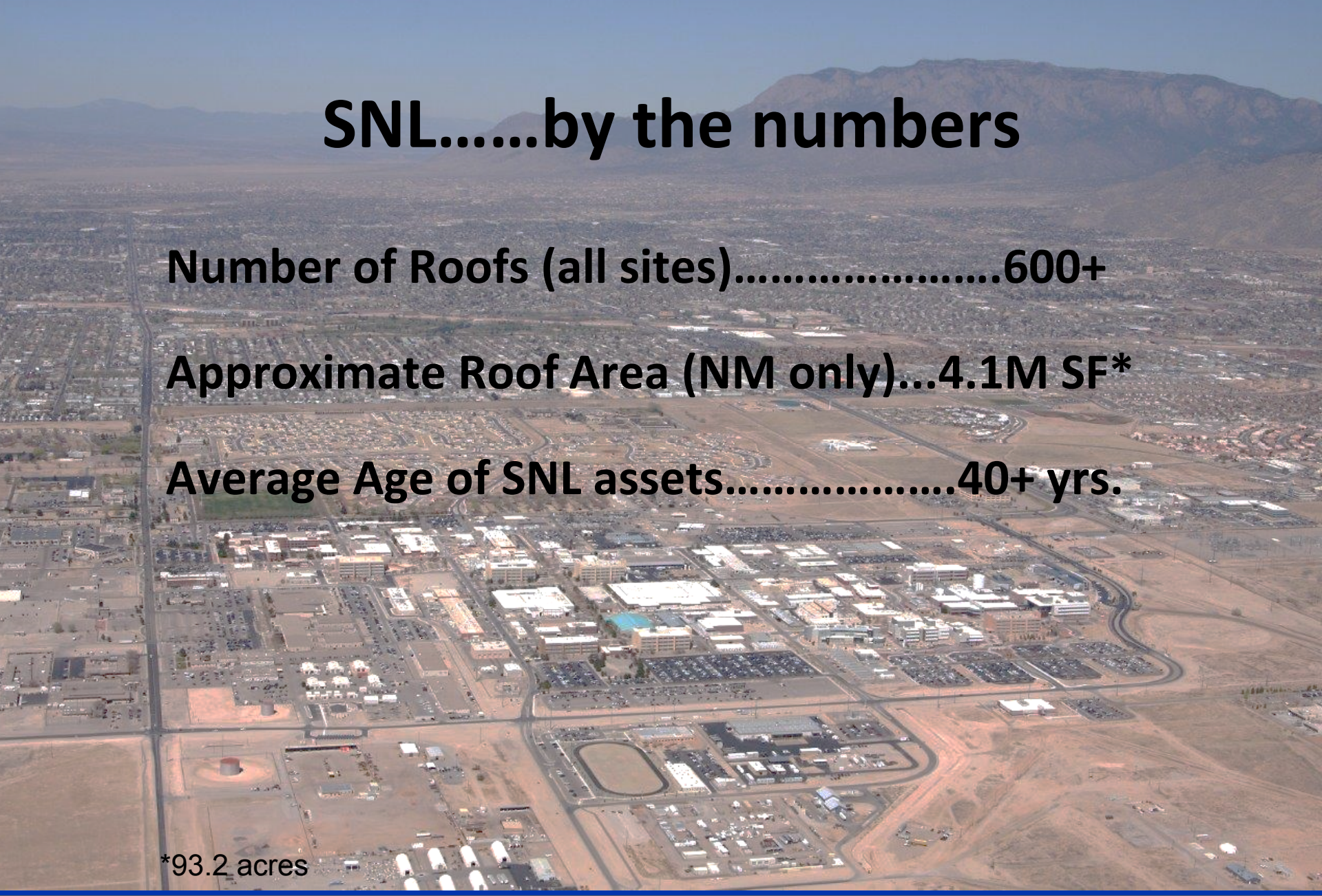

Questions / Comments?

SNL……by the numbers

Number of Roofs (all sites)……600+

Approximate Roof Area (NM only)…4.1M SF*

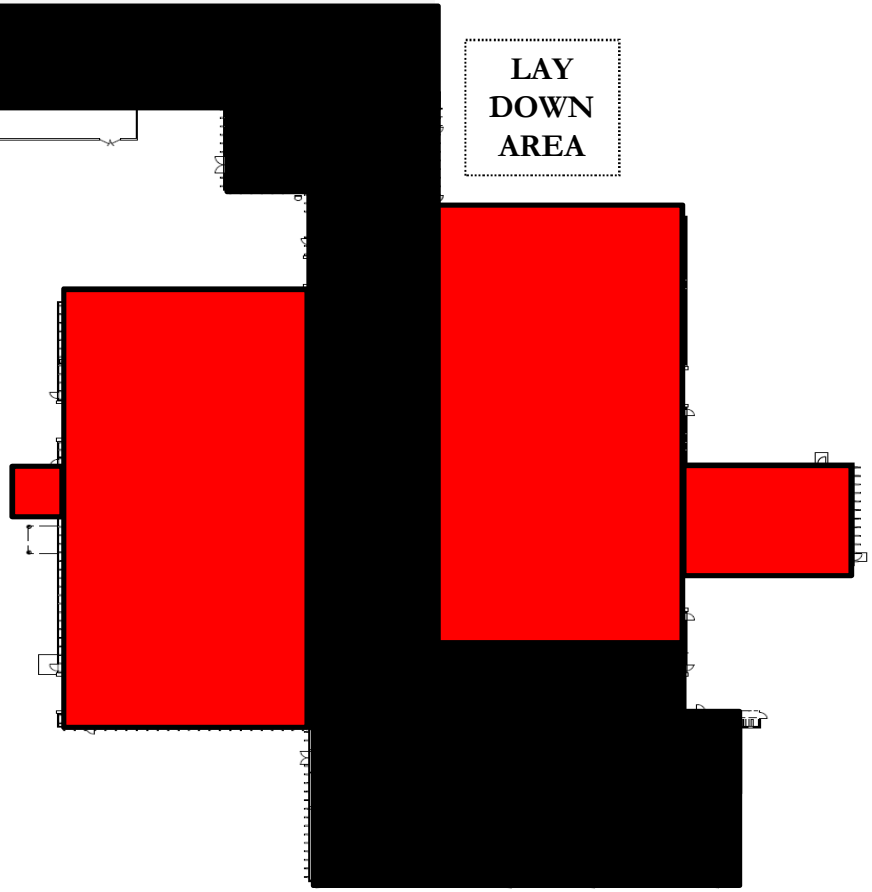
Average Age of SNL assets……40+ yrs.



*93.2 acres

Building 963; phase II (before)

Areas are not included in this phase/scope



FY17 Estimated Site Support Costs

Project Management & Operations Engineering	2%
Inspection	3%
Escorts/Security	11%
Construction Management	2%
ES&H	1%
Sum of Estimated Site Support Costs	**19%**

SNL Roof System Plan

Site	Bldg No.	Prop Name	Area Name	Yr. Built	Tot Bldg Area (GSF)	Tot Roof Area (GSF)	Type of Roof	Roof Cond Index (AVG)	POF Cond Index score	CAIS score (FCI index)	Yr of Latest Roof Install	Optimal FY for re-roof	Est cost of replacement	Indirect TPC	most recent roof inspect.	Current Roof Age	POF roof age	Bldg. Occs.	POF bldg Occs	% Lab	FC lab %	SR's[1] 1/1/13-1/1/15	Maint Freq	FC maint freq	Recoated (Y=Compl)	estimated recoat cost	Bldg Classification	MDI	FC bldg class (2)	Overall priority roof	Agg FY	Conserv. FY	Source	DM
														1.70																	FY18-21	FY18-24		
SNL-NM	878	Process Development Lab	TA-1	1989	138,298	91,278		5.00	10.00	90%		2018	$2,555,784	$4,344,833		27.0	5	107	4	72.7	4	10	0.110				mission critical	81.70	6.75	29.75	18	18	RAMP	
SNL-NM	890	Inst System Lab	TA-1	1989	147,438	28,635		5.00	10.00	90%	1993	2017	$859,050	$1,460,385		23.0	5	326	5	49.0	3	12	0.419				mission depend, not critical	66.70	5.25	28.25	17	17	Indirect	
SNL-NM	963	Strategic Defense Facility	TA-4	1995	87,818	85,556		4.27	8.54	65%	1995	2016	$2,737,792	$4,654,246		21.0	5	18	2	91.3	5	21	0.245				mission critical	99.30	7.50	28.04	17	17	Indirect	
SNL-NM	894	Receiving, Power Supplies	TA-1	1950	105,660	86,363	PVC	3.94	7.88	50%	1995		$2,418,164	$4,110,879		21.0	5	142	4	54.1	4	15	0.174				mission critical	84.30	6.75	27.63	18	18	Indirect	
SNL-NM	6590	Sandia Pulsed Reactor Facility	TA-5	1961	1,190	1,158		4.50	9.00	75%	1960		$86,850	$147,645		56.0	5		1	100.0	5	1	0.864				mission critical	91.00	7.50	27.50	18	18	Indirect	147,645
SNL-NM	880-A	Computing, 880 Annex	TA-1		50,197	40,000	HYP + PVC (zone 5)	5.00	10.00	90%	1990		$1,200,000	$2,040,000		26.0	5	14	2	87.7	5	0	0.000				mission depend, not critical	67.30	5.25	27.25	17	17	Indirect	
SNL-NM	858-EL	Mesa Micro-Lab East Lab	TA-1	2006	171,498	39,901		5.00	10.00	90%	2000		$1,197,030	$2,034,951		16.0	4	313	5	34.0	3	13	0.326				mission depend, not critical	53.60	4.50	26.50	18	18	RAMP	
SNL-NM	959	Waste Management Facility	TA-2	1987	1,911	3,139		5.00	10.00	90%	1988		$94,170	$160,089		28.0	5	1		86.1	5		0.000				mission depend, not critical	70.10	6.00	26.00	18	18	Indirect	
SNL-NM	983	Particle Beam Fusion Lab	TA-4	1983	51,164	46,735		4.19	8.38	65%	2000		$1,402,050	$2,383,485		16.0	4	4	1	94.7	5	9	0.193				mission critical	95.90	7.50	25.88	19	19	RAMP	

- Complete with NM, CA, & TTR in database
- Allows objective prioritization across each site
- More granularity than RAMP database – allows SNL to manage entire asset portfolio across different funding sources