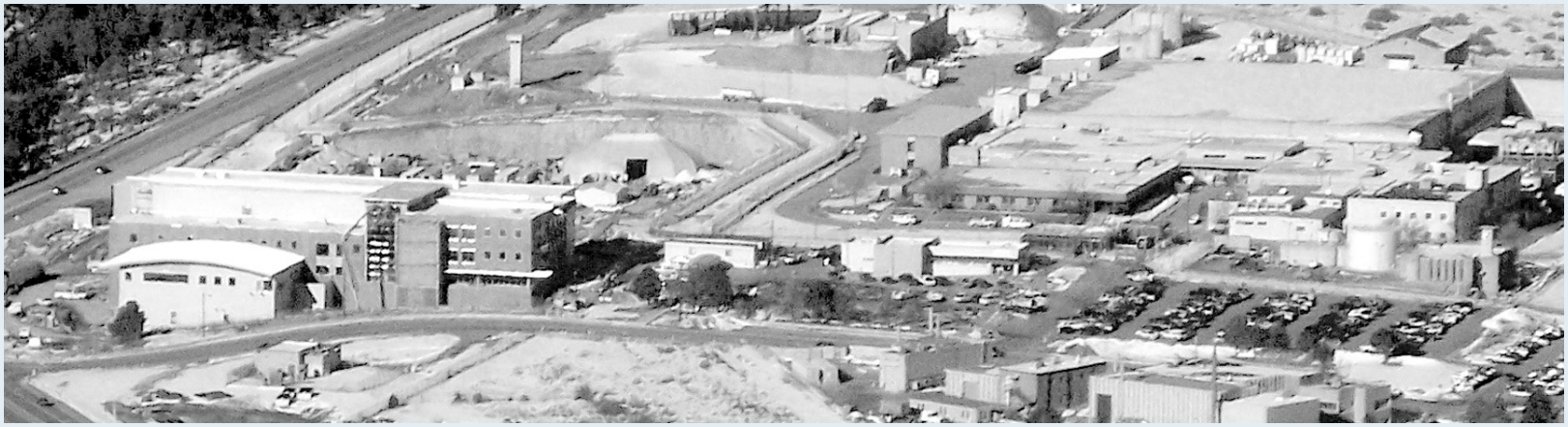
Interested Parties CMRR Presentation September 20, 2011



Welcome to our 12th Meeting!

This is the 12th semi-annual public meeting required as part of a 2005 settlement between DOE/LANL and an network of community groups:

- Concerned Citizens for Nuclear Safety
- Embudo Valley Environmental Monitoring Group
- Loretto Community
- New Mexico Environmental Law Center
- Nuclear Watch New Mexico
- Peace Action New Mexico
- Tewa Women United

Welcome to our 12th Meeting!

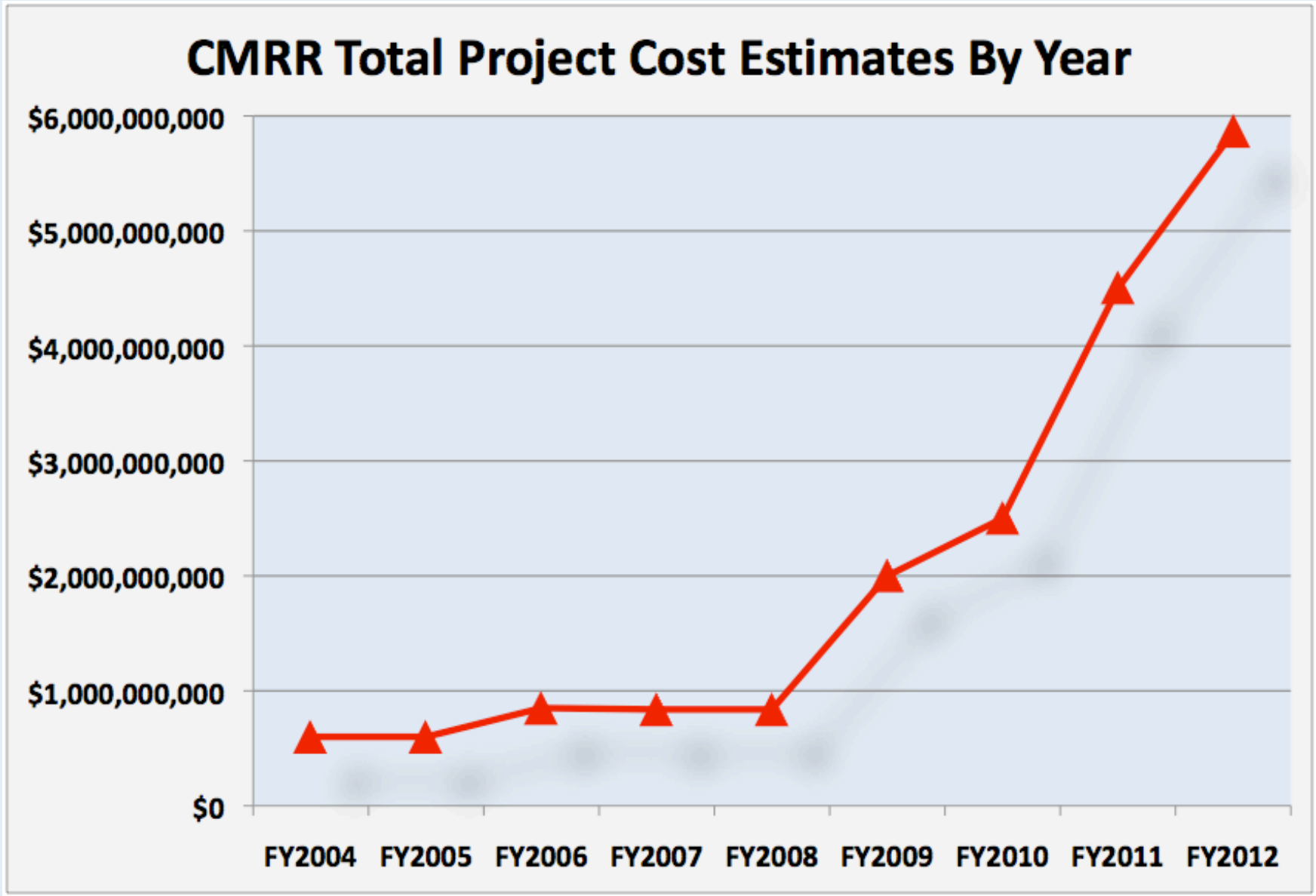
Topics to be covered in this Chemistry and Metallurgy Research Replacement Project (CMRR) presentation:

1. Opening from Marian Naranjo
2. 2012 Budget
3. Costs
4. Lack of Economic Impact
5. Infrastructure Requirements
6. Waste Generation
7. Affected Areas
8. Seismic

Senate Energy & Water Appropriations For FY2012

Chemistry and Metallurgy Facility Replacement Project, FY2012 proposed is $240,000,000 total. Within these funds:

- $35,000,000 is to complete equipment installation at the Radiological Laboratory,
- $125,000,000 is for design activities to reach 90 percent design maturity by the end of the fiscal year,
- $40,000,000 is for long-lead procurements, and
- $40,000,000 is for site preparation.


CMRR Total Project Cost Estimates By Year
$6,000,000,000
$5,000,000,000
$4,000,000,000
$3,000,000,000
$2,000,000,000
$1,000,000,000
$0
FY2004
FY2005
FY2006
FY2007
FY2008
FY2009
FY2010
FY2011
FY2012

CMRR NF Cost

The current cost range estimate based on 45 percent design is between $3,710,000,000 and $5,860,000,000.

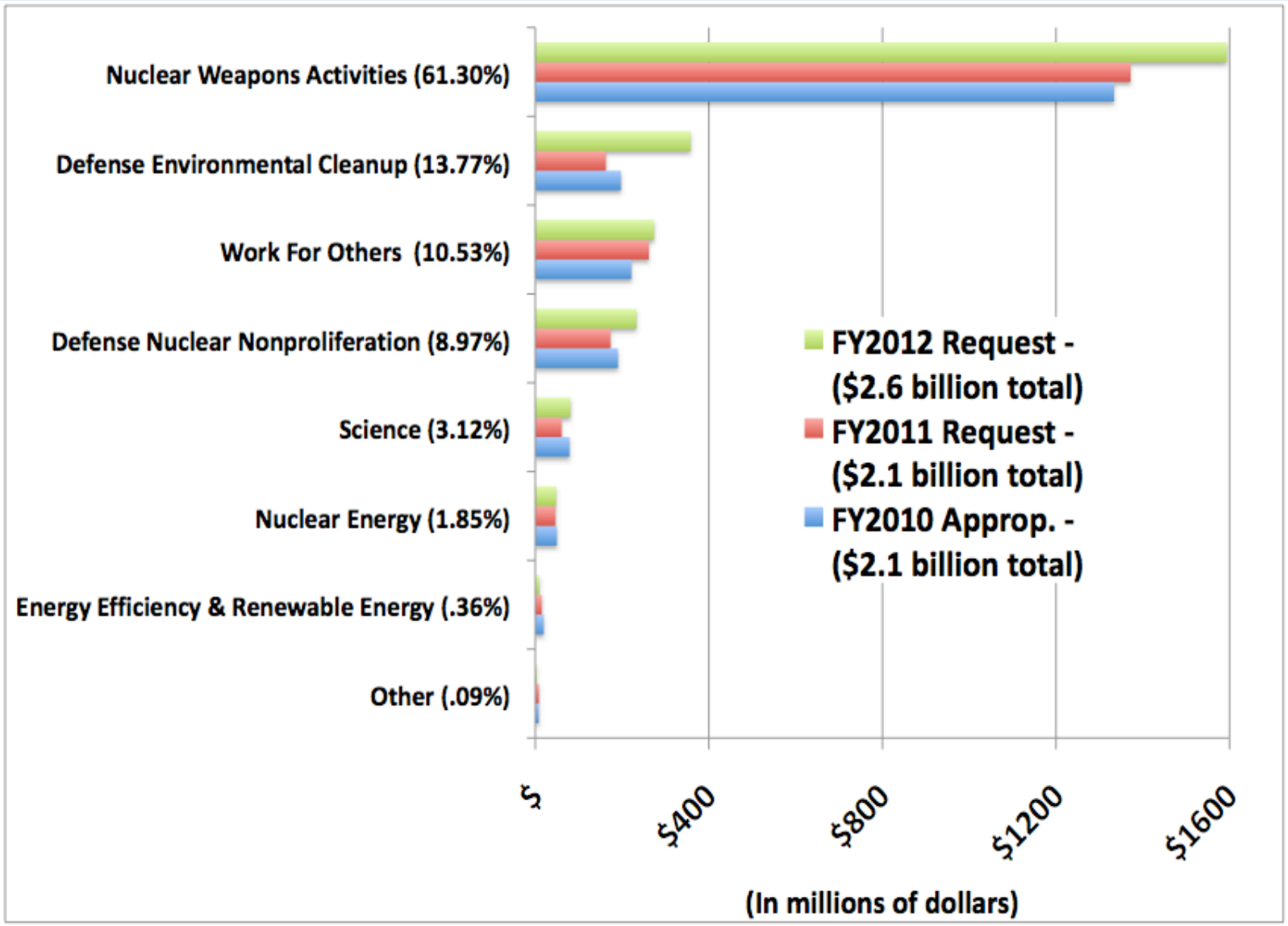
$10,000+ square/foot

Is there a maximum cost for the Nuclear Facility?

How much of the increasing cost is due to seismic hazard requirements?

Taxpayers are paying a high, escalating, and unknown price for pit production to continue at Los Alamos National Laboratory.

DOE/LANL Budget Priorities FY2012



Construction Requirements

Table 2–1 Summary of Chemistry and Metallurgy Research Building Replacement Nuclear Facility Project Construction Requirements

Building/Material Usage	*Modified CMRR-NF Alternative Deep Excavation Option* [a]	*Modified CMRR-NF Alternative Shallow Excavation Option* [a]
Land – permanent changes (acres)	12	12
Land – temporary changes (acres)	116 to 135	96 to 115
Building – length by width (feet)	342 by 304	342 by 304
Building size (square feet) [b]	407,600	407,600
Nominal excavation depth (feet)	130	58
Remaining material to be excavated (cubic yards) [c]	545,000	236,000
Water (million gallons per year)	4.6	3.8
Electricity (megawatt-hours per year) [d]	31,000	31,000
Propane (gallons per year for 3 to 6 years)	19,200	19,200
Concrete (cubic yards)	150,000 (structural) 250,000 (low-slump)	150,000 (structural)
Steel (tons)	560 (structural) 18,000 (foundation & reinforcing)	560 (structural) 18,000 (foundation & reinforcing)
Peak construction workers	790	790
Average number of construction workers	420	410
Estimated number of offsite truck trips [e]	38,000	29,000
Nonhazardous waste (metric tons)	2,600	2,600
Construction period (years)	9	9
Transition from CMR Building complete	2023	2023

CMR = Chemistry and Metallurgy Research; CMRR-NF = Chemistry and Metallurgy Research Building Replacement Nuclear Facility.

[a] The Deep and Shallow Excavation Options refer to options to build the Modified CMRR-NF with a nominal 130-foot excavation or a nominal 58-foot excavation, respectively.

[b] Building size is expressed in gross square feet, including the width of the walls.

[c] Includes tuff remaining to be excavated for the CMRR-NF building and the tunnels that would connect the CMRR-NF to RLUOB and the TA-55 Plutonium Facility. Approximately 30 feet of material have already been excavated from the proposed CMRR-NF site in TA-55 as part of the previous geological investigation of the site.

[d] Annual site infrastructure estimates for electricity use round to 31,000 megawatt-hours for both the Deep and Shallow Excavation construction options. However, the Deep Excavation Option is expected to require more electricity over the life of the alternative to support the creation of additional concrete for the layer of low-slump concrete fill.

[e] Offsite truck trips include the delivery of construction equipment, construction materials, and building equipment and supplies to the building site over the estimated 9-year life of the construction project.

Note: To convert acres to hectares, multiply by 0.404685; feet to meters, by 0.3048; gallons to liters, by 3.7854; cubic yards to cubic meters, by 0.76455; tons to metric tons, by 0.9072.

Source: LANL 2011a:Data Call Tables, 002, 003, 026.

This chart from the Final SEIS is still not right. The requirements of the Deep and Shallow options can not be the same.

The electricity cannot be the same if electric concrete batch plants are to used.

Same construction period?

Lack Of Permanent New Jobs from **Draft** SEIS

Resource/Material Category	*No Action Alternative* [a]	*Modified CMRR-NF Alternative*	*Continued Use of CMR Building Alternative*
Socioeconomics			
Construction	Employment would have resulted in little socioeconomic effect.	Peak direct (790 workers) plus indirect (450 workers) employment would represent less than 1 percent of the regional workforce and would have little socioeconomic effect.	Not applicable
Operations	Approximately 550 workers would have been at the CMRR Facility (2004 CMRR-NF and RLUOB); they would have come from the CMR Building and other facilities at LANL so the facility would not have increased employment or changed socioeconomic conditions in the region.	Approximately 550 workers would be at the CMRR Facility (Modified CMRR-NF and RLUOB); they would come from the CMR Building and other facilities at LANL so the facility would not increase employment or change socio-economic conditions in the region.	Approximately 210 workers would continue work at the CMR Building, many of whom would be among the staff members whose offices would be relocated to RLUOB. Another 140 workers would work in RLUOB. Workers would come from the CMR Building and other facilities at LANL so there would not be an increase in employment or a change in socioeconomic conditions in the region.

CMR = Chemistry and Metallurgy Research; CMRR = Chemistry and Metallurgy Research Building Replacement; CMRR-NF = Chemistry and Metallurgy Research Building Replacement Nuclear Facility; LANL = Los Alamos National Laboratory; RLUOB = Radiological Laboratory/Utility/Office Building.

[a] The impacts shown for the No Action Alternative reflect impacts as reported in the *CMRR EIS* for the purpose of comparison with the action alternatives, with the exception of the facility accident results, which were reanalyzed for this *CMRR-NF SEIS*, and transportation and traffic impacts and greenhouse gas emissions, which were not analyzed in the *CMRR EIS*. As stated in Section S.4, the 2004 CMRR-NF would not meet the current standards for a PC-3 facility, and a PC-3 facility is required to safely conduct all of the analytical chemistry and materials characterization work required to support DOE and NNSA mission work. Therefore, the No Action Alternative is not being evaluated in this *CMRR-NF SEIS* as an alternative that would meet NNSA's purpose and need.

Construction Impacts

- "Construction of new buildings at TA-55 to house CMR activities would require a peak construction employment level of 300 workers. This level of employment would generate about 852 indirect jobs in the region around LANL. The potential total employment increase of 1,152 direct and indirect jobs represents an approximate 1.3 percent increase in the workforce and would occur over the proposed construction period.
- "This small increase would have ***little or no noticeable impact on the socioeconomic conditions*** of the region of influence." (final SEIS Pg. 4-12)

Operations Impacts

- "CMRR Facility operations would require a workforce of approximately 550 workers. As evaluated in the CMRR EIS, this would be an increase of about 340 workers over currently restricted CMR Building operational requirements.
- "Nevertheless, the increase in the number of workers in support of expanded CMRR Facility ***operations would have little or no noticeable impact on socioeconomic conditions*** in the LANL Region Of Influence."

  (final SEIS Pg. 4-12)

CMRR Infrastructure Requirements

Table 4–54 Estimated Combined Infrastructure Requirements at Los Alamos (Operations)

Resource	*System Capacity* [a]	*Current LANL Requirement* [b]	*Current Los Alamos County Requirement* [b]	*Available System Capacity*	*Modified CMRR-NF Alternative* [c]	*Remaining Capacity*
Electricity						
Energy (megawatt-hours per year)	1,226,000 [d]	563,000	150,000	513,000	161,000	352,000
Peak load demand (megawatts)	140 [d]	101	23	16	26	0
Natural Gas (million cubic feet per year)	8,070	1,200	1,020	5,860	58	5,800
Water (million gallons per year)	1,807	412	1,241	153	16	137

CMRR-NF = Chemistry and Metallurgy Research Building Replacement Nuclear Facility; LANL = Los Alamos National Laboratory.

[a] Data from 2008 *Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico (LANL SWEIS)*, Chapter 5, Table 5–83, for the No Action Alternative.

[b] Data from Tables 3.4.1-1, 3.4.2-1, 3.4.2-2, 3.4.3-1 of the *SWEIS Yearbook – 2008* (LA-UR-10-03439), with the exception of the Los Alamos County requirement for natural gas, which was calculated using the projected requirement for the No Action Alternative in the 2008 *LANL SWEIS* (Table 5–83) and data from Table 3.4.1-1 of the *SWEIS Yearbook – 2008*. In addition, adjustments were made to reflect higher usage associated with the Metropolis Complex and Material Disposal Area remediation activities as included in the Expanded Operations Alternative in the *LANL SWEIS* (selected in the associated Records of Decision) and exclusion of requirements associated with the 2003 CMRR Facility, as included in the No Action Alternative in the *LANL SWEIS*.

[c] Data from Table 4–17 of this *CMRR-NF SEIS*.

[d] Does not include addition of an electrical substation in TA-50 capable of providing up to another 40 megawatts peak load capacity.

Note: To convert gallons to liters, multiply by 3.7854; cubic feet to cubic meters, by 0.028317.

Sources: DOE 2008b; LANL 2011a:Infrastructure, 011, 012, 013.

Table 4–57 Estimated Annual Cumulative Waste Generated at Los Alamos National Laboratory (cubic yards)

Waste Type	*LANL Operations* [a]	*CMRR-NF SEIS Modified CMRR-NF Alternative* [b]	*CMR Building DD&D* [c]	*Revised LANL Operations*
Expanded Operations Transuranic	530 to 3,300	88	38 to 75	570 to 1,030
Less Manufacturing of up to 80 Pits	0 to -250			
Less GNEP	0 to -900			
Less Consolidated Nuclear Facility	0 to -1,200			
Less earlier CMR Building Operations Estimate	-90			
Less earlier CMR Building DD&D Estimate	0			
Plus GTCC [d]	0			
Revised Total	440 to 870			
Low-level radioactive	27,700 to 141,400	2,640	9,500 to 19,000	33,000 to 137,000
Less Manufacturing of up to 80 Pits	0 to -410			
Less GNEP	0 to -3,400			
Less Consolidated Nuclear Facility	0 to -12,000			
Less earlier CMR Building Operations Estimate	-2,600			
Less earlier CMR Building DD&D Estimate	-4,000 to -8,000			
Plus GTCC [d]	5			
Revised Total	21,000 to 115,000			
Mixed low-level radioactive	390 to 18,300	26	70 to 140	420 to 18,300
Less Manufacturing of up to 80 Pits	0			
Less GNEP	0 to -4			
Less Consolidated Nuclear Facility	0 to -72			
Less earlier CMR Building Operations Estimate	-30			
Less earlier CMR Building DD&D Estimate	-38 to -75			
Plus GTCC [d]	0			
Revised Total	320 to 18,100			
Construction and Demolition Waste	64,000 to 72,000	2600	27,500 to 55,000	177,000 to 208,000
Less earlier CMR Building DD&D Estimate	-5,000 to -10,000			
Plus GTCC [d]	88,000			
Revised Total	147,000 to 150,000			
Chemical Waste (million pounds)	6.4 to 12.9	0.024	0.13	6.6 to 11.8
Less Consolidated Nuclear Facility	0 to -1.4			
Less earlier CMR Building Operations Estimate	-0.025			
Plus GTCC [d]	0.05			
Revised Total	6.4 to 11.5			

CMR = Chemistry and Metallurgy Research; CMRR-NF = Chemistry and Metallurgy Research Building Replacement Nuclear Facility; DD&D = decontamination, decommissioning, and demolition; GNEP = Global Nuclear Energy Partnership; GTCC = greater-than-Class C; LANL = Los Alamos National Laboratory.

[a] Data from Table 5–84 of the 2008 *LANL SWEIS* Expanded Operations Alternative divided by 10 to show annual rates, except GTCC.

[b] Data from Table 4–35 of this *CMRR-NF SEIS*, except GTCC.

[c] Data from Table 4–50 of this *CMRR-NF SEIS*, except GTCC. Work to be done over a 2- to 4-year period.

[d] Highest annual data computed from information in Table 5.3.11–1 of the *GTCC EIS* (DOE 2011b).

Note: To convert cubic yards to cubic meters, multiply by 0.76456.

Source: DOE 2008a; LANL 2011a:Data Call Tables, 004.

Waste Generation

Figures based on manufacture of 20 pits per year.

CMRR Construction Affected Areas

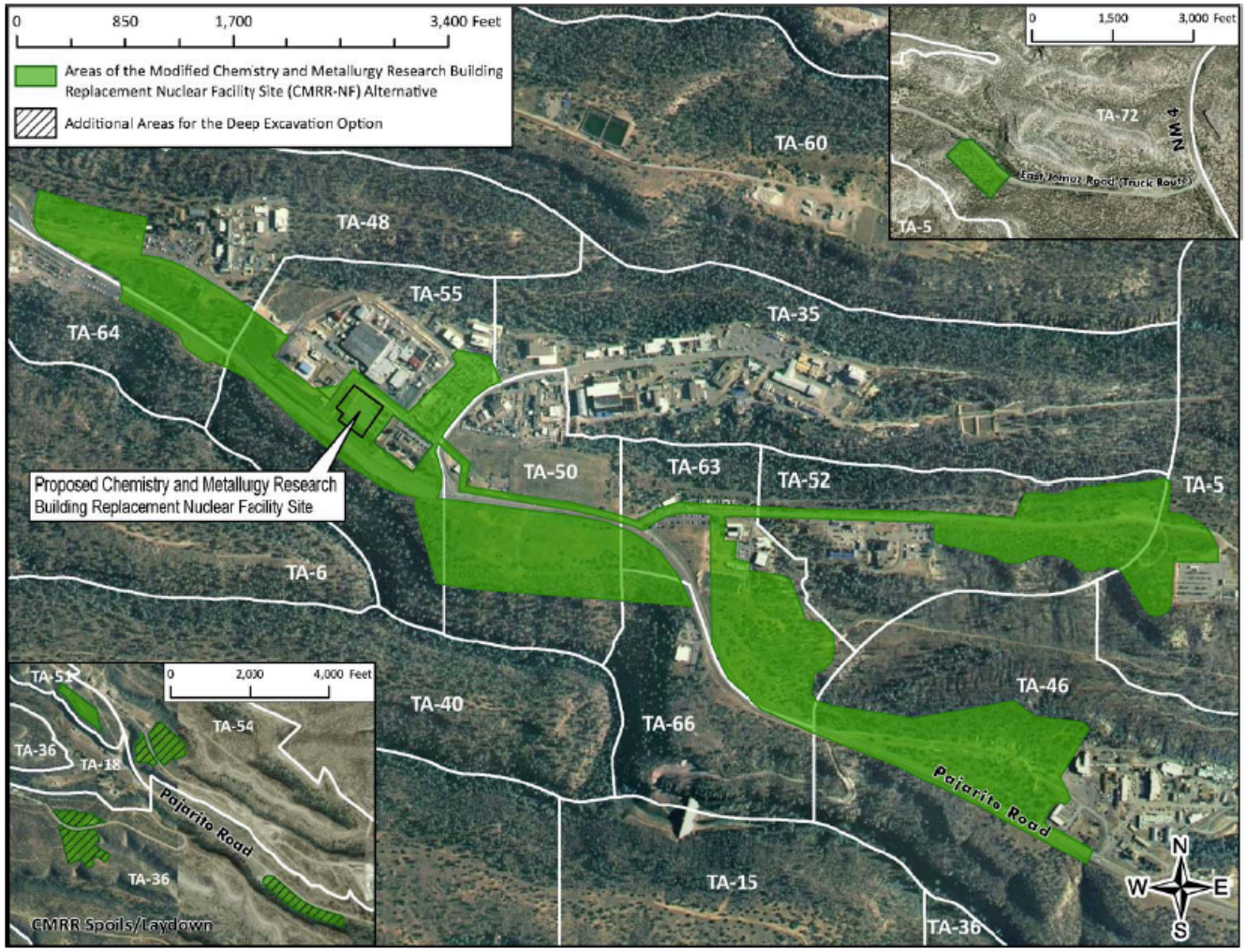
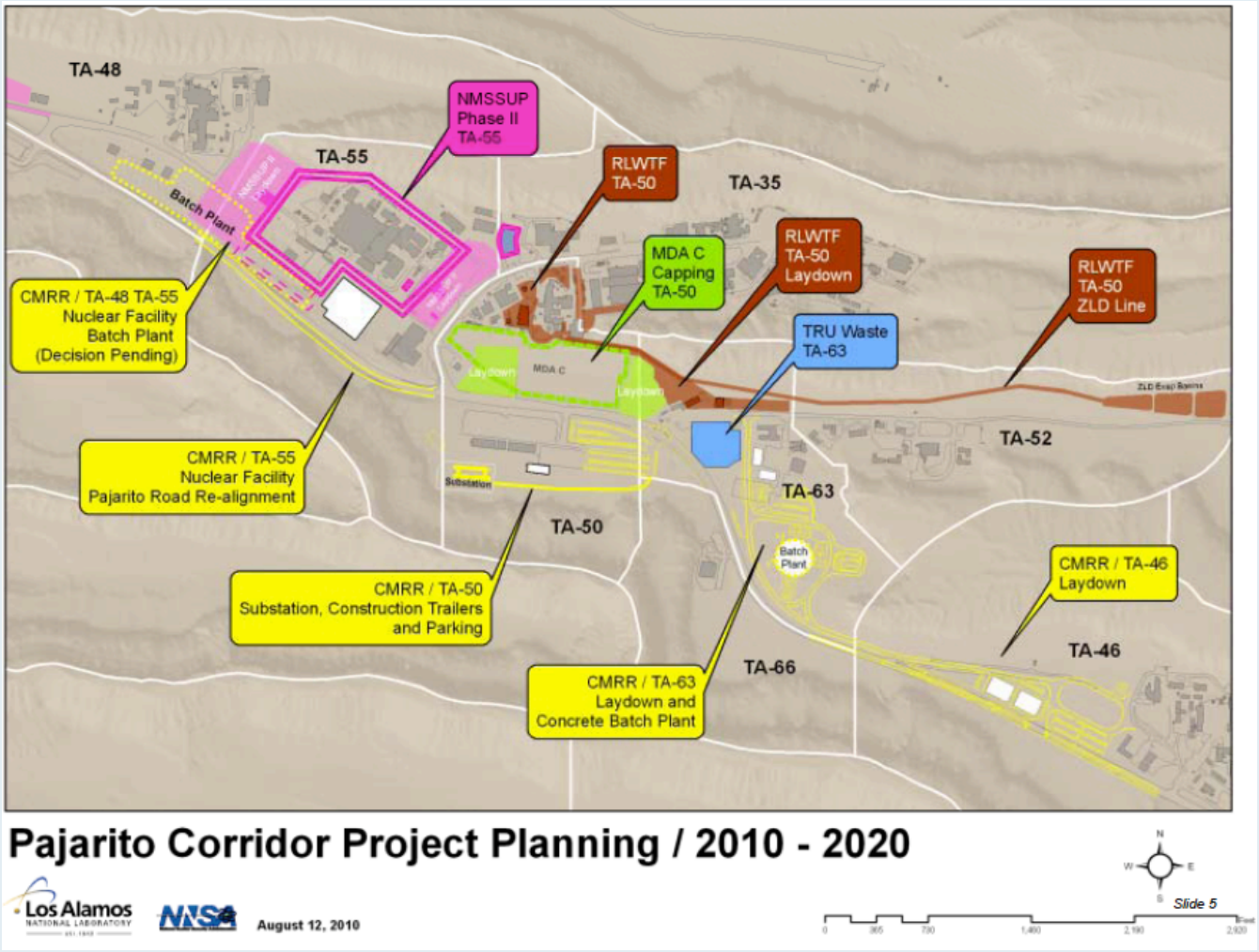
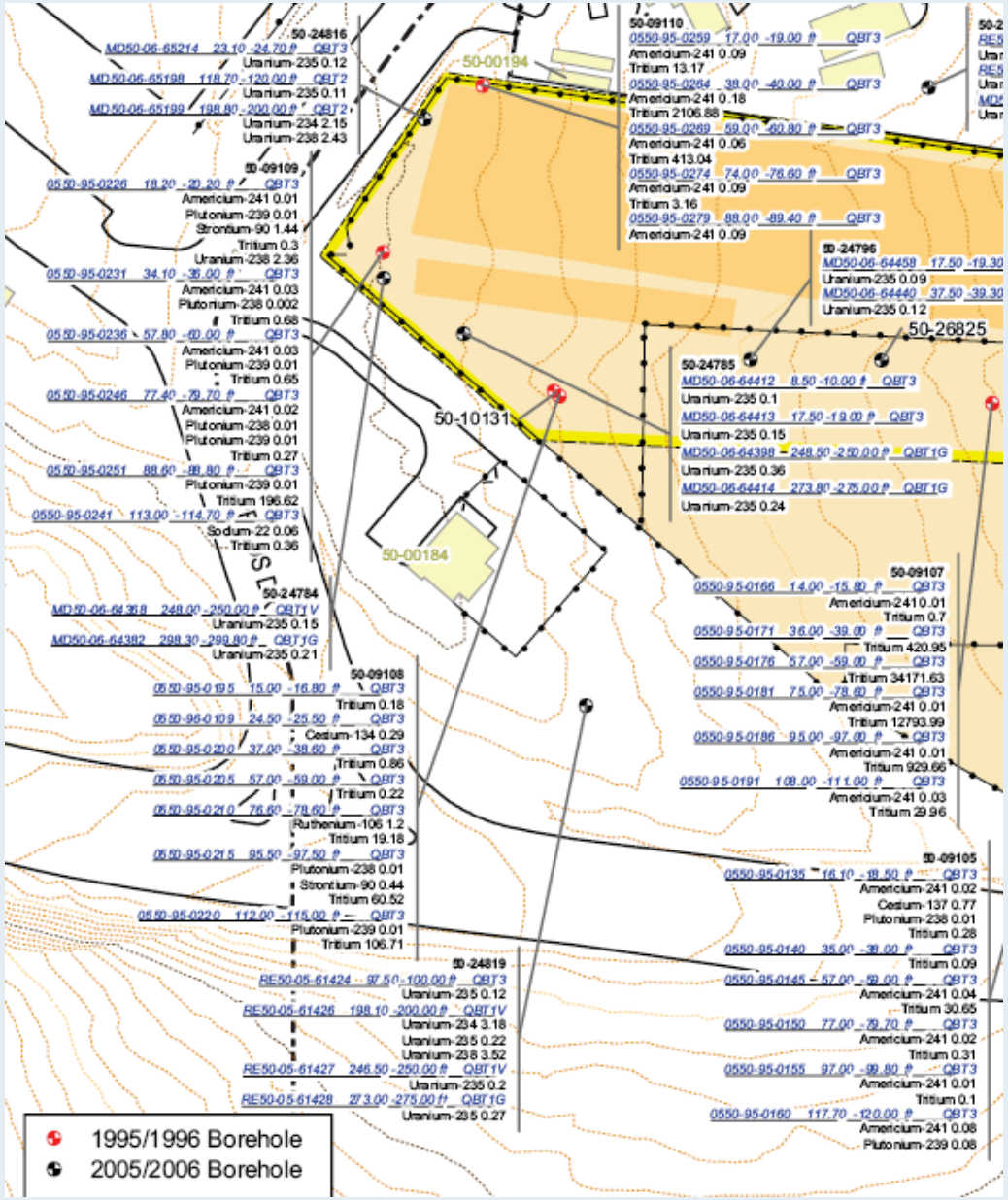


Figure 2–9 Potentially Affected Areas Under the Modified CMRR-NF Construction Plan

Pajarito Road Planned Construction



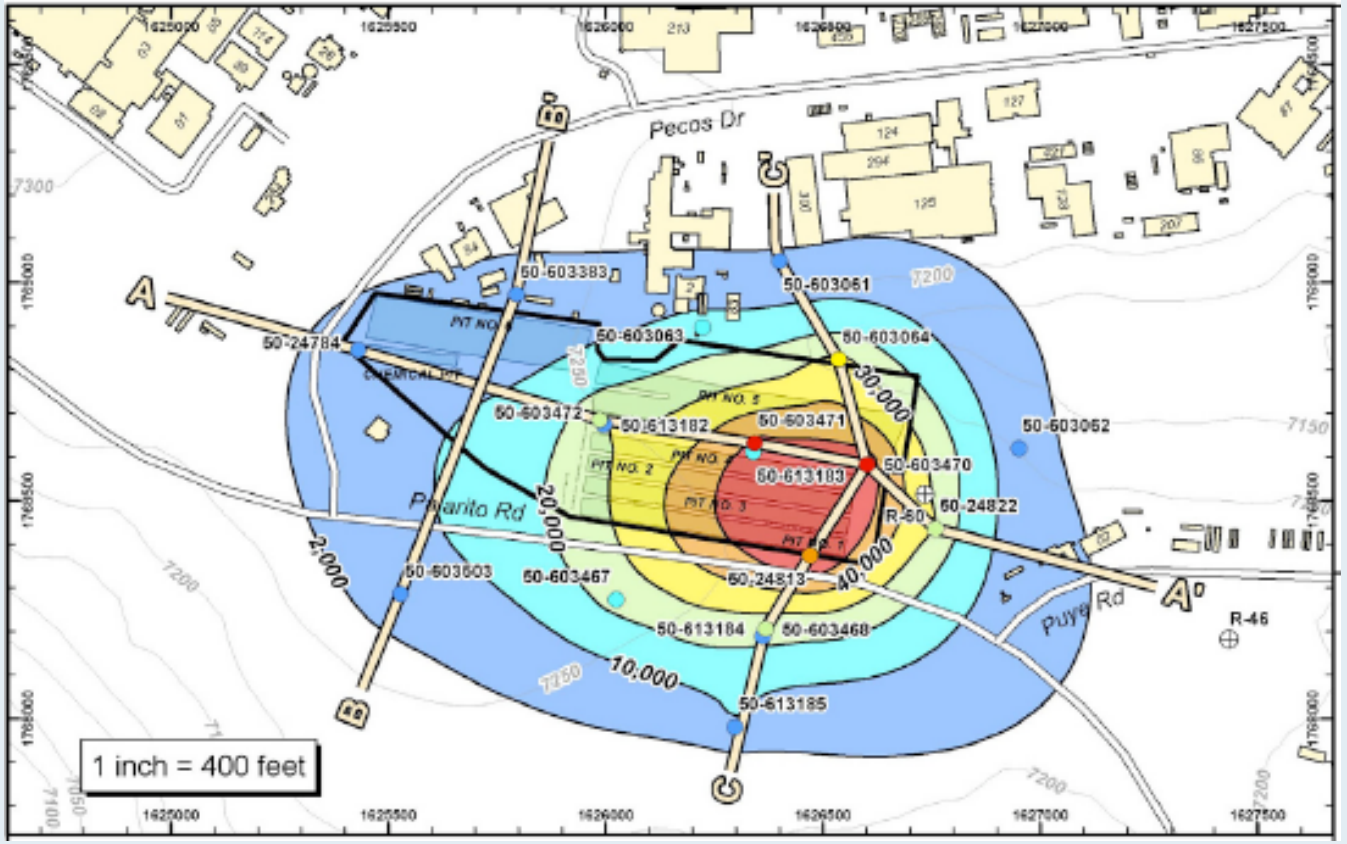


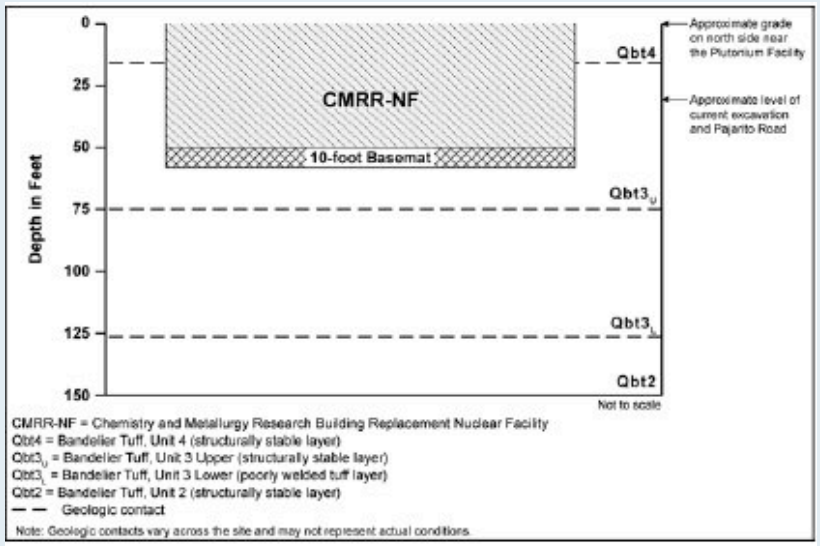
MDA C

The final SEIS states, "Surveys have been conducted to identify potential release sites (PRSs), and no unidentified or unexpected soil contamination or buried media have been encountered (LANL 2010d). There are, however, known PRSs located within the affected technical areas (for example, Material Disposal Area [MDA] C in TA-50)," (Pg. 4-67)

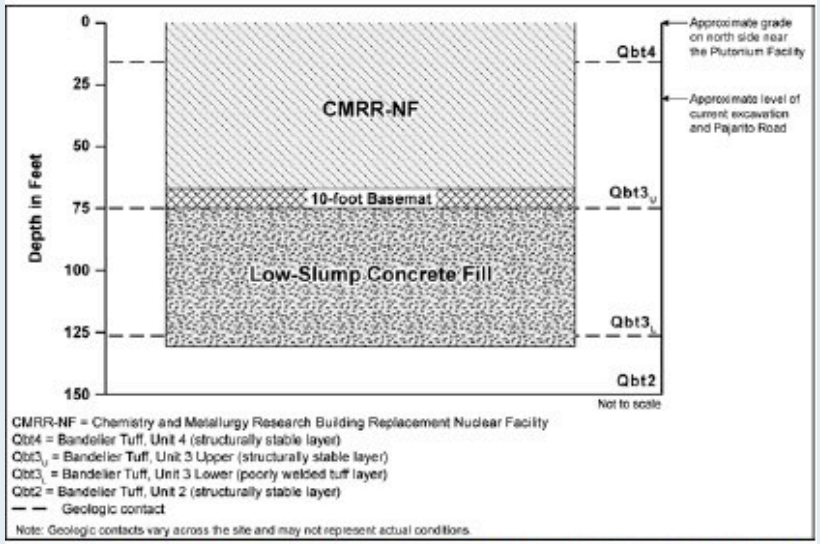
MDA C

"[I]nvestigation for MDA C, for example, concluded that, although further investigation activities were required, MDA C did not pose an unacceptable present-day risk to human health under the industrial and residential scenarios" (FSEIS Pg. 2-7) Below: MDA C TCE plume, MDA C Investigative Report, June 2011, Pg. 2-7





Modified CMRR-NF, Shallow Excavation Option Relative to Geographic Stratigraphy

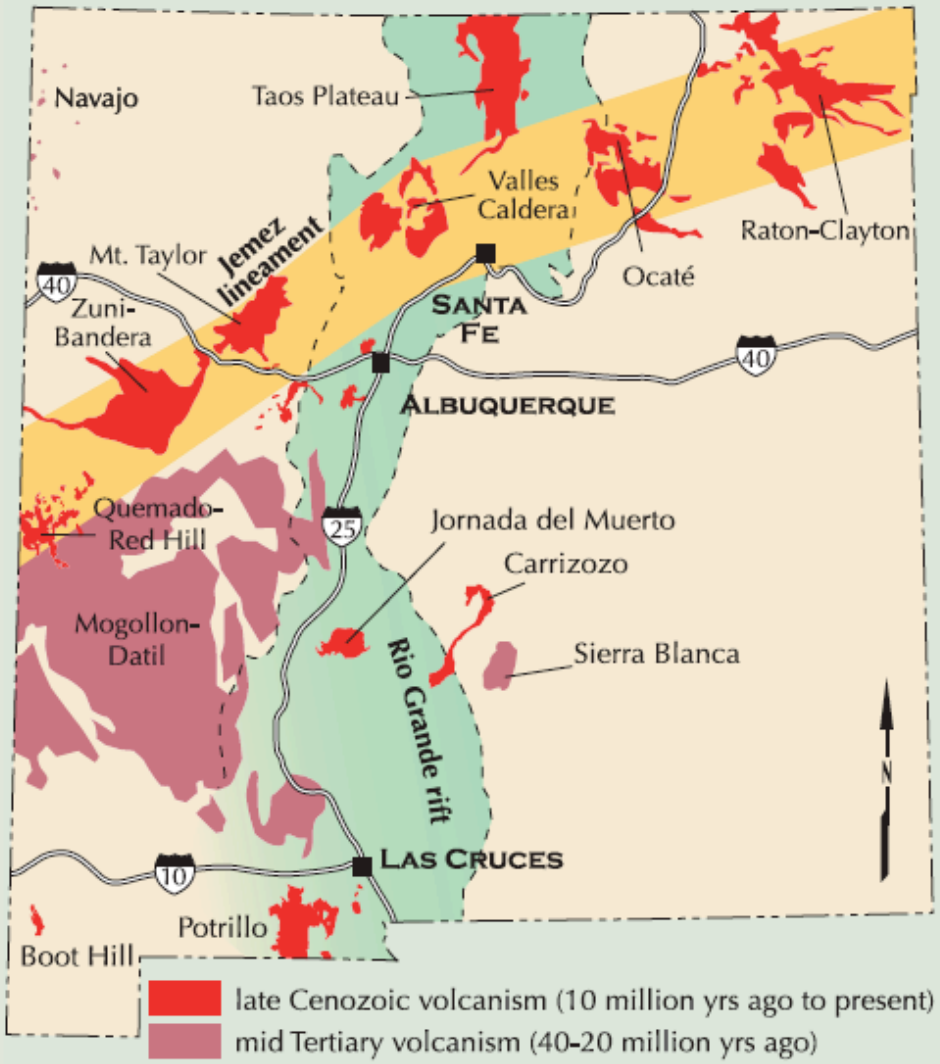


Modified CMRR-NF, Deep Excavation Option Relative to Geographic Stratigraphy

Shallow and Deep Weak and Extremely Weak

"Units Qbt4, Qbt3U, and Qbt2 are classified as "very weak" rock based on criteria established by Brown, ISRM (1981). Transitional units Qbt3L-t and Qbt2-t are classified as "extremely weak" to "very weak" rock. Unit Qbt3L exhibits average unconfined compressive strength below the lower threshold of 36 psi for "extremely weak" rock, making it more appropriate to classify its strength on the soil scale."

(Pg. 51) Geotechnical Engineering Report DCN 19435.10528.5-ALB06RP002 Chemistry and Metallurgy Research Facility Replacement Project No. 19435 Los Alamos National Laboratory Rev. 0 Copyright 2007, Kleinfelder 5/25/07 *19435.10528.5-ALB06RP002, Rev. 0 – Page 51 of 300*



The major volcanic fields in New Mexico tend to follow two major zones of weakness in the crust and underlying mantle, the Jemez lineament and the Rio Grande rift.

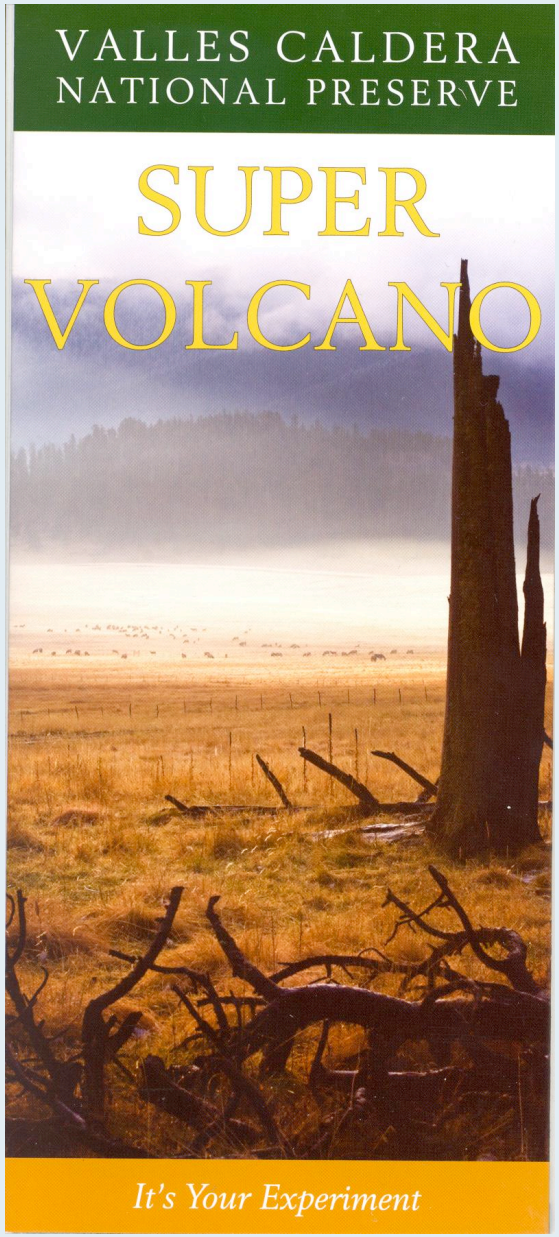
http://geoinfo.nmt.edu/publications/periodicals/earthmatters/6/EMV6N1.pdf

Where the Jemez Lineament Crosses the Rio Grande Rift

This zone may be the weakness formed where two very old blocks of the earth's crust were pressed together.

In addition to crustal weakness, volcanism in New Mexico is also likely related to upwelling of abnormally hot mantle material.

With the possible exception of the Jemez Mountains, all existing volcanoes in New Mexico are probably extinct.

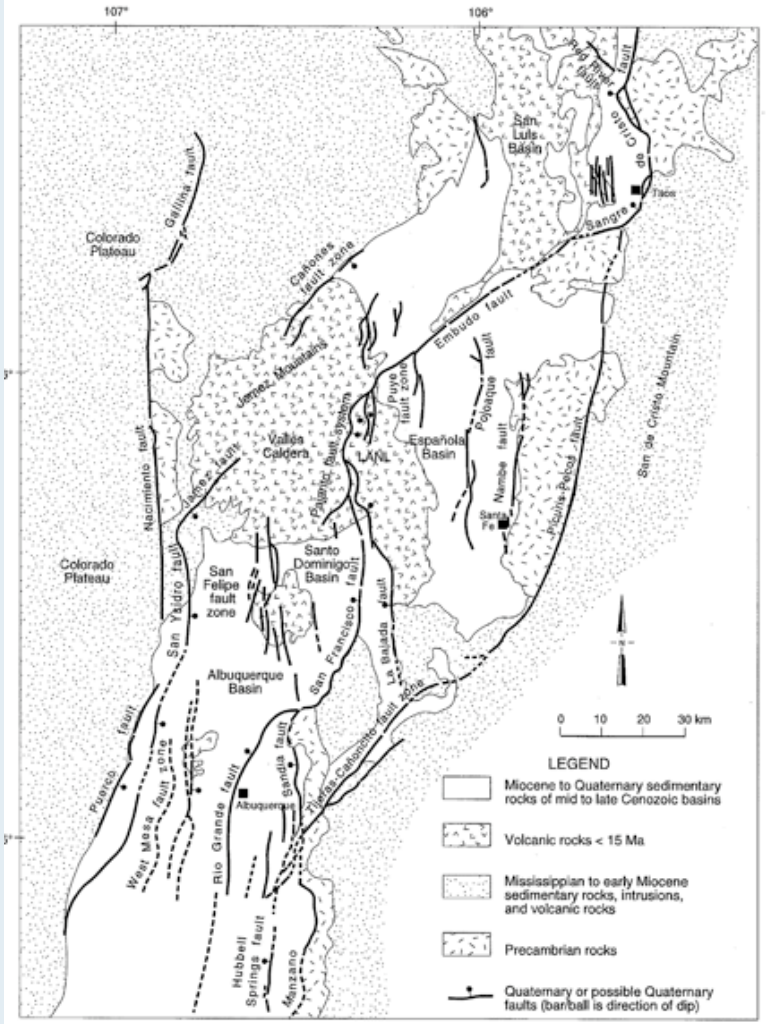


Super Volcano

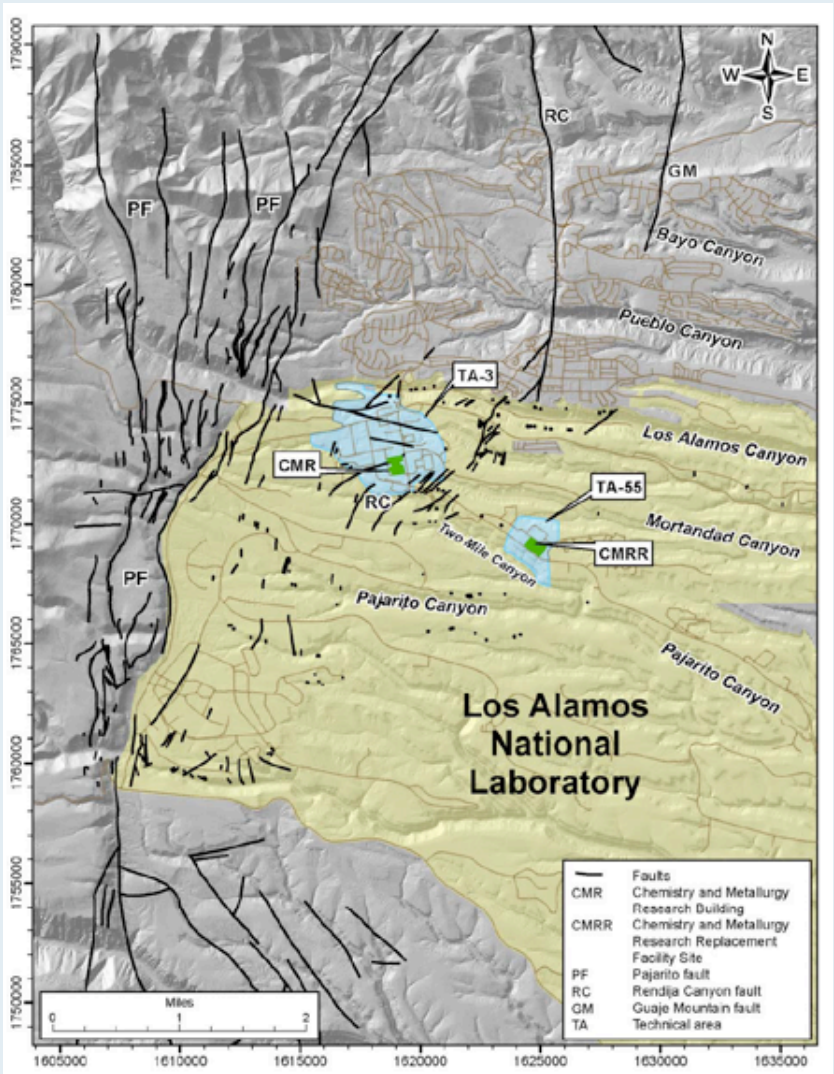
The collapsed caldera is 14.5 miles in diameter and is the result of two explosive super eruptions 1.6 and 1.1 million years ago (i.e., 500,000 years apart).

These eruptions formed the Pajarito Plateau. They laid down a 700 ft thick layer of volcanic ash, called the Bandelier Tuff, at the proposed CMRR-NF location.

Complex Seismic Zone

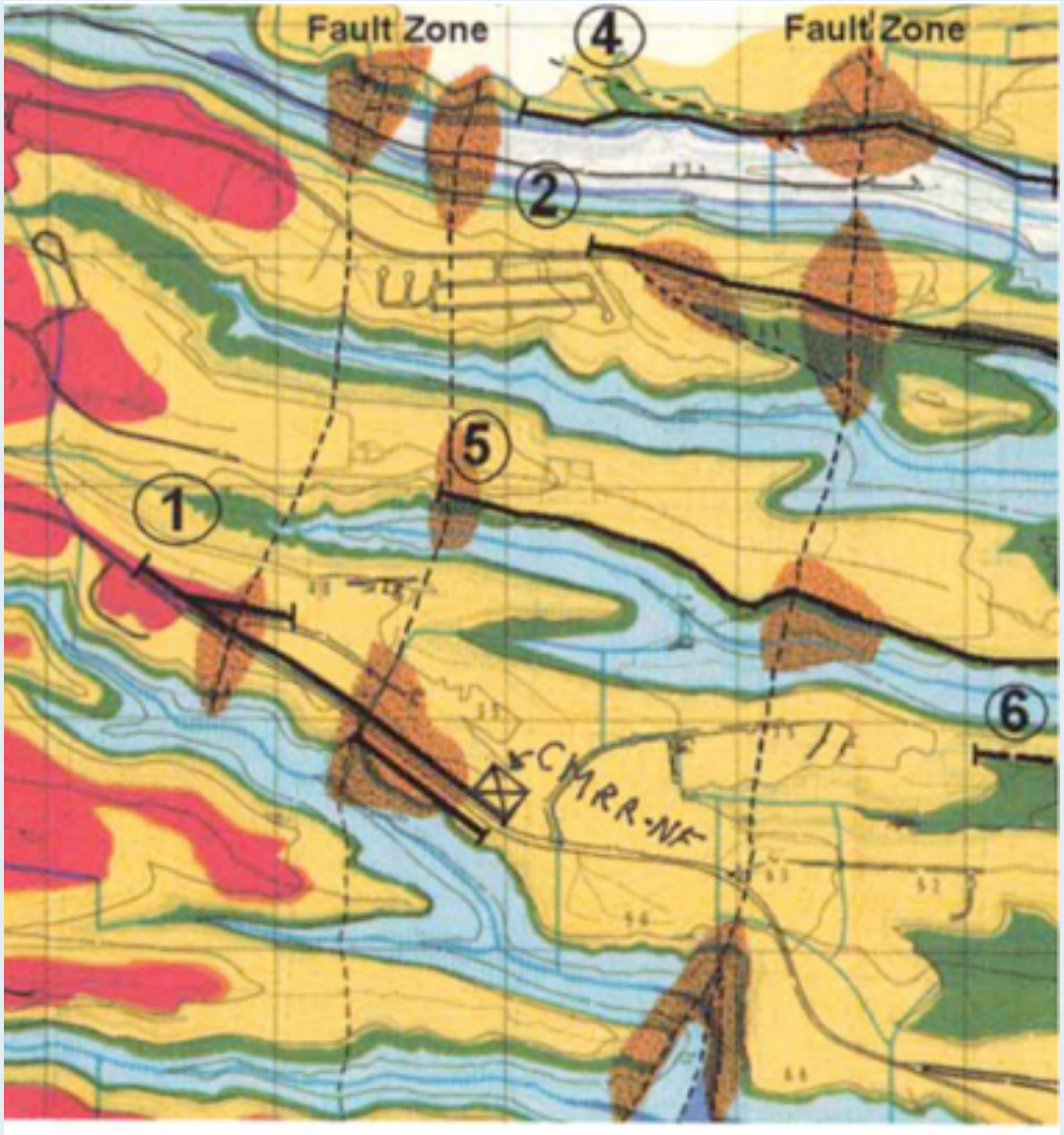


Source: Figure 3-2 *in* LANL 2007 PSHA Report



A Safe and Cost Effective Engineering Design for the Proposed CMRR-NF Must Include

- buried active faults close to or below the proposed NF location
- site-specific velocity in volcanic layers down through the dacite to an approximate depth of 900 ft
- ground motions – single earthquakes and synchronous earthquakes
- kappa – a key parameter for calculation of ground shaking



Inferred Faults Nearby

Map in 2004 LANL Report by Wohletz showing the inferred locations of the north-south trending buried active faults 800 feet west and 2,000 feet east of the proposed CMRR-NF.

Source: Figure 14 in Wohletz, 2004 (LA-UR-04-8337).

- Dashed black lines show trend of inferred faults - - - - - - - -
- Brown patches along dashed black lines are zones of intense fractures
- Circled numbers 1 to 6 have no relation to zones of intense fracture

Buried Active Faults Nearby

- The buried active fault located 800 ft west of the proposed CMRR-NF may be an extension of the Guaje Mountain Fault, which may generate ground motions close to the proposed NF site
- From the final CMRR SEIS – Response to Public Comments:

  "The fault shown 800 feet (244 meters) west of the proposed CMRR-NF is an inferred fault, meaning that the fault is interpreted to be present at some depth below the location at which it is mapped."

Deep Borings Did Not Characterize The Geologic Column Down To Bedrock

- The only boring drilled a short distance into the dacite below the proposed NF location discovered the dacite was extensively fractured.
- It is a serious omission that multiple borings were not drilled deep into the dacite below the proposed CMRR-NF for accurate knowledge of the shear velocity of the dacite and the presence or absence of faults.

Hazard Is Higher For Synchronous Rupture

- **FROM THE LANL 2007 PSHA REPORT:**

  "The [seismic] hazard is higher for synchronous rupture because the ground motions will be larger from seismic slip involving two subevents versus more uniform slip in a single albeit larger simultaneous event."

- It is a serious mistake that the engineering design of the proposed CMRR-NF is for ground motions from a single earthquake and not for the 75% greater ground motions from synchronous earthquakes

Incomplete Knowledge Of The Seismic Hazard Parameter Kappa

- Accurate knowledge of kappa is essential for accurate calculation of ground motions for the engineering design.
- Kappa should be calculated from accurate records from seismographs.
- Unreliable values for kappa are being used for very expensive seismic designs.

Weak Motion Seismographs Are Needed

- LANL has only a few strong motion seismographs that recorded only nine events over 25 years. The University of Nevada has determined that weak motion seismographs collect hundreds of events over a period of a few months that can be used to calculate kappa.

- LANL should immediately install a network of weak motion seismographs to improve knowledge of kappa and to monitor the increase in power of the youthful Pajarito Fault System.

Kinematic Model Needed For The Pajarito Fault System

- The LANL seismic hazards geology team described the need for a robust kinematic model in a paper published in a peer reviewed journal in 2009:

  "Despite the importance of understanding the geometry of the fault system and potential linkage among faults for purposes of seismic hazard analysis, a robust kinematic model of the [Pajarito] fault system is lacking."

THE DOE RESPONSE TO COMMENTS ON THE 2011 DRAFT SEIS DESCRIBED THE IMPORTANCE OF A KINEMATIC MODEL FOR THE PAJARITO FAULT SYSTEM AS FOLLOWS:

- "This idea is a natural follow-on of the scenario model development of the LANL 2007 PSHA … such a study could help refine seismic source parameters. . . It is nevertheless prudent to consider such interactive fault models (kinematic and dynamic) in the future for possible application to the Pajarito fault system."

- It is a serious omission that the very important robust kinematic model is not provided now for the engineering design of the proposed $6 billion super Walmart sized nuclear weapons facility for storage of six metric tons (13,228 pounds) of plutonium.

CMRR - Continuous Money down a Ruthless Rift

- Many feel that the completion of the Consent Order is at risk.
- DOE/LANL/LANS should put construction of new projects, including CMRR, on hold until all the requirements of the Consent Order are funded first.

Clean Up, Don't Build Up!

In Memory of Peggy Prince