-----Original Message-----
From: isaacson@lanl.gov [mailto:isaacson@lanl.gov]
Sent: Wednesday, December 14, 2005 4:09 PM
To: KIRK.W.OWENS@saic.com
Subject: Fwd: TA-55 Reinvestment Project Comments to Draft SWEIS

Roy Bonds comments

>X-Sieve: CMU Sieve 2.2
>From: "Roy Bohn" <royb@lanl.gov>
>To: "'Withers, Elizabeth'" <ewithers@doeal.gov>
>Cc: "'Roy Bohn'" <royb@lanl.gov>, "'Ron Wieneke'" <ronwieneke@lanl.gov>,
>   "John Isaacson" <isaacson@lanl.gov>,
>   "Susan D. Radzinski" <sradz@lanl.gov>,
>   "'Ken Towery'" <ktowery@lanl.gov>,
>   "William H. Hamilton" <whh@lanl.gov>, <imail-trp@lanl.gov>
>Subject: TA-55 Reinvestment Project Comments to Draft SWEIS
>Date: Wed, 14 Dec 2005 11:23:58 -0700
>Thread-Index: AcYA2kGY3EXdcZF2S4G5CpHKhB3tzQAABSsA
>X-PMX-Version: 4.7.1.128075
>
>Elizabeth,
>
>Attached are the TA-55 Reinvestment Project comments to the 2nd Draft LANL
>SWEIS. I will bring over a hard copy to your office today as well.
>
>-----Original Message-----
>From: Teresa Hiteman [mailto:hitemant@lanl.gov]
>Sent: Wednesday, December 14, 2005 11:15 AM
>To: royb@lanl.gov
>Subject: scanned file
>

>
>Teresa Hiteman
>ENV-ECR
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TA-55 REINVESTMENT PROJECT COMMENTS

debris would result from modification of the existing building. Wastes would be handled and disposed as described under the New Radiography Building Alternative.

G.7 TA-55 Reinvestment Project Impact Assessment

This section provides an impact assessment for LANL TA-55 Reinvestment Project. Section G.7.1 provides background information on the reinvestment project and the proposed action to modernize and upgrade facility and infrastructure portions of the TA-55 Complex that are in danger of failing their safety and programmatic support requirements within the next ten years. Section G.7.2 provides a brief description of the proposed alternatives for modernizing and upgrading the facility infrastructure at TA-55. Section G.7.3 presents the environmental consequences from the proposed infrastructure modernization and upgrade activities at TA-55. Appendix I.1 presents an analysis of proposed security-driven transportation modifications in the West Pajarito Corridor that encompasses TA-55.

G.7.1 Introduction and Purpose and Need for Agency Action

The LANL TA-55 Plutonium Facility Complex (complex) encompasses about 16 hectares (40 acres) and is located about 1.6 kilometers (1 mile) southeast of the central technical area (TA-3). Most of TA-55 is situated inside a restricted area surrounded by a double security fence. The main complex has five connected buildings: the Administration Building, the Support Office Building, the Support Building, the Plutonium Facility, and the Warehouse. The Nuclear Materials Storage Facility (Plutonium Facility 41) is separate from the main complex but shares an underground transfer tunnel with the Plutonium Facility. Various support, storage, security, and training structures are located throughout the main complex.

To address the threats of the 21st century, the U.S. nuclear deterrent strategy requires a safe, secure, and reliable capability to design and manufacture plutonium weapons components. This capability is provided through the Stockpile Stewardship Program. The LANL TA-55 complex is needed to support the Stockpile Stewardship Program and other nuclear programs. It must continue to operate to achieve its programmatic milestones, safely and cost effectively, for at least the next 25 years. The TA-55 Reinvestment Project would enable an extension of TA-55's lifetime by recapitalizing selected major facility systems to help ensure the facility's continuing capability and reliability to support NNSA's missions, particularly those in Plutonium Facility. In this project, major (also referred to as "critical") systems are defined as those facility and infrastructure systems whose loss of functionality or reliability due to an emergent disability could disrupt TA-55 for an unacceptably long duration pending repair.

Background

The TA-55 complex at LANL, which was constructed in the mid 1970's, is the premier nuclear and plutonium facility in the nation. It consists of a security Category I Special Nuclear Material laboratory and processing facility as well as support systems and structures. It is the most modern and well-equipped nuclear facility at LANL; however, it is aging and critical systems are beginning to require excessive maintenance. The goal is to support the Stockpile Stewardship Program and other efforts delineated in the Nuclear Posture, DOE Strategic Plan, and other guidance documents through continued operation and programmatic milestones cost effectively

for the next 25 years. An investment is necessary in the near term (e.g. the next ten years) to upgrade electrical, mechanical, safety, security, facility controls, and other selected facility related systems.

The scope of work for the overall project is to modernize and upgrade facility and infrastructure portions of the TA-55 complex that are failing or in danger of failing their safety and programmatic support requirements in the next ten years. This project is part of a comprehensive, long-term strategy to extend the life of TA-55 so that it can operate safely, securely, and effectively for at least another 25 years (LANL 2004a).

The project would be executed through a series of subprojects; ~~21~~ 20 high priority subprojects are contemplated, although this analysis covers all potential subprojects including those that are currently designated as having lower priority. The subprojects focus on high-priority facility systems and components that would improve overall facility reliability and that are critical to facility and program operations. Subproject sequencing would minimize disruptions to operations. Subproject sequencing involves a process that considers a number of factors that have direct bearing on the way this project would be executed. The factors include mission impact and project execution planning. Mission impacts include:

- Probability and timing for an existing subproject system to fail, and the impact or consequences of the failure (e.g., shutdown of all missions in the facility)
- Coincidence with other major projects and interfaces, especially in the same building or space
- Potential for and timing of any "hot" project that has to be completed without interruption (e.g., a weapons campaign).

Project execution planning impacts includes:

- The impact, on funding and cash flow needs, of the expected cost and duration of an entire package
- Subprojects that have to be done in a specific order (sequentially or concurrently), either within the package or with other packages
- Combining related activities, and the determination as to whether a new subproject can be put into the facility in parallel with the old system and then cut over, or whether demolition must take place first and the new system installed in the same space
- Availability of cleared crafts and specialized equipment (including lead time to design and test, if needed)
- Condition assessment or other investigative work needed before the subproject can be taken to detailed design and construction.

The best description of the existing condition for all subprojects is "incipient failure." The systems generally are old, past their design lives, hard to get parts for, and increasingly expensive to maintain, but they are not yet unsafe or in failure mode.

The subprojects include not only functional replacement but also upgrades in capability, reliability, and maintainability to suit the projected mission needs. This is the main driver for inclusion in the Readiness in Technical Base and Facilities planning rather than in the Facilities Infrastructure Recapitalization Project. They range from relatively simple roof membrane replacement to relatively complex fire and criticality alarm systems~~, and a proposed new building structure~~. The majority of the projected work is in and/or immediately surrounding the Plutonium Facility. Many of the subprojects involve operating systems within the complex that have a limited ability to be shut down for extended periods of time. Execution of these subprojects would have to be done by approaches such as building a parallel system and cutting over to the new system from the old or by demolition and replacement over laboratory shut down periods. A larger than normal planning effort would be required for those subprojects to reduce impact to ongoing and planned programs (LANL 2004h).

Facility and system modifications and installation of support equipment associated with each subproject would be coordinated with ongoing line item projects; general plant projects, maintenance work, and other projects and operations at TA-55.

Risks

Because this project consists of several subprojects that involve modifications and improvements to utilities and equipment within an existing operating facility~~, including the new construction of a small emergency operations building~~, the overall project faces several risks and constraints. This includes project management, design and construction risks and constraints imposed by funding, secure personnel, safeguards and security, and limitations imposed by ongoing facility operations.

Project Management—This project has higher than normal inherent project management risk in the potential for impact to programs because of the long schedule, working in an operating nuclear facility, interrelationships of the subproject, other major projects being conducted in the same site areas, classification of information, access to restricted areas, safeguards and security needs, and changes in priority of the work due to mission changes over the time of the project.

Risks would be mitigated by using a larger than normal Integrated Project Team to provide continuing and focused management oversight and support. ~~The project would have an annual internal re-planning cycle that would consider possible changes and trends in Mission Need, incipient system failures, and coordination of impacts to the work from other programs and projects~~.

Design—The Plutonium Facility is a facility that has been in operation for nearly 30 years, and history at LANL and other DOE sites has shown there should be some concern over the as-built condition of the facility and how well the documentation has been maintained. In addition, the condition of various systems is only known at a high level and system boundaries for the replacement and upgrade activities would be a problem for a number of the subprojects. Site

access would be a risk for getting required information from drawings and walkdowns due to security restrictions and availability of systems engineers.

Construction—A ~~large number~~ FEW of the subprojects ~~would~~ MAY have to be installed in parallel with the existing components to avoid long term impacts on operations and maintain safety systems in operation until the cut over to the new systems can be accomplished. The old components would then be demolished. This is contrary to a normal project where the old components are removed and the new ones are then built to replace it. There is a cost impact to reversing the normal process but safety and operability must be maintained ~~in many instances~~. In addition, some of the construction would take place in restricted areas, so cleared personnel such as craft workers would be needed. Access would also pose a risk as discussed above in the design section.

Risks would be mitigated by close interaction with the facility personnel for the Plutonium Facility subprojects and by having the knowledgeable personnel provide support to specialty and other contractors for the work. The funding profile would be limited so that an undue strain is not placed on the cleared craft personnel and if level funding can be maintained, a dedicated cleared craft staff might be put in place for the duration of the project.

Contamination Control and Waste Management—A significant portion of the work scope would have to deal with demolition of existing facility components and the contamination that would come with that demolition. Waste that is generated for some of the subprojects would or may contain transuranic materials and those wastes are subject to special safeguards, control and handling.

Problems in this area would be mitigated by the more detailed level condition assessments so that the construction team would know what they face before starting work and the waste facilities would be prepared to accept the demolition generated materials (LANL 2004h).

Constraints

- *Funding*: the present proposal for the scope of work is limited by the expected funding level. More work is needed than can be funded presently. Level funding is expected to allow the most effective use of the funds.

- Q-*cleared personnel including craft*: as the work would be done in one of the most highly secure areas of the site, all craft must be Q-cleared for certain subprojects.

- *Safeguards and Security requirements for work in facility*: increasing security requirements for the facility would reduce the effectiveness of the work staff and planning processes. While the need for the security is real and expected, there would be an impact on the work.

G.7.2 Alternatives Considered

G.7.2.1 No Action Alternative

In this alternative, no action would be taken. The existing set of activities would be operated as they are today; corrective maintenance and actions would continue to be done as failures occur.

This alternative does not require capital funds~~, and its disadvantages may be somewhat mitigated by Facilities and Infrastructure Recapitalization Program actions~~. However, maintenance cost would increase to support maintenance of the aging systems until they must be shutdown or replaced. If the systems proposed for replacement on this project are neither modified nor upgraded, they are expected to fail in the next 10 to 15 years. Based on the information available right now, it is not possible to predict the nature, timing, or type of failures. However, many of the failures would likely delay programmatic work, possibly damage the equipment, and possibly pose a risk to personnel safety, campaigns, critical experiments, and their activities where plutonium analysis and capabilities are required. All of this would result in higher program costs and lengthier schedules. Because the facilities are over 25 years old, they would experience more and more severe system failures over time, until they would either have to be replaced on a piecemeal basis through corrective maintenance (resulting in increased operating costs) or the facility would have to be shut down if unreliability adversely impacts safety.

G.7.2.2 Proposed Action

Existing facilities would be renovated for purposes of life extension rather than just maintenance. This alternative would entail renovating building systems in the Plutonium Facility, or systems supporting the Plutonium Facility. The advantage is that this approach is likely to be considerably less costly because only the systems most in need of upgrading would be included. However, the renovations would have to be conducted in an operating nuclear facility, with the attendant programmatic impact and reduction of construction efficiency. Contamination control and safeguards and security issues would not be trivial and would have to be addressed.

All the work would be done inside the existing TA-55 complex. Most of the work would be inside existing facilities or would entail modifications to existing facilities that are relatively minor in scope. The proposed action would be limited to LANL's TA-55 complex and is organized by TA-55 locations as follows:

- Inside the Plutonium Facility,
- Exterior to the Plutonium Facility but closely related support work (for example, the Plutonium Facility roof),
- ~~Support buildings such as the Utility Building 6,~~
- ~~Other TA-55 complex site facilities (for example, a new emergency response building), and~~
- TA-55 complex site utilities.

G.7.2.3 Alternative Considered but Dismissed

Move the Stockpile Stewardship Program to another facility over the next 10 to 15 years

This alternative would reduce the amount of capital invested at LANL. The need for continuing mission support would eventually be superseded by other facilities. However, the only other facility that currently has plutonium processing and analysis capability is the Superblock

Complex at Lawrence Livermore National Laboratory. That facility is also in need of upgrade; further, it is located in an area with a much larger population density. Strategic planning for Lawrence Livermore National Laboratory indicates a reduction in plutonium processing type of work as the preferred option. Therefore, this alternative was dismissed from further consideration.

G.7.2.4 Alternatives to Accomplishing the Mission Need at the Subproject Level

The subprojects can be executed in a variety of ways, depending on the scope of the specific subproject. The analysis focuses on alternative approaches to the subprojects as a whole.

Alternative Subproject 1—Treat subprojects as individual projects for design, construction, and completion. Each subproject would be treated as a stand-alone entity and the entire gamut of investigation, design, authorization, construction, start up, and close out would be done for each one. The advantage to this approach is that the project team could focus on only one subproject at a time. There would be a complete and full set of documentation and lessons-learned that could be brought forward to the next subproject. However, this approach would require approximately 80 individual Critical Decision packages, would take an inordinate amount of time to accomplish all subprojects, and would run the risk that critical systems might fail before they could be upgraded.

Alternative Subproject 2—Conduct all subprojects simultaneously. This minimized the review and approval effort and is the most streamlined approach for project planning purposes. Planning package effort is reduced and various activities (such as condition assessment and design) can take advantage of synergies among similar subprojects. However, the effort is so large that all the work could probably not be done in parallel because of the impact to programs and the unavailability of sufficient cleared personnel. The budgetary cost would also be high in terms of cash flow so that funding could be a major obstacle.

Alternative Subproject 3—Employ a tailored or graded approach by bundling subprojects into similar work scopes. This approach uses some of the better of the first two approaches, while minimizing some of their negative impacts. Subprojects would be grouped ("bundled") together where it makes sense in terms of design, construction, or programmatic impact. Some subprojects might be done as individual entities. However, a number of other similar subprojects could be combined. This would reduce management costs to a reasonable level but still provide sufficient oversight and change control. It would also minimize impact to programs because bundling would allow all the work to be done together in a given area of the facility. This is the tailoring approach recommended in DOE Manual 413.3-1 and preferred by the Integrated Project Team.

Subprojects – Proposed Upgrades for Phase 1 (LANL 2004i)

Following is a list of preliminary subprojects upgrades which are currently scheduled for phase 1. These are examples of subprojects based on current planning assumptions. This is not a comprehensive list and may change based on future planning decisions. Subprojects which are currently scheduled for a later phase may be reconsidered in the future for an earlier phase.

- Heating and Cooling Systems (preheat coils in intake stacks)

- Heating, Ventilation, and Air Conditioning Plenums and Associated Zone 1 Plenums
- Roof (Confinement) for the Plutonium Facility
- Confinement Doors in the Plutonium Facility
- Heating, Ventilation, and Air Conditioning Ductwork Zone 1
- Criticality Alarm System
- Fire Water Sprinkler Piping
- Vault Water Tanks
- Air Dryers
- Stack Upgrade/Replacement
- Fire Alarm Panel and Wiring
- Fire Alarm Devices – Buildings
- Fire Alarm Devices – Gloveboxes
- ~~Emergency Response, Facility Incident Command Building~~
- Heating, Ventilation, and Air Conditioning Plenums (Non Safety Class Portions)
- Glovebox Stands
- Chiller Replacement
- Replacement of Cooling Towers
- Elevators
- Industrial Waste
- Uninterruptible Power Supply Replacement

Subprojects – Proposed Upgrades for Later Phases (LANL 2004i)

Following is a list of preliminary subprojects upgrades which are scheduled for later phases than those listed above based on current planning assumptions. This is not a comprehensive list and the scheduled phase may change based on future planning decisions. Any of the following subprojects could be reprioritized to an earlier phase in the future.

- Heating and Cooling Systems (Except Preheat Coils in Intake Stacks)
- Non Plutonium Facility Heating, Ventilation, and Air Conditioning
- Heating, Ventilation, and Air Conditioning Plenums ~~(Safety Class) Zone 1 - 200 Area~~
- ~~Heating, Ventilation, and Air Conditioning Plenums & Associated (Safety Class) Zone 1 – 100 Area~~
- ~~Heating, Ventilation, and Air Conditioning Plenums and Associated (Safety Class) Zone 1 – 300 Area~~
- Heating, Ventilation, and Air Conditioning Ductwork Intakes, Bleedoff, Exhaust ~~(Safety Class~~

- ~~Heating, Ventilation, and Air Conditioning Ductwork (Non-Safety Class~~
- Heating, Ventilation, and Air Conditioning Fans & Motors
- ~~Heating, Ventilation, and Air Conditioning Fans - Variable Frequency Drives~~
- ~~Control System (Replace Pneumatics)~~
- Facility Control System
- Non-Process Cooling Water System ~~– Piping~~
- ~~Non-Process Cooling Water System - Coils, Chillers, Equipment, Pumps~~
- ~~Fire Suppression - Fusible Links (Glovebox Trains)~~
- ~~Fire Suppression Plutonium Facility Sprinkler Heads~~
- ~~Fire Suppression Plutonium Facility Vault Pre-Action System~~
- Fire Suppression System - ~~Fire Loop Pumps~~
- Fire Suppression - Halon System
- Fire Doors Electrical Distribution System
- 13.2 Kilovolt Distribution
- Paging System
- Process Air
- ~~Continuous Air Monitoring Blowers~~
- ~~Continuous Air Monitoring Piping~~
- Continuous Air Monitoring ~~Units (200 to 400 Additional)~~ systems
- FHAS Blower System
- Steam System
- Positive Pressure Chilled Water
- Acid Waste System ~~– Internal~~
- ~~Acid Waste System – External~~
- Bubbler Bypass Features
- Chlorine Gas Delivery System
- Remove Selected Gloveboxes from Throughout the Building
- Generator Related to Uninterrupted Power Supply
- Hot Water System
- Utility Gas Systems
- Industrial Gas Systems (Trailers) ~~– Internal~~
- ~~Industrial Gas Systems (Trailers) – External~~
- Radiation Protection Systems

- Wet Vacuum
- Acid Distribution
- Water Storage Tank Exteriors
- Sanitary Waste
- Site Drainage
- Material Control and Accounting Systems
- Tie in Facility Improvement Technical Support Building (TA-55) (FITS) & NTSF (protocol) to Classified Local Area Network
- Communications Capacity
- Roofs
- Structure (Confinement System)
- Lockers & Change Facilities
- Operations Center
- Attic
- Laboratories – Doors
- Vault Racks & Shelving, Kardex Unit & Special Nuclear Material Storage Drawers
- Trolley Systems
- Perimeter Road & Site Paving
- Upgrade Tunnel – Plutonium Facility to Plutonium Facility 41
- Facilities for Site Support Service Contractor
- Warehouse Capability
- Cafeteria
- Training Center & Mockup for TA-55
- Equipment & Glovebox Mockup/Assembly Area

G.7.3 Affected Environment and Environmental Consequences

In the case of the proposed project, it is difficult to upgrade an operating nuclear facility with high levels of security because of the organizational, programmatic, safety, and security constraints that are involved. The constraints and requirements are necessarily much more formal and detailed that those for an office building, for example. The proposed project involves existing, required assets. As such, it must be constructed at TA-55, within the existing systems and infrastructure; there are no other options as to location. As such, the affected environment is TA-55, although the region of influence for each resource evaluated may extend beyond TA-55 and LANL.

The analysis of environmental consequences relies heavily on the affected environment descriptions in Chapter 4 of the main body of this document and care has been taken not to repeat

this information. Resource areas or disciplines that are not expected to be affected by the TA-55 Reinvestment Project, or which would not directly or indirectly affect project implementation, have not been included. Otherwise, where information specific to TA-55 is available and adds to the understanding of the TA-55 affected environment and potential environmental consequences, it has been included.

The following environmental or resource areas were considered but dismissed either because they do not exist at the proposed action site or nearby, or because neither the Proposed Action nor the No Action alternative would have any impact on them:

- Environmental Justice – No disproportionate impacts
- Biological Resources – Located in an already-developed area of TA-55
- Cultural Resources – Located in an already-developed area of TA-55

This impact assessment focuses on those areas of the affected environment where potential impacts are most likely to occur: land resources, geology and soils, water resources, air quality and noise, human health, socioeconomics and infrastructure, and waste management.

G.7.3.1 No Action Alternative

The No Action Alternative would not result in impacts to land resources, water resources, human health or facility accidents. Resource areas which would potentially be impacted as a result of the No Action Alternative are discussed in detail below.

Geology and Soils

No additional direct impacts on geology and soils are anticipated at LANL TA-55 under the No Action Alternative beyond the effects of existing and projected activities independent of the proposed action described herein.

Air Quality and Noise

No increases in nonradiological or radiological air emissions are expected at TA-55 in the near term beyond the effects of existing and projected activities independent of the proposed action described herein. However, under the No Action Alternative, the Stack Upgrade/Replacement subproject for the Plutonium Facility would not be undertaken as proposed. The two Plutonium Facility stacks are corroded and surveillance and sampling is becoming problematic which could degrade regulatory compliance. In addition, the stacks no longer meet ANSI stack requirements and New Mexico State requirements.

No measurable change would be expected in the acoustic environment associated with normal TA-55 complex operations under the No Action Alternative.

4307 **Socioeconomics and Infrastructure**

4308 No change in utility infrastructure resource requirements for operations of existing TA-55
4309 facilities would be expected in the short term under the No Action Alternative. Operations at
4310 TA-55 under the No Action Alternative would essentially reflect a continuation of current
4311 activities. However, as existing radiological facilities age, and associated utility systems
4312 deteriorate, maintenance demands would increase which could adversely affect utility system
4313 performance over time.

4314 **Waste Management**

4315 No changes in waste types or generation rates from existing TA-55 operations would be expected
4316 in the short term under the No Action Alternative beyond the effects of existing and projected
4317 activities independent of the proposed action described herein. Some additional wastes may be
4318 generated through maintenance activities as facilities age and equipment deteriorates. The waste
4319 generation rates are expected to remain within the capabilities of the LANL waste management
4320 infrastructure.

4321 ### G.7.3.2 Proposed Action

4322 The TA-55 Reinvestment Project is subject to significant environmental limitations in terms of
4323 environmental permitting, and many restrictions are imposed by the *1999 SWEIS* (DOE 1999a)
4324 which envelope the types of activities and throughput than can be conducted. The project would
4325 not result in material changes to the permitting basis (e.g., air and water emissions), and likely
4326 the subprojects would fall within the bounds of existing permits.

4327 Further, work related to the subprojects would primarily be performed within existing or around
4328 existing structures at TA-55. Only one higher priority subproject (Emergency Response, Facility
4329 Incident Command Building), involves construction of a new free-standing structure.

4330 The subprojects would be designed and installed so that any changes in operation are consistent
4331 with the approved environmental permits issued by the U.S. Environmental Protection Agency
4332 and State of New Mexico. The subprojects would not materially change any aspect of DOE's
4333 ability to comply with permits. While the new structures, systems, or components may not
4334 function in precisely the same way as the existing ones and may likely be constructed, fabricated,
4335 and operated in a different manner, they would fulfill the same function and provide at least the
4336 same level of protection and monitoring as the existing ones. One exception is the Stack
4337 Upgrade/Replacement subproject for the Plutonium Facility. The proposed modifications are in
4338 part in anticipation of more stringent stack release requirements. These modifications would go
4339 beyond the existing stack parameters.

4340 **Land Resources – Land Use**

4341 TA-55 is situated in the west-central portion of LANL along Pajarito Road between Two Mile
4342 and Pajarito Canyons approximately 1.1 miles (1.8 kilometers) south of the Los Alamos
4343 townsite. The Plutonium Facility Complex within TA-55 encompasses 40 acres (16.2 hectares)
4344 of land of which 43 percent is developed (DOE 2003c). Existing land uses within the TA-55
4345 complex are designated Nuclear Materials Research and Development (LANL 2000d). TA-55

falls within the Pajarito Corridor West Development Area. In general, the plan designates land use north of Pajarito Road as Infill (the area around existing structures), Primary Development (to the west and south of developed areas), or Parking (to the southeast of developed areas) (LANL 2001).

Construction Impacts—All proposed work would be done inside ~~and/or adjacent to~~ the existing TA-55 complex. Most of the work would be inside existing facilities or would entail modifications to existing structures, systems, or components that are relatively minor in scope. ~~Construction of the 3,200-square foot (297-square meter) Emergency Response, Facility Incident Command Building would occur within a currently landscaped and previously disturbed area southeast of the Administration Building. Temporary ground disturbance including impacts to nearby pavement, sidewalks, utilities, and landscaping could total approximately 10,000 square feet (930 square meters) (LANL 2005k). Nevertheless, this construction would be consistent with existing land use and would have a minor impact on land use or other resources including ecological or cultural resources as the area is already developed.~~

Implementation of several ~~of the lower priority~~ subprojects to the existing project scope would involve varying degrees of land disturbing activity ranging from grading work and replacement of roadways to construction of accessory structures or additions to existing structures within the TA-55 complex. These subprojects would collectively have a negligible to minor incremental impact on land resources at LANL and would be consistent with the prevailing land uses of the TA-55 complex.

Operations Impacts—Following the completion of TA-55 Reinvestment Project activities, facility operations would not result in additional impacts on land resources at LANL.

Geology and Soils

The 9-mile (14-kilometer) long Rendija Canyon fault is located approximately 0.8 miles (1.3 kilometers) west of the Plutonium Facility at TA-55 (see Section 4.2 of this SWEIS). Most of the small faults observed in the area have been inferred to represent ruptures subsidiary to the major faults, and as such their potential rupture hazard is very small (Gardner et al. 1999).

Proposed new and upgraded structures, systems, or components ~~and the new Emergency Response, Facility Incident Command Building~~ would be designed, constructed, and operated in compliance with the applicable DOE Orders, requirements, and governing standards that have been established to protect public and worker health and the environment.

Construction Impacts—Reinvestment project activities at TA-55 would have no or negligible direct impact on geologic and soil resources, as all the work would be done inside and/or adjacent to existing TA-55 facilities. ~~Construction of the one-story Emergency Response, Facility Incident Command Building would take place near the Eastern Guard Gate (southeast of the Administration Building). Adherence to standard best management practices for soil erosion and sediment control for implementation of all subprojects, including watering, during construction would serve to minimize soil erosion and loss. After construction, disturbed areas would lie within the footprint of the new building with temporarily disturbed areas stabilized and/or revegetated and would not be subject to long-term soil erosion. Such best management practices would be observed during implementation of all subprojects, where appropriate.~~

The potential does exist for potential release sites to be impacted by reinvestment project activities at TA-55. Prior to commencing any ground disturbance, potentially affected contaminated areas would be surveyed to determine the extent and nature of any contamination and required remediation in accordance with procedures established under the LANL Risk Reduction and Environmental Stewardship Remediation Program. Other buried objects would be surveyed and removed as appropriate.

Geologic resource consumption would be negligible under this alternative. Approximately 100 cubic yards (76 cubic meters) of aggregate in the form of crushed stone would be required for implementation of the high priority reinvestment upgrade subprojects. ~~This would principally be used in construction of the Emergency Response, Facility Incident Command Building (LANL 2005k). Construction of this facility would also require about 300 cubic yards (229 cubic meters) of concrete~~. Aggregate resources are readily available from onsite borrow areas and otherwise abundant in Los Alamos County. Concrete would be supplied via an off-site supplier.

Proposed new and upgraded structures, systems, or components ~~and the new Emergency Response, Facility Incident Command Building~~ would be designed, constructed, and operated in compliance with the applicable DOE Orders, requirements, and governing standards that have been established to protect public and worker health and the environment.

Operations Impacts—Following the completion of TA-55 Reinvestment Project activities, facility operations would not result in any additional impacts on geologic and soil resources at LANL. The structural integrity and seismic safety basis of TA-55 facilities would be improved because a number of the Proposed Action subprojects would involve structural upgrades that specifically include the installation of seismic bracing to meet current performance category standards.

Water Resources – Surface Water

TA-55 is located on a narrow mesa (Mesita del Buey). The mesa is flanked by Mortandad Canyon to the north and Twomile Canyon to the south. TA-55 is primarily a heavily developed facility complex with surface drainage primarily occurring as sheet flow runoff from the impervious surfaces within the complex. No developed portions of the complex are located within a delineated floodplain. One TA-55 facility discharges cooling tower blowdown directly to Mortandad Canyon (via National Pollutant Discharge Elimination System Outfall 03A-181) (DOE 2003c). In 2004, discharges through this outfall totaled 2.7 million gallons (10.2 million liters) (LANL 2005h).

Construction Impacts—Impacts on water resources would be negligible under this alternative as there are no natural surface water drainages in the vicinity of the TA-55 complex and ground-disturbing activities would be minor. Appropriate soil erosion and sediment control measures (sediment fences, stacked hay bales, and mulching disturbed areas) and spill prevention practices would be employed ~~during construction of the Emergency Response, Facility Incident Command Building~~ to minimize suspended sediment and material transport, and potential water quality impacts. No onsite discharge of sanitary wastewater and no impact on surface waters are planned.

Operations Impacts—Following the completion of TA-55 Reinvestment Project activities, facility operations would result in no additional impacts on water resources at LANL. The proposed reinvestment upgrades are not intended to materially change TA-55 operations, and no measurable increase in effluent discharge is expected (LANL 2005k).

Air Quality

Estimates for selected toxic and hazardous air pollutant emissions from key LANL facilities were made in the *1999 SWEIS* (DOE 1999a) based on chemical use at LANL and assumed stack and building parameters. Chemical purchasing records for these key facilities have been reviewed each year and estimated emissions reported in the annual *SWEIS* yearbooks (LANL 2004c). **Table G–28** presents estimated toxic and hazardous air pollutant emissions and associated chemical usage from TA-55.

Table G–28 Toxic and Hazardous Pollutant Air Emissions from Existing Operations at TA-55

Chemical and Form	*2004 Air Emissions (kilograms)*
Ammonium chloride (fume)	0.38
Chloroform	1.56
Ethanol	14.12
Hydrogen chloride	362.28
Hydrogen fluoride, as F	2.9
Hydrogen peroxide	12.31
Isobutane	0.16
Lead, elemental and inorganic compounds, as Pb	0.03
Methyl alcohol	0.28
Nitric acid	226.27
Oxalic acid	28.18
Phosphoric acid	0.32
Potassium hydroxide	122.96
Sulfuric acid	0.97

Note: To convert from kilograms to pounds, multiply by 2.2046.
Source: LANL 2005h.

Radiological air emissions from operations at TA-55 in 2004 are described in Radiological Monitoring (Section 4.4.3.1). TA-55 typically produces a minimal amount (less than 3 percent) of the total LANL air emissions.

Construction Impacts—As execution of the higher priority subprojects would primarily involve upgrades to and repairs and/or replacements of existing structures, systems, and components including electrical, electronic, plumbing, and mechanical systems, most work would be performed with portable equipment and hand tools. There would be some emissions of criteria and toxic pollutants from the use of fuels, solvents, acids, and epoxies associated with subproject work. Because implementation of individual subprojects would be spread out over a number of years rather than performed concurrently, any impacts on ambient air quality would be negligible to minor and of short duration.

Construction ~~of the new Emergency Response, Facility Incident Command Building~~ activities would result in a temporary increase in emissions from construction equipment, trucks, and, to a lesser degree, employee vehicles. Incremental increases in toxic air pollutants would be small and would have a negligible to minor short-term impact on local ambient air quality.

While no radiological releases to the environment are expected in association with construction activities at TA-55, the potential exists for contaminated soils and possibly other media to be disturbed during excavation and other site activities. There are several small potential release sites at TA-55. To determine the extent and nature of any contamination, an assessment of the affected areas would be performed prior to commencing ground disturbance. If the contamination poses an unacceptable risk to the public or to LANL workers, the sites would be cleaned up before proceeding.

Operations Impacts—Following the completion of TA-55 Reinvestment Project activities, facility operations would not result in any measurable increase in air emissions. Implementation of the Stack Upgrade/Replacement subproject would provide for improved in-stack mixing and emissions monitoring in support of improved regulatory compliance.

Further, implementation of ~~two~~ subprojects for Chiller Replacement~~, Fire Suppression - Halon System~~ would have a positive impact on environmental quality by removing ozone-depleting substances, and one subproject (Steam System) would directly reduce emissions of criteria pollutants by replacing natural gas-fired boilers with electric units.

Noise

Construction Impacts—Reinvestment project activities and new facility construction would result in some temporary increase in noise levels near the TA-55 complex and near specific subproject work areas. There would be no change in noise impacts on the public outside of LANL as a result of construction activities, except for a small increase in traffic noise levels from reinvestment project workers' vehicles and materials shipment. Noise sources associated with the proposed subprojects are not expected to include loud impulsive sources such as blasting.

Operations Impacts—Following the completion of TA-55 Reinvestment Project activities, facility operations would not result in any measurable increase in noise levels.

Human Health

LANL workers receive the same dose as the general public from background radiation, but they also receive an additional dose from working in facilities with nuclear materials, such as at TA-55. However, occupational radiation exposures for workers at LANL remain well below those projected for the *1999 SWEIS* ROD. The majority of the LANL offsite maximum exposed individual dose in 2004 (1.68 millirem) resulted from emissions out of the LANSCE stacks. The portion of that dose attributed to operations at TA-55 is minimal (less than 1 percent) (LANL 2005l). All the other doses were below this limit, and also below the 2 rem per year performance goal set by the As Low As Reasonably Achievable Steering Committee in accordance with LANL procedures (LANL 2005h). Further details can be found in Section 4.6.2.1.

Construction Impacts—No radiological risks would be incurred by members of the public from proposed reinvestment project activities. Reinvestment project workers would be at a small risk for work-related accidents and radiological exposures. They could receive doses above natural background radiation levels from exposure to radiation from other past or present activities at the site as well as from work in contaminated areas and encountering contaminated materials during subproject execution. However, these workers would be protected through appropriate training, monitoring, and management controls. Their exposure would be limited to ensure that doses were kept as low as is reasonably achievable. The individual dose to involved workers would be less than 500 millirem for any subproject (LANL 2005k).

Operations Impacts—Following the completion of TA-55 Reinvestment Project activities, there would be no increase in radiological releases to the atmosphere from normal operations as the proposed upgrades are not intended to materially change TA-55 complex operations. Similarly, there would be no change in the basis for postulated accidents and resulting consequences from implementation of this alternative as upgrades would not materially change facility operations and materials at risk would not be affected. A number of the higher priority subprojects involve upgrades that would substantially improve the safety basis of the TA-55 complex and of Plutonium Facility in particular. In addition, implementation of the Stack Upgrade/Replacement subproject as previously discussed would provide for improved in-stack mixing and emissions monitoring in support of improved regulatory compliance.

Socioeconomics and Infrastructure

The LANL-affiliated workforce continues to include University of California employees and subcontractors. The total workforce numbered 13,261 employees at the end of 2004, which exceeded *1999 SWEIS* ROD projections by 2,265. Of the total workforce, 727 full-time and part-time regular employees are attributed to the TA-55 complex (LANL 2005h).

Utility infrastructure at the TA-55 complex encompasses the electrical power, natural gas, steam, and water supply systems needed to support mission requirements. TA-55 uses approximately 14,500 megawatt-hours of electricity annually. TA-55 uses natural gas to fire boilers and for other facility uses and is estimated to use approximately 45 million cubic feet (1.3 million cubic meters) annually. TA-55 water usage is not metered (DOE 2003c).

Construction Impacts—Requirements for utility infrastructure resources including electricity, fuels, and water are expected to be negligible for most reinvestment upgrade subprojects. Existing TA-55 utility systems would easily be capable of supporting project activities (LANL 2005k). Small quantities of gasoline and diesel fuel would be required for such uses as operation of construction vehicles and possibly for portable generators to power hand tools and spot lighting, and other construction equipment. This fuel would be procured from offsite sources and, therefore, would not be a limited resource. Total fuel consumption (mainly diesel fuel) is estimated to be about 13,100 gallons (49,600 liters). Up to 900 gallons (3,400 liters) of water per workday over a period of some six years would be required to support the potable and sanitary needs of the reinvestment project workforce. ~~An additional 138,500 gallons (524,300 liters) of water is projected to be required for dust suppression and soil compaction during grading and foundation work for construction of the new Emergency Response, Facility Incident Command Building~~. The existing TA-55 water supply infrastructure would be easily capable of

handling this demand. The use of portable sanitary facilities by the reinvestment project workforce would also greatly reduce incremental water use. ~~Further, as discussed above, it is likely that some fraction or all of the 25 workers would be drawn from the existing subcontractor workforce that normally services LANL, so that the net effect on LANL water use would be substantially less than projected.~~

Operations Impacts—No increase or decrease in permanent employment at TA-55 would result from completion of the proposed reinvestment project. Therefore, there would be no additional impact on the socioeconomic conditions around LANL from implementation of the Proposed Action.

Waste Management

LANL generates chemical and radioactive wastes as a result of research, production, maintenance, construction, and remediation services activities. For 2004, waste quantities generated from operations at the key facilities were below *1999 SWEIS* ROD projections for nearly all waste types (LANL 2005h). **Table G–29** presents the latest available waste generation data for TA-55 operations.

Table G–29 Waste Generation from Existing Operations at TA-55

Waste Type	*1999 SWEIS ROD Projection*	*2004 Generation*
Chemical (kilograms per year)	8,400	7,807
Low-level waste (cubic meters per year)	754 [b]	189
Mixed low-level waste (cubic meters per year)	13 [b]	1.5
Transuranic waste (cubic meters per year)	237 [c]	13.7
Mixed transuranic waste (cubic meters per year)	102 [c]	23.3

Note: To convert from kilograms to pounds, multiply by 2.2046; from cubic meters to cubic yards, multiply by 1.308.
Source: LANL 2005h.

The plutonium facility has capabilities to treat, package, store, and transport the radioactive waste produced as part of TA-55 operations. Liquid wastes are converted to solids or are piped to the TA-50 Radioactive Liquid Waste Treatment Facility. Some transuranic wastes are immobilized with cement in 55-gallon (208-liter) drums. Other transuranic waste is consolidated in 15- or 30-gallon (57- or 115-liter) drums or is packaged in waste boxes. Low-level wastes also are packaged in the Plutonium Facility, where care is taken to avoid combining hazardous wastes with radioactive waste to form undesirable mixed wastes. Solid wastes of all types are stored temporarily at TA-55 until they are shipped to on-site waste storage or disposal locations, primarily TA-54 (LANL 2005j).

Construction Impacts—Reinvestment project activities are expected to generate ~~transuranic waste~~ low-level radioactive waste, mixed low-level waste, hazardous waste, and nonhazardous solid (industrial) and sanitary wastes. Projected waste volumes, for those wastes where estimates have been made, are provided in **Table G–30**.

Table G–30 Total Waste Generation from Implementation of the Proposed Action at TA-55

Waste Type	*Projected Generation*
Low-level waste (cubic meters)	~~Less than 100~~[a] 988
Mixed low-level waste (cubic meters)	~~Less than 10~~[a] 165
Transuranic waste (cubic meters)	~~No estimate~~ ~~N/A~~ ~~200~~ 150
Mixed Transuranic waste (cubic meters)	~~No estimate~~ ~~N/A~~ ~~150~~ 110
Hazardous waste (kilograms)	~~No estimate~~ 900
Nonhazardous solid waste (cubic meters)	~~No estimate~~ 2096

[a] Based on LANL (2005).
Note: To convert from kilograms to pounds, multiply by 2.2046; from cubic meters to cubic yards, multiply by 1.308; from liters to gallons, multiply by 0.26417. Source: LANL 2005k.

Low-level wastes would be expected to mainly consist of personal protective equipment. Hazardous waste could include various materials removed from TA-55 facilities as part of the upgrades including ~~asbestos~~, electronic components, wiring, batteries, and other materials (LANL 2005k). Low-level wastes may also include spent chemical wastes or leftover materials which could not otherwise be recycled such as solvents or acids. Nonhazardous solid waste would include construction debris and miscellaneous removed equipment (e.g., water tanks, pumping units, heating AND ventilation equipment), some of which could also be contaminated. All wastes would be managed and disposed in a fully compliant method that minimizes volume while minimizing exposure to workers. Subprojects would be designed and constructed to incorporate pollution prevention and waste minimization features. For some subprojects, demolition would be done after the new systems are in place; for others, demolition would be part of the critical path. Waste volume estimates would be refined through Conceptual Design Report activities. A waste management plan would be developed by the project ~~at the start of the~~ AS PART OF Conceptual Design Report.

Operations Impacts—Following the completion of TA-55 Reinvestment Project activities, there would be no increase in TA-55 waste generation rates as the proposed upgrades are not intended to materially change TA-55 complex operations.

G.8 Los Alamos Science Complex

This section provides an assessment of environmental impacts for the Proposed Action consisting of the construction and operation of the Science Complex at several alternate LANL sites. The Science complex would be constructed within the timeframe under consideration in this SWEIS. More general descriptions of the affected environment at LANL are located in Chapter 4 of this SWEIS, while this appendix focuses on project specific analyses of those resources that would be impacted by the Science Complex project. The proposed Science Complex project included in this appendix is categorized as being one that would relocate existing operations to a completely new facility, and then D&D an equivalent square footage of existing LANL facilities. Section G.8.1 provides background information and rationale for the proposed action to build the Science Complex, while Section G.8.2 provides descriptions of the proposed alternative locations for the construction of the Science Complex. Section G.8.3 describes the affected environment and impacts of the no-action alternative and the proposed

END COMMENTS