INDEPENDENT TECHNICAL REVIEW OF THE MOUND PLANT

June 1994

**CONDUCTED FOR THE
U.S. DEPARTMENT OF ENERGY**

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2. PREFACE

This report documents an Independent Technical Review (ITR) of the facilities, organizations, plans, and activities required to transition particular elements of the Mound Plant from Defense Program (DP) funded operation as appropriate either to community developed reuse or safe deactivation leading to decontamination and decommissioning (D&D). The review was conducted at the request of the Dr. Willis Bixby, Deputy Assistant Secretary, U.S. Department of Energy EM-60, Office of Facility Transition and Management and is a consensus of the nine member ITR Team.

Information for the review was drawn from documents provided to the ITR Team by the Miamisburg Area Office (MB) of the DOE, EG&G, the City of Miamisburg, and others; and from presentations, discussions, interviews, and facility inspections at the Mound Plant during the weeks of March 14 and March 28, 1994. During the week of April 25, 1994, the ITR Team met at Los Alamos, New Mexico to develop consensus recommendations. A presentation of the core recommendations was made at the Mound Plant on May 5, 1994.

This is an independent assessment of information available to, and used by, the Mound Plant personnel. Repetition of the information is not meant to imply discovery by the ITR Team. Team members, however, acting as independent reviewers, frequently assess the information from a perspective that differs significantly from that of the Mound Plant personnel.

The report is based on information obtained and conditions observed during the March 1994 review interval. The ITR process and normal site work often initiate rapid, beneficial changes in understanding and organization immediately following the review. These changes frequently alter conditions observed during the review, but the report does not address changes subsequent to the review interval.

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3. EXECUTIVE SUMMARY

3.1 Review Synopsis

No significant technical barriers will prevent the transition of elements of the Mound Plant to either community economic development reuse, or safe deactivation leading to eventual D&D. The path to either state is complicated by the large number of plausible options, the need for rapid change within complex organizations, and funding limitations which bound the viable choices. To clarify and simplify the paths to reuse or deactivation, the ITR Team identified a number of sequential and parallel activities and branch points which will rapidly bring the site to a defined end state consistent with The City of Miamisburg or Community Reuse Organization (CRO) decisions and funding limitations. In the short term, the proposed path forward will neither minimize the cost to DOE, nor will it eliminate any potential for community reuse. It will subject proposed reuse activities to market scrutiny allowing the City to pursue those with a high probability of success and DOE to deactivate those portions of the Mound plant which are shown to have no verifiable reuse value.

3.2 Background

As a consequence of the reduced need for nuclear weapons production, portions of the defense complex are being declared excess to the needs of the DOE. Rapid reductions in the Defense Program (DP) budget require that the cost of maintaining unneeded facilities and capabilities be quickly reduced to the lowest level consistent with health, safety and environmental concerns. The rapid reduction of funding at unneeded sites will adversely affect the economies of nearby communities. To offset these competing requirements the Congress has amended the Department of Energy Organization Act (42 U.S.C. 7256), and the DOE has undertaken the creation of economic development guidance.

The amendment to the Department of Energy Organization Act (Hall Amendment) allows the Secretary of Energy to lease (Sec. 3154) or transfer (Sec. 3155) property at DOE weapons production facilities. Real or personal property may be leased "upon terms and conditions the Secretary considers appropriate to promote national security or the public interest;" personal property may be transferred "to any person if the Secretary determines that such transfer will mitigate the adverse economic consequences that might otherwise arise from the closure of a Department of Energy Facility." This amendment supports the possibility of beneficial

economic development. Real property transfer may be outside of the scope of this document, but it appears to be the most beneficial path for the DOE.

The draft Department of Energy Interim Guidance for Support for Local Economic Development Activities (February 25, 1994) distributed by Robert W. DeGrasse, Jr., Chairman of the DOE Task Force on Worker and Community Transition, gives guidance on community involvement, funding and resource allocation, and use of real and personal property. This guidance gives insight into the Department's current view of community reuse of DOE facilities.

Draft EM-60 documents Facility Acceptance Criteria and Strategy for Deactivation of DOE's Surplus Facilities, and end point criteria developed during prior ITRs were used to develop plans for facility transition from cessation of operation to a "locked, lights out, stable state" awaiting D&D. These documents do not yet reflect community reuse but form the basis for consideration of this more complex problem.

The ITR Team synthesized their understanding of Congressional and DOE guidance, the observed condition of the site, the expressed intentions of the MB and EG&G, the commercial market potential of products and service centers, the needs of the CRO, and an understanding of the EM-60 facility transition process into a clear and understandable path forward for the Mound site.

3.3 Path Forward Recommendation

The proposed path forward is designed to quickly move Mound capabilities (the potential to produce goods and services) through a City of Miamisburg based decision process leading to reuse or deactivation. The process starts with cataloging of all surplus capabilities by DOE. The capabilities are then offered to the marketplace through an advertisement, for example an advertisement in the Commerce Business Daily (CBD). Commercial business expressions of interest will allow the City to make judgments on marketable versus unmarketable capabilities. Capabilities which have no market value will move directly into deactivation. Capabilities with market value will be leased or transferred to the City or its agent for reuse.

A preliminary facility liability screening will occur in parallel with capability cataloging. This will separate facilities into three conditions: (1) obviously good; (2) economically repairable; and (3) the obviously uneconomical to repair. While all three conditions will be offered in the CBD advertisement, the obviously unrepairable will be put into safe shutdown,

and planning for their deactivation will begin. This will reduce the time for deactivation of obviously substandard or seriously contaminated facilities. It is estimated that about 18 months will pass from the issuance of a DOE Defense to Environment program transfer of responsibilities memo of agreement to definition of the reuse status of the capabilities. During this time it will be necessary for DOE to fund the maintenance of capabilities housed in condition (1) and (2) facilities. Capability maintenance will increase the cost to the DOE funding agency, but will provide the City/CRO an opportunity to exploit viable reuse opportunities.

This report lays out a foundation sufficient to allow the site to create an DOE-EM based mission and develop a transition plan which will quickly move the site along a path culminating in reuse or deactivation by the end of FY 1995.

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4. BACKGROUND

4.1 The Mound Plant

The Mound Plant is located on a 306-acre site in southern Montgomery County in southwestern Ohio, as depicted in Figure 4.1-1. The site is mainly within the southern city limits of Miamisburg and is about 10 miles south-southwest of the Dayton city limits.

Figure 4.1-1. Regional location of the Mound Plant

The Mound Plant has been operated for the DOE by EG&G Mound Applied Technologies since October 1988. Previously, the site was operated by Monsanto Research Corporation. The main mission of the Mound Plant was to manufacture both nonnuclear and tritium-containing components for nuclear weapons that are assembled at another DOE site. The Mound Plant has been in continuous use since 1948.

Production activities were conducted in more than 100 buildings situated on two hills (the "Main Hill" and the "SM/PP Hill") and in the valley separating the two hills, as shown in Figure 4.1-2. As can be seen from the figure, the northern part (183 acres) of the Mound Plant site is a heavily developed site with a high density of buildings, roads, and parking lots.

Figure 4.1-2. The complete Mound Plant site.

The southern part (the new property, which includes 123 acres) was purchased in 1983 and has not been developed although some portions of it may be contaminated (chemically or radiologically). The Mound Plant Site

Development and Facilities Utilization Master Plan had identified the majority of the new property as suitable for future major construction projects. A detailed map of the developed part of the site is shown in Figure 4.1-3.

Figure 4.1-3. The developed portion of the Mound Plant site.

The Mound Plant was involved in a number of weapon and nonweapon programs in fulfilling its missions. A wide variety of activities were performed for the following major programs:

- Weapons Program - Activities associated with the weapons program included research, development, and production of detonators; timers, transducers and switches; firesets; actuators; and nuclear components. Surveillance was also performed on

various components of weapons taken from stockpile. In addition, 36 products on 9 different types of ordnance were procured for other sites involved in the program.

- Safeguards Program - The safeguards program at the Mound Plant includes research and development for nuclear measurement instruments and methodology and provides site assistance for nuclear material accountability and calorimeter reimbursable materials.
- Tritium Recovery Program - The Mound Plant received tritium-containing scrap materials from other DOE sites and recovered and purified the tritium for future use.

Based on current DOE program guidance, the Mound Plant appears to have production missions in the following areas:

- Stable Isotope Program - The major efforts include stable isotopes production and inventory sales program for government, industry, biomedical, and scientific applications and isotopes separations (including chemical exchange) research and development.
- Heat Source Program - Activities in the heat source program include hardware fabrication; radioactive module assembly; radioisotopic thermoelectric generator (RTG) assembly; and testing of heat sources for the production of electricity in space, in the ocean, and on land. Also associated with this program are the receipt and monitoring of space flight RTGs after launches are completed at Kennedy Space Center.
- Calorimetry Research and Development and Reimbursable Program - This calorimetry effort includes development of instrumentation and measurement techniques to improve calorimetric assay as a safeguards tool for national and international applications. Provides services throughout the DOE complex and internationally to supply, maintain, and enhance the use of calorimeter systems. The calorimeter systems are used for accountability measurements, shipper/receiver differences, product acceptance measurements and verification measurements.

4.2 Economic Development

EG&G Mound Applied Technologies, Inc., the City of Miamisburg, and the DOE formed a partnership and have initiated several

activities in support of economic development at the Mound Plant. EG&G established an executive-level position, Vice President, to coordinate these activities with the other two entities. The City of Miamisburg created a Mound Transition Office, and the DOE assigned the MB responsibility of working with the partnership. Some of the activities completed by the partnership are:

The partnership created a comprehensive Future Use Plan to address the actions and efforts related to the transition process.

Business and Industry Days encouraged industrial concerns to visit the Mound Plant. These Days were promoted through the Commerce Business Daily, local media, and mailings to area businesses and current Mound Plant customers.

Environmental Site Assessments and Facility Surveys were contracted on the buildings designated for economic development activities.

EG&G formed a Lease Committee to support the business information needs of formulating the DOE lease with the City of Miamisburg.

The City of Miamisburg commissioned The University of Dayton Research Institute to perform a preliminary commercialization study of the Mound Plant.

The City of Miamisburg funded two courses: entrepreneur training and business plan development. Mound Plant employees could attend these courses free-of-charge.

The City of Miamisburg, based on proposed DOE grants, established four programs: Loan Guarantee, Pilot/Prototype Funding, Capital Improvement, and Community Improvement Corporation. These programs will fund and administer the human and technological resources and physical assets at the Mound Plant.

The partnership proposed the creation of the incubators facilities.

Site Deactivation And Environmental Restoration

At the time of the Independent Technical Review, EG&G Mound had developed the economic development - deactivation process flow depicted in Figure 4.3-1. In the EG&G process, a facility was placed in administrative or operational standby and offered to the city for economic development when its mission was completed. If not required by the City, the facilities were placed in safe shutdown and released to EM-40.

Figure 4.3-1. EG&G Mound economic development - deactivation process.

The EG&G Mound definition of each of the process flow facility states was as follows.

PHASE I ADMINISTRATIVE STANDBY—All process activities that were conducted in the facility cease and building occupants relocated. The building will be placed under the authority of the Building Manager. Signs will be posted to indicate that the facility is under Administrative Standby. Normally the building will be locked. Utilities and activities such as

housekeeping, maintenance, etc. will be reduced. A walk-through will be conducted and an action item list developed for completion in Phase II.

PHASE II OPERATIONAL STANDBY--All raw materials, products, and administrative files not associated with the building or equipment are removed from the building and repairs considered necessary for safe standby are completed. Service and maintenance requirements are reduced to safe standby levels. At this point it is assured that the facility in this state will not compromise personnel safety, environmental and property protection and the building operating costs are minimized. The transfer of a facility to the City of Miamisburg for Economic development normally will have taken place before the end of Phase II. Facilities that have not been transferred and are reserved for Economic Development are placed in Safe Standby as delineated in Phase IIIA. Facilities that are not reserved are placed on Safe Shutdown as defined in Phase IIIB.

PHASE IIIA SAFE STANDBY--Personal property items are inventoried. Applicable historical records and documents pertinent to future use of the facility are inventoried and consolidated for safe keeping. A building specific S&M plan is developed and followed with appropriate documentation. After Phase IIIA the building is considered to be in "safe standby" condition until it is transferred to Economic Development.

PHASE IIIB SAFE SHUTDOWN--All hazardous residue materials, (pre-D&D activities) will be removed. Non-essential systems and equipment are de-energized. Personal property and specific items that are selected for reuse are removed from the building. Applicable historical records and documents pertinent to D&D of the facility are inventoried and consolidated for safe keeping. After Phase IIIB the building is considered to be in the state of "safe shutdown", will be declared surplus and turned over to EM for ultimate disposition.

Based on the process flow, the definitions, perceived MB and EG&G mission needs, and interactions with the City, EG&G developed the schedule for building commercialization and deactivations shown in Figure 4.3-2.

**FACILITY DEACTIVATION OF THE MOUND PLANT
ILLUSTRATES FUTURE USE BY DOE OR ECONOMIC DEVELOPMENT**

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Figure 4.3-2. EG&G schedule for building disposition.

As DP production activities have ended, some buildings have been placed in administrative shutdown and occupants have been consolidated. A site characterization to fully classify the baseline hazards for both chemical and radiological contamination has not been conducted, but a great deal of data exists from other sources.

Environmental Restoration

Some Environmental Restoration activities are already underway. In the past, D&D activities were conducted to recycle facilities. D&D took facilities to a "re-use" criteria which was different than a "restoration criteria." For example, floor contamination was partially removed and covered over in some cases, a situation which could impact facility re-use for economic development.

As of February 1993 a total 170 possible release sites have been recommended for inclusion in the Mound Plant CERCLA Program. Based on geographical location, these sites have been divided into management groups, called Operable Units (OUs). Throughout the CERCLA process, OUs may be eliminated or regrouped. Originally there were nine OUs at Mound Plant. Currently there are six. Note that current OUs are numbered 1, 2, 4, 5, 6, and 9. Suspected release sites within OUs 3, 7 and 8 have been determined not to warrant further investigation or have been regrouped within the active OUs.

The following is a description of the OUs currently being investigated at Mound Plant.

Operable Unit 1, Area B

Addresses possible chemical and radioactive contamination of the portion of the Buried Valley Aquifer (BVA) which underlies the southwest corner of the original Mound Plant. The main concern in OU1 is volatile organic compounds (VOCs) migrating in ground water. It is believed that such contamination originates from the area that was formerly used for open burning and waste disposal. Crushed empty thorium drums and waste from cleaning filters in Mound's Waste Disposal Building are also included in OU1.

OU1 covers four acres on-site and includes a historic landfill, the site sanitary landfill and an overflow pond.

Operable Unit 2, Main Hill

Addresses the source and pathways of possible ground water contaminants on Mound's Main Hill. Historical tritium releases have been tracked since the 1970s; the extent of VOC contamination is uncertain. Off-site ground water seeps on Mound's North Hillside are included in OU2.

The land area encompassed by OU2 has increased in size from its original delineation. OU2's enlargement results from its shift in focus to all hydrogeology and possible release sites on the Main Hill, not only the Main Hill seeps. Also, former OU3 and OU5 areas on the Main Hill will be addressed by OU2.

Operable Unit 4, Miami-Erie Canal

Addresses contamination of the old Miami-Erie Canal bed in Miamisburg resulting from plant runoff, including an accidental plutonium spill in 1969. The 1974 Rogers Study, conducted when the plutonium was discovered and supported by the US and Ohio EPAs, and the Ohio Department of Health, concluded that the plutonium in the Canal posed no imminent threat to human health and the environment. Tritium is also a contaminant of concern in the canal and was studied in the late 1970s as part of the Potable Water Project. All drinking water supplies in the area are in compliance with the Safe Drinking Water Standard for tritium of 20 nanocuries per liter as established by the US EPA.

The land area covered by OU4 has not changed from its original delineation. The north portion of the Miami-Erie Canal bed is within the Community Park, owned by the City of Miamisburg.

Operable Unit 5, South Property

Addresses on-site soil areas in the southern portions of Mound Plant known or suspected of being contaminated by radionuclides or chemicals. OU5 will fully characterize the sources of contamination and migration within its geographical boundaries. OU5 contains three geographical areas: the SM/PP Hill, the Valley and the New Property. Historically, plutonium operations and thorium redrumming were performed on the SM/PP Hill. The Valley area encompasses a number of buildings where explosive devices are tested, the Main Plant drainage ditch and the plant's waste water treatment facilities.

The New Property was acquired in the early 1980s and remains undeveloped.

Available data indicate that most of OU5 is uncontaminated. However a number of areas within OU5 are known to be contaminated with radioactive materials, principally thorium and plutonium. The areas were contaminated by disposal of contaminated soil or debris.

Operable Unit 6, Verification of Sites Under the Management of the D&D Program

Addresses residual contaminants from Mound's ongoing Decontamination and Decommissioning (D&D) of unused radiological facilities on-site. The current D&D Program at Mound began in 1978 and presently addresses surplus plutonium facilities and underground waste pipelines.

The land area covered by OU6 has changed only slightly from its original delineation to reflect D&D work done since the original Operable Units were defined.

The D&D Program is independent of the CERCLA Program and is not routinely subject to EPA oversight. However, upon completion of D&D activities, every site will be evaluated by the CERCLA Program under OU6.

Operable Unit 9, Site-Wide/Off-Site

Addresses the total environmental effects of contamination attributable to Mound Plant that may be found in the air, ground water, soils, surface water and sediments; includes all ecological concerns. OU9 encompasses the cumulative impact of all other Operable Units on-site and in the off-site environment, including characterization of possible contamination in the Buried Valley Aquifer and the plant drainage system.

Presently, site-wide investigations encompass the entire plant and the area within a 20-mile radius of the plant.

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5. RECOMMENDATIONS

The recommendations of the ITR Team must be viewed both in terms of context and terminology for a complete understanding of their intent. This section is organized to present the details of the recommendations after a discussion of the ITR Team's view of context and terminology. The recommendations include:

- Establish a "Best Practice" Economic Development Approach.
- Define the New EM Mission and Mission Strategic Plan.
- Redefine the M&O as a General Contractor.
- Categorize Activities as Liability Reduction, Funded Program, or Base. Eliminate all others.
- Establish Liability Reduction Projects.
- Implement Safe Shutdown and Deactivation Via Projects.

5.1 Context

Introduction of new business requirements into an organization with long experience in performing traditional tasks requires the introduction of new terminology and assumptions. Terminology needs to precisely convey the new concepts and activities without leading people immediately into the old thought patterns. Assumptions must address the new business environment and define the new bounds on opportunities.

New assumptions are required because of the radical change from weapons component production to reuse and deactivation. The former mission had a national mandate that continued relatively unchanged for 50 years. The new mission has no national mandate, and the time for completion is an order of magnitude shorter.

5.1.1 Terminology

The definitions are based on ITR Team's experience during the transition to deactivation of several DOE facilities over the past two years. Past experience does not include reuse of facilities or community economic development. The definitions presented here have been modified and expanded to include the requirements of reuse and economic development.

The set of terms defined is limited to those that have developed specific meaning during the review process. All other terms retain their normal dictionary definitions.

The terms which need definition fall into three groups: those relating to existing property and the ongoing ability to do work, those relating to unneeded property, and those relating to ongoing transition activities.

The concepts of property and the ability to do work are the core of reuse, economic development, and deactivation for storage. Terms relating to real and personal property as defined by the DOE are generally adequate for our discussions.

It is useful to define a **facility** as *an entire building and all support structures, outbuildings, equipment, tanks, pads, and utility support systems that are dedicated to the main building; and soil within a five foot perimeter of the structures.*

A **site** is therefore composed of *a number of facilities.*

Capability is *the potential to produce goods or services.* It can be any combination of physical objects, including buildings and equipment, and the ability to do work based in trained and experienced employees.

Liability is *the potential to incur a loss of credibility and/or assets.* Liability encompasses all aspects of risk, safety, security, environment, financial, and public interest implications. The definition has an insurance industry focus rather than the risk view taken by the nuclear industry.

Base activities are *activities that must be performed or maintained because they are mandated contractually, are absolutely essential to keep the site or facility at an acceptable liability state, or enable liability reduction.*

Liability reduction activities are *activities that lower liabilities by changing their physical state.*

Funded program activities are activities which are fully funded by a program or project. Fully-funded programs would generally fall under DP or NE, but in the case of economic development, may include outside entities. Full funding includes responsibility for the facility and associated landlord support services.

To **commercialize** an activity, *the DOE /M&O need for an activity is filled by transitioning both the requirement and the capability from the M&O contractor to a commercial contractor.*

If a facility has no proven reuse value, it will then move into a deactivated storage state awaiting D&D. The first step towards deactivation is **safe shutdown**, during which the past operating organization brings the facility into *conformance with the draft EM-60 acceptance criteria* (Appendix D).

Once a facility is accepted by EM-60 it undergoes a process called **deactivation** which is *the process of transitioning a facility from safe shutdown to deactivated storage*.

Deactivated storage is a *safe, stable minimum mortgage state for a facility awaiting ultimate disposition, typically D&D*. The criteria for deactivated storage is normally locked, lights out, quarterly surveillance and EM-40 Program acceptability.

5.1.2 Assumptions

Assumptions are based on the ITR Team's view of the business environment in which the Mound Plant transition will take place. That view includes changes in: customer requirements and success indicators; funding sources, levels, and duration; definitions of products and markets; customers and stakeholders; regulatory and DOE order requirements, and roles and responsibilities of the DOE (Headquarters, AL, OH and MB), EG&G, and the local communities. Once bounding conditions and roles of the participants are set, the logic of the path forward can be defined. Changes in the assumptions may lead to changes in the path forward, but the process used remains valid.

The assumptions fall into two general classes: basic philosophy of site transition and economic development; and definition of the funding, management and business environment. The assumptions set limits inferred by existing guidance on facility transition, and define the roles and responsibilities of: DOE in general, EM-60, the M&O, and the CRO. The assumptions used by the ITR Team include the following:

The success of the economic development process will rest on transitioning the best DOE capabilities to the private sector first. The focus of the Mound transition/economic development process is not down-sizing the capability in the face of shrinking budgets by divesting non-functional activities, high maintenance buildings or equipment, or other unwanted capabilities. It is a process of leaving the community with the best and dispositioning the remainder as rapidly as possible. The object of the commercial world is to keep the assets and divest the liabilities. In this instance it should be the object of the DOE to keep the liabilities and divest the assets.

Economic development is based on knowledgeable employees, not real estate. People without buildings can create economic development; buildings alone cannot. Saving the buildings without saving the staff and the corresponding knowledge base will make economic development nearly impossible. Economic development, on the other hand, can take place independently of the present facilities because the work force is mobile. The Community leaders indicated they could develop their businesses at another location, and some could see benefits that might outweigh the consequent disruption. At outside locations, economic development can move forward independent of site imposed constraints. Also, regulatory permitting may be simpler for some activities if they are not tied to the legacies of past site work.

Liabilities from past DOE work will be documented, stabilized and become part of the reuse agreement. Commercial companies will be reluctant to move adjacent to or into a facility with liabilities from past work which might affect future profitability. If a facility is on a fast-track to economic development, liability baselining, stabilization and cleanup should be underway. The need for rapid progress may strain regulatory and waste management functions, but will force forward motion and make barriers and opportunities evident.

Components produced to weapons specifications have limited application in the commercial market. Converting weapons components to commercial application will require time and money. It is not clear that this conversion is required for, or part, of successful economic development and capability reuse.

Economic development does not mean that the present personnel will make the civilian versions of weapons components at the past pay rate with the same benefits package. Through the years wages at DOE sites have risen to keep pace with national trends. This will not be an objective of private enterprise and labor rates will fall to prevailing local levels. Economic development may maintain the tax income to the local municipalities, but it will not prevent hardship on some displaced DOE and contractor employees.

In common with commercial industrial practice, the DOE will take risks, suffer failures, and continue forward. Inaction is the least risky path forward, but is unacceptable. Increased interaction with the public and compliance with regulations will not reduce the risk to zero. Environmental restoration, waste management, pollution prevention, and economic development will progress faster if prudent risk taking is rewarded.

Guidance on transition of former weapons production sites to community reuse is being developed by Congress and the DOE.

Consequently, some written direction is in draft form. The ITR Team used the Hall Amendment and the DeGrasse Draft Economic Development Guidance as the basis for the proposed path forward. One branch of the proposed path forward assumes that real property can be transferred to the CRO. Real property transfer may be outside of the scope of these documents, but it appears to be the most beneficial path for the DOE. Use of this branch of the path will require a greater understanding of the process to transfer real DOE property. In addition to the Hall and DeGrasse documents, the Team used EM-60 draft acceptance and transition documents and concepts developed during past ITRs.

Based on the Team's understanding of the Hall Amendment and the DeGrasse Guidance, they assumed that the CRO will implement the economic development and reuse process defined by DOE. On the proposed path forward, the DOE will begin the process by cataloging capabilities. DOE will also support the CRO by offering expertise and other support, but the pivotal decision making role will be vested in the CRO.

While the M&O has been the key player at the Mound Plant for many years, it is unclear whether EG&G is considered part of the community by the CRO. It is important that the M&O become one with the local community because the M&O contractor's future use of surplus capabilities will be implemented through the CRO.

The recently negotiated "Right-To-Use" Agreement between EG&G and DOE will become an issue during transition. The "Right-To-Use" is associated with functioning production lines, and all production and the capability to continue production will cease at the end of FY94. At the time the agreement was signed production was to continue until the end of FY95. The DOE has no obligation to maintain the "Right-To-Use" in FY96 and beyond, neither are they obligated to immediately terminate this capability at the end of FY95. The use of capabilities based on an agreement between EG&G and DOE is outside the direction of the CRO and may block the use of facilities for CRO supported activities.

A number of assumptions were made about the role and responsibilities of the DOE in the transition process. DOE site "mortgage" costs and liabilities must be safely and rapidly reduced, while fulfilling environmental and economic development obligations.

Economic development was not viewed by the Team as a long-term assistance or subsidy program so it was assumed that economic development assistance is a limited scope, near term activity.

In the same vein, it is assumed that DOE-EM, DOE-DP and the M&O contractor are near term site residents; DOE is seeking long-term reuse by someone other than DOE.

During the transition process and within future lease or transfer agreements, the economic development initiative does not displace DOE's other statutory requirements.

The introduction of the CRO decision making process will complicate and lengthen the EM-60 facility transition process, with a consequent increase in cost. The process of transition to deactivation must be selective because safe shutdown could eliminate desirable features of capabilities. This slower selective process will increase costs.

To limit the EM-60 funding liability, the Team assumed that EM-60 program funds will not be used to refurbish facilities for reuse, EM-60 will not maintain support infrastructure and base activities used primarily for long term economic development, and program capabilities will not be maintained to primarily or solely support the M&O contractor's "Right-To-Use."

The following sections contain the ITR Team recommendations.

5.2 Establish "Best Practice" Economic Development Approach

As it shuts down operations in the Miamisburg area, DOE has the opportunity to establish an economic development "best practice" standard. While the DOE cannot make the local community be successful in economic development, near-term "best practice" economic development assistance should enable the community, working with regional stakeholders and private business, to be successful in replacing its losses as a result of the DOE's departure. The ITR Team identified and recommends three elements of a best practice approach to economic development: 1) mitigate the impact on the local tax base, 2) retrain production specialists with new, portable skills, and 3) make surplus capabilities available for reuse. The three elements are developed in the following sections.

5.2.1 Mitigate Closure Impact on Regional Tax Base

The mission of a community government is to provide quality of life and quality services to its residents. Its ability to carry out this mission is directly linked to the economic prosperity of the community and the resultant tax revenues. City officials stated that employees of the Mound Plant operation contribute roughly 1/3 of the total Miamisburg tax revenue,

through a 1.75% local income tax. The City must find means of replacing such a sizable loss or severely cut services.

5.2.1.1 Lump Sum Funding

If the DOE, at the will of Congress, is to mitigate the impact of its departure on the host community, its first objective should be to assist the City in maintaining its tax base. The ITR Team recommends that this be carried out through an unencumbered grant of funds (one-time lump sum funding) to the local community. The community should have the maximum flexibility to use the grant funds consistent with its economic development planning. For example, the City's economic development effort could take the form of reuse of the surplus DOE facilities or the development of a separate new business park. The process and formula for determining the amount of the grant should be consistent at all surplus DOE sites. Ideally the grant process should be independent of stakeholder pressure. The grant formula should be linked to the anticipated tax revenue loss, e.g., a percentage of the plant's salaries and local purchases averaged over the prior three years.

5.2.1.2 Make Assets and Resources Available

A second means of mitigating the impact of the DOE departure on the host community is to provide the community with other DOE assets and resources which could make a significant difference in the community's success at economic development. The Mound Plant contains first class office accommodations in facilities OSE, OSW, and A which are likely the most significant economic development features of the site. A Fortune 500 Company might find the Mound Plant industrial facilities attractive if the package included first class office space. Under current plans, these buildings are designated for use by the DOE and EG&G management until the cleanup effort is complete. DOE and EG&G could make one or more of these facilities available to the City/CRO early in the economic development effort by relocating personnel into the facilities where DOE will need to maintain a site cleanup presence, such as R, SW, and T Buildings.

Within the DOE community, there are many seasoned managers, tech transfer specialists, and administrators who might assist the City in areas it identifies as critical to its near term economic development needs and success.

5.2.1.3 Commercialize Mound Plant Support Activities Locally

Commercialization is proactive transitioning, from the non-competitive to the competitive environment, of capabilities for which there is an ongoing commercial market and near term Mound Plant need. All Mound Plant capabilities will become surplus to the DOE with time; with the

end of production mission, some are surplus now. Some capabilities will be required near term as a part of production reconfiguration, Nuclear Energy (NE), shutdown, deactivation, and D&D activities. These capabilities can be transferred to the public sector when they become surplus, at some jeopardy, or the inevitable transition process can begin now.

The ITR Team recognized two ways of transitioning a capability where a Mound Plant need and a commercial market both exist: 1) bring private sector work into the M&O capability to help support and transition the capabilities, or 2) transition the Mound Plant capability and the near term support need to the commercial sector. Most DOE contractors have pointed out that carrying out work under DOE's system of oversight and Orders is more expensive than work in the commercial arena. Therefore, it would appear that bringing commercial work inside the M&O contract requires some degree of DOE subsidy. This raises a significant issue – should DOE funds be used to subsidize M&O capabilities in competition with regional businesses?

Commercialization of Mound Plant support services should be a key element of the economic development plan. If supported by DOE work, commercialization can facilitate business survival or growth within the private sector without the trauma associated with the last minute disposition process described in Section 5.2.3 below. Commercialization of the support services is an economic or business development approach with several significant short-and long-term benefits. It is a unique economic development opportunity in that both the capability and the market currently exist; it provides DOE services at market-driven costs; it stimulates economic growth for the City of Miamisburg; it supports economic development of other site capabilities; and it can strengthen local small business so they can do business in a broader market or geographical area. Commercialization of Mound Plant support services also enables the DOE to meet its original economic development commitment to the employees and communities at minimal additional expense.

Commercialization of support services could enable the Mound Plant employees to: 1) incorporate market ready services into small businesses today, 2) provide services and products that they know better than anyone, 3) use their knowledge of the local community to market the services elsewhere, and 4) develop viable self-sustaining enterprises much faster. To assume that all employees can successfully organize, incorporate, sell, service, and make profits is a very myopic view. But just as businesses of every size fail everyday, so businesses of every size succeed and grow everyday. This is the truest sense of economic development.

The roles of each of the entities in commercializing the Mound Plant's support service should be as follows:

DOE

1. Identify current Mound support service needs and capabilities to the City/CRO.
2. Enable the timely transition of capability assets to the City/CRO.
3. Establish set-aside contracts with the new businesses.
4. Modify the EG&G contract as required to make rapid commercialization feasible and attractive.

City/CRO

1. Provide economic support for business start-up.
2. Negotiate and execute building and equipment leases with the businesses.
3. Promote the capabilities to government and private sector clients.
4. Ensure the Mound Plant work force is given the opportunity to establish businesses.
5. Champion the interest of the Mound Plant work force, so it can continue to make its valuable contribution to the community.

EG&G Mound Applied Technologies, Inc.

1. Identify the facilities and equipment that are required for support services.
2. Quantify the current annual operating costs.
3. Facilitate the timely conversion of DOE assets to the City/CRO.

Since a functional, reliable, and cost competitive site support infrastructure is key to successful economic development of the Mound Plant, it should be a first focus of commercialization. This includes roads, grounds, water and sewer systems, and the power plant with associated steam and electrical distribution systems. The commercial enterprise sells the necessary services, at market driven prices, to the DOE and other tenants on the Mound Plant.

5.2.2 Retrain Production Specialists With Portable Skills

Part of any "best practice" economic development effort includes transitioning the work force. Some of these efforts are already underway under Section 3161 of the Defense Authorization Act of 1993. Section 3161 sets forth specific requirements for the training of personnel impacted by

down sizing of the DOE complex plant closure. Most of the management, professional staff, technicians, crafts, clerical, and security personnel have training and job skills which enable them, without retraining, to find equivalent jobs at other DOE sites, in the community, in their own enterprises, or in the national market place.

In a few cases, however, the skills and knowledge possessed by the workers are not transferable to other jobs. DOE weapons production at the Mound Plant has created a small group of less than 100 hourly production employees who are highly trained and skilled in the manufacture of weapons-unique piece parts. Because of their specialized nature, these job skills and knowledge may not be portable. The ITR Team recommends that this segment of the Mound Plant work force be given first priority to new cleanup jobs and retraining as a part of "best practice" economic development. Additional EG&G or subcontractor personnel will likely be required in hazardous materials consolidation and disposition, radioactive materials consolidation, processing, packaging, and shipment, waste processing and packaging, asbestos abatement, and facility surveillance and maintenance. Training could be a combination of class room and on-the job learning experiences.

5.2.3 Make Surplus Capabilities Available to Others

The Mound Plant has a number of capabilities which are surplus as a result of the stop production order. The November 10, 1993 Hall Amendment to Section 646 of the Department of Energy Organization Act, 42 U.S.C. 7256, enables the Secretary of Energy to lease surplus real and personal property and to transfer personal property and equipment. As a part of the "best practice" economic development effort, the ITR Team recommends that all surplus capabilities be quickly made available to the commercial sector through a standard process. Since the production and production support capabilities have been declared surplus by Defense Programs, the full viability of the capabilities is in jeopardy and a speedy, coordinated effort by all parties is of the essence.

5.2.3.1 Capability Hierarchy

A capability is the potential to produce goods and services. In the ITR Team defined hierarchy of capabilities, shown in Figure 5.2-1, the highest level capability is a complete site, such as the Mound Plant. The number of capabilities expands rapidly as you move down the hierarchy, with literally hundreds of thousands of potential capabilities at the base of the hierarchy.

The entire Mound Plant with its various product lines and support infrastructure is a capability which was meaningful to Defense

Programs and could possibly be useful to some other enterprises. The next tier of the hierarchy is the major product lines and associated infrastructure, such as explosive components. The third tier contains individual technology and infrastructure elements. Examples of Mound Plant capabilities at this level include explosives formulation and explosives aging analysis. The fourth tier of the hierarchy contains sub-elements capabilities of the major technology areas, such as the formulation of pyrotechnics. At the second from the bottom of the hierarchy tier are facilities and equipment which support the elements and sub-elements, with the bottom tier being buildings, parts of buildings, and individual equipment.

The commercial value of a capability is tied to its product impact. The site or product lines at the top of the hierarchy may enable systems or subsystems, while an individual piece of equipment at the bottom of the hierarchy can probably only enable a process step for a component. It appears to be in the City of Miamisburg's best economic development interest to, if feasible, attract users which want capabilities at the top of the hierarchy, not to seek reuse of partial buildings or individual pieces of equipment.

The DOE liability reduction perspective is similar; if DOE can transfer the whole site to another entity, commercial or government, its liabilities could potentially be eliminated. If the City's economic development efforts only reuse a few buildings and pieces of equipment, its Mound Plant liabilities and mortgage remain high. The DOE should give priority to reuse transfer or lease of capabilities near the top of the hierarchy.

The incentives are fundamentally the same, therefore, for the DOE, the City, and the commercial sector - reuse capabilities as high on the hierarchy as is feasible. Avoid transfer of individual equipment or buildings.

Figure 5.2-1. Hierarchy of commercial capability value and DOE liability reduction.

5.2.3.2 General Decision Logic

The objective of the surplus capability process, shown in summary block form in Figure 5.2-2, is to allow the commercial sector to determine if surplus capabilities have commercial value before they are put into safe shutdown and ultimately deactivated. The blocks summarize the key steps in the Hall Amendment and the DOE Draft Economic Development Guidance. The ITR Team recommends that DOE establish the steps in the reuse process and that the process specify high level roles and authorities. The City of Miamisburg/CRO can then take the lead in applying the process to evaluate and lease or transfer the Mound Plant capabilities. If the City/CRO controls the economic development reuse process and lump sum funding, there is no need for DOE or EG&G to have access to the proprietary business information of others.

When a capability is no longer required by a DOE program, DOE must decide if the capability is truly surplus to its needs. If the capability is surplus, it can be offered to the commercial sector for reuse, through the City/CRO. If the private sector has a need for the capability, it may be transferred or leased to the City/CRO, its agent, or the commercial enterprise, depending upon the nature of the capability (See Appendix D). The transfer or lease of the capability should be carried out in a way which best reduces the DOE's long-term site liabilities and mortgages.

A fundamental tenet of economic development reuse of the DOE surplus capabilities is that they have value. The ITR Team recommends, therefore, that 1) the capabilities be maintained in a near operational state until they can be evaluated and 2) surplus capabilities be made available as is, where is. Reuse modifications or refurbishment should be the responsibility of the City of Miamisburg/CRO. The City/CRO must evaluate and prioritize the reuse modifications cost/benefit in terms of local alternatives and its available economic development funds.

If the commercial sector and/or the City/CRO have no use for the capability, then DOE will shutdown and deactivate the facility to reduce its liabilities and site mortgages.

Figure 5.2-2. Summary process for disposition of surplus capabilities.

The specific steps of the capability disposition process, as depicted in Figure 5.2-3, generally fall into two parallel paths—a reuse and a deactivation path. The upper reuse path begins with the DOE surplus determination. DOE's continued need for the Mound Plant capabilities might include the weapons production reconfiguration program, the EM waste treatment, deactivation, and environmental restoration projects, as well as other DOE program areas such as NE. If the capability is surplus, both the upper reuse evaluation path and the lower deactivation path are implemented in parallel.

The reuse evaluation path begins with a comprehensive cataloging of the significant capabilities which are surplus. The capability catalog should describe the upper levels of the capability hierarchy, possibly down to the sub-elements level. DOE, EG&G, and the City/CRO should jointly create this catalog. Much of this work has already been accomplished, but needs to be reviewed to ensure that all surplus capabilities are listed.

The City/CRO, with assistance from DOE and EG&G, should then broadly advertise the surplus capabilities, such as in the Commerce and Business Daily (CBD), to ascertain commercial interest. The CBD advertisement should include a reuse decision schedule and the selection criteria. If feasible, specific industries should be targeted, particularly those whose activities and needs appear to match Mound Plant capabilities. Companies and individual managers should be contacted prior to the announcement. Targeting the right people is critical. The V.P. for Manufacturing is a better prospect than the Manager of a individual plant or production line. The former has a breadth of knowledge of company needs and has the clout to make things happen. The latter, if meeting his production quotas within budgeted costs, often is reluctant to expose himself

to risk or to rock the boat. Similarly, on the technology side and for analogous reasons, the V.P. of Research and Development is a better prospect than even the most renowned of senior scientists.

EG&G, DOE, and the City have already advertised a portion of the Mound Plant capability, but the ITR Team recommends that all capabilities which have not already been designated for a reuse by the City be re-advertised. The additional advertisement should eliminate any question of availability and commercial interest.

After the announcement and other appropriate advertisement, commercial companies will wish to inspect and evaluate the capabilities, as occurred on the previous Mound Plant Industry Day. The security perimeter should be collapsed to the minimum set of buildings before the industry evaluation period, to facilitate the best possible commercial review and interaction. The City/CRO should subsequently request letters of intent from the commercial businesses as a basis for determining viable interest and economic development potential. Businesses should clearly be informed not only of the capability, but also of the liability associated with the site/facility. The City/CRO is then in a firm position to request the lease or transfer of all

Figure 5.2-3. Detailed process flow for disposition of surplus capabilities.

capabilities for which it has an intended use. For those capabilities without commercial reuse interest, the government excessing process should be used to further reduce the site liabilities and mortgages. It may be possible to save significant time by using a common announcement to address both reuse and the government excessing processes.

The DOE should apply whatever statutory means it has to reduce its long-term liabilities and mortgages and to stay out of the real estate leasing business. If property is transferred either directly or indirectly through the GSA, the DOE liability at the site can be negotiated, as shown in Figure 5.2-4. Ultimate disposition of the capability, including D&D, become the responsibility of the new owner. If property is leased to the City/CRO, DOE maintains an indefinite liability, including potentially the added environmental liability for commercial businesses which fail. DOE also maintains responsibility and future liability for ultimate disposition of the capability.

Figure 5.2-4. Transfer or lease options to liability reduction.

The ITR Team recommends that the DOE maintain capabilities at a standby-like state until the reuse has been evaluated. Since the ITR Team estimated the reuse evaluation process may take 18 months to complete (See Section 5.2.3.3), maintenance of the capabilities will be an expensive short term DOE commitment. To mitigate this expense where prudent, the ITR Team recommends that the Figure 5.2-3 lower safe shutdown and deactivation planning path be carried out in parallel with the capability evaluation process. The preliminary liability screen, as depicted in Figure 5.2-5, is used to identify those capabilities which have a low probability of economic reuse. All capabilities are offered in the Figure 5.2-3 upper reuse process, but those with a very low potential for reuse would be put in safe shutdown and deactivation planning initiated.

The ITR Team's recommended basis for capability reuse potential is the condition of the associated facilities. A facility which has never been contaminated, meets applicable codes, and is in good physical condition is a prime candidate for reuse. At the Mound Plant, buildings such as OSE, OSW, and A are in this "Condition 1" category. Other buildings are radiologically contaminated, and/or don't meet applicable codes, and/or are in poor physical condition. If the City/commercial reuse cost of repair and refurbishment is greater than 110% of the fair market value (FMV = commercial lease cost per square foot per year times the area times 10 years), the probability the facility will be commercially reused is low. Example of "Category 3" facilities at the Mound Plant are R, SW, and T Buildings. Most buildings at the Mound Plant are probably "Category 2" facilities—there are contamination, code, and/or physical condition issues which can be corrected for less than 110% of the fair market value.

Facilities which screen as Category 3 and the associated capabilities would be placed in safe shutdown and deactivation planning initiated, as shown in Figure 5.2-3. Capabilities and facilities which were not transferred or leased as a part of the reuse or Government excess process would also be placed into safe shutdown. Deactivation project planning would be initiated, and the capabilities would be deactivated to a locked, lights out, quarterly surveillance state for long-term safe storage until D&D.

Figure 5.2-5. Screening tool to establish facility condition.

5.2.3.3 Schedule

To be meaningful, the economic development process must be expedited. Capabilities are perishable. Skilled personnel, faced with an uncertain future, will seek other, more stable employment. Equipment and processes not in routine use will atrophy. However, both DOE and the City of Miamisburg are entering into uncharted waters in developing their legal and working relationship and in defining and implementing such a large scale and complex program. The leasing process in itself is fraught with hidden shoals. Before entering into a lease, DOE must obtain the concurrence of EPA or the appropriate state official (Hall Amendment, Sec. 3154, (e), (2)). Additionally the Interim Guidance sets up rather detailed and rigorous procedures, including a requirement for at least two levels of DOE Headquarters' approval of the community's economic development plan. Without close attention, these inherently bureaucratic processes almost certainly will entail more time and effort than anticipated.

The ITR Team estimates that the surplus capability reuse evaluation process can be completed in approximately 18 months. The estimate is based on the individual activity logic and time frames shown in Figure 5.2-6. Because the capabilities are perishable, the ITR schedule is ambitious. Its realization will require rapid, expedited, effective responsiveness by and between DOE and the City and with the commercial prospects. Non-trivial slippage of a widely publicized schedule has the potential for adverse consequences to the economic development program.

A significant effort has already been undertaken at the Mound Plant to catalog surplus capabilities; sufficient information exists to start the liability screening process; and the NEPA process has already been started. A preliminary environmental evaluation is required with sufficient depth to provide businesses potentially interested in capability reuse with an estimate of the associated liabilities. Existing Mound Plant data and the ITR facility walk-down descriptions may, if summarized, satisfy this requirement.

Economic development personnel in the Mound Plant area have experience in preparation, approval, and publication of a CBD announcement. They have also facilitated a preliminary industry day, which should provide a lessons learned basis to improve and expedite these process steps.

The City/CRO should be in a position to make final capability transfer/lease selections by the first of calendar year 1995. Shutdown and deactivation of Condition 1 and 2 facilities not required by the City can be initiated at that time.

ACTIVITY NAME	1994								1995											
	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
MOA			◆																	
Surplus Determination																				
Capability Catalog																				
Reuse and Condition Determination																				
Economic Development NEPA Process																				
Preliminary Env. Baseline																				
CBD Development and Publication																				
CRO Selections and Statement Intent																				
CRO Title																				
Env. Baseline Offered Facilities and Capabilities to Establish DOE Liability																				
Declassify																				
DOE Maintain Site Offered Facilities and Capabilities																				
Deactivate Offered But Not Accepted Facilities and Capabilities																				
ER Program Activities																				
	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D

Figure 5.2-6. ITR proposed schedule for disposition of surplus capabilities.

5.3 Define the New EM Mission and Mission Strategic Plan

The management of the Mound Plant must be altered to become consistent with the new mission. Although not yet formally stated, the mission is to move from a production-oriented weapons components plant to a project-focused organization completing the final phases of weapons work, performing site deactivation, supporting a few ongoing DOE missions, and fostering economic development. This new mission is driven by the fact that weapons production funding will rapidly diminish to a few million dollars in FY95 reaching zero at the end of FY96. In contrast, the EM related portions of the new mission are growing short term, but probably not to a level that will offset the decrease in weapons production funding. This will cause major economic and cultural changes at the Mound Plant.

The ITR Team recommends that DOE, EG&G, and the stakeholders initiate and focus these changes by defining a site mission. A simple, high-level liability reduction mission is invaluable to communicate to and gain acceptance from the DOE EM-60 customer, the work force,

regulators, and stakeholders. The mission plan then becomes the guiding basis for the creation of the detailed project management plans. The ITR Team proposes that the Mound Site mission statement be:

**Declassify the defense production capability
and transition to reuse or deactivation
leading to local control of the Mound Site.
Support continuing, fully-funded DOE programs.**

With the definition of a new site mission, DOE and EG&G can develop a mission strategic plan. Key elements of the mission plan should include:

Vision: A statement of the anticipated condition and use of the site when the liability reduction effort is complete.

Objectives: A mission requires a mechanism for implementation. Objectives are designed as broad-based overarching descriptions of what has to happen to accomplish the mission. Objectives should describe measurable liability reduction and be project oriented.

Strategies: A tiered support structure is required as the mechanism for the implementation of the objectives. As broad-based descriptions, objectives require a more defined implementation step. A strategy expresses how to accomplish the objectives.

Activities: A project implements part of a program. Projects and/or activities are a subsequent progressional element of a program. A project addresses a defined piece of work with a defined beginning and end and an anticipated cost. A project and/or activity also provides a measurable outcome directed at accomplishing the mission.

Performance Measures: A performance measure provides the measurement mechanism that monitors movement towards an objective. Measures also supply a reference standard to compare the progress of meeting the intent of the mission. The measures can also be effectively incorporated into an award fee structure. A performance measurement is in quantitative terms with a specific objective value. "Rad waste volume reduction over time" is a quantitative indicator; "improve rad waste processing" is not.

Organization: The organization should clearly define the group of personnel with the responsibility and authority to implement the elements of the mission plan per the performance measures. Project command and control should be clearly evident from the organizational structure.

WBS: The general Work Breakdown Structure (WBS) should define how work will be defined and tracked in the appended annual work plans.

Waste Minimization Subplan: The waste minimization subplan should define the objectives, strategies, and performance measure to be used in minimizing down-stream waste liabilities as a result of the Mound Site deactivation.

Personnel Redeployment Subplan: The personnel redeployment subplan must lay out the pathway for Mound Site deactivation project personnel upon phase down and completion of the projects.

5.3.1 Integrated Site-Wide Plan

To be useful, the Mound Site strategic plan must be the backbone of a site-wide integrated approach to all liability reduction activities. Reconfiguration, "Right-To-Use," commercialization, safe shutdown, deactivation, and environmental restoration can not be efficiently and effectively planned and implemented in isolation. DOE and EG&G Rocky Flats have an integrated site-wide planning effort similar to that needed at the Mound Site. Key concepts of the Rocky Flats approach are summarized here for reference.

Each Mound Site activity must be planned as an integrated element of a site-wide effort, as depicted in Figure 5.3-1. Unless the relationships between the elements are fully understood, activities can produce results which either do not fully or efficiently support the overall liability reduction mission or are counterproductive to another activity.

The strategic plan is the backbone element of the integrated site management system essential to accomplish the new EM mission. To implement the strategic plan, the objectives and strategies must be hard linked to EM funding documents and to a site wide baseline logic, as shown conceptually in Figure 5.3-2. The Rocky Flats process couples EM funding documents to site-wide objectives and strategies. The site and program/project baselines provide the high level logic, schedule, and funding profile for implementing the objectives and strategies.

Figure 5.3-1. Integrated plan for all Mound Site activities.

Figure 5.3-2. The relationships of the strategic plan, EM funding documents, the site wide baseline, and management control systems and instructions.

The baseline establishes the high level logic steps to be used in moving from the current liability state of the site to the desired future state, as shown in Figure 5.3-3. The baseline contains summary resources and schedules to implement the logic as well as the associated standards and requirements.

Figure 5.3-3. Elements of a baseline.

The historically unique, valuable, and expensive M&O contractor approach to DOE weapons production is not necessarily appropriate or cost-effective for cleanup and deactivation work. To efficiently achieve the new Mound Site liability reduction mission, DOE should transition its M&O contractor to a general contractor role. In the construction industry, a general contractor provides overall project integration and certain core competencies. Most specialty work is subcontracted to obtain the lowest cost and to share risk. As a deconstruction analogy of construction, Mound Site safe shutdown, deactivation, and environmental restoration project activities must be integrated and cost effective. EG&G's rich knowledge of Mound Site processes, facilities, and history is essential for the general contractor integration role. However, numerous commercial environmental firms have established, proven credentials to accepted cost and schedule performance standards. To minimize deconstruction costs and time, the DOE MB and EG&G management should use these established commercial capabilities to obtain cost-efficient deconstruction, consistent with commercial environmental benchmarks.

Based on the construction analogy, EG&G would directly implement 20% to 30% of the deconstruction work, with the remainder performed by subcontractors via fixed price projects, as depicted in Figure 5.4.-1. The use of subcontractors will stabilize the EG&G work force during the transition period and yet allow the number of on-site personnel to change with the work load. EG&G should determine the key deconstruction capabilities it has and wants to maintain (competitive advantage), and internally perform only those functions required to support those capabilities. All other tasks should be subcontracted to the best commercial sources. EG&G should transfer some of its technical and schedule risk to subcontractors. For example, subcontracting for disposition of hazardous wastes rather than for hazardous waste technician services places the risk for unknowns on the subcontractor rather than EG&G.

Figure 5.4-1. General contractor approach to Mound Site de-construction.

As a general contractor, EG&G's organization would consist principally of management, technical supervisory personnel, and some support staff. EG&G should be staffed through the equivalent of deconstruction project manager level. Included within that staff would be a cadre of technical experts sufficient to track and review subcontractor work for technical adequacy. EG&G managers should be trained in project tracking and held accountable for project success. The accounting system should be modified to provide the minimum amount information necessary to track deconstruction activities.

The EG&G procurement organization should be skilled in placing and managing large service contracts or basic ordering agreements (BOAs). The BOAs should be placed in FY96, cover a period of three years with extension possible, and the dollar value of each should allow any vendor to perform all of the work planned for any given fiscal year. BOA contracts while competitively placed, should include set-asides or provisions that foster development of facility deactivation, waste management, environmental restoration capability in the Miamisburg area.

As projects are subcontracted, EG&G might reorganize to matrix important functions, reducing redundancy and adding flexibility.

5.5 Categorize Activities as Base, Liability Reduction, or Funded Program Activities

Since the mission has shifted from weapons production to liability reduction, a complete mission-based review of all Mound Site activities is required to reassess the value of each activity. Past ITR Teams have identified three general categories of activities on EM landlord sites; base activities, liability reduction activities, and fully funded program activities. All other activities must be demobilized. EM 60 landlord funding will be limited and relatively fixed. To make deactivation progress, the effort must be made to maximize the efficiencies of mandated or liability reduction enabling base activities. The funds saved through these efficiencies allow enhanced reduce liabilities activities, as depicted graphically in Figure 5.5-1. Since funding for liability reduction activities is limited, these activities must be prioritized by some criteria. As liabilities are reduced, the efficiencies process is repeated and the base activities driven even lower. For example, if certain security measures are required for classified materials, but all classified materials have been removed, then those security measures are no longer necessary to support the mission.

5.5.1 Selecting and Sizing Base Activities

The first step in the evaluation is to determine whether facility base activities, such as surveillance and maintenance, are consistent with the Base Activities Criteria, described below. Those activities which are not consistent are either reduced in scope to be consistent or are terminated. Obviously, appropriate documentation updates, such as modifications of OSR mode applicability lists or LCD requirements, are performed before the actual activity is terminated.

Figure 5.5-1. Allocation of limited funds first to base-like activities, then to liability reduction activities.

A prior ITR Team identified base activities as those which meet the following criteria.

Activities must clearly meet one of the following to continue funding:

- 1) Are required to achieve the site mission.
- 2) Are mandated by the EG&G contract.
- 3) Maintain facility vital safety and environmental systems consistent with the current liabilities and hazards.
- 4) Maintain the facilities weather or secondary confinement envelope.

Activities must satisfy all of the following criteria to continue funding:

- 5) Be limited in scope to liability reduction necessary and sufficient.
- 6) Assume all facility, functional, and process capabilities not essential to safety, environmental protection, or transition to deactivation have zero value.
- 7) Use cost-effective methods benchmarked against commercial cost and schedules for comparable work.

Existing base-like activities which do not meet the base criteria are demobilized.

Examples of Mound Site base-like activities that should be demobilized unless specifically funded by a program include software development, maintenance of production records, production inventories, production equipment maintenance and repair, process and equipment engineering, production training and qualification, and product QC and QA.

Given the dynamic nature of a liability reduction mission, the Mound Site management must continually evaluate whether base activities are effectively supporting the mission. Regulatory drivers have profound effects on the realities of a liability reduction effort, directly influencing options and schedule and indirectly, but decisively, influencing cost. However, regulatory driven approaches are not necessarily optimal from the standpoint of long-term goals and performance objectives. Furthermore, from DOE's standpoint, cost is the key resource limitation and therefore has a direct influence on the options, schedule, and ultimately the regulatory strategy. Thus, there is a need for a strong, flexible base activities that take advantage of productivity opportunities to ease the divergent pressure of DOE cost and regulatory risk consciousness.

To approach commercial cost and schedule standards for performance, DOE and the contractor must insist that managers at all levels take a risk management cost/benefit approach to base activities. Managers and staff must believe that they will be evaluated on cost and schedule performance in addition to the current standards of regulatory compliance, public acceptance, and DOE order compliance. There must be incentives for the project Team to invent simpler procedures and take prudent risks to achieve competitive costs.

Application of commercial codes and standards

Currently operations at Mound Site are conducted in accordance with permits, national standards, and recommendations such as OSHA, NFPA, RCRA, and CERCLA. These are standards that are routinely used by all private industry in the United States. In addition to the national standards and regulations, the DOE and its contractors operate in accordance with numerous DOE Orders. The bulk of these Orders relate to security and environment, safety and health programs. The nature of the materials DOE handles and manages have been the primary driver behind these Orders. The Mound Plant has been operated and maintained in a level-of-effort, on-going program fashion. Since the primary mission will be to deactivate and clean-up the site it needs to be managed as a **project** with a definitive end point. Some support activities, such as the operation of the utilities and maintenance of NE facilities and administrative buildings used by commercial entities, should continue in a programmatic manner. The balance of the activities are deconstruction and should be executed in accordance with CERCLA, OSHA 1926 (the construction standard), and accepted industry practice. The application of DOE Orders governing SARs, OSRs, ORRs, etc. are not designed for construction/deconstruction, but rather for startup and operation. These Orders are very expensive and are not all necessary to protect health, safety, the environment, and security in a non-production environment.

5.5.2 Selecting and Prioritizing Liability Reduction Activities

Proposed and existing liability reduction activities must first be screened for mission consistency and then prioritized to determine funding support.

Note: It is important to note that liability reduction activities may be necessary in any facility, and reducing liabilities does not necessarily mean that the facility will be acceptable for economic development.

5.5.2.1 Selecting Liability Reduction Activities

The starting point or the evaluation of a liability reduction activity is a determination as to whether it supports a Liability Reduction Criteria. Actions not passing this screen are reevaluated, reconfigured, canceled or stopped.

Activities must clearly meet one of the following to continue funding:

- 1) Reduce DOE/Contractor Liability
 - Eliminate or stabilize an environmental or safety risk

- Achieve a compliant intermediate or end waste state
 - Eliminate the need to maintain current expertise or capability
- 2) Reduce The Base Activities Mortgage
 - Eliminate operational, safety, or utility requirements
 - Implement lights out, locked, quarterly surveillance
 - 3) Establish D&D Appropriate Documentation and Records

Activities must satisfy all of the following criteria to continue funding:

- 4) Be Limited In Scope To Deactivation Necessary and Sufficient
- 5) Assume all facility, functional, and process capabilities not essential to safety, environmental protection, or transition to deactivation have zero value
- 6) Use cost-effective methods based on benchmark comparisons to equivalent commercial work

Examples of activities which would pass the liability reduction activities screen include:

- Application of strippable coatings to reduce migration of contaminants.
- Seals on primary or secondary containment systems.
- Placement of passive monitoring systems.
- Removal of combustibles and ignition sources.
- Upgrades to the facility envelope which reduce S&M requirements.
- Installation of blanks on glove box and hot cell ports.
- Isolation and shutdown ventilation and exhaust systems.
- Plugging drains.

Examples of activities which would not pass the liability reduction activities screen include:

- Removal of equipment which the donor program did not want and pay to remove.
- Maintenance of process equipment.
- Replacement of lighting lamps in deactivated buildings.
- Decontamination of parts of the primary containment system.
- As-is drawings for internal utility systems and process piping.

5.5.2.2 Prioritizing Liability Reduction Activities

Priority setting is based on doing the most important things first with limited resources. There is a tremendous variety of methods

from “gut” to analytical. Prior ITR Teams have recommended the “first cut” tool depicted conceptually in Figure 5.5-2. The result of applying the tool should be agreement about the appropriate course of action, thereby providing focus and consistent application of efforts.

Criteria (Question) Number	Relative Weight	Evaluator's Score	Value (Weight * Score)
1	100		
2	30		
3	20		
4	80		
5	10		
6	50		
.	.		
.	.		
.	.		
TOTAL ACTIVITY VALUE			

Figure 5.5-2. Conceptual liability reduction activity prioritization tool.

To implement prioritization, a group of knowledgeable managers score proposed liability reduction activities in response to a list of criteria that are formulated as questions to explore the priority of each of the proposed activities. If appropriate, weights can be assigned to each criteria. A strawman list of criteria is listed in Section 5.5.2.3. The first part of the process for applying the tool requires individuals to score a set of questions using a quantitative technique to measure opinions. The second part of the application uses the process of open discussion to factor in qualitative issues to reach understanding, decision, and agreement about appropriate and achievable priorities.

The scheme for the first part of the process requires individuals to score a specified set of questions. Some principles for use when applying the tool are:

- Best results are obtained when questions are discussed until they are understood and then individuals write down their scores without sharing their numbers with others. Since there is ample time for discussion, users of the process should argue the issues and refrain from arguing the numbers. The score is only important as an average after each individual applies his/her knowledge and perspective independently.

- Risk is acceptable at reasonable levels where the result will mitigate threat to people and the site environment in the long-term. This principle is based on the assumption that a key mission objective is to make progress towards deactivation.

5.5.2.3 Priority Criteria

The following prioritization criteria, developed by a previous ITR Team, is provided as an example. The example criteria places emphasis on those liability reduction activities with the highest probability of providing rapid down scoping progress. This frees additional base activity funds for further liability reduction work. A similar prioritization criteria should be developed by the MB, EG&G, and the Mound Site stakeholders for HQs approval.

The criteria were developed using a scale of one to three. A higher score indicates a greater importance in immediately reducing the project scope. Conversely, a lower numerical score indicates a lesser likelihood of successfully liability reduction in the near term. A "0" score implies some aspect that does not apply to the question.

Ease of Deactivating An Entire Facility: This should reflect the expected difficulty in stabilizing hazards associated with the entire structure when the structure is viewed as a whole. The presence of external structures dependent on the main structure should also be considered. For example, a glove box that must have contaminated materials or waste removed would rate a score of 3. If the same glove box also had windows that could not be seen through and would require remote viewing equipment would rate a score of 2. If the same glove box also had HEPA filters that have failed or were nearing full loading, or the material to be removed is a mixed or regulated waste, would rate a score of 1.

Hazards Screening: The facility structure, its known contents, suspected problems, support services, and external connections should all be considered in assigning the rating. For example, the more extensive the residual contamination problem is the lower the rating would be. For example, in a radioactively contaminated facility radiation areas of 1 to 100 mR/hour might receive a 3 rating, from 0.1 to 1 R/hour a 2 rating, and above 1 R/hour a 1 rating. In situations where the residual contamination was unknown a higher rating should be given.

The rating should also be lowered as the number of hazards contacted increases. For example, the presence of mixed waste, friable asbestos, and energetic materials would also lower the rating.

Facility status should also be included in assigning the rating. If the structure presents a hazard itself a lower rating should be assigned.

Presence of Nuclear Material Inventory and Radioactive Waste Content: This rating is intended to assign lower ratings to the facilities that are going to temporarily house radioactive waste or that now house Isotopes Inventory.

Ease of Deactivating HVAC: The basis for these ratings should reflect the contrast between the simpler structures and the specific problems that are have to be dealt with in the complex facilities.

Deactivated Storage: This criteria is intended to identify the difficulty in attaining and maintaining confinement of residual contamination inside the facility without causing significant difficulty in accessing the facility during S&M.

Utility Isolation Issues: The basis for these ratings should reflect the contrast between simple structures and their services and more difficult facilities (for example, a stand-alone fire suppression system versus a multi-building system). This also should reflect the presence of partial facilities or structures inside a facility.

Operational Safety Requirements: The basis for rating the facilities in this category should reflect the hazard screening that was formally done. A 'Low' hazard, or 'Generally Acceptable' facility would receive a '3' rating.

Residency and Occupancy: This is intended to compare the truly 'safe shutdown' facilities with the facilities that are still routinely occupied and still have ongoing operations.

Contamination Confinement: This rating should be solely based on the contamination type, expected amounts, known extent or unknown but suspected extent of contamination spread, and type of facility structure intended to confine the contamination. If the contamination levels are known and are not high or can be easily removed, if the contaminated areas can be accessed and stabilized in place by the application of a spray coating, if the contamination is

confined inside of a confinement structure, and if the consequences of loss of confinement are not consequential then the facility would rate a '3'.

5.5.3 Managing Fully Funded Program Activities

Activities associated with fully funded programs would seem easy to identify. However, in some cases where only a partial building is being used, or multiple tenants are sharing a building, the path may be less clear. A screening criteria for fully funded program activities will prevent EM-60 subsidization of this work. A criteria would include the following:

- Include only whole facilities. Add the remaining portions necessary to make existing buildings whole facilities to the fully funded program budget, or return the facilities to the surplus facilities list.
- Establish FY95 milestones for programs to discontinue use and occupancy of partial buildings where programs will not assume full funding for the facility. (If programs can consolidate themselves so that multiple programs finance an entire facility, this is acceptable.)
- If program occupancy and/or use of the facilities is required beyond the milestone, facility responsibility and mortgages should be transferred to the using program. (Hourly or daily use charges are not an acceptable alternative. The program would maintain facility responsibility until they certified the facility was surplus and resubmitted it to the surplus facility program.)
- If the facility is required for interim waste/materials storage or environmental restoration, transfer the responsibility to EM-30 or EM-40.

5.6 Establish Liability Reduction Projects

The ITR Team recommends the following considerations in establishing liability reduction projects at the Mound Site.

5.6.1 Nuclear Materials

Significant portions of the nuclear material facilities have not been adequately characterized for radiological hazards. This step is necessary both as a baseline to support deactivation and decommissioning and as a data point for economic development. A comprehensive site characterization must be planned and implement in the near term, focusing on areas and buildings which will be impacted by economic development. When performed at commercial nuclear facilities (e.g., Ft. St. Vrain Nuclear Plant,

Rancho Seco Nuclear Plant; both sites where reuse or economic development is planned), this is the first activity in any decommissioning or re-use. It is a very detailed process. The general philosophy is as follows:

- The entire site must be characterized. This means buildings, tanks, underground, concrete, everything.
- The sampling and analysis is based in part on history. For buildings or portions of the yard where no activities ever occurred, sampling & analysis is done primarily to verify the clean condition. These kinds of surveys would be done in the training facility, administration building, parking lots, etc.
- Where any potential of contamination exists, sampling is more intense. These kinds of areas would include gravel around transformers for PCBs, outdoor piping and valves.
- Where contamination is known to exist, sampling is even more intense. This might include scrapings from inside tanks and pipes, core bores, ground samples, etc.

In the near term, this data is critical for DOE in determining potential liabilities associated with economic development, and for potential lessees. For example, an underground line may have caused some soil contamination. An entity considering leasing or assuming liability for a building should certainly be aware of this potential. Workers not previously associated with the building should also be informed of the potential liabilities. DOE could also use this information as part of the leasing process. This data is also very useful to support decommissioning cost estimating, demolition planning, and waste disposal (all relatively long-term non-EM 60 activities).

It was not clear to the ITR Team how a previously used, contaminated facility would be re-licensed by the Nuclear Regulatory Commission in support of economic development. If economic development of rad contaminated facilities is possible, DOE Headquarters should meet with NRC officials to determine the NRC's expectations regarding close-out of DOE activities and transition of responsibility to a new licensee. The DOE/NRC meetings should result in a clear understanding of answers to the following kinds of questions.

- (1) Must the facility be completely cleaned of materials prior to a license for a similar activity being granted?
- (2) If a facility can transfer to an NRC license with residual materials present, does the NRC licensee assume all liabilities

for these materials? (I assume yes) What about undiscovered materials due to underground leaks, etc.?

- (3) Will DOE pay these re-licensing fees, or in any way support the new entity through the NRC process, since DOE has the best historical knowledge associated with the materials?
- (4) How long could the process be expected to take?
- (5) If residual materials are known to be or expected to be present and the new process does not involve the use of radioactive materials, but merely the space, must the new tenant/owner license the facility?

The nuclear materials requiring consolidation and disposition are located in two or three buildings (T, R/SW, 59). If building 59 is utilized for economic development, it is of no further concern to EM. If economic development does not occur, removal of the U-235 should be contracted to an outside party. Buildings T and R/SW are of longer term concern.

Shipment of the U-233 (now planned for 1995) and of the attractiveness level C Pu-239 (now planned for 1996) will allow Mound Site to go to a Safeguards Category III level from the present Category II. In addition, there are three groups of Pu-238 material which offer targets for radioactive sabotage. Two of these groups are planned to be shipped to SRS; the third group has no current disposition planned but could be shipped if a receiving site was identified. EG&G staff estimated that removal of the above items would result in an annual security savings of \$200,000.

Most of the SNM requiring removal is in inventory in shippable form and will require identification of a receiving site. However, much of the tritium inventory is in process systems and will require treatment, removal, and packaging prior to shipment. Therefore, most of the effort to remove the nuclear material from will be associated with the tritium.

While the tritium is still in the process systems, a pressure differential needs to be maintained in the glove boxes and in the building. The fastest route to deactivate the tritium facilities is to package and ship (in so far as possible) the current forms of the material at the Mound Site. The materials are not in a form to allow burial so future treatment at the receiving would be required to recover the tritium and treat the residues. After removal of tritium from the process lines and the glove boxes, they could be "flushed" to remove residual tritium to a level to allow sealing the systems and boxes and eliminate the need to maintain the need for high air flows and multiple levels of pressure differentials. (An alternate way to remove the tritium would be to process all inventory to a product grade

tritium gas in the Mound Site systems – this would take much longer to accomplish and is likely to require activation and contamination of the new TERF system, as the ERS system is approaching the end of its useful life.) The last system to operate would be the ERS system in the SW building. As long as the ERS is in operation, tritiated water will be generated.

Retention of Key People Resources (Key Skills)

There are areas of activity in the nuclear operations where certain key people should be protected/retained for a period of time if at all possible. These areas include continued operation of necessary systems. Examples are 1) the Effluent Recovery System (ERS) which is essential while significant quantities of tritium remain in the process systems, 2) operation of the waste disposal (WD) and possible the sanitary (SD) systems, and 3) operations of critical safety systems. Operations that are underway or soon to be started with knowledgeable people can be completed much safer and quicker with those people. Examples are 1) disposition of the orphan sources, 2) packaging/treatment of old historical samples (e.g., U-233, Tritium), and 3) waste management where historical knowledge is necessary. This list is not meant to be all inclusive. Availability of certain key people would provide the safest, shortest and cheapest route to completing the removal of the nuclear materials.

To summarize a waste removal path forward:

- Remove the U-233 and Pu-239 plus the three small lots of Pu-238 to allow a category III site security level.
- Remove the tritium from the process lines and the glove boxes in its current form and ship to a receiving site (SRP or LANL).
- Flush out the tritium process lines and the glove boxes to reduce the tritium level and allow sealing the systems and glove boxes.
- Obtain approval for a package to ship tritium contaminated water.
- Place facilities in safe shutdown mode.

5.6.2 Explosives

There are at least four routes for removing the explosives inventory from the site:

- (1) Complete those production components that are in-process and near completion and ship to the next assembly recipient.

- (2) Ship incomplete components, piece parts, and related explosives inventory that are required to meet active weapon system requirements to the reconfiguration receiver site.
- (3) Ship surveillance samples to the responsible design agency for continuation of surveillance activities.
- (4) Destroy the excess explosives inventory at the Mound Site "burn site" or functionally destroy components in one the Mound Site's test chambers.

The burn site is an EPA approved site which can burn approximate 1000 grams/day but can only be operated under favorable atmospheric conditions (potential gradient must be below the typical warning limit of 1000 volts per meter, i.e., no thunderstorm activity in the area). The Mound Site personnel pointed out that the outside temperature was another impediment to operation of the burn site because the operator control room is neither heated nor cooled.

The majority of the explosives inventory on site (perhaps 75%) is the form of loose powder or pressed pellets, is well characterized, and can be rapidly disposed of at the burn site. The Mound Site must have a complete characterization of the feed material entering the burn facility and must also characterize the ash leaving the facility for disposal. This material, once it is declared excess, can be disposed of in less than 6 months (weather permitting). The remaining inventory that has not been identified for transfer to another site may take much longer to destroy. Most of this remaining inventory is contained within weapon components that must be completely characterized both in terms of the energetic and the inert materials that make up the component. Procedures must be written for the disassembly and destruction of these components. *(A detailed inventory of the energetic materials on site sorted both by explosive type and by location was requested but not supplied. The listing was determined to be classified when all parameters are included.)*

With the exception of the long-term storage magazines which have storage limits based on total explosive weight, the facilities and/or rooms within buildings that contain explosives operations have energetic material limits based on a Maximum Credible Event (MCE) which is defined in the DOE Explosives Safety Manual as: *"The MCE from a hypothesized accidental explosion or fire is the worst single event that is likely to occur from a given quantity and disposition of explosives/explosives devices. The event must be realistic with a reasonable probability of occurrence considering the explosive propagation, burning rate characteristics, and physical protection given to the items involved."* This must be kept in mind because the total quantity of explosives or other energetic materials in any given

location may be far more than indicated by the MCE quantity. Detailed inventories that are kept for individual labs, rooms, or buildings must be examined to determine what quantity and type of materials are present.

As an aside, there may be some confusion about how a quantity of explosives in a DOT approved, non-propagating shipping container is counted in terms of a Maximum Credible Event or MCE. For buildings and labs where explosive operations are being performed, several components stored in a closed approved storage container are counted at the Mound Plant as the explosive weight of one (1) component against the MCE quantity since the container is designed to prevent propagation to adjacent internal components or to adjacent containers. In other cases, such as the surveillance storage building, each approved container is counted as zero (0) grams of energetic material and the building has a limit designation of zero (0) grams toward MCE (even though it contains thousands of energetic material components). This is because there are no operations allowed in the surveillance storage building except movement of materials in approved containers. Lab operations, on the other hand, permit the opening of cases which could present an initiation stimulus to a component in an adjacent unopened container.

The explosives component and material inventory that has a long lead time to destruction because of characterization or procedural requirements could be transferred to a few long-term storage magazines and destroyed on an ongoing basis. An operations building or set of labs within a building would need to be dedicated to the disassembly, characterization, and procedural requirements until all of the inventory had been removed from the site.

Some of the buildings that appear on the explosives liability list have in the past or currently house production and development operations that involve handling of loose powders, liquid slurries or solutions of energetic materials. There is the possibility that exhaust ducts, HVAC systems, drains, and other areas of these buildings are contaminated with explosive material residue. These areas will have to be identified and cleaned, using established Mound Site procedures, prior to any general public or private use of the facilities.

5.6.3 Classified Materials and Components

Classified documents not designated for receiver sites in the MOA should be consolidated, packaged, transported to the regional incinerator, and burned per the existing, functional procedure.

Classified components and in-process material not designated for shipment shipped to receiver sites should be consolidated and

inventoried. Consideration should be given to determining if the components still justify classified status. If not, they could be crushed and disposed of. If the components still require classification protection, the demilitarization activity should be bid as a project and accomplished by the lowest total cost method.

5.6.4 Wastes

Implement a process to proactively disposition suspect mixed waste. A program similar to one in place at INEL or Pinellas would be effective. Use a commercial vendor to lab pack, ship, and dispose of all hazardous materials on site that do not have an immediate use. This action would reduce the liabilities associated with hazardous materials which currently have no owner. A new hazardous waste storage facility is planned for FY96 construction at a cost of \$8M. To avoid this cost, consideration should be given to management of RCRA waste in 90-day temporary accumulation areas coupled with a periodic commercial "milk run" to pick up and disposition the wastes.

Mixed Wastes

Develop an integrated plan to disposition these wastes. Currently each waste stream disposition is a stovepipe project. The plan needs to address NEPA, permitting, treatability studies, and actual treatment. The intent is to treat these wastes to meet land disposal restrictions. Look to the commercial sector to treat and dispose of these materials. Requests for Proposal should be issued for treatment and disposal of the mixed waste inventory. Treatability studies will disposition the small volume items. Envirocon in Utah is new commercial disposal facility that is permitted too accept some mixed wastes.

Low Level Wastes

Quantify and consolidate the wastes regardless of who is generating it. The waste management organization must become a leader in identifying, characterizing and managing the waste instead of pinning responsibility on the generator organization. This is particularly important for historical wastes for which little characterization exists. The extensive analytical capability of the Mound Site facilities should be directed toward waste characterization. Radiological determination of the sewage sludge could be supported through this capability. With the end of production activities, the routine classification of all sewage sludges as LLW should be reconsidered.

Establish an aggressive priority program to gain acceptance of the low level wastes at NTS. Although there is no regulatory driver to raise

the priority of disposition of low level wastes, a viable disposal conduit is necessary to support deactivation and the anticipated increase in generation rate.

Look to the commercial sector for treatment and disposal of these wastes. Requests for Proposal should be issued for treatment and disposal of the low level waste inventory.

Transuranic Wastes

Consolidate these wastes in one storage location on the site. Arrange to ship this waste to another site for storage. This action would reduce the need for long-term waste management at the Mound Site.

5.6.5 Residual Contamination

In the past, several buildings or portions of buildings at the Mound Site went through a D&D process to prepare them for reuse. The end-point of this process was appropriately geared at DOE occupational reuse of the facilities. No buildings were D&D'd using a "free-release" end-point criteria. Even the current occupants in some of these buildings did not realize that those buildings might actually have some residual contamination below the exposed surfaces.

This poses a potential liability for non-occupational reuse of those facilities. In the D&D process, if the floors were contaminated, they may have had the upper 2 inches of surface removed, new surface and tiling replaced. This would have made the floors "clean" for any new DOE-work related occupants. Other surfaces would have been prepared similarly. If the building surfaces and dose-rates are checked for economic development reuse, it is likely that these checks would result in the building being released for new non-DOE occupants. If core samples were taken, this might not be the case. A longer range scenario which should be of concern to DOE from a liability point of view is that the building is released for non-DOE reuse. The contract will probably limit modifications that can be made to the facility. However, if a client wanted to fix a piece of equipment to the floor with anchor bolts, this might not be viewed as a modification and thus permitted. If the post D&D surface were breached, a non-occupational exposure and contamination event could occur.

This potential liability could be mitigated in several ways.

- The contract could be modified to describe the potential for contamination below the surfaces in these buildings. Individual worker right-to-know would need to be answered via contract as well.

- The release of building for economic development could include a D&D survey which included core samples, surface scrapings, and the like.
- Buildings which may pose that type of liability could be eliminated from economic development.

5.7 Implement Safe Shutdown and Deactivation Via Projects

A principal objective of the DOE and EG&G management should be to focus the resources on liability reduction. The ITR Team has two recommendations to achieve this.

- Run the liability reduction activity as a project (or multiple projects).
- Manage the project(s) by the few key measures.

The first is intended to focus management at the DOE/EG&G interface on objectives (the What's) rather than methods (the How's). The second is intended to highlight the few key measures of success ("few" in the Pareto sense), and thereby direct the attention of each level of management to the appropriate level of detail.

5.7.1 Run as a Contract

The Mound Site liability reduction effort should be based on a written DOE/contractor project agreements covering the work to be done, as well as the schedule and cost. The project agreements and subsequent changes should be signed by both organizations. They should spell out DOE requirements clearly, but allow the contractor maximum flexibility to achieve these requirements efficiently. The DOE approach to construction of a major facility might be a good model for the project agreements, since construction uses some of the same DOE orders and directives on management.

A single DOE contracting officer should control both the individual project requirements and budget. DOE should discontinue current practices which allow informal and verbal requirements to be provided by headquarters staff, AL, and MB personnel.

5.7.2 Manage by the Few Key Measures

DOE should evaluate EG&G's liability reduction performance strictly on the terms of the proposed agreement, just as in a commercial contract. The team recommends that key measures be captured in the agreement in simple ways.

- Milestones that capture schedule and performance requirements (leading indicators of eventual successful completion, as well as completion of important portions of the work).
- Metrics tied to project objectives.
- Peer reviews or bench marking against other organizations performing similar work.

In each case, the team recommends adherence to the following principles (extracted from the work of quality expert Phil Crosby).

- Measure only the few things that are important to mission objectives. A few measurements focus management's attention. More metrics will cost more and will generally be less effective.
- Simple measures, intelligently applied, are usually better management tools than complicated precise ones.

5.7.3 Capability and Facility Deactivation

Deactivation of non-reuse "Condition 1" facilities should be carried out as the first project. Consolidation of personnel and facilities will require several buildings for deactivation. A recommendation for the steps leading to deactivation through consolidation of the remaining industrial facilities is provided later. Some facilities are essentially ready for deactivation now. These include the modular buildings, the old cafeteria, security building, and other similar facilities.

The project management approach could be applied as follows.

- Use a liability reduction priority criteria, as described in Section 5.5.2, where buildings with the highest mortgages (direct and indirect) are scheduled for deactivation or demolition first. (A direct mortgage cost includes the service charges directly attributable to a building such as electricity, periodic maintenance, etc. An indirect mortgage cost includes charges attributable more to overhead such as security, roads, etc. As a result, a modular building requiring little in the way of utilities may be a high priority for demolition if it results in a security zone being reduced.)
- Consider a single RFP to remove modular buildings from the site as the first RFP, since it would be fairly straightforward and many of the modular buildings have been placed in administrative standby.
- Use a contract approach to deactivation projects.

- Within 2 weeks after a determination is made to either deactivate or demolish a building or set of buildings, prepare an RFP.
- Allow EG&G to respond to the RFP including cost and schedule required to complete the project. If EG&G is not responsive by commercial benchmark standards, issue the RFP to the regional deactivation or demolition community.
- Feed back any lessons learned into the RFP process.
- Once this process is in place, consider issuing BOAs to the three most responsive contractors. Allow the remaining deactivation work to proceed using the BOA contractors to compete for sets of facilities.

After economic development reuse is resolved, the deactivation of "Condition 1" facilities and consolidation of personnel should commence, regardless of the status of other decisions affecting the site. Closing individual facilities will not result in a corresponding immediate reduction in the mortgage for the Mound Site. However, it will effectively use the personnel on site and begin the transition process. Provided with site-wide guidelines for deactivation, the staff associated with a facility can be used to "separate the wheat from the chaff" while dispositioning the materials in that facility. Once several such facilities are deactivated, savings should become apparent.

5.7.4 Deactivation Path Forward

The previous sections have defined processes for sorting necessary activities which eventually lead to a deactivated state. Appendix B provides specific building by building recommendations for deactivation. This section provides technical recommendations which result in that deactivated state. Based on the text and the proposed schedule (See Figure 5.7-1), these technical recommendations would be incorporated into the guidelines developed by the General Contractor for executing deactivation projects.

Figure 5.7-1. Deactivation schedule.

The technical recommendations are broken into three categories, technical recommendations which:

- Result in lower mortgage
- Result in reduction of radiological hazards
- Result in efficiencies of the base program

5.7.4.1 Technical Recommendations Which Result in a Lower Mortgage

The ITR technical recommendations related to utilities and services are intended to: (1) support those activities necessary to achieve a deactivated storage endpoint; and (2) lower the overall facility mortgage once it is placed in a deactivated storage state. All deactivation activities must be

engineered and under configuration control. Best practices for minimum activity cost are required. A deactivation-applicable graded approach to DOE orders and standards must be applied. Technical recommendations for the following utilities and services are provided.

Fire Protection System: Removal of combustibles and ignition sources is key to reducing costly surveillance and fire protection compliance activities. Cardboard cartons, paper (records), chemicals, and other combustibles and sources of ignition should be removed/eliminated. If fire protection systems are not required to protect radioactive material containment systems, to provide life (unoccupied) and property protection (no value), the systems should be shut off and drained so that freeze protection is not required.

Access Control Systems: Safety and health order requirements are linked to occupancy. If a facility is unoccupied, the cost of compliance can be drastically cut. Controls to prevent unauthorized entry and occupancy must be put in place as security is reduced to facilitate economic development. Access control should occur on a facility basis, rather than an area basis. Access to a facility should be limited to only those personnel responsible for surveillance and maintenance activities or emergency response. All entrances should be secured with limited and controlled keys distribution. Controlled keys in combination with "security seals" should be used to control entry and alert authorized personnel to any breaches in access control. Unauthorized broken "security seals" should be handled as reportable occurrences.

Nonessential Utilities: Energy and utility related activities represent a significant Mound cost. Utilities not required to meet base surveillance and maintenance or other emergency requirements should be terminated. Nonessentials such as hot water, telephones, ventilation/exhaust systems and electricity should be shut down, and plumbing and steams systems drained and flanged. The costs associated with providing and maintaining these services should be reduced to the maximum extent possible.

Isolation of Drains: All pathways for liquids to escape the containment of the facilities should be identified and sealed off. Process and sanitary drains should be isolated. Drain lines that are plugged or capped need to be considered from a facility perspective. Lines should be cut, blanked, drained, or monitored in a manner that the condition can be known and does not create a loss of control.

Tag out and drain safety showers where initiating requirements are no longer applicable. Showers in some administrative shutdown areas are still checked on a frequent basis. As soon as possible, all safety showers

should be removed from service. They should be clearly labeled as such. If necessary, portable stations can be used for periodic maintenance activities as the buildings are deactivated.

5.7.4.2 Technical Recommendations Which Result in a Reduction of Radiological and Other Hazards

Deactivated radiological facilities should have minimal surveillance and maintenance activities after deactivation is complete. Procedures should be formalized requiring cost benefit and ALARA assessments of planned deactivation work. All cost effective options and modifications should be considered which would reduce surveillance and maintenance activities.

Passive contamination confinement is of utmost priority. Formalize a decontamination plan based on EM-40 end-point criteria, minimizing waste, to stabilize residual contaminants in place or to, as a last resort, remove it. Modern complex wide and commercially available technology is to be used. Examples of this approach include putting strippable coating over contaminated surfaces, or blanking off ventilation which contains residual energetic materials. Use expanding sealants, fixative, or strippable coating, and non-water dependent decontamination techniques such as ice blasting or carbon dioxide blasting.

Characterization and location identification of radiological and other contamination is required. Facility by facility surveys should include measurements on accessible surfaces. In this case, accessible means that personnel can reach the surface during periodic surveillance and without disassembling the equipment.

Varying degrees of characterization effort will be required to assess the "hidden" source term. Where feasible, surveys of process piping, drains, and ventilation ducting should be carried out using directional probes to attempt quantification of internal contamination levels. If they haven't already been performed to support economic development, the surveys may be implemented in conjunction with deactivation activities. These surveys are expected to identify areas where additional confinement efforts must be focused.

A systematic approach should be initiated to document as much of the historical knowledge of the hidden source term as is cost effective. This would include locations and extent of prior radiological or chemical releases, areas where contamination was known to be fixed in place, and contamination under tiles or equipment.

Turn-off exhaust and ventilation systems. A major concern in the shutdown of exhaust is the loss of confinement and subsequent contamination migration. The spread of contamination inside a facility can be easily identified by periodic surveillance techniques. If the facility is weather tight with a null pressure condition, contamination spread outside the facility is not expected.

The surveillance and maintenance plans must include identification of survey points which are to be surveyed during each entry. The survey points should be tracked to allow rapid comparison of the confinement considerations.

For facilities where HVAC services were terminated, consider installing connections allowing ventilation of the facility from an externally mounted filtered and sampled exhaust system.

Develop and implement an aggressive waste minimization sub project. Begin immediately. Extend the amount of segregation of suspect and non-suspect materials. Prevent the generation of unnecessary radioactive or mixed waste during cleanup by include waste minimization guidelines in the project planning contracts.

5.7.4.3 Technical Recommendations Which Result in Efficiencies of the Base Program

The major activities conducted in the base program will be categorized as surveillance and maintenance. The most efficient way to reduce the base is to reduce the S&M.

Reduction in Surveillance & Maintenance: The objectives of the Surveillance & Maintenance program for deactivated facilities are: (1) maintain facilities in a state which minimizes environmental, health, and safety risks; (2) S&M activities are predicated on current use/condition, i.e., deactivated storage; and (3) minimize mortgage associated with the facilities. Inspections of necessary equipment such as hoists and cranes should be conducted prior to use; not on a program maintenance schedule which assumes routine use.

The goal of the proposed S&M plan is to reach the minimum level or surveillance required and still maintain assurance that the deactivated facilities remain in a safe and stable condition. To reach the goal the facilities will be placed in a passive configuration which will require nominal maintenance with only surveillance being the primary effort.

The approach provided includes establishing the necessary weather envelope, good record keeping, tracking, and trending data, with minimum waste generation. Systems will be placed in a dry, drained-down configuration, and all ignition and combustible sources will be removed to the extent practical. Portable sampling and ventilation systems will be used for pre-entry. The building contaminated surfaces will be coated with fixative materials to the extent practical to minimize the migration and mobility of contaminants. Facility structures will be maintained and monitored to assure confinement. Access controls will be established and maintained to assure no entries unless part of S&M or emergency condition.

The primary objectives of the base S&M program include: (1) Ensure surveillance systems and controls are in place to detect releases and minimize exposures, (2) Establish and maintain adequate confinement of hazards to prevent releases, and (3) Where practical utilize passive and remote systems, access controls and current S&M technologies.

Deactivation planning must emphasize deactivation storage surveillance, including use of a directed procedure, placement of temporary lighting, use of reflective tapes, and signage for direction, and the use of video records. The surveillance must be engineered to assure safe, technically adequate, and meaningful entry. A pre-deactivated storage dry run is recommended. General facility deactivation recommendations are provided in Section C.3.

Take a step approach, versus linear, to surveillance reduction.
When facilities are placed in a deactivated state such that S&M can be reduced because of decreased hazard, it is important to verify the effectiveness of the deactivation. As a result, a step approach to surveillance reduction provides a significant baseline documentation of the change, while the staff who implemented the change are still available. This means that after the facility is declared deactivated, for the first six months, surveillance might be performed and tended monthly, then quarterly after that.

6. NEAR TERM ACTIONS

6.1 Suggested DOE EM-60 Actions

Complete the Defense Programs to Environmental Management MOA. Authorities and responsibilities for FY 95 landlord funded site work must be established. Mound Plant personnel are receiving some FY 95 work directions from DP program managers at ALO. Equipment, raw material, complete and partial production components, and documents which will be shipped to other sites as a part of DP reconfiguration must be finalized. Detailed inventories of in-process materials, production scrap, and wastes are required.

Establish an integrated DOE HQ strategy and guidance for liability reduction. For efficient and timely liability reduction, plans and project baselines for reconfiguration, safe shutdown, economic development, Right-To-Use, deactivation, and landlord activities must be integrated. An overarching liability reduction strategy and guidance is needed as a basis for the planning integration. This includes specific criteria for things like residual contamination.

Resolve mission execution roles and responsibilities. For liability reduction cost and schedule efficiency, the responsibilities and authorities must be established or clarified for DOE EM program personnel within the EM-60, Albuquerque Operations Office, Ohio Field Office, and the Dayton Area Office. The contractor should know where to look for guidance and direction.

Seek to establish a statutory and institutional basis which enables rapid commercialization of on-going Mound Site work. Enabling basis may include procurement set asides and guarantees for Miamisburg area new and existing businesses as well as commercialization performance incentives for EG&G.

6.2 Suggested OH, MB, and EG&G Actions

Define past, present, and future liabilities (legal) and reach a "Hold Harmless" position. The DOE should identify and enter into a formal agreement with the City of Miamisburg defining past, present, and future liabilities. This agreement should assign liabilities such as in M&O "Right-To-Use" agreements and stipulate a Hold Harmless Clause binding each and all parties. The ability of DOE EM-60 to reduce liability up front could lessen landlord costs in the future.

Define, socialize, and structure for the EM mission. The ITR team recommends the following actions to establish a foundation for the new Mound Plant mission. Unless specifically addressed, all current activities continue until a new foundation exists sufficient for action.

Establish a formal mission statement for the Mound Plant. Develop and issue a concise, formal RFP mission statement. Involve regulators and external stakeholders in the development.

Establish a site integrated planning function which reports directly to senior management. Integrated planning is essential to cost and schedule efficient liability reduction at the Mound Plant site. To accomplish the integrate planning function, it must have unfiltered access to the key decision makers and the authority to gather data.

Develop and implement an internal Mission communications strategy. Socializing the new mission and the associated language with the work force is management's absolute first priority.

Establish a surplus employee pool for use in staffing liability reduction activities. Activity screening, scoping, and prioritization efforts will identify excess personnel. The Mound Plant will need a mechanism for holding and funding these personnel outside of these programs until they are placed in new liability reduction projects or are out-placed.

Develop and implement a base activities requirements and alignment project. The Mound Plant production support infrastructure needs to be realigned and sized for the new mission and associated requirements. The focus of this project is concise, management-level decision input. Establish a core-existence budget for each base-activity.

Establish a mission implementation plan, including objectives, strategies, roles and authorities, deactivation priority criteria, decision process, and a personnel redeployment plan. The new integrated planning activity should facilitate Mound Plant leadership's development and approval of the first cut mission implementation plan.

Align the Award Fee with the mission implementation plan. Tie the award fee to the mission implementation plan objectives and indicators.

Align the RFP organizations with the mission implementation plan. As required, align the production organization structure to support implementation of the mission plan.

Couple the ADS funding structure to the mission implementation plan. Fund base activities and liability reduction priority programs and projects. Document justification and defer lower priority activities. Support organizations are funded through projects.

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7. DIAGNOSIS

7.1 General Diagnosis

The DOE consolidation of the nuclear weapons complex directly impacts the Mound Plant, since it is not a consolidation site. To offset the impacts, the DOE, at the direction of the Secretary of Energy, is working with the Mound Plant stakeholders to plan and execute economic development reuse initiatives. The Mound Plant production was scheduled to end on September 30, 1995; however, in March 1994 the stop production milestone was changed to April 30, 1994. The new milestone severely cut the anticipated time to plan the transition to economic development reuse. It is in this context that the ITR team developed the following summary and supporting diagnosis.

The following two sections contain the ITR Team summary diagnosis.

7.1.1 Reuse Complicates and Delays Liability Reduction

The mission of the DOE Office of Facility Transition and Management, EM-60, is liability and mortgage reduction. EM-60 receives surplus sites or facilities from other DOE programs and reduces the liability and mortgage by reuse, transfer to the GSA, and/or deactivation to a safe, stable, long-term storage state until subsequent D&D. Where reuse is not a factor, such as the Hanford PUREX Plant and the Oak Ridge National Laboratories Isotopes Facilities, a deactivation project plan is developed to rapidly transition the facilities to a safe, stable, low-mortgage state.

The potential for site/facility reuse is based, in part, on the functionality of the associated capabilities. If functional capabilities are shutdown and the personnel are discharged or reassigned, the capabilities will inherently have substantially less reuse value. To exploit the reuse liability and mortgage reduction potential, DOE must maintain capabilities in a standby state until the private sector has an opportunity to evaluate their need for the surplus capabilities. The time required for this evaluation process can eliminate potential near term shutdown mortgage savings for the DOE.

DOE guidance establishes the Community Reuse Organization (CRO) as the communities' reuse agent. The involvement of multiple parties, the CRO, private businesses, the DOE, and the M&O contractor, in liability/mortgage reduction plans and decisions in the short term, will inherently make the process long and complicated.

7.1.2 Commercial Market Not Driving Economic Development Planning

Economic development reuse planning to date has been primarily based on opinions rather than business facts. While business interest has been solicited, the perceived value of Mound capabilities seems to have been determined primarily by the opinions of current and ex-Mound Plant personnel as well as university and private consultants. The ITR team was chartered to provide yet another opinion. While these opinions may be useful in the short term, they cannot be the basis for investment of precious economic development resources. Those investments must be directly coupled to the private sector's willingness to invest resources in reuse of the Mound Plant capabilities.

The following sections contain the ITR Team supporting diagnosis.

7.2 Opportunities

7.2.1 Parties Striving to Make Economic Development a Reality

It was obvious to the ITR team that the City of Miamisburg, EG&G, the DOE/MB, and their respective employees are striving to make economic development reuse a near-term reality. The City Of Miamisburg supported early efforts by the Mound Plant employees to identify unique and valuable capabilities. EG&G, in cooperation with the MB, initiated a noteworthy effort, including creation of an industry advisory board assignment of key management personnel, and identification of potential markets and opportunities for the Mound Plant capabilities. The City initiated a multiphase economic development effort, despite delays in DOE grant funding. The City's Phase I physical and environmental evaluation of 6 buildings has been completed, and a request for lease of the buildings has been submitted to the MB. MB drafted a lease agreement which the City is reviewing. An Agreement-In-Principle has been established between the City and one potential reuse company.

7.2.2 Deactivation of Other Than Tritium Facilities Can Be Done Near Term

The vast majority of the 140 Mound Plant buildings contain only industrial hazards that can be quickly resolved for safe, long-term locked, lights-out, quarterly surveillance storage. Equipment, process piping, and duct work in a few facilities are contaminated with energetic materials, but the Mound Plant has existing decontamination procedures to resolve these

liabilities. The small set of tritium facilities represents a more complicated but tractable deactivation problem. The ITR evaluation of buildings liabilities and deactivation issues is presented in Section 7.4.3 and Appendix B.

7.3 Barriers

7.3.1 Liability Reduction Objectives, Roles, And Processes Unclear

Economic development and deactivation objectives, roles, authorities, and processes have not been defined and integrated to execute liability reduction quickly and efficiently. The plant is to be turned over to the new DOE EM-60 landlord on October 1, 1994. EM-60 has not yet provided guidance regarding the new DOE EM mission, liability and landlord mortgage reduction. As a result, the MB and EG&G management and employees do not yet fully appreciate the objectives of the new EM-60 customer.

7.3.1.1 Economic Development Process Absent

The reuse of surplus DOE sites for community economic development is a new DOE activity, chartered by the November 10, 1993 Hall Amendment to the Department of Energy Organization Act, U.S.C. 7256 (Appendix D). As a result, HQ guidance and directives are being developed and refined while the City, MB, and EG&G are moving aggressively to implement reuse. Since roles and authorities were not clear, the efforts have not always been fully complementary. Misunderstandings and distrust of motives have resulted. For example, the City felt that it was on the outside looking in on the process, as a result of the traditional and close relationship between the MB and the M&O contractor.

The DOE Task Force on Worker and Community Transition issued draft economic development guidance in February, 1994 (Appendix D). The guidance places control of the reuse effort with the local communities, through a new construct named the Community Reuse Organization (CRO). While recognizing the fundamental community role, the guidance conflicts with the early aggressive efforts by MB and EG&G at the Mound Plant.

The DOE draft guidance established an economic development funding process. Unfortunately, the bureaucratic process does not quickly provide the community with knowledge of the total funds available for economic development. The process also appears to be highly dependent on the political pressure. The City felt, through political pressure, they had verbal commitments for funding. They were unsure if and when those commitments would be fulfilled and were concerned that similar pressure from other sites would impact their funding.

During the ITR team's visit, economic development and reuse processes were still being sorted out. For example, the plant manager recognized that his effort would need to be refocused to support the City lead effort, but this had not yet been accomplished. EG&G was carrying out "technical reviews" of business reuse proposals but was also exploring "Right-To-Use" and some business development, a potential conflict of interest. The City recognizes the need for a process to investigate and qualify businesses interested in reuse, but had just begun to develop it.

7.3.1.2 Maintenance-Of-Effort Confused With Economic Development

Mound personnel appear to perceive EM and economic development as a new source of maintenance-of-effort funding. The Defense Programs effort had a level-of-effort structure. The Mound Plant represented a capability which was to be used, maintained, and enhanced for production. Production commitments were set each year, but a substantial fraction of the funding supported infrastructure activities. MB and EG&G had substantial flexibility to initiate and support level-of-effort activities. Line management competed each year for a larger part of this level-of-effort pie. The Mound Plant personnel appear to be viewing economic development and the DOE EM customer from this historical perspective.

The Mound Plant business development strategy is centered on maintenance of the overall infrastructure. It is envisioned that the current support services infrastructure will need to exist to attract tenants to the Mound Plant. All of the capability parts are interrelated – if one capability is lost then the functionality of the remainder is severely degraded. Reuse is sought for each major capability, but not from the perspective of funding the entire operation of the capability. EM-60 is viewed as the ongoing funding source for maintenance of the unfunded support infrastructure. Two of many examples are particularly enlightening. When asked how long it would take to bring about a product, a manager responded five or more years and that they would look to EM for the necessary support. In a presentation, economic development was portrayed as a means to maintain the Mound Plant capability for the future return of Defense Programs work.

7.3.1.3 Relationship Between "Right-To-Use" and Economic Development Unclear

The concept of "Right-To-Use" has traditionally been associated with a contractor's fractional use of a functional government capability for commercial work. For example, if a contractor was operating a government production line to produce government products, the contractor could negotiate the "Right-To-Use" of that line to produce commercial product on a non-interference, full cost recovery basis. EG&G and the DOE recently negotiated a "Right-To-Use" contract clause at the Mound Plant. However,

Defense Programs also issued a stop production and maintenance-of-capability order. Thus, for production capabilities the case for fractional use of a functional capability appears to no longer exists.

The concept of M&O contractor "Right-To-Use" appears to be in conflict with the DOE's economic development guidance - make surplus capabilities available to the private sector through the CRO. If EG&G is given first right to any capabilities by and through the DOE MA, it might be perceived that the community is being offered only those capabilities which have no commercial value to EG&G.

7.3.2 Liability Reduction Mission Not Understood

DOE EM has not yet articulated a liability reduction mission for the Mound. Mound management and personnel did not appear to understand the DOE's post production need for rapid and safe liability and mortgage reduction. The Defense Programs FY 95/96 reconfiguration program and the economic development effort are viewed as key plant missions. While these are important missions, management does not appear to be planning the activities from the perspective of rapid, safe liability and mortgage reduction. Two examples of this perspective include EG&G line management statements that DP components and documents not dispositioned by the reconfiguration program must be preserved at the Mound Plant in perpetuity. The approach to resolution of the remaining SNM and tritium is similar. Surplus material is being viewed as a product to be processed and stored or shipped, rather than as a potential waste to be treated and dispositioned from the site. The product-like approach could be significantly more costly, take more time, and create greater volumes of contaminated waste.

7.3.3 Potential For Capability Reuse Appears Limited

From the ITR team's perspective, the potential for self-sustained reuse of the Mound Plant capabilities and infrastructure, as presently configured, appears limited. A number of characteristics, while individually not major barriers, when combined create an economic development reuse feasibility question.

7.3.3.1 Commercial Value of Capabilities Limited

The main technology mission of the Mound Plant, explosives and explosive components, are limited in interest to a few commercial and DoD specialty products. The facilities "ear-marked" for economic development are highly specialized, i.e., the explosives complex.

The individual capabilities lack clear product or market definitions; none appear to have market ready products. Several can provide equipment, services, and expertise which enable new products. Creating new market ready products requires a significant investment of resources. Most of the capabilities do not have a business plan; only the machining and the explosives groups have made this effort.

Equipment at the Mound Plant is, with few exceptions, commercially available. The uniqueness of the Mound Plant capability lies in the knowledge and skills of the personnel to produce to precise, specific weapons requirements. Tolerances for machined parts, for example, can be one or two orders of magnitude tighter than those of typical commercial products. Making parts to these specifications requires skills, tools, and measurement equipment that, while unique, are expensive and slow. There may be a limited commercial requirement for tight tolerance machine work, but if the requirement was significant, market forces would have made it commercially available. The precision machining capability could potentially be relaxed to commercial tolerances, provided work practices can be brought into alignment with commercial productivity standards.

Some of the high technology manufacturing capabilities, such as the flexible PC board and microelectronics capabilities, have never been functional and are not equipped with contemporary pollution control equipment. Equipment was installed and tested but never used to routinely produce a product. Some parts of the production capability, such as explosive component manufacturing, have been shutdown or placed in standby. Earlier reductions-in-force have thinned the ranks of experienced engineers. Start-up or restart of these capabilities could be costly and time consuming.

The culture of the Mound Plant work force is not one of "bottom line"; productivity and profitability are not lived day-to-day. Through the years, work practices and compensation at DOE sites have been structured to keep a mobile work force captive regardless of the production work load. The Mound work "culture," therefore, has not been judged against the commercial productivity benchmark. For example, there is approximately one exempt person for every hourly employee. The stop production order and the lack of a new mission has also impacted the culture. Most work has come to a stop. The ITR team observed many personnel in non-productive activities with the knowledge and consent of their first line managers. The work culture also appears to be characterized by an informal, casual approach to ongoing activities, having to ask the right question of the right person to get an answer, and the need to assemble a dozen people to answer any question. Management appears steeped in a culture which finds these types of practices acceptable.

The Mound Plant overhead costs are poorly defined but appear too high for most commercial application. Management was unable to quantify the overhead costs of individual facilities. There is currently almost no idea of individual activity costs. The accounting system, as presently configured, apparently cannot provide the data. The cost per square foot of space can be estimated at \$29/ft² by dividing the FY 95 landlord budget request by the total building square footage (\$38M/1.3M ft²). EG&G estimates that it can reduce the infrastructure cost for commercially leased space to \$10/ft². It was not clear if this same rate would be applied to the landlord space (\$13M maximum landlord cost). The City of Miamisburg estimated that equivalent industrial space leases for \$4-5/ft² (\$10-12 ft² for prime office space).

The plant is primarily made up of aged buildings constructed in the 1940s to 1970s. Most of the buildings are sound, a few need significant shell work (See Appendix B). Significant physical barriers exist to reuse, including security fences and credentials, access and parking, physical plant and utilities, and fixtures. Superfund Site liability issues could also inhibit an outside firm from considering reuse.

7.3.3.2 Commercial Value of Capabilities Overestimated

The ITR team believes the value of the Mound Plant capabilities is being overestimated. Given the current climate, over-estimation of the value is not unexpected. Employees have been politically active in pressing the value of the plant capabilities. The City, MB, and EG&G have aggressive marketed the capabilities to attract commercial interest and DOE Task Force funding. The few business plans have very optimistic business development and market share expectations and lean cost of operations and infrastructure cost estimates. The business plans were developed by Mound Plant employees familiar with a non-competitive, level-of-effort work environment and inexperienced in small business operation. The City has been forced to judge a broad range of capability values based on a limited technical background. Normal commercial proprietary information restrictions make evaluation of the reuse potential, except for a limited few people, nearly impossible. As a result, the regional opinion of the value of the capabilities has remained high. In the end, only the business interest in and commitment to the capabilities will be of significance.

7.4 Key Liabilities

The ITR team used information provide by the Mound Plant personnel and building walk downs to identify the key EM-60 landlord liabilities in materials, wastes, and facilities.

A significant liability issue is identification of recipient sites for Mound Plant materials. Many of the ITR Team discussions with site

personnel ended with “those materials” will go to the Savannah River Site or will go to Los Alamos. No formal agreements apparently exist between the Mound Plant and any receiver sites.

7.4.1 Materials

Material liabilities include nuclear materials, nuclear material accountability control, energetic materials, and productive materials, components, and documents.

7.4.1.1 Nuclear Materials

The Mound nuclear material inventory consists of a large number of accountable containers/units and a large number of non-accountable (mostly microcurie quantities) samples and sources for standards, calibration, etc.

The accountable materials as shown in Table 7.4-1 are all located in seven (7) buildings. Two of the buildings are NE (38 & 50), one of the

	Location (Building)						
	T	R/SW	38	50	23	45	59
Pu-239 (kg)	7.5	0.4			0.001		
Pu-238 (kg)	12	0.05	4	7.5	0.001		
Enriched U (kg)	0.3						2
Depleted U (kg)	100	10					
Normal U (kg)	140						
U-233 (kg)	3.5						
Deuterium (kg)		4	6				
Thorium (kg)	1						
Am-241 (g)	4		4				
Cf-252 (microgram)	1					125	17000
Tritium (kg)	2.5	1					

Table 7.4-1. Accountable Nuclear Material

NOTES FOR TABLE 7.4-1:

1. All but 1.8 (kg) of the Pu-239 is excess to current requirements. The 1.8 (kg) is associated with Safeguards R&D and should follow the program.
2. Most of the Pu-238 is associated with the NE heat source program, approximately 100 grams is declared as waste, and the remainder is calorimeter standards.

3. Seventy grams of the enriched U is associated with the Safeguard program and should follow the program. The 2 (kg) in Building 59 is in the neutron multiplier (CFX).
4. The U-233 requires repackaging (planned) and shipment to ORNL (planned).
5. The Thorium is excess to current needs.
6. The AM-241 in the T Building is associated with the Safeguard Program and should follow the program. The Am-241 in Building 38 are excess neutron sources.
7. The Cf-252 in T and 45 Buildings is for health physics use. The Cf-252 in Building 59 is associated with CFX.
8. The tritium is 2700 (gm) as a solid, 750 (gm) as a gas, and 70 (gm) as water.

buildings (23) is a waste assay and storage facility, and one of the buildings (45) is a health physics standards and measurement facility. Building 59 (the neutron multiplier facility) is not operating. The City of Miamisburg has identified the building for economic development.

If Building 59 is not required for reuse, then removal of the enriched Uranium should be contracted to an outside party. Building T and R/SW are the two buildings requiring longer term cleanup.

Most of the non-accountable sources are sealed with a notable exception of several hundred "orphan sources" collected at the site approximately three years ago. These "orphan sources," some of which are solutions, are being processed in Building 38 for disposal as waste (most, if not all, as LSA). The non-accountable sources should not present a problem in disposition. They can be used as required and the excess disposed of.

Several operations for tritium recovery and processing at the Mound Plant are in a shutdown condition or are new operations which have not gone hot and are not contaminated at this time. Of particular note is the new Tritium Effluent Recovery Facility (TERF) which is not yet contaminated. This system was constructed to replace the old system in SW Building. Given the liability reduction mission, the advisability of starting up the TERF and contaminating of the system is questionable. The viability of using the existing ERS system through deactivation thereby avoiding the need for D&D of TERF must be seriously considered.

As a result of the on-site inventory, the Mound Plant is a Category II special nuclear material facility. The cost of safeguards and security at the site was estimated by EG&G personnel to be \$7M to \$9M per year. If the SNM was relocated to other sites, such as Los Alamos, the site could be down-rated to a Category III facility. EG&G personnel estimated that

the burdened cost savings of the down rating would be approximately \$1000K. They were not sure that even this modest cost savings could be realized because of radiological sabotage security requirements. The ITR team felt that a separate review was required to fully address landlord security costs, including the facilities currently dedicated to this activity.

7.4.1.2 Nuclear Material Accounting

A review of nuclear material control and accountability (MC&A) practices and procedures was performed as a part of the Independent Technical Review. This review focused on the inventories of tritium and SNM and was specifically concerned with determining the level of confidence for the nuclear material inventory quantities. Because of this orientation, the review concentrated on those areas of MC&A with direct impact on inventory values: nuclear material measurements, measurement and statistical control programs, and control indicators (inventory differences and shipper/receiver differences).

Requirements for nuclear MC&A at DOE facilities are provided in DOE Order 5633.3A, *Control and Accountability of Nuclear Materials*, issued February 22, 1993. Oversight for Mound's MC&A program has been the responsibility of the DOE-AL, Nuclear Safeguards Branch which performs an annual survey and prepare a formal report rating the program as satisfactory, marginal, or unsatisfactory with respect to compliance with DOE requirements and performances.

Summary of SNM Inventories and Status

The Mound Plant has substantial inventories of tritium in both bulk and item forms. Additionally, the facility has SNM inventories of enriched uranium, plutonium-239, plutonium-238, and uranium-233. Table 7.4-2 summarizes the tritium and SNM inventories, based on an accounting system report, by item location. Total quantities on inventory are classified and will not be presented in this report. The only current activities involving these materials are (1) tritium - tritium processing, reservoir surveillance and commercial sales; and (2) plutonium-238 - heat source and radioisotope thermoelectric generator (RTG) fabrication. The only material in process is approximately 25% of the tritium inventory. The remainder of the tritium inventory is in the form of storage items. The plutonium-238 is not considered to be in process because it is always clad. The inventory of plutonium-239 and uranium-233 is in storage and remains static.

<u>Building</u>	<u>Enriched Uranium</u>	<u>Pu-239</u>	<u>U-233</u>	<u>Pu-238</u>	<u>Tritium</u>
26		12		5	
50				5	
59	1			13	
38 (PP)				3	
R					80
SW		24		12	403
T ²	10(70%)	74(95%)	16(100%)	109(50%)	81(75%)
TOTAL	11	110	16	147	564

TABLE 7.4-2. Locations of tritium and SNM inventories items based on the accounting system.

NOTES TO TABLE 7.4-2:

1. Number of items refers to accounting systems number of entries; not to actual item count (e.g., several items in a drum may be identified as a single item in the records and on this table).
2. For T Building, the percentage by weight of the site inventory is given in parenthesis.

The most recent DOE-AL survey of MC&A (September 1993) rated the program satisfactory, the highest possible rating under DOE guidelines. There were several findings of non-compliance in specific areas; however, they were essentially procedural in nature, and did not directly impact nuclear material measurements or inventory quantities. The results of the DOE-AL survey suggest a fundamentally sound MC&A program which provides strong assurance that the nuclear material records are complete and accurate.

Nuclear Material Measurements

Accountability measurements for SNM generally meet the DOE requirements and the needs of the facility, except for the concerns expressed below.

Measurements of tritium gas are performed by PVT; tritium items are measured by calorimetry. (Mound is the DOE Center-of-Excellence for calorimetry.) Both methods are used in conjunction with mass spectrometric measurements of the isotopic composition of the tritium. Except for the W87s, tritium in reservoirs from Pantex or Savannah River Site is not measured, and is received at shipper's values. There is an unresolved bias in measurements of tritium in W87 reservoirs between SRS and Mound.

Pu-238 is measured by calorimetry for accountability purposes, except for Pu-238 in RTGs for which Mound has no measurement methods. Pu-238 and enriched uranium are measured by standard nondestructive analysis (NDA) techniques. There is no measurement capability for U-233.

Concerns regarding measurement systems include the following: 1) the unresolved bias for tritium in W87s could result in an error in the tritium inventory; however, this difference is not likely to be substantial compared to the total tritium inventory and 2) the lack of measurement capability for U-233 could complicate the process of getting the material shipped off site.

Measurement Control and Statistical Control Programs

Measurement and statistical control programs are important for determining the uncertainty for nuclear material measurements and inventory values. The measurement control program meets DOE requirements and provides effective control.

The statistical control program has been effective in the past; however, recent staff cuts resulted in a cutback in this program. The performance of trend analysis on inventory difference data was terminated when the responsible individual left the facility. Limits of error for inventory differences have apparently remained static (set at the last value determined prior to termination of trend analysis) since about November 1993. If this situation continues, there is a possibility that statistical control limits on inventory differences may not be appropriate for the level of activity occurring at the facility.

Control Indicators

The primary control indicators used for nuclear material accountability are inventory differences and shipper/receiver differences.

The inventory difference is defined as the difference between the book value of the inventory and the value determined when a physical

inventory of nuclear material is performed. DOE Order 5633.3A defines warning and alarm control limits for inventory differences as 2 and 3 standard deviations, respectively. Facilities have specific investigative and reporting requirements when these limits are exceeded. The recent history for inventory differences have shown few instances of exceeding control limits, indicating that the measurement system are providing accurate data. At the time of this review, there is no unresolved differences exceeding limits. The only concern is that stated in the preceding section that the control limits are not being updated through continuing analysis of current data. The current rate of occurrence of differences exceeding control limits is running at about that expected (based on a normal statistical distribution) which indicates that the limits are not badly out of line, but this situation needs to be watched carefully as long as trend analysis is not being performed routinely.

Shipper/Receiver differences are the differences between the shipper's and receiver's measured values for transfers of nuclear materials between facilities. Control limits are defined as the statistical combination of the shipper's and receiver's 2 sigma measurement uncertainties. Differences exceeding these limits are defined as significant and must be investigated and resolved. The frequency of significant shipper/receiver differences has not been excessive, and there were no unresolved significant shipper/receiver differences at the time of this review.

General Concerns And Conclusions

This review concurs with the assessment of the DOE-AL MC&A survey report of 1993 – that the MC&A system is operating effectively and that the SNM quantities on inventory are known accurately, within the stated uncertainties. The concerns raised in the immediately preceding section raise the questions as to whether this level of effectiveness can be maintained in the future. In addition to the concerns related to the three previously discussed topics, the following items need to be considered with respect to assurance of the accuracy of the SNM quantities.

- Much of the tritium inventory and all of the Pu inventory will have to undergo processing prior to disposition. There will almost certainly be losses associated with this processing and the uncertainty associated with inventory quantities generally increases with processing. Thus, the quantities currently listed on inventory and the associated uncertainties should be expected to change. These changes are likely to be most significant in the case of tritium where losses to process hold up could be large.

- The deterioration of the measurement and statistical control program due to staffing decreases which was discussed in prior sections illustrates the possibility of a more general decline in the effectiveness of the MC&A program that could occur as the facility continues along the path toward shutdown. While the conclusion that the system is effective holds now, there is no guarantee that it will continue to be effective. Continuing effective review and oversight will be required to assure that the program is maintained.

7.4.1.3 Explosives and Explosive Components

The Mound Plant has 29 buildings that are or have been used to develop, process, test, or store explosive materials, subassemblies, and components. These 29 buildings enclose approximately 184,000 square feet of floor space. Explosives liabilities associated with individual buildings are noted Section 7.4.3 and in Appendix B.

The total explosives inventory for the Mound Plant, as provided by EG&G Mound Applied Technologies, is 2010.3 lbs. (Table 7.4-3). The majority of this inventory (approx. 1509 lbs.) is in explosive magazines at the site. The quantity in long-term central storage magazines (as opposed to building or activity specific magazines) is approximately 1452 lbs. The remaining inventory is spread across several buildings. Most of this remaining inventory is in the form of small discrete components or component piece parts at various stages of completion (numbering in the hundred thousands). Many of these components and piece parts are also classified, mostly CRD.

BUILDING	QUANTITY (LBS.)	TOTAL QUANTITY (LBS.)
Production		
1	8.6	
2	<0.1	
3	0.8	
35	0	
27	4.7	
42	1	
49	72.6	
87	2.4	
DS	19.0	
I	20.6	
		129.8
Development		
43	5.1	
94	0.7	
COS	1.5	
51	7.7	
		15.0
Surveillance		
63	0.2	
48	3.3	
89	350	
E	1.5	
R	<0.1	
SW	<0.1	
T	1.3	
		356.5
Storage Magazines		
5	340.2	
10	36.9	
20	241.7	
52	7.4	
53	-15	
54	7.9	
64	0.1	
80	343.2	
81	206.4	
82	163.1	
83	76.7	
84	70.4	
		1509
GRAND TOTAL		2010.3

TABLE 7.4-3. Functional categories, buildings, and current explosives inventories.

Because the 1994 cessation of production operations was only recently announced, there has been little effort to consolidate this material to central locations for transfer to other sites or for destruction. EG&G management stated 20 lbs. of raw material was designated for shipment to other sites and that it would take 3-4 years to destroy the remainder of the explosives inventory due to operating restrictions at the "burn site." These restrictions are based primarily on climatic conditions.

The retort burn facility, Building 90, is permitted to burn from dawn to dusk six days per week, per the Mound permit schedule request. Longer burn time may be feasible. The facility is typically not operated in the winter months because the building is not heated. The facility can burn raw material at the approximate rate of 1000 grams/12 hour day. Seven persons are qualified to operate the facility.

7.4.1.4 Production Material, Component, and Document Liabilities

As a part of the production and surveillance activities, the Mound Plant facilities contain several million discrete components or component piece parts at various stages of completion, as summarized in Table 7.4-4. The components include detonator safe strong links, flat cable products, plastic parts, detonators and explosive timers, non nuclear acorn, ceramic headers and parts, and precision machining parts. Many of these components and piece parts are classified, mostly CRD. EG&G management anticipated shipping about 33% of the explosive components to receiver sites. The majority of the inert classified components are small machined parts. EG&G management anticipates shipping all inert, classified and about 75% of the inert unclassified parts to receiver sites.

Approximately 500 to 700 production tools, fixtures, and gauges will be shipped to receiver sites during FY 95. In addition, current plans call for shipment of a 5 axis milling machine, a SIP coordinate measurement machine, and 2 physical vapor deposition systems.

The pedigree, quantity, and location of in-process, completed, and surveillance WR product is inventoried at the plant level. The reconfiguration requirements for this material are still being determined. Some of the surveillance material has been informally "spoken for" by the National Labs, but funding and dates for formal transfer have not been set. A production "museum" in A Building houses a few additional classified parts.

The pedigree, quantities, and location of in-process reject material, engineering parts and in-process material, and scrap and waste components are known to individual group managers and engineers, but are not inventoried at the site level. The ITR team observed this material during the building walk-downs, but was unable to obtain formal part type

inventories. Some production scrap components, especially explosive timers, were observed to have been stored without disposition for over three years.

Because the cessation of production operations was only recently announced, there has been no effort to consolidate this material to central locations for transfer to other sites, demilitarization, or surplus reapplication.

Energetic	Classified	Quantity (Units)	Explosive Weight (lbs)
Inert	Unclassified	213,979	
Energetic	Unclassified	23,384	39
Inert	Classified	1,924,534	
Energetic	Classified	118,332	463

Table 7.4-4. Energetic and classified in-process materials.

NOTES FOR TABLE 7.4-4:

1. The number of classified inert components was estimated by EG&G personnel.
2. The number of some energetic components was estimated by EG&G personnel by counting storage containers.

In addition to production and surveillance materials, the site houses several hundred thousand classified documents and files. Approximately 72,800 classified documents are housed in the Building A basement vault. An additional approximately 15,000 classified computer tapes and storage media are located in the OSW fourth floor vault. The OSE Building third floor design area houses 34, five-drawer drawing cabinets and 12 safes with over 65,000 drawings, a part of which are classified. The Room 310 vault contains 10,000 to 15,000 classified drawing mylars as well as a large rotating file of classified aperture cards and computer disks. An additional 119 five-drawer document safes are located throughout the secured portion of the facility contain an unknown quantity of classified documents which are not required by DOE order to be inventoried.

The reconfiguration and design agency need and transfer date for the inventory of classified documents has not been finalized.

A process currently exists for destruction of classified documents. The documents are boxed and transported by security personnel to a regional classified document burn facility.

7.4.2 Wastes

7.4.2.1 Hazardous Wastes

The EG&G waste management organization's attitude toward hazardous waste is that "it is the generators responsibility" when in fact it is an EG&G and DOE responsibility. No distinction will be made by the regulator internal to the organization. The culture of the waste management organization must be shifted toward proactive waste identification and disposition.

Hazardous waste in labs are not being managed in accordance with RCRA. Satellite accumulation areas have not been established in work areas. Materials are present in the labs and production areas labeled as hazardous wastes which have been in the areas in excess of one year. Many of these materials appear to have been abandoned, since little or no activity is ongoing in the labs and many of "owners" no longer work at the Mound Plant. Building managers appeared to be largely unaware of the mechanics and responsibility for hazardous waste management.

The suspect mixed waste shipping moratorium has caused significant amounts of hazardous materials and wastes to accumulate in the Buildings R, SW, and T. These materials and wastes will be a liability as the buildings are deactivated. A workable process to determine if the material is contaminated and to disposition the material has not been developed or implemented. Until such a process is implemented, hazardous wastes will continue to accumulate in radiological buildings.

There are drums and tanks of Environmental Restoration Program generated wastes from sampling and remediation activities which are not being stored in accordance with good practice. Specifically, drums bulged from freezing which are in excess of a year old, appear abandoned near Building 55. Tanks of aqueous wastes are being stored outside near several buildings on the south hill. It appears that remediation generated wastes are not being resolved in a timely manner.

7.4.2.2 Mixed Wastes

Mixed wastes are being stored in an interim status facility. No treatment for these wastes is available. The Conceptual Site Treatment Plan has been submitted in accordance with the FFCA requirements. Potential treatments have been identified in the report. Wastes which would be generated during deactivation have not been identified nor addressed. The use of the Glass Melter is being touted as a treatment for a significant portion of the mixed wastes. The Glass Melter does not seem a viable treatment

system given the condition of the unit (poor material condition, lack of safety basis documentation, lack of procedures, the unit has not run for over six years).

The RCRA Part B application is not consistent with the Conceptual Site Treatment Plan for Mixed Wastes (FFCA). The liability is that no permitting has been initiated for mixed waste treatment other than the glass melter.

7.4.2.3 Low Level Wastes

Low level waste is a plentiful commodity at Mound. Low level waste is stored on virtually any flat area at the plant. In addition to loaded metal waste boxes lining many of the roadways, in excess of 110 trailers are being used to store low level wastes. Historically, low level wastes have been disposed at the Nevada Test Site (NTS). However, low level wastes have not been shipped to NTS for approximately two years. The inability to continue shipment of these wastes has been driven by difficulties in complying with the NTS waste acceptance criteria and non-acceptance of bitumen coated barrels used to ship solidified tritiated waters. Since there is no regulatory driver to disposition low level wastes in a timely manner, disposition of low level waste has been a low priority. Until this situation is resolved, low level wastes will accumulate until the Mound Plant is completely constipated. At a minimum, the amount of low level waste being stored is unsightly and creates the impression that it is not being proactively managed.

7.4.2.4 Transuranic Wastes

A limited amount of Transuranic Wastes (TRU) waste is being stored in several locations. The liability with these wastes is similar to all other DOE sites. No disposal capability currently is available in the complex. Continued storage and management will be required. Some consolidation of storage locations may be possible.

7.4.2.5 Sanitary Wastes

Sludges from sanitary waste water treatment system are being managed as low level waste. As noted above low level wastes are currently being stored but not disposed. It is unclear whether the sludge is in fact a low level waste. If it is not, the sludge could be disposed as normal sanitary waste locally.

7.4.2.6 Other Waste Issues

Air emissions at the Mound Plant governed under the National Emission Standards for Hazardous Air Pollutants (NESHAPs) are non

compliant due to the lack of isokinetic sampling of the stacks. The emissions are not above the regulatory limits; only the monitoring systems is deficient. The Mound Plant is negotiating a Federal Facilities Compliance Agreement with EPA regarding this deficiency as an interim solution. A capital project to upgrade the sampling deficiencies is on track and scheduled for completion in FY 96.

Three constituents in the Mound liquid outflows cause periodic problems: Chlorine due to chlorination (dechlorination plant planned), copper from old piping (solved via coating), salt (no solution). The chlorination problem appears to be a process control problem. Chlorination is necessary to meet clean drinking water standards. The planned dechlorination plant may not be necessary if the control problem can be solved. The salt problems are due to water softener and do not have an identified solution at this time.

Mound has 9 identified operating units (described in Section 4.3) covered under the Environmental Restoration Program. Only six of these will require further actions. One of the areas involving volatile organic compounds (VOC's) in the aquifer was added to the National Priorities List in 1989. DOE will continue to retain liabilities associated with these areas until they are remediated, determined to require no future action, and closed as CERCLA or RCRA units as appropriate.

An environmental assessment has been drafted at the direction of DOE ALO to cover economic development at Pinellas. However, similar direction has not been given to the Mound Plant by DOE ALO. The Mound Plant faces many similar challenges in the economic development reuse arena. In order to adequately address the impacts of economic development an environmental assessment should be performed to bound the possible economic development alternatives. For economic development considerations the "no action" alternative should be deactivation. This is an important distinction in that releases in the deactivation mode would be less than economic development or D&D scenarios and the socio-economic impacts could vary greatly.

A RCRA Part B permit was submitted January 1993 covering the facilities listed below. All of these units are currently operating under interim status with the exception of the Test-fire Unit. As noted previously, this permit application is not consistent with all of the identified treatment alternative for the stored mixed wastes. It is unknown when the Ohio EPA will issue the Part B permit.

Active On-site – Hazardous Waste Management Facilities

Building/Area	Use
Building 23	Mixed Waste Storage
Magazine 53	Explosive Waste Storage
Building 72	Hazardous Waste Storage
Retort Unit	Detonating Components Containing Explosives
Open Burn Unit	Open Burning of Explosives and Pyrotechnic Wastes
Glass Melter	Thermal Treatment of Mixed Wastes
Test-fire Unit	Detonation of explosive Materials
Pyroshed	Pyrotechnic Waste Storage

Processes have been established at Pinellas to comprehensively and proactively identify any changes in regulatory status and permits resulting from reconfiguration, economic development, or deactivation. These processes provide a structured methodology to address changes and should be considered for implementation at the Mound Plant.

Economic Development Considerations

Most of the permitting agencies for the existing permits have provisions for situations where the landlord is the operator. In these cases some review of the operator's impacts compared to those addressed under the existing permits is made. If the impacts are enveloped, after some processing activities, the permit can be modified. If the activities are significantly different a new permit may be required, in some cases a permit may no longer be required. The liquid effluent permit has a provision for continued operation during processing to gather operating data to validate the permit conditions. Other permits may take anywhere from 30 days to two years to process depending on the scope of the change. In some cases a 45-day comment period is also required.

Where DOE permits could be used by an economic development entity, the DOE would retain oversight since DOE would retain liability. The effect of oversight and costs for compliance could impact startup and operating costs.

Where no permit is currently required by the DOE, the new operator may be required by another regulatory entity to obtain local, state, or federal permits. For example, a business insurer may require an occupancy permit. Facilities built and operated in accordance with DOE Orders for production may not meet requirements for other uses. If the product being

produced for commercial use involves radioactive materials, a state or federal license may be required. This could involve a lengthy permitting and public hearing process.

An entity considering economic development would certainly evaluate potential impacts as part of their business development evaluation. Any permitting changes or additions which involve time delays will affect the start-up costs of such enterprises.

Permitting Issues and Liabilities

The permits currently held by the DOE which could be modified to reflect the DOE as "landlord" and a different operator would be similar to those currently being processed which list EG&G as a co-operator. The permitting process is not the challenge for DOE.

The DOE challenge will involve insuring that multiple operators comply with all provisions of the permits. This would involve continued oversight by the DOE commensurate with the DOE's liability as "landlord." Most commercial entities are not familiar with the system of procedures, audits, and reports which the DOE has traditionally relied on as part of a compliance program. Ensuring that not only contractual documents reflect these requirements, but that any new tenants understand the magnitude of their obligation will be important to protect the DOE from liability, and protect the new tenants from unrealistic expectations which can ultimately impact the success or failure of a new business.

The DOE may still find itself impacted by requirements placed on the tenants from outside agencies. In some cases, the outside agencies may require the landlord to be listed on the permits. Additionally, the tenants may be required to make facility modifications to be compliant with new permit requirements. The modifications may impact systems or structures shared with other tenants or DOE.

If radioactive materials or hazardous materials were present in a facility, short of total D&D, some potential for exposure to new tenants remains. The pathways include underground lines from the industrial and radioactive drain systems, ventilation systems, fixed contamination in walls and floors, etc. In some cases new tenants might be conducting processes which involve the same or similar materials to those formerly used by DOE. In these situations a carefully crafted hold harmless clause and a comprehensive environmental baseline are critical in minimizing DOE liability.

Given these potential situations, and consistent with the path forward presented by the ITR, it is recommended that the community reuse

organization and its tenants secure and maintain the appropriate permits whenever practicable. DOE should not be expected to pursue new permits on behalf of prospective tenants.

7.4.3 Facilities

There are no major technical issues that prevent the deactivation of the facilities at the Mound Plant. Including facilities being considered for reuse. Many of the Mound Plant facilities are 40 to 50 years old and in need of refurbishment. Notable exceptions are the office buildings OSE, OSW, and A as well as the COS facility. The condition of individual facilities is described in Appendix B.

The planning for facility safe shutdown and deactivation is in an embryonic state. The existing planning has neither clearly identified the present building hazards and the steps necessary to mitigate these hazards, nor have the end state conditions been defined sufficiently to assure the work logic will lead to conditions necessary to satisfy the safe, stable, storage requirements for "deactivated storage" and eventual transition to EM-40.

The current state of the facilities, the basis for safe shutdown and deactivation planning, is not well known (although a great deal of existing data could be integrated to enhance this understanding). The current cost of operating individual buildings is not known. The cost savings to be realized in individual building deactivation is not known. The surplus productive materials and generator waste material inventories are not well known. The condition of the facilities and the degree of building and surrounding soil contamination are not well known. Fortunately, equipment is inventoried by building and printouts are available.

Mound Plant personnel have not yet adequately considered the process and logic of placing the facilities in a deactivated state. Some work to accumulate information on facility status and some general guidance has been developed. The effort to consolidate personnel is hampered by the lack of direction regarding the new mission. Many buildings were occupied by one or two people with no compelling reasons for being in that space. Empty buildings that were heated and maintained as if they were occupied. The Mounds Plant criteria for deactivation is to maintain the building at 55 degrees to allow reoccupancy on short notice. EG&G personnel indicated that they had not been directed to take facilities to a minimum mortgage state.

An organization has not effectively been put in place to shutdown and deactivate facilities in accordance with an overall site plan. While the Mound Plant personnel have excellent experience in decontaminating and decommissioning glove box lines and buildings, they do not have experience in deactivation.

7.4.3.1 Building Operational Costs

Removing occupants from facilities at the Mound Plant will not necessarily free up funds for deactivation. Of FY 94 non-programmatic funds, about 90% go to payroll, taxes, and benefits of M&O personnel, as depicted in Figure 7.4-1. The remainder pays for energy, services, communications, and materials. This is dramatically different from construction (or deactivation) where the ratio is generally closer to 1:1. Closing facilities without reducing staff only affects about 10% of the expense. Removing occupants can reduce energy costs, for example, but won't cut communication or custodial costs if the net number of phones and facility support personnel are not reduced. As the site begins deactivation, the staff must be reduced concurrent with the deactivation of the facilities if a portion of the available funding is to be made available for deactivation activities.

Figure 7.4-1. Allocation of Mound non-programmatic funds.

7.4.3.2 Mound Facility Categories

The Mound Plant facilities can be grouped into four general categories.

Structures that contain radioactive contamination.

These are facilities where designed for indefinite life. They were generally built in the fifties or sixties of steel and concrete, brick, or cement block on hard foundations. They typically have flat roofs and are one or two stories tall. Buildings such as T, R, E, SW, F, V, H, PP, WD, WDA, 38, and 59 are examples of this grouping.

The facilities have radioactive contamination in accessible and or inaccessible areas. They have some level of radioactive contamination in conduits, overhead spaces, glove box lines, hoods ventilation ducting, piping, sumps, floors, and walls. The precise and accurate survey and characterization of where, how much, and what kind of radiological contamination has not been done. Material in duct works is not well known. PCBs in electrical apparatus, and friable asbestos in insulation and building material are documented. "As built" drawings for these facilities were said to be adequate but not current or completely accurate.

Permanent structures that contain energetic materials contamination.

These facilities are typically constructed of steel and concrete, brick, or cement block. Some are storage magazines. These buildings were built from the 1940s to 1980s. The facilities were used in the development, testing and storage of explosive components. The nature of the buildings and the contents are relatively benign or can be made benign with limited effort. The small amounts and location of the contamination can be stabilized and isolated in a reasonable time and effort.

Permanent structures that are not contaminated.

These facilities, of steel and concrete, brick, or cement block construction, were generally built in the forties, fifties, or sixties. They were generally used for process support such as record storage, printing, warehousing, office space, cafeteria and garage. They generally have flat roofs and are one or two stories tall. Facilities such as P, G, GW, and the "Old Cafeteria," are in this grouping.

The most important buildings in this group are OSE, OSW, and A, which are modern, attractive office buildings and the centerpiece of the site. These three buildings appear to meet current codes and standards.

Uncontaminated semi-permanent structures.

This group includes modular buildings that were used to replace trailers and to provide space when building permanent structures were prohibited. Several are two stories tall. Several are covered with T 111 siding. They are generally built on slabs or pilings. They have sprinkler fire protection. Others in the group are of the "Butler" building type construction. One structure is a galvanized steel semi-circular "Quonset hut." These buildings were generally used for record storage, printing, warehousing, office space, and light machine shops.

7.4.3.3 Other Building Issues

The bulk of the open safety issues are minor electrical safety issues due to the age of the facilities.

Numerous life safety code deficiencies exist in 85 buildings. Line item funding has been requested to correct the deficiencies. Equivalency evaluations could eliminate many of these. Deactivation of buildings should also eliminate the need for upgrades.

The status of fire protection systems for deactivated facilities needs to be determined. Dry pipe or shut off would lower maintenance costs significantly over active systems. Deactivating the systems could be even more cost effective.

APPENDIX A

ASSESSMENT OF ECONOMIC DEVELOPMENT CAPABILITIES

A.1 General

Reuse Opportunity

The greatest opportunity for economic development reuse of the Mound Plant appears to lie in its first class office space. Three buildings contain 200,000 square feet of prime office space on a bluff overlooking the Miamisburg River valley. A modern engineering support facility is located near the office buildings. Significant paved parking is available near by. The buildings could be a very attractive feature to a large company considering consolidation, collocation, or relocation of administrative, engineering, and manufacturing operations at the Mound Plant. The buildings could also support an engineering college with other Plant buildings providing supporting laboratories and infrastructure.

Buildings OSE and OSW (Office Support East and West) are modern four story brick office buildings in excellent condition. Building A, the original administration building on the site, is of two story brick construction and in excellent condition. Building A has a finished basement and joins OSE and OSW on the first two floors. OSE and OSW contain large mainframe computer support facilities. OSW has a modern cafeteria, an auditorium, and several executive conference rooms. OSE contains a vault room. The three buildings are wired to support the needs of the electronic office.

The COS Building is also a modern 64,700 ft², multi-story brick facility with office and laboratory space. The basement contains a 10,000 ft² Class 1000 clean room. The COS building is on the main hill of the plant near the OSE, OSW, and A Buildings.

Barriers

The main entrance to the Plant passes some very unattractive views of the Mound. The older buildings, stacks, and a very unattractive retention basin visible from the road do not project an image of a modern, first class industrial park. The construction style of the retention basin, in particular, gives the impression of a contaminated site. Judicious use of landscaping could significantly enhance the appearance of the Plant entrance.

The Mound Plant capabilities need to be crisply defined. A credible list of potential products and services is essential to the commercialization of any capability. Definition must include the space, equipment, skills, and costs required to maintain the capability. Evaluation would include the comparison of the space, equipment, skills, and costs of the Mound Plant capabilities to other commercial ventures. There has been little effort at consolidation and cost reduction by any capability at the Mound. To be commercially attractive, each capability must be seriously pruned. Space, equipment, and personnel must be cut to the lean essentials. Financial projections must be based on realistic overhead costs, without which none of the capabilities need consider reuse or commercialization.

A "visionary" does not exist for all capability as a focal point for organization, funding, and marketing. The "visionary" should identify costs, products and services, markets, and competition and drive the crisp definition of the capability. This person, by necessity, must believe in the economic development and commercialization of the capability. Some on-site, business hours, efforts at business education, capability definition, and marketing are critical.

All Mound Plant capabilities currently rely too heavily on the one-stop shopping or full-service aspect of the technology-base at the Mound Plant. Each capability must make a practical assessment of the value and cost of the support services it receives at the Mound Plant. The value and cost of these services must be compared to alternative commercial sources. No capability should rely solely on the figures provided by other service providers.

A.2 Machining

The machining capability is an excellent candidate for an independent prototyping or small lot production manufacturing facility. The facility has the necessary equipment and skilled crafts people with a proven history of precision machining.

The machining capability includes the standard conventional turning and milling operations plus multi-axes computer controlled turning, milling, inspection, and wire-cut electrical discharge machining. The majority of the equipment is suitable for small precise work. Two computer-controlled jig grinders, in conjunction with surface and cylindrical grinding capabilities, give the facility the necessary tools to perform very precise grinding operations on a wide-range of metals and ceramics. An off-line Applicon Bravo CAD system supports the programming of the computer-controlled equipment via direct numerical control, fiber optic cable, punched mylar tape, or floppy disk.

The machining operations are divided into three areas: tool and gage, ceramic machining, and process development and production machining. The three functions are supported by a perishable tool inventory control system that offers support of a six-axis Walther's tool grinder. Six axis machining is not readily available elsewhere. An inventory control system for tooling, raw materials, and finished products is in place. A vault is available for classified product and materials. Product acceptance and verification are accomplished in a temperature controlled inspection area on two very precise computer controlled SIP coordinate measuring machines and a wide variety of other inspection equipment. Qualified in-house personnel perform preventive maintenance and repairs to support the machining and inspection equipment. The host computer is on-site.

The 43 non-union personnel appear to be a cohesive economic unit led by Al Hodapp. They have presented themselves as an employee group interested in the acquisition of the machining capability and have generated a draft written business proposal. Mr. Hodapp has availed himself of the business and entrepreneurial training courses offered locally. The group has an existing apprenticeship program with Sinclair Community College.

Machining operations are located in Building 105, which was constructed in 1986. Design and construction techniques are likely to meet those required by ADA and other commercial codes and standards. The location of Building 105 at the boundary of the Mound Plant Complex provides added reuse advantage. The location makes it feasible to isolate the building from Mound Plant centralized services and security. The combination of concrete construction and movable partitions allows for easy expansion and subdivision of the building. The facility is large enough to accommodate additional manufacturing personnel. New larger-product-size capabilities could easily be added to existing equipment complement.

A.3 Batteries (Carbons)

No battery work is conducted at the Mound Plant. Mound Plant engineers have developed carbon materials for the Department of Defense special applications. These carbons are also capable of lithium intercalation into their structure. As a result, the United States of Advanced Battery Consortium (USABC) has funded the Mound Plant to develop carbon materials for lithium ion battery and ultracapacitor applications. The task is limited to scale up from small monolithic discs to powders in one to ten kg batches. While the carbon work has tremendous potential, it has not been going very well because of ES&H restrictions and requirements. The carbon development lab contains several hundred thousand dollars of equipment that is commercially available.

The purpose of the USABC program is to develop an all solid state lithium ion rechargeable battery for electric vehicle applications. The use of lithium intercalatable carbon electrodes in place of metallic lithium has been successfully demonstrated in prototypes as well as small commercial cells by Sony Energetic Inc. of Japan. One of the advantages of carbon electrode over metallic lithium is no lithium metal was produced during battery operation, which enhances the safety of the rechargeable battery. Another advantage is that unlike lithium, these cells deliver a considerable number of cycles without much capacity degradation. Like cells with metallic lithium anodes, these cells yield one of the highest energy densities of all ambient temperature rechargeable batteries. USABC is funding \$30 M/year of lithium ion battery development.

Mound Plant management has shown limited interest in developing this line of business. The staff appears to lack enthusiasm and optimism for the USABC project. No one has emerged as a "visionary" to create an image of the future. The capability lacks real organization, cost data, and market research. No formalized business plan was available for review. There has been no firm interest in the further development of this capability by Mound Plant employees or outside companies.

A.4 Explosives

The explosives capability is spread throughout 29 buildings on the Mound. These buildings have been used to develop, process, test, and store explosive materials, subassemblies, and components. The historical explosive operations are typical of the DOE production complex; they are labor intensive, manual, intricate, expensive operations that produce products with excellent reliability, materials tractability, and quality. The laser-ignited devices and slapper detonators have potential commercial potential.

Most of the economic development efforts associated with the explosives capabilities have been unified under the Star City Ordnance business proposal. Although the Red Team members requested access to the Star City business plan and data, no specific information was provided either by the CRO or EG&G.

A.5 Lasers

The laser capability includes a broad range of diagnostic and inspection capabilities. The equipment, although quite diverse, is not unique. This capability, for the most part, acts as a support service and has few potential commercial products and services. The staff felt there was a limited market for laser hazard awareness training, laser facility inspections,

cooperative education, and optical calibration. A possible new business involves a laser ignition system for jet engines.

The group does have a "visionary" in Larry Dosser, but lacks real organization, cost data, and market research. No formalize business plan was made available for review. There has been no firm interest in the further development of this capability by Mound Plant employees or outside companies.

A.6 Joining and Welding

The Mound Plant Joining and Welding capability is a leader in the field of micro-welding. Although micro-welding does not appear to have a large local market there could be national potential. This capability has a large inventory of state-of-the-art laser, electron beam, gas tungsten arc, resistance welding, brazing, and soldering equipment. Two capabilities are particularly unique: diffusion bonding and the wire-feeder for NdYAG laser welding. The diffusion bonding system was designed and built at the Mound Plant to join copper bridge wires. Wire feeders for laser and electron beam welding are, however, available elsewhere.

No individual has emerged as a "visionary" to create an image of the future. The capability lacks real organization, cost data, and market research. No formalized business plan was available for review. There has been no firm interest in the further development of this capability by Mound Plant employees or outside companies.

A.7 Ceramics

The Mound Plant has a unique capability for producing strong hermetic packages, based on the S-glass/Inconel 718 material system for use in high pressure, explosive components. Attempts at process commercialization, while still ongoing, have been extremely difficult due to the complex subtleties associated with S-glass processing. As a result, Sandia and Los Alamos have relied heavily on the Mound Plant to continue providing this expertise.

The floor space in the production support areas is greatly underutilized, and while many of the assemble stations and batch furnaces are state-of-the-art, most of the development equipment is old and out-dated. Consolidation of the facility would certainly reduce costs. None of the equipment is novel or unique.

There is a potential for diversifying and extending the high-value S-glass technology into the lower-value, large hermetic component industry that exists nationally and worldwide. The Mound Plant shows no

interest in developing this line of business. The staff appeared to lack enthusiasm and optimism for aggressive economic development. No one has emerged as a "visionary" to create an image of the future. The capability lacks real organization, cost data, and market research. A business plan was not available for review. There has been no firm interest in the further development of this capability by Mound Plant employees or outside companies.

A.8 Isotopes

Mound's principal isotope activities are the production and distribution of enriched stable isotopes and the packaging and distribution of tritium. Thermal diffusion (gaseous and liquid) techniques are employed for production. Chemical exchange techniques are in the R&D stage.

Table A.8-1 lists the enriched stable isotopes the Mound Plant is capable of producing. Certain products are restricted from commercial sale that limits the sales to DOE and other government agencies. All stable isotope production is conducted in about one half of the HH Building; tritium loading and packaging is performed in the Kyle facility in the T Building.

Ar	36, 38, 40	N	14, 15
Br	79, 81	Ne	20, 21, 22
C	12, 13	O	16, 17, 18
Ca	48**	Kr	78, 80, 82, 83, 84, 86
Cl	35, 37	S	34, 36
He	3	Xe	124, 126, 129, 131, 134, 136

Table A.8-1. The Mound Plant Stable Isotope Production Capability*

* Refers to production capability and includes isotopes for which there is no current market requirement and hence no distribution.

** Currently seeking funding for pilot plant development with a view toward distribution availability after two years of R&D.

Mound Plant staff reports annual isotope sales to be: 1) Tritium = \$0.5 - 1.0M, 2) Helium 3 = \$0.5 - 1.5M, 3) Others = \$0.1 - 0.5M.

Recently, DOE Headquarters assigned Mound the additional responsibility of providing a centralized marketing function for the DOE-wide isotopes production and distribution program.

There appears to be a disconnect between institutional planning as set forth in the "Nonnuclear Consolidation Activity Plan Summary", dated 7/1/93 (Report ATG ID NO: 4) and the Mound Plant staff's understanding as to the disposition to be made of the tritium and Helium 3 distribution activities. The feasibility of continued isotope production and distribution activities at the Mound Plant is dependent upon the future availability of and adequacy of support services to building T and HH. Future production and distribution operations for stable isotopes would require continued use of the Kyle facility in Building T for tritium and one half of Building HH. If the landlord does not financially sponsor these buildings, the isotope program either would have no home or would have to absorb the buildings' overhead costs. The latter would result in significant escalation of production costs and selling prices. Assuming continued availability of the buildings, maintaining production and distribution operations therein is dependent upon the availability of key support services. Mound deactivation implementation which resulted in eliminating or significantly diminishing repair and maintenance support capabilities, e.g., welding, machining, engineering, would compromise the isotope production and distribution operations.

Because of perceived lack of DOE Headquarters' authorization, Mound Plant staff declined to discuss isotopes production and distribution program "privatization" issues. Some conclusions, however, can be derived from the available information. Specifically, a variety of constraints, notably national security, make the privatization of tritium packaging and distribution a quite remote possibility at best. As the daughter product of tritium decay, Helium 3 privatization is similarly constrained. For the remaining stable isotopes, economic considerations pose a significant obstacle to privatization. Combined revenues of \$0.1M to \$0.5M annually do not appear adequate to support the investment required. Future commercial entrepreneurial "cherry picking" among these products could speculatively be envisioned. This would, however, result in potentially prohibitive escalation of Mound's unit production costs for the remaining products.

Tritium

The previously referenced Report ATG ID NO: 4 states that about 500,000 curies per year of tritium are distributed commercially and to DOE facilities and other federal agencies, providing an income of approximately \$1.6 million annually. The Mound Plant staff puts these figures at 150,000 to 500,000 curies per year and \$0.5 to \$1.0 annually. The commercial market is quite significant in terms of quantity purchased. Private commercial product manufacturers depend upon tritium availability and applications utility, e.g., commercially manufactured luminescent "EXIT" signs, such as those aboard commercial aircraft, are tritium activated.

The ATG ID No: 4 Report states that the tritium packaging and distribution activity is to be transferred to SRS and notes a consequent gap in tritium availability between September 1995 and April 1997. The Mound Plant staff states they have been advised informally by DOE/NE that it is the latter's intention to keep the tritium packaging and distribution activity at the Mound Plant. If this, however, proves not feasible, it would be NE's preference to transfer it to Los Alamos National Laboratory rather than SRS.

Helium 3

Report ATG ID No: 4 further states that the Helium 3 activity also is to be transferred to SRS. No gap in availability is anticipated, since a ten-year supply of purified Helium 3 is currently available. The Mound Plant staff sees no impact of Mound facility deactivation upon their capability to distribute Helium 3 and do not currently foresee this activity being transferred elsewhere.

Noble Gases

Argon, Neon, and Krypton isotopes, as well as Xenon isotopes, are generally prohibited from commercial distribution. There are a few exceptions, e.g., Xe-126.

Carbon Isotopes

These isotopes are available for distribution only to other DOE facilities.

Nitrogen and Oxygen Isotopes

These products are no longer produced. Items are sold from inventory. Most of the inventory is depleted. Commercial sources of supply exist, although there are shortages of some oxygen products.

Calcium 48

Calcium isotope enrichment of chemical exchange is in the R&D stage and production feasibility has been demonstrated. It is estimated that two years of R&D are still needed.

Other Isotopes

Bromine, chlorine, and sulfur isotopes are routinely available to all customers.

Testing And Conditioning

Overall the market for testing and conditioning capabilities seems limited. Key personnel were aware of the industries that used environmental conditioning and nondestructive evaluation, but specific product applications were not enumerated. In light of the down sizing of DOE and DOD programs, the government market appears to be contracting while the number of competitors appears to be expanding. Although key personnel seemed well informed of the technical applications, they did not have accurate operational costs, market research data, or competitive pricing information. A business plan was not available for review. There has been no firm interest in the further development of this capability by Mound Plant employees or outside companies.

Environmental Conditioning

Most of the environmental conditioning capability is electro-mechanical in nature and does not consume energy while idle. If left in an idle condition, these capabilities do not present hazards whose severity increase with time, i.e., chemical corrosion, spreadable radioactive contamination, etc. The equipment used in these capabilities is not normally considered portable or mobile for transport and use at another location due to its size, weight, and its special utility and data gathering requirements. The equipment is commercially available and not currently scheduled for immediate transition to use by any private or public entity on or off site.

Nondestructive Evaluation

The nondestructive evaluation capability consists of equipment that does not consume energy when not in use. Nondestructive evaluation methodologies use electromagnetic, chemical, radioactive, and radiation-producing equipment and processes. The latter three methodologies may pose significant environmental and personnel hazards. Some of the equipment is portable or mobile and can be used in other areas or practically relocated. The unique capabilities associated with nondestructive evaluation include a neutron radiography facility, a X-ray tomography facility, and a microfocus X-ray facility. Other equipment is commercially produced. Personnel are certified in accordance with the nationally recognized NDE standard, SNT-TC-1A. These capabilities are not currently scheduled for immediate transition to use by private or public entity on or off site.

From the technical viewpoint, some of the capabilities may be applicable to a production or a NDE job shop. Re-evaluation and diversification of the capabilities might include the following.

1. Establish a mobile darkroom and isotope radiography capability for on site inspections in the Midwest. Inspections could include magnetic particle, dye penetrant, and ultrasonic, if portable equipment is available.
2. Exploit the X-ray tomography capability as a diagnostic tool for industry in the Midwest. Offer a quick turnaround. This capability is very dependent on personnel, one engineer.
3. Determine the restoration costs of the neutron radiography facility. If the reactivating costs are reasonable, an explosives or explosives component manufacturer may be attracted to the site.
4. Determine the appropriate level of professional certification required to compete in the private sector.

A.10 Analytical Services

The Analytical Services group consists of analytical chemistry, surface characterization, and metrology. The group is capable of offering a broad range of capabilities that can be brought to bear on a variety of industrial problems. Analytical Services will play an important role in the cleanup activities as well as in the success of Star City Ordnance. These activities will use a fraction of the capabilities. The capabilities, i.e., equipment and skills, are available elsewhere. Efforts are currently underway to consolidate the group's activities to one building. Efforts are also currently underway to expand the analytical laboratory capabilities.

The Metrology segment of the Analytical Services capability has made some efforts to consolidate into one building. It provides support services to most of the other Mound Plant capabilities. Ron Dehart, Manager of Metrology, acts as the group's visionary. A formalized business plan was not available for review.

A.11 Plastics

Plastics, as a capability, does not exist at the Mound Plant. References made to plastics in the economic development initiatives at the Mound are related to the City of Miamisburg efforts to lease Building 29 to a plastics manufacturer. Assessment of the plastics manufacturer was outside the scope of the review.

A.12 Flexible Circuits

The Mound Plant has two flexible circuit capabilities. A new flexible circuit design and production capability using a custom-designed

automated reel-to-reel processing system exist in a 10,000 square foot Class 1000 clean room in the COS Bldg. basement. The process includes cover coat fabrication and punching, selective material removal, lamination, electroplating, bridge joining, and component bonding. Although the production equipment is relatively new, most processing steps have not been developed or integrated into a well-defined system. The equipment has not been used recently and is turned off. The clean room is functional and operating. However, the clean room has not been equipped with the environmental protection equipment required to operate under current regulations. The capabilities to monitor and neutralize waste water, to capture and dispose of solvent waste, or to water scrub exhausts do not exist. Liquid wastes were drummed and managed by the Mound Waste Management personnel.

The DS building houses a second small development flexible circuit capability. The capability was being modified and updated during the ITR visit. Output of the development capability was said to be limited to approximately 500 flexible cables per month. At this level, the product costs are most likely too high for consumer electronic applications.

Although key personnel seemed well informed of the technical applications, they did not have accurate operational costs, market research data, or competitive pricing information. A business plan was not available for review. There has been no firm interest in the further development of this capability by Mound Plant employees or outside companies.

A.13 Microelectronics

Microelectronics is not a well-defined capability at the Mound Plant. A limited set of basic silicon wafer fabrication equipment was installed in a new clean room in the DS Building in 1989. The clean room is operational. Vendors initially checked out their equipment after installation but the equipment was never used. Processes have not been developed. Some of the equipment manufacturers have since gone out-of-business, and therefore, equipment maintenance, modification, and training are not readily available.

A set of thin film coating vacuum systems collocated with the microelectronics clean room is operational and in limited use.

The microelectronics clean room has not been equipped with the environmental protection equipment required to operate under current regulations. The capabilities to monitor and neutralize waste water, to capture and dispose of fluoride and solvent waste, to burn pyrophoric and explosive gases, or to water scrub exhausts do not exist.

Although key personnel seemed well informed of the technical applications, they did not have accurate operational costs, market research data, or competitive pricing information. A business plan was not available for review. No employee and commercial interests were indicated

APPENDIX B

BUILDING DEACTIVATION RECOMMENDATIONS AND ASSESSMENTS

B.1 Facility Deactivation Recommendations

The intent of deactivation is to place a facility which no longer has value in a known, benign, easily inspectable, safe long-term storage condition. To minimize the post-deactivation building mortgage while maintaining safe conditions, it is essential to use the absolute minimum of dynamic systems, energy, and surveillance staffing. The integrity of the building envelope must be established, routinely inspected, and repaired as required. Therefore, deactivation planning and implementation must enable economic, disciplined, safe periodic assessment of post-deactivation building conditions, with tracking and trending.

The following deactivation recommendations are generally applicable to all facilities:

1. Restore the weather tight integrity to the facility. Develop a formal plan to maintain the envelope integrity.
2. Remove and disposition all excess, removable productive nuclear, hazardous, energetic, and combustible materials.
3. Remove and disposition uncontaminated, portable, excess productive equipment.
4. Under design and configuration control:
 - All fluid systems should be isolated at the distribution header by disconnecting/cutting. Fluid systems should then be blown-out with air; install piping blanks. This includes fire suppression sprinkler systems, potable water, and the heating and cooling system.
 - Electrical power sources to buildings and external components should be disconnected at the electrical service (breakers removed; feeders disconnected).
 - Plug all drains locally. Isolate drain lines at their discharge points.
 - Install a pipe penetration through a wall at some convenient location for use as a future air sampling point for a portable air sampler. Externally identify and cap the pipe.
 - After all other deactivation activities have been completed isolate the discharge and intakes of the exhaust system. Install a blower fitting exterior to the facility to allow attachment of temporary

- exhaust lines for future reentry. Externally identify and cap the blower fitting.
- Locate reflecting tape on passageways floors and walls as appropriate directing surveillance personnel along inspection route.
 - Provide hazards and facility conditions postings in conspicuous locations.
5. Assure windows and windows in the doors provide maximum free and clear visual inspection access.
 6. Develop a formal, facility specific surveillance inspection procedure including:
 - Work control, training requirements for entry and inspection, RWP's, drawings and maps of the facility area for the inspection to be performed.
 - Prescribe personnel protective clothing practice.
 - Permanent radiation survey points to be used in all future surveys. This will allow establishment of a baseline surveillance surveys which can be easily trended to detect any migration of contamination. The use of the temporary fittings for air samples and negative ventilation must be described.
 - An inspection check list to detect and record changes in the buildings condition and detect adverse conditions. Record conditions found and any other desired parameters. Video and or photos should be used.
 7. Stop any remaining surveillances after deactivation is complete.
 8. Lock all accessible entry points to prevent unauthorized facility entry. Apply a security seal.
 9. Quarterly and after heavy rains, visually inspect facility internals through door windows using a high intensity light. Look for puddles, stains and signs of abnormalities. If abnormalities are found; sample the buildings air, ventilate through the installed portable ventilation connection and make an entry for inspection. Make repairs as required.
 10. If no abnormalities have been noted after five quarters of surveillance and maintenance then make an entry as above. Perform a detailed inspection, radiation survey, perform needed maintenance on weather envelope and document facility condition.

B.2 Key Building Descriptions

B.2.1 BUILDING 2

Building Description: Building 2 was built in 1956 for explosive component testing and has been used for that exclusive purpose. The test

cells were enclosed in 1960. It is an old concrete block building that probably does not meet many life safety codes.

Current Status: The last test was conducted 8 months ago. EG&G personnel said one more test is scheduled for this building after which it will be placed in an administrative shutdown mode. The roof was replaced two years ago. The equipment room was refurbished in the same period.

Hazardous Conditions: No concerns were identified.

Radiological Concerns: No concerns were identified.

Environmental Concerns: No concerns were identified.

Surveillance: No concerns were identified.

Equipment: The building contains several instrument racks with counters, timers, streak camera control systems, oscilloscopes, etc. It contains 2 Cordin rotating mirror streak cameras and 2 LANL Model B rotating mirror streak cameras. There are numerous wooden test fixtures to stage components during functional testing. It is possible that these are required by one of the design labs if testing of those components is to continue at the lab(s). There is a new X-ray machine in one room as well as a new Blue-M oven.

Material Inventory: No concerns were identified.

Personnel Safety Concerns: The center aisle of the facility may be too narrow to meet current fire code.

Economic Development: No observations.

Special Considerations for Shutdown: None.

Additional Deactivation Recommendations: None.

B.2.2 BUILDING 3

Building Description: Building 3 is a 12,301 ft² building constructed in mid 1966. The building is built on grade with exterior walls constructed masonry. The roof is tar sheeting with rock cover. Building 3 is used for destructive test firing and environmental testing of explosives for Defense Programs. The building contains steel test firing cells rated at 225 grams of explosive materials. Testing is controlled remotely from a control room. There are 3 surge tanks located outside the building that support the test cells. For explosive testing the building contains drop tables, vibration

systems, and environmental test equipment to test the effects of shock, vibration, thermal stress and humidity. Building 3 is located in a secured area.

The building is serviced by a central HVAC unit and some duct work is in poor condition from rusting due to roof leaks. The building is supplied with a fire protection system including detectors and sprinkler system. There is a 80 watt laser in the building and the surrounding area has a visual warning system when the laser is operational. The building is laid out with explosive test cells to the rear or south side of the building and laboratories and office areas to the front or north side.

Current Status: Building 3 is still occupied by explosive test personnel and supporting staff. The building and equipment are still operational. The building shows signs of age. There are asbestos floor tiles, ceiling tiles and insulation on piping. Process knowledge based facility characterization identified that Building 3 is contaminated with small amounts of energetic materials, which will require cleanup before building deactivation or reuse by commercial firms. Star City Ordnance wishes to take over this building with or without the clean-up.

Environmental Concerns: There are asbestos floor and ceiling tiles plus asbestos insulation on piping. The building is also contaminated with small amounts of energetic materials.

Radiological Concerns: No concerns were identified.

Hazardous Conditions: No concerns were identified.

Material Inventory: Facility personnel noted that some test material has been stored in Building 3 for approximately 15 years.

Personnel Safety Concerns: No concerns were identified.

Surveillance: No concerns were identified.

Equipment: High value equipment is listed on equipment inventory.

Economic Development: The condition of the building appears sound. The roof is rated as fair to poor condition. Building 3 would be useful for any application requiring remote testing of energetic or explosive materials. The environmental test facilities in Building 3 would be of broad usefulness in testing a wide range of products for their resistance to shock, vibration, heat, cold and humidity.

Special Considerations for Shutdown: None.

Additional Deactivation Recommendations: None.

B.2.3 BUILDING 27

Building Description: Building 27 is a concrete block on slab structure. The exterior walls are in good condition. The floor area is approximately 5285 ft². The building completed construction in 1966. The building was designed for explosive process operations to manufacture explosive powders. The building is two-story with one major corridor running the length of both floors in an east/west direction. The first floor/north side of the building contains office, administrative, and storage with the south side of the building containing the explosive process bays. The process bays have one foot thick concrete walls and ceilings with sliding blast doors. The building is designed and located such that in the event of accidental detonation, the over-pressurization would be directed from the back or south side of the process bays. The second floor contains HVAC and other building support equipment plus rest rooms/change rooms and administrative areas. The building and equipment are still in operation supporting explosives processing. The east end of the building is an explosive/solvent mixing operation that extends through both first and second floors. The explosive solvent mixing operation is supported by a remote solvent storage and dumping facility. Building 27 is serviced by plant-wide steam, prime and electrical systems.

Building 27 has explosion proof electrical wiring, systems and components. The floor is non-conductive. The interior condition is fair with peeling paint noted on ceilings. The roof is sheet/tar with multiple patches. The building is protected by a sprinkler system.

Current Status: Building 27 is currently operational. The administrative areas on the north side of the building are occupied and explosive operations are being conducted in the process bays. The explosive/solvent mixing bay in the east end of the facility is in operation and periodically processes materials. Explosive materials are packaged in Building 27 and prepared for shipment. Building 27 contains functional fume hoods, presses, chemical processing equipment, and freeze dry equipment. The electrical equipment is noted to be of older design and construction. The HVAC has been inspected and identified in major work. The air handling units are in disrepair. Site inspection records identify major defects in the HVAC, electrical distribution, roofing and structural components of Building 27.

Environmental Concerns: Asbestos insulation is identified on piping within the building.

Radiological Concerns: None.

Surveillance: No concerns were identified.

Hazardous Conditions: No concerns were identified.

Material Inventory: Amounts required for processing.

Equipment: Listed on equipment inventory.

Economic Development: The condition of the building appears fair. Some problems have been identified by site personnel with the roof, HVAC, and building structure. This building has been identified to be a part of the explosives capability.

Special Considerations for Shutdown: None.

Additional Deactivation Recommendations: Described in Section 5.7.2.

B.2.4 BUILDING 30

Building Description: The 30 building is a one story, cement block on a slab structure approximately 40 ft. X 24 ft. The building was built in the 1950s. The building is dry; the roof appears in good condition. The building is simple and has no special or noteworthy features. It is wet pipe sprinklered.

Current Status: The building is being used by about 5 health physics personnel to survey earth moving and other vehicles involved in decontaminating soil activities. Tritium and Alpha swipes are mainly counted in this building.

Environmental Concerns: There is asbestos insulation on piping.

Radiological Concerns: There are five known fixed contamination spots on the concrete floor that have been painted over.

Surveillance: No concerns were identified.

Hazardous Conditions: No concerns were identified.

Material Inventory: No concerns were identified.

Personnel Safety Concerns: No concerns were identified.

Economic Development: Could be used for general purposes.

Special Considerations for Shutdown: None.

Additional Deactivation Recommendations: None.

B.2.5 BUILDING 38

Building Description: Building 38 is a windowless concrete and pre-stressed concrete structure. The building is a two story split grade structure with a basement at grade level. The intent of the building was to process Plutonium. The floor area is reported to be about 44,000 ft². Building 38 was completed in 1969. The building is built on a slab and is included in the protected area. The building appears weather tight and in good repair. The building was said to have been built in accordance with DOE 6340.1 design criteria and probably meets all local codes and standards. The roof was recently replaced.

The building underwent extensive decontamination. Much of the original process equipment and utilities have been removed. About three- fourths of the building's floor space is empty.

The building's heating, ventilation and air conditioning are provided by a once through air inlet and discharge system. The system is comprised of supply fans with pre-filters, preheaters, cooling coils, exhaust filters and an axial flow exhaust booster fan to the stack. The building ventilation system has descending static pressure zones and local in line HEPA filters. There are underground pipes that transferred contaminated streams to waste disposal. These lines are cast iron and based on historical process knowledge pipe joints may leak. Records of this may exist. The building is wet pipe sprinkled and serviced from the plant underground fire protection loop. The system is fed by two gravity water towers with about 175,000 gallons of water available for fire fighting. Maintenance is done by matrixed type personnel who respond to work orders.

Current Status: Approximately 20 people are located in the 38 building. Currently three rooms on the south side of the building are equipped with renovated, secondary containment in which encapsulated plutonium oxide components are assembled. Glove boxes located within a water shield with viewing windows and over the top remote manipulators are used for dose reduction. Work is going on to support an NE mission. Four rooms on the north side are equipped for conducting chemical analysis of alpha radioactive material.

The packaging of "orphan sources" is also done here. There are said to be about 3000 items of 40 different radionuclides. The person responsible for packaging these items said that the material could be disposed of as LSA waste in about 10-55 gallon drums.

A Health Physics instrumentation storage and calibration facility is also located in this building and is planned for relocation in the future. Large areas of the building that have been D&D are empty. There are currently no offices in this building. Some D&D and reconstruction work is in progress to support RTG activity.

Environmental Concerns: Asbestos insulation is marked on some piping. It was said that there was an asbestos abatement campaign and there may be documentation but it was not presented. Some floor tile are asbestos.

Radiological Concerns: The building has recently under gone D&D of surface areas. Possible contamination is in those component and systems that were not cleaned such as switch gear, conduit and similar. There may be Pu contamination in the ventilation ducts. Postings indicating potential contamination. There is suspected soil contamination associated with the buildings past operation.

Surveillance: An FSAR is in the approval cycle. Routine surveillances consist of checks of monitoring systems and ventilation air flows. The systems that support on going activities are covered such as corrosive Vapor Recovery system, Fire, Emergency Power. The building is connected to a central alarm station. The building is essentially shutdown from Thursday night to Monday with no one in attendance.

Hazardous Conditions: There were no reported open safety items from OSHA, TSA, Tiger Teams or open safety type work orders.

Material Inventory: Described in Section 7.4.1.1.

Personnel Safety Concerns: One life safety code concerns three sliding doors.

Equipment: Listed on equipment inventory.

Economic Development: The condition of the building appears sound and is pleasant in appearance. Because of its past history and use and the real possibility to find contamination above free release limits, there is a reluctance to turn this building over to any activity not able to rigidly control, monitor and detect small to trace amounts of radioactivity. Some spaces were

decontaminated for DOE reuse and are being used as non-contaminated spaces, although additional characterization would be required for unrestricted use.

Special Considerations For Shutdown: Building 38 is assigned to the NE program and currently planned for use.

Additional Deactivation Recommendations: Building 38 is assigned to the NE program and currently planned for use.

B.2.6 BUILDING 42

Building Description: Building 42 is a single-story building of concrete block, concrete slab, and built-up tar/metal roof on steel girders construction built in 1968. It has a HVAC penthouse accessible by exterior walk-up stairs. It contains 2892 ft² of space used for Hazard Class 1 pyrotechnics blending, aging, and analysis. A main hall separates the processing cell from the analytical and aging studies rooms. Capabilities include 4 process cells with remote handling equipment for pyrotechnic blending. The building is equipped with a self contained temperature and humidity HVAC system which is not connected to the central plant. A smoke detection system is linked to a high speed ventilation system.

Current Status: The building is in use but there are no permanent residents. One rest room had been converted into a lab. Interior construction was in progress during the tour, but housekeeping generally appeared poor.

The building appears to be settling—cracks are evident in the exterior block walls. The building manager said the cracks were new.

Roof integrity and soundness appear questionable. The metal roof pan is severely corroded in several places on the interstitial space side - apparently from humidity condensation. **Roof access should be limited.** No warning signs or barriers were posted on the walk-up stairs to the penthouse.

Environmental Concerns: No concerns were identified.

Radiological Concerns: No concerns were identified.

Hazardous Conditions: Hoods, filters, and duct work may be contaminated with energetic material residues.

Materials Inventory: A limited amount of lab chemicals. (Note: facility was shut down for construction during the tour - energetic materials had been removed.)

Personnel Safety Concerns: The corroded roof, accessible by walk-up stairs, appears unsafe.

Surveillance: No concerns were identified.

Equipment: The facility contains analytical equipment which is listed on the equipment inventory for this building.

Economic Development: Due to the exterior wall and roof condition as well as the possibility of energetic materials contamination, the building has limited economic potential.

Special Considerations For Shutdown: Place notices and barriers to limit roof access. Investigate the roof load bearing capability; repair as appropriate.

Additional Deactivation Recommendations

- 1) Evaluate hoods and duct work for residual energetic material contamination; remove residues if appropriate.
- 2) Remove surplus equipment to protect from roof leakage.

B.2.7 BUILDING 48

Building Description: Building 48 is where the explosive component surveillance activities are performed. The building was built around the 1950's.

Current Status: It has office, conference, and common areas on the first floor. Operations are performed on the second floor. An RF shielded room with blow out wall is part of the operations space on the second floor.

Hazardous Conditions: No concerns were identified.

Radiological Concerns: No concerns were identified.

Environmental Concerns: No concerns were identified.

Surveillance: No concerns were identified.

Material Inventory: Described in Section 7.4.1.3.

Personnel Safety Concerns: No concerns were identified.

Equipment: This building is still actively operating and contains personal computers, copiers, and AV equipment in the office areas. The second floor operations areas contain various microscopes, other pieces of inspection equipment, a remote operation lathe and mill, an SEM, and various testers (MT1090, MT1073, and others).

Economic Development: No observations.

Special Considerations for Shutdown: None.

Additional Deactivation Recommendations: None.

B.2.8 BUILDING 49

Building Description: Building 49 is used as a production area for explosive timer driver assemblies. The original building was built in about the 1950 to 1960 time frame. A new wing was completed in 1988 and contains most of the active operations. Eleven (11) small parts workers, 2 technicians, a foreman, and a production engineer are working on the active production activities in this building. There were two rooms in the older part of the building used for storage of explosive components. One had approximately 40 lbs. of material in explosive components and the other contained several containers identified for destruction and marked "waste." *It was pointed out to the building manager that a regulatory time limit is imposed on how long this material can be kept in an undeclared temporary storage location such as this.*

Current Status: No Observations

Hazardous Conditions: No concerns were identified.

Radiological Concerns: None.

Environmental Concerns: No concerns were identified.

Surveillance: No concerns were identified.

Equipment: The new wing of this building is still actively operating and contains several pieces of equipment. There are numerous stereo microscopes, balances, air gages, presses, and numerous program related tools, jigs, and fixtures in the production areas. There are several (at least 20) explosion proof ovens used to cure adhesives and potting materials, and several testers (PT3513, MT1077, MT4075, MT4086). There are two mild detonating fuse (MDF) precision cutters, an automated welder, and two MDF pressurization machines.

Material Inventory: Described in Section 7.4.1.3.

Personnel Safety Concerns: No concerns were identified.

Economic Development: No observations.

Special Considerations for Shutdown: None.

Additional Deactivation Recommendations: None.

B.2.9 BUILDING 51

Building Description: Building 51 is a sheet metal siding on steel frame building. Building 51 is constructed on slab or grade. The exterior of the building appears to be in good condition. The building has a die rolled steel roof. Building 51 is a 3541 ft² two-story building built in 1972. Building 51 was originally designed and constructed as the Mound incinerator. Materials to be incinerated included plant trash and classified materials. The Building 51 penthouse contains HVAC and other building mechanical equipment. Building 51 is protected with a fire sprinkler system.

Current Status: Building 51 is a building within a building due to modifications and mission. Building 51 houses a laboratory that currently supports the production of thermites and the production of carbon in a lithium battery/capacitor research project funded by the USABC. The equipment in the laboratory includes two California-type fume hoods, a dry atmosphere glove box, 3 freeze dryer systems, plasma spray system with robotic head, sand blast system, six 1200°F tube furnaces, one 3600°F tube furnace and an isostatic press. Current site inspection has identified major defects but operable system conditions in the HVAC, plumbing, and roofing.

Environmental Concerns: Building 51 is contaminated with energetic materials.

Radiological Concerns: None.

Surveillance: No concerns were identified.

Hazardous Conditions: No concerns were identified.

Material Inventory: No concerns were identified.

Personnel Safety Concerns: No concerns were identified.

Equipment: Listed on equipment inventory.

Economic Development: The condition of the building appears to be fair. Some problems have been identified by site inspection with the roof, HVAC, and plumbing work in others is probable.

Special Consideration in Shutdown: None.

Additional Deactivation Recommendations: None.

B.2.10 BUILDING 59 & BUILDING 35

The CFX Building 59 is of special interest because it contains a unique Enriched Uranium fuel core assembly designed to always remain sub-critical.

Building Description: According to the Weston report, Building 35 was built in 1967 and Building 59 in 1978. These buildings are built on grade level with exterior walls constructed of concrete masonry on steel-frame structure. The 35 building is about five feet from 59 and is one story. This building services the two-story 59 building. The 35 building houses the control room for CFX, offices, neutron radiography and eddy current non-destructive testing laboratory to support the mission of the CFX. The CFX neutron process uses a moveable Californium source to supply neutrons to a region of 93% enriched aluminum clad, U235 and aluminum alloy plates. The system provides neutrons for activation analysis and neutron radiography. The CFX is on the second story of the building. The lower story is the radiography cell. The assembly is designed to be maintained sub critical. The assembly is designed not to exceed a reactivity (K_{eff}) of 0.99. The assembly is in a core tank and water moderated. The tank is surrounded by a thick concrete shield. The water is said to be filtered and demineralized to reduce hydrolysis reactions within the core. Sampling of the moderator for activity provides a check of fuel integrity. There are four Aluminum clad Cadmium vertical rods.

There is a Safety Analysis Report revised November 15, 1977 which is minimal and not acceptable by today's standards. The facility was shutdown in 1990 because of a concern for the need for more analysis and development of a modern FSAR. At that time it was determined that the cost and time to restart the facility was not justified based on its use. The facility was designed by IRT Corporation (San Diego, CA).

Current Status: The facility has been shut down since 1990 and it was said that the water moderator has been continuously circulating. Sampling is said to be maintained and no abnormalities noted. The core assembly and Californium source are still present. The buildings are neat and clean and the roofs appear tight and sound. Two people occupy the space in the 35 building.

A testing company is said to be interested in the reuse of this facility. It is expected that NRC requirements would be needed to be met to have the facility licensed by the NRC. The operability of some systems such as of nuclear instrumentation (Power Monitoring) and components such as Safety Rod Drives, microswitches is not certain because of the long term of inactivity. Procedures exist for some operations. The procedures reviewed do not meet current DOE standards. There has been no inspection of the condition of the fuel clad, safety rod clad.

Environmental Concerns: Aluminum clad enriched Uranium 235 Aluminum alloy and Aluminum clad Cadmium have been irradiated. The FSAR, procedures and documentation are said not to be available for disassembly. These would have to be reconstituted. Tooling and containers for disassembly and shipping or storage of the irradiated components need to be obtained. Ultimate disposition of the irradiated components will need to be resolved.

Radiological Concerns: The radiological conditions of the facility are uncertain, however in discussions with personnel involved, they indicated there is no loose contamination anywhere in the facility. The radiation levels due to activation are not known. There was no comprehensive survey available at the time of review. The cladding condition of the Cadmium or fuel is not known. It was said that there has been no activity detected in the moderator. pH excursions could cause the deterioration of the cladding of the fuel and Cadmium.

Surveillance: It was said that moderator sampling has been on going and no abnormalities reported. It was said the resin in the moderator loop has not been changed over the life of the facility. Chemistry of the moderator was not reviewed during this review.

Hazardous Conditions: There were no reported open safety items from OSHA, TSA, Tiger Teams or open safety type work orders.

Material Inventory: Aluminum clad, 93 % enriched Uranium 235 and Aluminum alloy fuel, Aluminum clad Cadmium, Aluminum cone filled with enriched Lithium Fluoride. There may be neutron activation products.

Personnel Safety Concerns: No concerns were identified.

Equipment: The equipment is listed on the inventory.

Economic Development: The condition of the building appears sound and is pleasant in appearance. It has been said that there is interest by

testing company in the commercialization of this facility. It is expected that NRC requirements would be needed to be met to have the facility licensed by the NRC, and this could be very expensive to upgrade to today's standards. If the facility is transferred an understanding of ownership and ultimate disposition of the radioactive fuel and component is only one issues to be worked out. A protracted negotiation could result in loss of reuse interest.

Special Considerations For Shutdown: There is enriched Uranium 235 and Aluminum clad Cadmium that have been irradiated. The FSAR will need to be upgraded, procedures and documentation will need to be developed for disassembly. These would have to be reconstituted. Tooling and containers for disassembly and shipping or storage of the irradiated components need to be obtained. The ultimate disposition of materials will need to be resolved. Some help may be available from owners of similar systems sold by the CFX vendor.

Deactivation Recommendations

1. Under modern day contamination controls, defuel and disassemble and dispose of the core, control rods and irradiated components and the Californium source. Perform comprehensive radiation surveys. If disposal is not possible, prepare for long-term, inert storage. (This will be a significant effort, possibly spanning several years.)

B.2.11 BUILDING 63 EAST

Building Description: Building is a cinder block building that was built in 1980 for the tester fabrication organization at Mound.

Current Status: The building is presently empty and in an administrative shutdown mode. The HVAC is still on and there is some equipment in the "lab areas" and the offices are still furnished.

Hazardous Conditions: No concerns were identified.

Radiological Concerns: No concerns were identified.

Environmental Concerns: No concerns were identified.

Surveillance: No concerns were identified.

Material Inventory: No concerns were identified.

Personnel Safety Concerns: No concerns were identified.

Equipment: A machine shop in the building still contains a mill, lathe, and drill press. Several new equipment racks in the building have partially completed tester parts in them (HP computers, power supplies, etc.). A number of "spare parts" in the form of power supplies, computers, printers, and other tester components are in a storage area in the building. Large format plotters and a limited amount of CAD equipment are in the building as well.

Economic Development: No Observations.

Special Considerations for Shutdown: The building is essentially in safe shutdown.

Additional Deactivation Recommendations: None

B.2.12 BUILDING 63 WEST

Building Description: Building is used to store components at temperature for accelerated aging studies. Thermal shock and centrifuge tests are also performed in the building.

Current Status: The building is in active use for accelerated aging studies and is occupied by several personnel.

Hazardous Conditions: No concerns were identified.

Radiological Concerns: No concerns were identified.

Environmental Concerns: No concerns were identified.

Surveillance: No concerns were identified.

Material Inventory: No concerns were identified.

Personnel Safety Concerns: No concerns were identified.

Equipment: At least 7 ovens are operating in the building with explosive components in them. There are two thermal shock machines (dual chamber ovens), and two centrifuges.

Economic Development: No Observations.

Special Considerations for Shutdown: Safe shutdown requires an MOA decision on the future of the accelerated aging studies.

Additional Deactivation Recommendations: None.

B.2.13 BUILDING 67

Building Description: Building 67 is a 3,787 ft² concrete-covered, polystyrene foam building used to support of work in Bldgs. 27 and 42, pyrotechnics processing and compatibility. The building contains multiple offices, a conference room, and a secured office with classified files.

Current Status: The building is being used for its function. The building is in good condition.

Environmental Concerns: No concerns were identified.

Radiological Concerns: No concerns were identified.

Hazardous Conditions: No concerns were identified.

Material Inventory: No concerns were identified.

Personnel Safety Concerns: No concerns were identified.

Equipment: The building houses standard office equipment.

Economic Development: The building may have value as support infrastructure for the energetic materials R&D, fabrication, or testing facilities.

Special Considerations For Shutdown: None.

Additional Deactivation Recommendations: None.

B.2.14 BUILDING 85

Building Description: Building 85 is a Class 1 powder processing facility of cast-in-place concrete and metal panel construction with a concrete pad and roof. It was built in 1987 to replace Building 1. The 3160 ft² building contains a range of powder drying and blending equipment. Many of the machines are remotely operated. The building is not equipped with a rest room.

The facility is equipped with a control room and five TV monitored process cells of various sizes. The process cells were constructed with metal blow out panels. Access to the process cells is via outside doors;; there is no internal hallway. The facility is not equipped with a storage magazine, but existing magazines are near by.

Current Status: The building has never been used and is in excellent condition. The program driver for operation of the facility was canceled. The Safety Assessment was not completed. The building is unoccupied and there are no raw materials stored in the building. All facilities equipment is in operation. EG&G personnel said there was no maintenance budget for the facility but that the equipment was operating to support potential economic development. They stated it would be too expensive to shut the facilities equipment off.

Environmental Concerns: None.

Radiological Concerns: None.

Hazardous Conditions: None.

Material Inventory: None.

Personnel Safety Concerns: None.

Equipment: Very little process equipment was installed at construction.

Economic Development: The building may not meet current codes and standards, for example it has no rest room. An operations safety assessment was never prepared. The building has little process equipment installed, which could be an opportunity or a barrier depending on the application.

Special Considerations For Shutdown: None.

Additional Deactivation Recommendations: None.

B.2.15 BUILDING 87

Building Description: The Explosive Component Test Facility (ECTF) Building 87 is a single-story building of ~34,000 ft² which provides for testing of both production and development weapon system components, maintenance and calibration in a single location, as well as space for administrative and engineering functions. The facility is located in the lower area of the Mound site, adjacent to the existing test fire facilities. The building and complex explosion was completed in 1987 at an approximate cost of \$23.1 million, including equipment and test cells. Designed to enhance the operational flexibility of Mound's destructive testing capabilities, the ECTF incorporates new calibration techniques, improved safety interlock systems, state of the art data acquisition equipment, test system hardware and software interchangeability, and real time statistical process control.

The building houses three large testing cells and provides space for additional smaller, portable, self-contained test cells (known as "boom boxes"). Each test cell is approximately 14 feet, 6 inches in diameter by 24 feet in length, with exhaust systems that terminate in three expansion chambers and three emission control separators located to the rear of the building. The three expansion chambers (surge tanks) are interconnected to be used as a single unit to handle the detonation discharge from any of the three cells. Each test cell is designed to safely handle the detonation of ten pounds TNT equivalent of high explosive. Also adjacent to each cell is a preparation room for test preparation. A large room is provided for single point (portable, self contained ("boom boxes") testers, and service facilities immediately adjacent to the single point testing area include segregated high explosive and pyrotechnic preparation rooms. The building also includes a standards laboratory where electronic calibration is performed to support testing operations. The engineering and administrative staffs are housed in a single area with conference room and records storage area. Additional services provided in the building are a loading dock and a lunch room with a capacity for forty people. A penthouse of approximately 6200 ft² is located on the roof above the test cells to provide a centralized location for both electrical and mechanical equipment, including air handling equipment that utilizes a minimal length of duct runs. Emphasis has been placed on equipment accessibility and maintainability within the penthouse.

The ECTF is a reinforced concrete structure with walls 12 inches thick in the testing part of the building with 1 3/4 inch solid steel blast doors leading to the vestibules. Accidental detonation of the explosives in the test cells or preparation room will not propagate to an adjacent cell or preparation room. All electrical or spark producing equipment is explosion proof. Flooring in the test area is non-conductive. Blast resistant design features of the ECTF are used to mitigate any accident evolving from an accidental detonation. Another feature is locating the preparation rooms at the rear of the facility where they can vent onto an open hillside. The building is designed in a "zone" concept. The north side of the building contains the administrative offices. Explosives are handled at the south side of the building.

Roof: Due to settling of the building, room separation has occurred and leaks have been identified by building inspection.

Fire Protection: The ECTF has two wet pipe sprinkler systems, each with a dedicated riser and alarm check valve that is provided with a retarding chamber and pressure switch to independently protect the test and office areas. System signals are transmitted to the Mound Control Communications Center and Fire Station. The facility is also equipped with smoke detection in space below computer floors and in all ceiling plenums.

Heating, Ventilation and Air Conditioning: Separate air flow systems serve the administrative and testing areas. The separate air flow systems are comprised of built up component air handling units with 30% efficiency filters, chilled water cooling coil, hot water heating coil, centrifugal force, and steam humidification grid (test area only). Return air is drawn from the plenum space above the ceilings at the two main areas. The test cells are served by two different supply systems depending on the mode of operation.

Liquid Nitrogen System: Liquid nitrogen is used to cool components being tested in the test cells. The liquid nitrogen is stored in a 1500 gallon cryogenic tank mounted on a concrete pad outside the west wall of the facility. Each test cell supply line contains an isolation valve, a liquid/gas phase differentiating valve and a subcooler. During operation of the liquid nitrogen supply tank, opportunity exists for oxygen displacement in the work environment. Oxygen analyzers are provided to alert operating personnel of this hazard.

Safety Systems: The ECTF is a combination of a general use facility and an important or low hazard facility. As stated previously, the north hall of the building is an administrative office and support area which is the general use part of the building. The south hall of the building is a controlled access operational area which is an important or low hazard usage category. The type of explosives tested in the facility are limited to secondary explosives and/or self-contained or self-contained textured, sensitive energetic components.

Hazards analyses conducted concluded that the critical hazards to operations personnel are accidental electrocution and inadvertent detonations of test loads. Other lesser hazards were also noted. Installed to safeguard against potential accidents are building interlocks, preparation room fume hoods, closed circuit television, area intercoms/voice synthesizers, and halon fire extinguishers for the test cells.

Current Status: Approximately 30 people are located in Building 87. Explosive operations and testing has been shutdown since 1991. Currently no testing is planned. Building inspection has identified roof separation and leaks into the interior of the building. The building is located in a secured area. Building management was concerned with the high electrical bills; the monthly bill exceeds \$6,400. The high utility bill may be due to other buildings being on the same meter. No one seemed to know if that was the case.

Environmental Concerns: No concerns were identified.

Radiological Concerns: None.

Surveillance: No concerns were identified.

Hazardous Conditions: Test cells and expansion tanks may contain explosive wastes due to incomplete combustion. Facility inspections suspect asbestos floor tiles are present in Building 87.

Material Inventory: No concerns were identified.

Personnel Safety Concerns: There was the distinct odor of raw sewage behind the building. The source was not.

Equipment: Listed on equipment inventory.

Economic Development: ECTF has been identified for possible use in Mound site economic development. The condition appears sound with relatively new construction and "state of the art" explosives testing capabilities. Both Lawrence Livermore and Sandia have similar contained test facilities.

Special Considerations for Shutdown: None identified as building is currently in safe standby.

Additional Deactivation Recommendations

1. Repair the leaking roof.
2. Investigate the sewage smell behind the building.

B.2.16 BUILDING 89

Building Description: Building 89 is a warehouse used to store long-term surveillance samples of components. All components are in approved DOT containers and stored in one of three rooms within the building.

Current Status:

Hazardous Conditions: None.

Radiological Concerns: None.

Environmental Concerns: None.

Surveillance: None.

Material Inventory: Described in Section 7.4.1.4.

Personnel Safety Concerns: None.

Economic Development: No Observations.

Special Considerations for Shutdown: None.

Additional Deactivation Recommendations: None.

B.2.17 DS BUILDING

Building Description: Building DS is a 47,810 sq. ft. building that is used for metrology, explosives production, and development in support of defense programs. The exterior of the building is brick. Building layout consists of two major hallways with rooms on both sides of those hallways. The building has several environmentally controlled rooms for calibration, clean room, and similar activities. The humidity control system has caused some interstitial space damage in portions of the building. The building was built originally in the 40's with additions for metrology in the past 25 years. Several rooms are accessible only through other rooms. Some rooms are shielded from radio frequency. Laboratories include fume hoods, testing and calibration equipment. Laboratory functions include:

- Dimensional Metrology
- Electrical Metrology
- Physical Metrology
- Mass Metrology
- Metrology Control Center (This is a data records storage area - very modern.)

The roof is metal pan and tar. It is leaking along the interface with the T Building. The metal pan on the roof looks good, with no evidence of corrosion in the interstitial space. A request to repair the roof has been pending for two years. In one of the laboratories, paint and ceiling damage from the leak are apparent. Effluent drains are closed and capped. The sprinkler system appears to be in good shape, with good clearances, fire doors closed.

T Building lies directly below DS Building. Previously, the potable water system was shared with T Building, but an in-process modification is isolating potable water. Building 93, a two story modular, is attached to the west end. Magazine 54 is on the east end and supports explosives day usage. The building is adjacent to COS Building also.

Current Status: DS building was originally built to house development operations and standards and still serves this purpose today (standards is now called metrology to reflect its broader mission in 36 measurement disciplines). This is a large building with supports a number of very diverse operations. There are RF shielded rooms, rooms with high precision temperature control, vibration control, a newly renovated data records room, clean rooms for PVD operations including a Class 100 room, a laser ignition development and diagnostics lab, office space, flex circuit development labs, explosive operations rooms with frangible walls, and packaging and shipping rooms. Although there are numerous operations in this building, most rooms were closed, locked, and shuttered. Very little activity was evident.

The building currently houses about one-third metrology and two-thirds explosive work. The explosives work is gearing down. Weapons work is being phased out and replaced by non-weapons work. Metrology personnel are being consolidated into the building from modular buildings. By the end of this fiscal year, 48 people will be housed in the facility. An employee-based calibration business is being considered.

The building is currently being upgraded to provide wheelchair access. Some modifications were ongoing in the laboratories as well.

Personnel Safety Concerns: The building may not meet current ES&H codes.

Radiological Concerns: No concerns were identified.

Environmental Concerns: Asbestos insulation is marked on some piping, and there are some asbestos floor tiles. Documents from the asbestos abatement campaign may show details for areas needing abatement. A known radiologically contaminated underground lines runs underneath DS Building.

Hazardous Conditions: No hazardous conditions were observed. Satellite waste storage areas were used. Except for the tritium exit lights, no radioactive materials were used in DS Building.

Material Inventory: Classified material and chemicals, as described in Sections 7.4.1 and 7.4.2, will need to be removed from numerous rooms.

Equipment: Since this building is still active and contains such a diverse set of activities, it is literally filled with valuable productive equipment. The equipment that supports the metrology operation includes large coordinate measuring machines and other programmable inspection

equipment (some originally valued in excess of \$500K). This equipment is, in many cases, unique in the DOE complex. Mound staff would like to continue this metrology service for the EM landlords and have been looking at excess equipment lists from the SSC project to expand Mound's capabilities if necessary. The laser ignition and diagnostics lab was only recently completed and contains several new pieces of equipment and the development flex circuit lab has new wet processing machines that have never been operated. Itemization of productive and excess equipment in DS building would be impractical.

High value equipment is listed on the equipment inventory. Bar codes and accountability tagging is visible on portable and stationary items. No equipment is currently scheduled to leave the building.

Economic Development: The leaking roof, the underground contaminated line, and the proximity of T building are the major deterrents to economic development.

Estimated Cost of Operation: Current occupants of the building were working to determine the cost of building operations to support their economic development intentions. However, this information was not currently available.

Special Considerations for Shutdown: The building is affected by its proximity to T and other facilities.

Additional Deactivation Recommendation: The environmental envelope requires isolation. This includes repair of the roof (not to a reuse condition, but to weather-tight).

B.2.18 I - BUILDING

Building Description: I-building is a steel frame/block/brick exterior, 25,736 sq. ft. building that is currently active and used for the loading and testing of explosive actuators. The building has been added on to twice; the most recent addition being in 1989. The east side of the building (which is the newest side) contains some mortar cracks in the brickwork. Three small metal sheds and a stand alone wood building are nearby. A three foot wall outside separates the explosives exclusion area, guard post, and chemical storage areas (3 drums). The south side of the building has a service area with heat/vent/blowers, some storage, and probable asbestos insulation. The north service area houses the HVAC shutoff, steam center, hydraulic, and drainage. There is the possibility of asbestos on the inlet pipes to the building. No soil contamination was observed.

The interior of the building has conductive flooring--no asbestos. Safety showers are functional. Service area contains asbestos insulation. New domestic water modifications have been completed. There is a room containing "MOCA" which is a suspected cancer causing agent 4,4' methylene bis (2 chloroaniline). The material is used as a potting material for explosive components and has been retained because it is no longer made and this represents "the world's supply." This room was used to mix this material and still contains 5, 25 lb. drums of the material. Explosives have been in all rooms at one time or another (with the exception of the new addition of a detonator production lab that was built for the SRAM II-W89 program (which was later canceled). This lab was designed as a class 10,000 clean room and has never been used. Explosive powders and pellets, and other energetic materials including classified materials and parts are in many of the rooms within the building. Classified document repositories are in the building. Several rooms have copper vacuum lines for loose explosive wastes that lead to central vacuum pumps and collection stations. The lines and pumps are probable contaminated with explosives and contamination of the building HVAC ducts and drains may also be present. Many of the rooms are used to handle and process static sensitive pyrotechnic materials and conductive shoe covers and cotton coveralls are required to enter the area.

The clean room in I Building contains a large number of laminar flow hoods and stainless steel bench tops, none ever used.

Current Status: Operational and partially occupied.

Hazardous Conditions: Possible energetic material contamination.

Radiological Concerns: There are no nuclear liabilities associated with this building.

Environmental Concerns: No concerns were identified.

Surveillance: No concerns were identified.

Material Inventory: Energetic materials are stored in most rooms, as described in Section 7.4.1.3.

Equipment: The new detonator production lab is outfitted with anti-static benches and contains numerous microscopes, curing ovens, stools, etc. There are powder balances, microscopes, balances, optical comparators, large presses, and small bench top presses in other rooms of the building. Three laser welders and numerous product testers are in the building including PT1550, PT3481, PT3404, PT3483, PT3369, and MT1077. There is an Instron machine, numerous product specific tools, jigs, and fixtures.

Economic Development: The new addition has clean room capabilities.

Special Considerations for Shutdown: None.

Additional Deactivation Recommendations: None.

B.2.19 P BUILDING

Building Description: The Power House Building is a two-story, enclosed structure of approximately 15,200 ft². The building was built in the 1950s. There are two package type steam boilers each capable of supplying steam of about 80,000 #/hr. The steam condensate is returned. Control air and breathing air are distributed to the other buildings from this building. The building is dry the roof appears in good condition. The building is simple and has no special or noteworthy features. The building is wet pipe sprinklered.

Current Status: The building is being used to supply heating and cooling to all the major buildings at Mound. The condensate is returned to the plant. It is said there is very little condensate lost. The plant appears well maintained. There were no steam or water leaks observed during the inspection. The cooling to the building is provided by circulating chilled glycol. The plant has a standby diesel to enable restart of the plant in case of loss of all electrical power from off site.

Environmental Concerns: There is asbestos in insulation but its location is documented and controlled. There are four buried 24,000 gallon fuel oil tanks in service. They are said not to be leaking. There are several cylinders of refrigerants which may contain chloroflorocarbons that may need special disposal when no longer needed.

Radiological Concerns: There is no radiological concern.

Surveillance: No concerns were identified.

Hazardous Conditions: No concerns were identified.

Material Inventory; No concerns were identified.

Personnel Safety Concerns: No concerns were identified.

Equipment: No Observations.

Economic Development: This building supplies utilities to all the major buildings on this site. Utilities would have to be provided to those buildings if to make them stand alone if the economic strategy dictates.

Cost to Operate Building: The costs to operate this building were available. Staffing requires about three operators.

Deactivation Recommendation

1. Remove all chemicals, refrigerants, fuels, oils, waste and combustible materials. The fuel oil tanks will require special consideration.

B.2.20 R BUILDING

Building Description: The Research (R) building is a brick and cement block on steel-frame structure. The brick work is in good condition the mortar is tight. The floor area is reported to be about 55,000 ft². The R building is one of the original buildings built at Mound in 1948. The building is built on a slab and included in the protected area. The operating areas are built along three major corridors running in the north and south direction. The original use was research in Plutonium initiators and their replacement. The building was also used for development of Plutonium-238 heat sources. The "cold side" of R building consists of laboratory and offices opening in to corridor number three.

The building appears weather tight and in good repair. The roof is a flat built-up asphalt composition covered with gray pea gravel. There are several soft raised places in the roof. The roof appears to be near the end of its design life with perhaps two to three years of satisfactory service. A penthouse structure contains ventilation and filter equipment. The roof of the penthouse is also in end of life state and shows signs of leaking in the southwest area.

The building heating, ventilation and air conditioning are provided by a once through air inlet and discharge system. The system comprises of supply fans with pre filters, preheaters, cooling coils, exhaust filters and an axial flow exhaust booster fan to the stack. Underground pipes transferred contaminated streams to waste disposal. These lines were of cast iron and process knowledge says that there were indications of leaks at pipe joints. Records of this may exist. Over the years there have been spills that caused legacy and small amounts of contamination that were cleaned. However, contamination may exist in unexpected areas. Small lines are visible overhead that carry Tritium and need to be dealt with. The building is wet pipe sprinklered.

Current Status: Approximately 70 people are located in the R building. The building underwent a seven year, \$9.4M D&D effort for DOE reuse (not unrestricted use). More than 1800 cubic meters of material were removed. Maintenance is done by matrixed type personnel who respond to work orders.

The "cold side" spaces consist of offices, respirator fitting facility, and research and development laboratories. The "hot" side consists laboratories processing tritium and tritium related components. These laboratories open into western most corridor number two. The operating area is well maintained, is neat and clean. Room 140 is contaminated with Pu-238. It was reported that levels of more than 1,000,000 d/m/100 cm² exists in the floor tile. A temporary vestibule is built at the entrance to room 140 to facilitate decontamination. Room 140 contains two rows of contaminated glove boxes. When decontamination will begin and end is uncertain. The other spaces that were decontaminated are being reused. Accessible contamination levels where known are less than those given in the Radiological Control Manual. The availability of "as built" and "as is" drawings is uncertain.

Environmental Concerns: Asbestos insulation is marked on some piping. It was said that there was an asbestos abatement campaign and there may be documentation showing details needed for abatement.

Radiological Concerns: Although the building except for Rm. 140 and has been decontaminated of Pu-238, because of past history spaces may still contain more than trace amounts in ducting, and conduits and electrical components that were not decontaminated.

The following is broad summary obtained from discussions with Health Physics personnel but should not be taken as a complete or comprehensive survey of the building.

Room 172: Fume hoods <500 dpm removable alpha (Pu 238).

Room 167: Fume hoods <500 dpm removable (mixed isotopes).

Room 140: Entire room is awaiting D&D. It is not characterized. The surface contamination is generally <500 dpm alpha removable. Cracks, crevices, and inaccessible areas probably much higher; possible 500,000 dpm removable. The floor was surveyed contain alpha contamination (up to 10~ dpm) direct. The room is currently unused and in a "surveillance and maintenance" stage. The glove boxes are highly contaminated.

Corridor 5 (D&D but unfunded): Surfaces <100 dpm removable alpha.

Crawl Space (Area between room ceilings and building roof): The entire area is considered a future D & D project. The area is not characterized. Prior D & D project areas involved some decontamination and removal in areas above the labs. Existing levels of alpha removable contamination probably <100 dpm average above HPCAs with spotty areas up to maybe 5000 dpm especially above R-140. Areas above non HPCAs probably <20 dpm average with possible "hot spots", as indicated by protective clothing contamination history.

Filter Banks in Penthouse: There are 7 filter bank areas in the R-building penthouse, designated as W-1, W-2, R-1, R-2, Y-1, Y-2, and Y-3. All banks have alpha contamination which varies from ranges of 1000 dpm removable to 200,000 dpm. Due to the nature of the contamination and need for a ventilation change or shutdown, the banks have never had a true radiological characterization.

Exhaust Duct Work: Radiological characterization is not available. Contamination levels could exceed those in the filter banks as most duct has been exposed to those or greater levels of contamination.

Drain Systems: Past D&D projects did not entail removal of subfloor alpha drains. These drain lines still exist. Characterization of these lines will not be easy at this time. Levels could exceed 100,000 dpm removable alpha. The subfloor alpha drain system remains in use. These liquids gravity feed a subfloor tank located in Room 128 and a lift station pumps the waste water through above ground lines to Waste Disposal (WD) Building for processing.

Other Contaminants

Room 170 Sink: A sink trap is known to be contaminated with Th 232.

Room 22: Contains a glove box line contaminated with Uranium. Interior removable alpha approximately 6,000 dpm.

Fume hoods: Probably removable Uranium contamination in fume hoods in inaccessible areas (behind panels, in ducts, etc.).

General: Probable trace quantities of various isotopes in analytical laboratory fume hoods and ductwork. (Insignificant ALARA concerns).

Surveillance: There is routine surveillance consisting of weekly checks of monitoring and ventilation air flows.

Hazardous Conditions: There were no reported open safety items from OSHA, TSA, Tiger Teams or open work orders.

Radiological Concerns: See above.

Material Inventory: Nuclear materials are described in Section 7.4.1.1. Chemicals inventories in several laboratories will need to be removed.

Personnel Safety Concerns: No reported open Safety Concerns were identified.

Equipment: Equipment is listed on equipment inventory.

Economic Development: The condition of the building appears sound and is pleasant in appearance. Because of its past history and use and the real possibility to find contamination above free release limits there is a reluctance to turn this building over to any activity not able to rigidly control, monitor and detect small to trace amounts of radioactivity. Some spaces were decontaminated and are being used as non-contaminated spaces, although D&D was for DOE reuse, not unrestricted reuse.

Special Considerations For Shutdown: Current thinking is to have parts of R building functional to support tritium activities in SW and T building.

Additional Deactivation Recommendations

1. Examine duct work to assure there are no standing, non safe amounts of material in low points or high points and on walls that need to be removed.
2. Determine from ALARA dose and waste analysis whether cleaning or stabilizing with a fixant or foam is cost effective. Under design and configuration control, plug glove box ports in best manner. Close and seal fume hoods in best manner. Under design and configuration control, plug glove box ports in best manner. Plug all openings to the glove boxes. Close and seal all glove box pots, doors, hatches in best manner. Attention to glove box fluid systems to prevent migration of contamination in best engineering basis is required. Close and seal best manner.

3. Under design and configuration control, break/cut and blank ventilation system. Install fitting to allow temporary ventilation for possible future use. The filter banks in the "penthouse" have not been characterized and will require special consideration on the best engineering solution for cleaning and or isolation. A small temporary, commercially available filtered, exhausts systems may be considered to maintain negative pressures for the building if engineering analysis indicates that there are technical reasons to do so.

B.2.21 SW BUILDING

Building Description: The SW building is a two-story brick and stone building on a slab originally constructed in 1950 and now used for tritium handling. It has since had thirteen additions and is a 43,000 sq. ft., complex. The building is in good condition. The original building was a high bay facility which later added a concrete slab second floor. The SW building is physically connected to the R building and a corridor (No. 2) connects to the SW building HVAC system.

The roof is flat built-up asphalt with gravel covering. There are many levels of roof with ages ranging from new to many years old. Some sections of the roof appear to be near the end of their design life with 2-3 years of service remaining.

The building is currently in use for tritium component development, component evaluation operations, tritium recovery, and material analysis. Two non-operating areas, the SW cave area and SW-19, have had operations with alpha materials and contamination remains. The cave area has removable quantities of Pa-231 and Room 19 has removable quantities of Pu-239.

Several exhaust stacks serve the building and all but one (the NCDPF) are HEPA filtered. The building ventilation is once-through outside conditioned air with exhaust to one of the stacks. All stacks have continuous tritium monitors installed and operating. The building houses numerous glove box lines in which almost all tritium operations are performed. These glove box lines are operated at pressures negative to the room, the rooms in turn are negative to the rest of the building areas. The glove boxes are exhausted to the effluent removal system (ERS) to remove tritium prior to exhaust to a stack. The rooms exhaust directly to a stack. The ERS oxidizes tritium in the exhaust gases and absorbs the resultant water on beds. The beds are periodically regenerated to remove the tritium containing water. The tritium effluents from the Mound site were said to be low (less than 500 total curies in 1993). The ERS operates 24 hours a day, 7 days a week and has

emergency exhaust capability for several hours via a large vacuum vessel north of the SW building. The access control to the radioactive areas is at the room level within the building.

Low level liquid wastes are collected in sumps and pumped via above ground lines to the WD building. Liquids (water) from the ERS system are treated in the building for disposal (package not currently approved for burial) or for recovery of the tritium (recovery system operation not currently approved). Currently approximately 65, 30-gallon drums of tritium contaminated water are stored in the SW building and approximately 16 drums are being generated per year. Approval of a shipping container for this material would allow disposal of this material.

Current Status: The building is currently operating except for the alpha contaminated areas (SW cave area and SW-19 where Pa-231 and Pu-239 are stored). These two are planned for D&D. Prior to D&D of the SW cave area. The plan is to repackage a quantity of U-233 to allow off-site shipment. In order to maintain low tritium emissions from the Mound site, it is necessary to operate the ERS system as long as any significant quantity of tritium is in the process.

Many of the original underground drains in the SW building are alpha or beta contaminated and will require removal/remediation at some time. They are not a current problem. The soil under the SW building is tritium contaminated.

The building operates under the OSR MD-10298 issue 1. FSAR MLM-ML-92-42-0001 has been submitted but not yet approved.

Approximately fifty (50) people are located in the SW building.

Radiological Concerns: A pressure differential as described above should be maintained as long as tritium can be released within the building. Small quantities of classified radioactive waste will result from cleanout of process. Removal of the thick concrete pad over the "original" cave in the SW-19 area could result in a release of Ac-227/Ra-226 contamination – not a current problem. A large number of potentially hazardous metal tritide samples need to be treated/removed. Personnel knowledgeable of the many special areas need to be available to assist (or provide knowledge) in material removal/treatment.

Hazardous Conditions: No concerns were identified.

Environmental Concerns: Asbestos is present in some building systems and in the floor tile.

Surveillance: Routine daily and weekly health physics and operating personnel surveillances are performed.

Material Inventory: Nuclear materials are described in Section 7.4.1.1. Many laboratories contain chemicals which will need to be removed.

Personnel Safety Concerns: There were no reported open safety concerns identified.

Economic Development: Limited to someone interested in operating a tritium facility.

Special Considerations for Shutdown: Noted under radiological concerns.

Deactivation Recommendations

1. Remove or process all inventory level material with aid of knowledgeable people.
2. Maintain operation of the ERS (or comparable) system and filter bank before and during D&D of the SW building.
3. Be aware of:
 - a. potential contamination beneath floor slab of the building
 - b. potential alpha/gamma contamination beneath floor of SW-19.
4. Maintain proper pressure differentials in the SW building while cleaning out tritium materials. After removal of the tritium materials and the processing systems and the glove boxes are sealed satisfactorily, containment can be maintained using smaller local blowers to maintain negative differentials and to allow continuous air monitoring and remote reporting to a central alarm. Other than the above, the building systems should be maintained and surveilled as in other former radioactive buildings held by EM for ultimate disposal. Due to the potential economic development activities on the site as well as the close proximity of Miamisburg, continuous monitoring with alarms with a corrective plan in place is necessary.
5. Obtain/develop approved packages to store and ship the expected wastes.

T BUILDING**Building Description**

T-Building is a 173,000 ft² building used for tritium operations, calorimeter manufacture, tritium commercial sales, heat source calibration, X-ray facility, and safeguards gamma scanning support. T-Building is one of the original buildings at Mound, and was constructed in 1948. It is an underground facility that was originally designed and constructed for polonium initiator manufacture. It is an extremely hardened facility with 18 ft. thick reinforced concrete walls. The building consists of two underground floors. Extensive asbestos abatement was performed in 1990 in preparation for the Nuclear Materials Modernization Project. The building consists of office space, laboratory space, process rooms, utility areas, storage areas, and a shipping and receiving area. A detailed walk through of T-Building indicated that it is a well maintained facility. T-Building is currently occupied by approximately 100 personnel.

The major process areas were used for tritium operations, such as weapon reservoir loading, tritium storage, isotope separation, recovery of tritium from tritiated water, mass spectrometry, health physics, and commercial sales of tritium. Major tritium operations are conducted in glove boxes for containment of tritium and protection of workers from tritium exposure. Glove boxes are nitrogen atmosphere. Effluents from glove boxes, vacuum pumps, airlocks, etc. are transferred to the effluent recovery system (ERS) in the adjacent SW building. The ERS removes tritium from these gases before discharge to the SW building stack.

Current Safety Envelope

T-Building is a Category II nuclear facility based on DOE standard 1027-92. DOE-approved FSARs and OSRs are in place for all operations conducted in T-Building, except the Tritium Engineering Development Laboratory for which the FSAR is pending. A new process area, the Tritium Effluent Recovery Facility (TERF), is under construction. TERF was designed to replace the older effluent recovery system (ERS) located in SW building.

Major Process Areas

Hydrogen Isotope Separation System (HISS): HISS consists of an approximately 1000 ft² process area that contains a set of cryogenic distillation columns for separation of hydrogen isotopes. This facility is currently operational. The facility has several glove boxes that contain process piping, tanks, valves, instrumentation, and uranium beds for storage of tritium as uranium tritide. HISS is operated in the temperature range 20-30 K. Liquid nitrogen and a helium refrigerator are used to maintain the distillation

columns at these temperatures. A large control panel contains most of the control instrumentation for HISS. There is process piping that connects HISS with other process rooms in T-Building. Cryogenic distillation of tritium systems similar to HISS exist at least two other locations (LANL and SRS) in the DOE weapons complex.

Tritium Aqueous Water Recovery System (TAWRS): TAWRS is a facility that is unique to the DOE complex. TAWRS was designed and constructed for the purpose of recovering elemental tritium from tritiated water. Tritiated water is generated in the SW-Building ERS in the process to remove tritium from various effluent streams generated in the tritium buildings and at other DOE sites. Tritiated water generated in ERS typically contains tritium in dilute form. TAWRS is capable of decomposing tritiated water to its elements, and concentrating elemental tritium to concentrations that can be sent to HISS for further upgrading to essentially pure elemental tritium. The large amount of protium recovered from the tritiated water feed is clean enough to be sent to the T-Building exhaust stack. The room where TAWRS is located contains glove boxes that contain all of the tritium contaminated process equipment. TAWRS consists of a process known as combined electrolysis catalytic exchange (CECE). The process consists of a solid polymer electrolysis cell, catalyst beds, and other gas handling equipment. Although Mound does not have sufficient funding to start up and operate TAWRS, attempts are being made to initiate operation of TAWRS since it could be used to eliminate the large inventory of tritiated water currently in storage at Mound. Significant quantities of tritiated water at other locations in the DOE complex could be sent to Mound for tritium recovery in TAWRS.

Kyle Loading Facility (KLF): The KLF is a facility that was used during the eighties for loading weapon tritium reservoirs with tritium. Currently, a portion of the facility is used to support commercial sales of tritium. It contains glove boxes that contain the production piping for the reservoir loading process, several uranium storage beds, pumps, thermal diffusion columns, calorimeters, pinch welders, and other process equipment. The KLF contains tritium inventory on the uranium beds that is used for the commercial sales operations.

Tritium Effluent Recovery Facility (TERF): TERF is a new facility that is currently under construction and is not yet contaminated with tritium. It is designed to be a modernized and enlarged version of the effluent recovery system that is located in SW-Building. TERF was designed and constructed to remove tritium from glove box and process effluent streams before discharge to the stack. All equipment is contained in glove boxes. The process equipment consists of catalytic reactors, molecular sieve beds, compressors, heat exchangers, process piping, and other equipment. TERF has a dedicated computer control area that is adjacent to the process

area. Mound personnel have indicated that TERF will begin its operational readiness review process. Once commissioned, TERF will replace the ERS facility in SW-Building, and will serve both T-Building and SW-Building for cleanup of tritiated effluents. Mound personnel indicated that TERF will facilitate the decommissioning of ERS.

Mass Spectrometry Lab: Gas analysis of hydrogen isotope mixtures is accomplished by mass spectrometry. The Mass spectrometry lab performs gas analysis for all areas in T-Building. Gas is transported from various facilities to the mass spectrometry lab in capillary tubing. The mass spectrometry lab contains two mass spectrometers and associated instrumentation and control that are located in the lab area. The inlet sampling system and connections for many capillaries are located in glove boxes in the lab. Vacuum pumps and other process equipment are also located in glove boxes. There does not appear to be a significant tritium inventory in this area.

Effluent Cleanup System (ECS): The ECS is a system designed to remove tritium that is released to process rooms in order to prevent escape of tritium to the environment through the building ventilation system. In the event of a major tritium release to a process room, normal building ventilation flow out the stack is stopped, and operation of the ECS is initiated to remove tritium from the affected room. The ECS consists of catalyst beds and molecular sieve beds. One of the two ECS molecular sieve beds has been lightly contaminated with tritium.

Calorimeter Manufacture: Several laboratory areas are used in the fabrication and calibration of calorimetry plutonium-238 heat sources. Work appears to be mostly machining and electronics work. A machine shop is also part of this operation.

Health Physics Counting and Control Room: This area is dedicated to tritium monitoring equipment. Readouts for the various process areas, and the ventilation system exhaust monitors are located here. Scintillation counting of radiological surveys are also conducted.

Other Laboratory Areas: There are a number of small laboratories that are used for a wide variety of activities. There is a lab used for development of tritium bubblers used for monitoring environmental releases. There is a small room that contains a gamma radiation spectrometer and some sealed gamma radiation sources. There is a darkroom and other small laboratories conducting non-radiological work. Most of these areas appeared to be well-maintained and in good condition.

Radiological Concerns: See above.

Hazardous Conditions: No Observations.

Environmental Concerns See above.

Surveillance: No Observations.

Material Inventory: Described in Section 7.4.1.1

Personnel Safety Concerns: No Observations.

Economic Development: No Observations.

Special Considerations for Shutdown: Described in Section 5.7.

B.2.23 MAGAZINES 5, 10, 20, 52, 53, 64, 80, 81, 82, 83, & 84

Building Description: The energetic materials storage magazines are of concrete construction covered on all but one side with earth. Access is through a locked and alarmed steel door. The magazines range in size from ~60 to over 400 square feet.

Specific magazine descriptions include:

- 5 Two cell, 300 sq. ft. temperature controlled magazine use to store weapons production energetic materials surveillance samples.
- 10 One hundred square foot magazine which was empty with the exception of one box.
- 20 Three hundred square foot magazine which is heavily loaded with materials.
- 52 A staging magazine for work in Bldg. 42. The 100 square foot magazine contains argon inert storage facilities.
- 53 This is an EM magazine used to store hazardous waste residues from the burn facility. The bunker was said to be a RCRA Part B permitted storage facility.
- 64 A staging magazine for work in Bldg. 42 with three small compartments.
- 80 A two cell, 300 sq. ft. temperature controlled magazine used for storage.

- 81 A two cell, 300 sq. ft. temperature controlled magazine used for storage.
- 82 A two cell, 300 sq. ft. magazine in use for storage.
- 83 A two cell, 300 sq. ft. magazine in use for storage.
- 84 A two cell, 300 sq. ft. magazine in use for storage.

Current Status: Most of the magazines are in good physical condition, clean, weather tight, and are in use.

Environmental Concerns: No concerns were identified.

Radiological Concerns: No concerns were identified.

Hazardous Conditions: No concerns were identified.

Material Inventory: Described in Section 7.4.1.3

Personnel Safety Concerns: The magazines have minimal passive ventilation but are not classified as or treated as confined spaces.

Equipment: Other than the cooling units and the inerting equipment, there is no equipment in the magazines.

Economic Development: The magazines may have value as support infrastructure for the energetic materials R&D, fabrication, or testing facilities.

Special Considerations For Shutdown: None.

Deactivation Recommendations: Empty by burning contents in the burn facility. Leave in a closed and locked state.

B.3 Other Buildings

BLDG	FT²	DESCRIPTION
1	986	Explosives Processing Building 1 is used for packaging and repackaging of energetic materials in support of defense programs. It is currently in active use for this purpose. Building 1 consists of four heavy-walled rooms, each of which can handle 10-pound quantities of energetic materials. The building is still used for explosives packaging and shipping and is occupied by one person.
6	90	Magazine Building 6 is used for ammunition storage for the security department. It is currently used for this purpose.
7	387	Magazine Building 7 is used for inert energetic material storage. It is currently used for this purpose.
8	66	Magazine Building 8 is currently used for ammunition storage for the security department. Contains ~ 44 boxes of 308M ammo from 1987; ammo type is no longer used by the security force.
11	372	Magazine Building 11 is used for long-term storage for I Building explosives. It is currently inactive and empty.
13	47	Firing Shed Building 13 is used for remote monitoring of explosives destruction in the burn area. It is currently in active use for this purpose.

The building contains a video monitor and electrical initiating equipment for firing explosives in the burn area.

14 53 Metal Melting

Building 14 is used for aluminum melting processes in the burn area. It is currently shut down and inactive.

16 480 Production Storage

Building 16 is used for production storage for I Building.

17 1,120 Production Storage

Building 17 is used for chemical storage for production areas.

19 4,480 Property Management/Surplus/Property Disposal

Building 19 is used as a warehouse. The warehouse is currently 95% empty. One office is housed in the building.

Bldg. 19 is the planned storage space for the CERCLA soil samples drums currently stored at the drilling locations around the site.

21 4,069 D&D Program

The building is rad-contaminated.

22 9,090 Development/Warehousing

Building 22 is used for storage and office space. Approximately one-third of the building is used for office space; the other two-thirds for storage. A line-item project is currently in the approval process that would convert the building to an LSA waste storage facility.

23	3,422	Waste Material Staging Area
		Building 23 is used as a warehouse for storing mixed and transuranic mixed waste. The building also contains a gamma radiation detection drum scanning station.
		Contains mixed waste storage; 100 to 150 drums; boxes of material from DS Bldg. dated 1990.
24	840	Potable Water Treatment
		Building 24 is used for treatment of the potable water. The building houses two 100,000-gallon tanks and two 55-gallon drums. Water from Building 24 is sent to the SM/PP water tower, which services the SM/PP area.
25	430	Weather Station
		Building 25 is used for collecting information on local weather conditions as part of Mound's environmental monitoring program. It is currently in active use for this purpose.
26	800	Maintenance
		Building 26 is used as a maintenance shop serving SW, R, COS, DS, and E Buildings. Currently in active use for this purpose, the building contains a welding shop, material storage area, and three offices.
28	11,329	Ceramics Production
		Building 28 is used for ceramics development and production. It is currently in active use for this purpose. The building contains several large ceramics furnaces.
29	6,601	Plastics Production
		Building 29 is in a standby reserve condition. It was formerly used as a plastics formulation and manufacturing facility.

31	8,740	TRU Waste Staging	<p>Building 31 currently supports the Decommissioning and Decontamination (D&D) and Waste Management operations. The building is used for storing transuranic (TRU) wastes and as a staging area for the metal LSA boxes. Currently there is no approved disposal site for TRU waste. The metal LSA boxes are touched up with paint, weighed, and labeled before being shipped to Nevada for burial. Building 31 is a prefabricated metal building. The original building is 27 years old. The B section is seven years old.</p>
33	1,344	D&D Operations	<p>Building 33 is scheduled for decontamination and decommissioning (D&D). The building is currently being used by D&D operations for storage. The grounds around Building 33 are radiologically contaminated. A May 1993 Mound Asbestos Survey identified Building 33 as a building that contains thermal system insulation containing asbestos. It was built in 1965.</p>
34	1,110	Emergency Brigade Training	<p>The Building 34 complex used for emergency brigade training. Section 1 is a block concrete facility used for live fire training. Section 2 is used as office space or a classroom. Section 3 is used as a storage area.</p>
36	4,255	Support Functions for RTG Assembly and Testing Operations	<p>Building 36 supports the GPHS testing operations. It was built in 1968. There are three high-temperature bake-out ovens and a long-term temperature facility that operate continuously. GPHS requires the long-term temperature study for several more years. This building also houses a degreasing facility for cleaning hardware.</p>
37	2,463	Organic Materials Development	<p>Building 37 is used for two functions. The first is research, development, and pilot plant production in conjunction with the U.S. Advanced Battery</p>

Consortium (USABC). The second function is converting processes with freon or other hazardous materials to processes that use safer materials as part of the Environmental Response Cleaning Program. Major equipment in the building are furnaces, presses, fume-hoods, polymer processing equipment, and mechanical testing equipment. There is also space in the building for two offices.

39 3,515 Engineering

Building 39 is used as a maintenance shop. It is currently in active use for this purpose.

40 12,227 Print Shop/Technical Manuals/Publications

Building 40 is used for plant printing services. The first floor contains printing and microfilming equipment, a small storage area, and a vault for classified documents. The second floor of the building contains office space.

43 1,516 Thermite Development

Building 43 is used for thermite development work in support of defense programs. It is currently in active use for this purpose. The building contains equipment including two powder presses, a lathe, and a milling machine. It currently contains approximately 2200 grams of thermites. The thermite storage cell in Room 5 contains 1380 grams of the total. There is an abandoned sump on the east side of the building; the contents are unknown.

44 2,480 Old Cafeteria

Building 44 was the SM/PP cafeteria. The building currently contains vending machines and is used as a lunch and break area. Meetings and training classes are also sometimes held there.

45 9,500 Health Physics

Building 45 is used for repair and calibration of radiation instrumentation and for dosimetry. It is currently in active use for this purpose.

Specialized equipment in the building includes: electrometers, source irradiators, X-ray units, and special ion chambers. The building contains cesium, strontium, and Co-60 sources for calibration of instruments. A recent SA is in place.

The roof currently leaks. The HVAC penthouse has significant cracks in the block wall just below the roof pan. The cracks are through the center of the blocks - not along the mortar joint.

46 2,439 Welding Development

Building 46 is used for welding development efforts in support of the heat source program. Some welding development for energetic materials is also performed in the building. It is currently in active use for these purposes.

The HVAC penthouse contains a vacuum pump and blower for the electron beam welder which appears to have leaked oil into an adjacent drain. The tar roof has some blisters; it may need to be replaced within several years.

47 3,611 Security

Building 47 is used for the protective force administrative functions, weapons storage, and classified waste storage. Shift formations are conducted three times a day and supervision of protective force activities is coordinated here. Building 47 is operational 24 hours a day.

50 14,849 RTG Assembly and Testing

Building 50 is used to assemble and test RTGs and may be required by this program for several years. It was build in 1971.

54 331 Magazine

Building 54 is used for the storage of detonators and explosives for the explosives development group. It is currently in active use for this purpose.

It contains four magazines. One was unlocked. None have lights or air conditioning. Otherwise, in usable condition.

55 330 Waste Management

Building 55 is used for storing environmental sampling equipment. It was built in 1973 and has masonry exterior walls. The building also contains process equipment which was abandoned in place.

Nine barrels of CERCLA soil samples stored outside of the building on the ground. One is marked "Caution." Barrels are marked 3/93. Some have freeze burst damage and corrosion.

56 613 Fire Pump and Water Tank

Building 56 houses a pumping station. Adjacent to this facility is a 350,000-gallon ground water storage tank. This system provides an emergency supply of fire protection water at an adequate pressure to supplement the regular plant fire water system. A diesel generator provides emergency power if the plant power fails.

57 510 Sanitary Sewage Treatment

Building 57 is used for analysis of sewage before its disposal. It is currently in active use for this purpose. The laboratory in Building 57 contains equipment such as ovens, a scale, and dissolved oxygen monitors needed to perform testing required by Mound's Ohio EPA permits.

58 6,110 Building SW Filter Bank

59 668 Neutron Radiography Facility (CFX)

Building 59 is a californium-252, multiplier, (CVX) neutron radiography facility. The control room for this facility is located in Building 35. The facility has not operated since 1989. The building was built in 1978.

Californium-252 is used as a neutron source; aluminum-clad enriched uranium-235 acts as the multiplier. The californium and uranium are located in Building 59. Mound plans to return the californium neutron source, which has about 2-3 years of useful service, to Oak Ridge in October 1993, and to return the aluminum-clad uranium to Sandia in approximately one year. The University of Cincinnati has a contract to develop a plan for the removal of the uranium from Building 59.

60 3,958 Ceramics

Building 60 is used for ceramic development and non-destructive testing. It is currently in active use for this purpose.

61 45,490 Warehousing/Procurement/Contracting

Building 61 serves Mound's needs in the areas of Contracting and Procurement, Shipping and Receiving, and Transportation. It is currently in active use for this purpose. Half of the building is taken up by offices; half by a warehousing and material handling facility. A large tank of liquid nitrogen outside the building supplies liquid nitrogen dewars throughout the plant.

65 2,400 Production

Building 65 is used as an office area. The building contains about ten offices, two general open areas (computer rooms), a conference room, and one bathroom.

66 600 Development

Building 66 is a modular wood building used for thermite development office space.

68 1,990 D&D Staging Area

Building 68 is a metal building built in 1979 that currently supports D&D operations. It is used for staging D&D and maintenance materials.

69	1,620	Production/Tritium Surveillance
		Building 69 is a single story, modular wooden building used for offices in support of production operations. It is currently in active use for this purpose.
70	3,366	Quality
		Building 70 houses general offices.
71	800	Flammable Liquids Storage
		Building 71 is a metal building, open on two sides, that is used for storage of flammable liquids. It is currently in active use for this purpose. It contains 200 to 300 gallons of common solvents. Five drums of CERCLA soil samples are stored adjacent to the building.
72	2,400	Hazardous Waste Staging
		Building 72 is a metal building, open on one side, and used for storage of hazardous waste. It is currently in active use for this purpose.
73	2,200	Gas Cylinder Storage
		Building 73 is a metal building, open on two sides, that is used for compressed gas cylinder storage. It is currently in active use for this purpose.
		Many of the gas cylinders are Mound owned. Contents are not hazardous - most could probably be vented to atmosphere. Several cylinders contain refrigerants which would need special disposal.
74	400	Production Storage
		Building 74 is a sheet metal on slab building with a die-rolled steel roof built in the mid to late 1980s is used for final packaging of defense programs explosives. It is currently in active use for this purpose. The building contains a banding machine, tools, air guns, wooden boxes and pipes for the purpose of overpacking and labeling explosives for DOT transport.

79	1,650	Waste Management Support
		Building 79 is a single story, modular wooden office building that houses offices for waste management support. It is currently in active use for this purpose.
88	7,200	Support Functions for RTG Assembly and Testing Operations
		Building 88 is an office building built in 1983s which is used to support the RTG operations.
90	656	Explosives Burn Facility
		Building 90 houses the thermal treatment equipment that is used to burn and dispose of energetic materials at a 78 grams/minute burn rate. The steel frame building was built in 1983.
91	8,065	Environmental, Safety and Health/Training
		Building 91 is used for computer training, general office operations, and conference rooms.
92	1,600	Production Training
		Building 92 is a wooden, modular office building that is vacant.
93	2,936	Standards
		Building 93 is a two story, wooden, modular office building used for defense programs standards functions. It is currently in active use for this purpose.
94	1,240	Materials Compatibility
		Building 94 is used for materials compatibility studies in support of defense programs. It is currently in active use for this purpose. One third of Building 94 is used for laboratories and the remaining two thirds of the building is used for environmental ovens.

95	2,000	Utilities Operations
		Building 95 is used as a chilled water plant for the SM/PP Hill and Test Fire areas of Mound. It is currently in active use for this purpose. Building 95 contains two large glycol chiller systems.
96	432	Disintegrator/Storage
		Building 96 is a prefabricated metal building used for storage of supplies in support of the Mound security force. It is current in active use for this purpose.
		A document shredder is located in the rear half of Building 96; however, plans are to remove it in the near future.
98	8,517	Fire Station
		Building 98 is the fire house for the site. It is currently in active use for this purpose. Equipment housed in the building includes two fire engines, an ambulance, breathing air equipment, a trailer and spare fire-fighting materials. The building is manned by 17 shift personnel trained in fire fighting and HazMat control.
99	11,412	Security Operations
		Building 99 is the security operations facility. It serves as the central location for the security program. The primary communications center (alarm system), radio console, badge reader, and lock shop are housed on the first floor. The second floor holds offices for security management. The third floor houses the emergency operations center for the site. Building 99 is hardened to meet DOE standards.
100	6,292	Security
		Building 100 is used to house the protective force training section, weapons storage, physical fitness assessment area change rooms, interactive video training room, and administrative offices.

101	1,815	<p>Engineering</p> <p>Building 101 is a modular building used for offices and storage. It is currently in active use for this purpose.</p>
102	10,982	<p>D&D Engineering</p> <p>Building 102 is used to support the D&D operations. It was built in 1987.</p>
104	1,800	<p>Test Fire Maintenance</p> <p>Building 104 is used as a maintenance shop and offices. It is currently in active use for this purpose.</p>
105	38,027	<p>Production Machining</p> <p>Building 105 is a single-story structure of approximately 125 by 200 ft. (27,500 sq. ft.) of slab-on-grade construction with precast concrete walls, concrete block interior walls and movable partitions. It was completed in 1986 (at a cost of \$3.6 million) but was not fully occupied until 1993. The roof is a standing seam metal deck system. A roof leak (following severe ice storms) has been recently repaired. Offices with movable partitions line the northeast edge of the building. Rest rooms are wheelchair-accessible. A partial mezzanine contains most of the utilities that serve the building.</p> <p>Based on the site history, no hazardous chemical contamination is suspected. The building transformers do not contain PCBs. There is an historic waste oil and solvent drum storage area about 150 feet southeast of Building 105. This area is contaminated with low levels of volatile organic compounds.</p> <p>All wastes from Building 105 (office, metal cutting, grinding dust, and waste cutting oil are handled by the waste management group at the Mound Plant. The cutting oil used is a non-hazardous water soluble oil (Cimperial 1011), no solvents are used and no radio-active materials have ever been handled in this building.</p>

About \$15,000 is required to bring the building up to ADA standards if it were to become a public space.

106 180 Production Storage

Building 106 is an aluminum shed used for general storage for Building 43. It is currently in active use for this purpose.

112 785 Sand Filters

Building 112 is a Butler building housing tertiary sand filters for sanitary waste treatment.

113 547 Dewatering

Building 113 is a Butler building housing a sludge dewatering press for sanitary waste disposal.

120 350 Health Physics Storage

Building 120 is a modular building that is used for storage of Radiological Assistance Team supplies. It is currently in active use for this purpose.

A 55,582 Administration/Quality

Building A has two stories plus a basement. The top floor holds executive offices and the remainder of the space holds general offices. There is a museum vault on the first floor. The basement is a classified area with document vault, two-man combinations safe, and ~ 20 document safes.

Basement Room 11 has water coming through the wall to a drain at the fire protection standpipe and water is leaking into the basement along the north wall.

B 27,735 Inert Production

C 13,403 Record Storage

COS	64,654	Development/Production
		The COS Building provides production support for weapons components. It is currently partially active for this purpose.
E	47,755	Analytical Services/Production/Analytical Laboratory
		E Building (including E-Annex) is used for environmental analysis, general analytical services, and mechanical assembly of products in support of a wide range of Mound programs. It is currently in active use for this purpose. Laboratories occupy 80% of this building, with the remainder of the building being occupied by offices. The building contains one conference room that is now being used for another purpose, and two raised-floor areas that are intended as computer rooms.
G	7,518	Garage
		G Building is used for the maintenance and repair of all plant GSA vehicles. In that capacity the building has several hydraulic lifts. The building is also used as storage for yards and grounds equipment and tools. The building has some office space and a conference room.
GH	5,347	Visitor Control
		The GH Building is used as office space for uncleared employees, part-time employees, and new employees. GH Building was converted into a computer lab training center and a rad worker training facility in January 1994.
GP-44	365	Record Storage
		The GP-44 Building is used for security records storage. The remaining two-thirds is used for uniform storage, laundry, and issue. It is currently in active use for this purpose.

GIS	166	Guard Island Entrance	<p>The GIS Building is used as a checkpoint when entering the main hill portion of the plant. It is currently not actively used for this purpose.</p>
GP1	7,792	Change Rooms/Firing Range	<p>The GP1 Building is used for security training. It contains an indoor firing range, physical fitness equipment, the alternate security communications center, one office, and both a men's and women's change room.</p>
GW	9,782	Bonded Stores/Receiving/Inspection	<p>The GW Building is used for bonded stores and receiving inspection for the weapons program. Two-thirds of the second floor is office space; one-third is bonded stores having a small amount of chemicals. The first floor is the receiving inspection area where incoming material is inspected using high precision instruments.</p>
H	17,334	Environmental Laboratories/Laundry/Change Rooms	<p>H Building houses a laundry facility, a bioassay laboratory, the credit union, a men's change room, a women's change room, a small maintenance shop, and some office space.</p>
HH	15,276	Isotope Separation	<p>The HH Building is used as an isotope separation facility. Isotopes, mostly in the gas phase, are produced and packaged in the building. One room is tritium contaminated from prior handling of tritium contaminated He-3.</p>
M	56,018	Tooling Fabrication/Ceramics Machining/Electro Plating/and Electronics	<p>Building M houses an electroplating shop, a Heat Source surveillance facility, an electronics maintenance shop, ES&H office space, and an electrical substation that services the main buildings.</p>

OSE	90,072	Engineering/DOE/Cafeteria/Auditorium/Computer Facility
		The OSE Building houses engineering offices, the DOE offices, a cafeteria, an auditorium, and a computer facility. The 4th floor computer center contains ~ 15,000 classified disks. Capabilities include a small photo shop with a limited chemical stock.
OSW	54,280	Accounting/Management Information/Drafting/Central Computer Facility
		The OSW Building houses the plant-wide computer system and computer-aided design (CAD) products, processes, and facilities. Drawing Control program management and administrative offices are also in OSW Building, as well as environmentally-controlled rooms for computer operations, vaulted areas for storage of sensitive documents, and drawing management equipment including computer output microfiche (COM), document scanning and drawing production.
		The 3rd floor has ~12 safes with design drawings. Room 310 has 10,000 to 15,000 design agency mylars, a large rotating file of classified drawing aperture cards, and several classified magnetic tapes. Room 309 contains 34 five drawer cabinets with ~65,000 mylar drawings.
PH	646	Storage
		The PH Building is used for parts storage. It is currently in active use for this purpose.
PS	2,288	Paint Shop
		The PS Building is used for storage and as a paint shop. It is currently in active use for this purpose. The building contains an EPA-permitted paint spray booth, with a specially designed ventilation and filtration system to trap volatiles.
SD	1,593	D&D Program
		The SD Building is currently being D&D'd. It is the old sewage disposal facility built in 1948. The SD Building is contaminated with radiological materials.

SM	21,700	D&D Program The SM Building is currently being D&D'd.
SST	590	Salt Storage The SST Building stores salt used for snow control.
W	32,484	Maintenance The W Building houses trade shops and offices. The first floor contains several offices, a rest room, and the trade shops, including mechanic, sheet metal, carpenter, pipe fitter/welder, and electric shops. On the second floor at the east end of the building are offices and a conference room.
WD	16,216	Radioactive Waste Treatment The WD Building is where water that has alpha and beta radiological contamination is processed.
WH1	374	Well House Building WH1 is used for housing the pump for the plant water supply. It is currently in active use for this purpose.
WH2	374	Well House Building WH2 is used for housing the pump for the plant water supply. It also houses a propane generator for emergency power backup. Building WH2 is currently in active use for this purpose.
WH3	128	Well House Building WH3 is used for housing the pump for the plant water supply. It also houses a propane generator for emergency backup. WH3 is currently in active use for this purpose.

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APPENDIX C

CHARTER

C.1 Charter

C.1.1 Scope

C.1.1.1 Mission

The Independent Technical Review (Red Team) is to assess the Mound and Pinellas Plants and to recommend changes which would enhance the safe, compliant, and efficient implementation of EM-60's impending landlord and facility deactivation responsibilities.

C.1.1.2 Objectives

C.1.1.2.1 Facility and Infrastructure Deactivation

Identify opportunities, liabilities, and issues to rapid, safe, compliant, minimum cost deactivation of surplus facilities and infrastructure to a minimum mortgage, D&D-ready condition. Recommend corresponding EM-60 deactivation program implementation strategies.

Focus areas:

- Buildings, infrastructure, equipment, materials, and waste status
- Risk analysis/liability reduction activities
- Infrastructure/base activities
- Planning, technical basis, and work logic
- Standards and practices
- Resource requirements

C.1.1.2.2 Economic Development

Identify opportunities, liabilities, and issues to meaningful, timely, economic development of surplus DOE assets. Recommend corresponding EM-60 economic development strategies.

Focus areas:

- Potential business development cases and priorities
- Planning, technical basis, and work logic

- Landlord, infrastructure, and resource requirements
- ES&H, liability, and regulatory framework

C.1.2 Interfaces

The Red Team will perform its activities under the direction of DOE-HQ Eastern-Southwestern Office of Site and Facility Transfer, EM-64.

The DOE-DAO and DOE-PAO will coordinate the interface between the team and EG&G and Martin Marietta. Direct ITR team discussions with M&O management and staff will be required during the review and, to the extent practical, DOE area offices will participate in these discussions.

C.1.3 Staffing

The Red Team will consist of 4 to 5 knowledgeable, independent experts who have had experience in one or more of the following areas:

- Facility, materials, and waste assessment
- Facility deactivation or D&D
- Environment, Safety and Health
- Business and economic development
- Application of DOE Order requirements and national codes and standards
- Project management

The team may use additional specialists to assist in the evaluation of plant economic development proposals. Specialist expertise may be required in:

- Thermal batteries
- Explosives
- Plastics
- Electronic switches
- Neutron generators

The team members shall be independent of the plant M&Os and the DOE area offices. A team leader(s) will be selected by DOE-HQ Office of Eastern-Southwestern Site and Facility Transfer, EM-64.

C.1.4**Schedule**

Initial Site Visits	Feb. 22, 28
Staff Team and Preparation	Feb. 24 to March 11
Training and Review Plan Update	March 10, 11
Week 1 @ Mound	March 14 - 18
Week 2 @ Mound	March 28 - April 1
Week 1 @ Pinellas	April 4 - 8
Week 2 @ Pinellas	April 18 -22
Presentation to Sites	May 5, 6
Presentation to EM-60	TBD
Draft Report to DOE	June 10

Additional time may be taken upon recommendation of the ITR Leaders and EM-60 approval.

C.1.5**Deliverable**

A written report will be prepared which will summarize the assessment and recommendations for each plant and each Charter objective. In addition, the Red Team shall make a summary of the results presentation to the plants, EM-60, and other groups and DOE organizations if so requested.

C.2 Review Plan and Schedule

MOUND ITR AGENDA

<u>DATE</u>	<u>TIME</u>	<u>SUB TEAM 1</u>	<u>SUB TEAM 2</u>
3-14	07:00 AM 11:00 PM 01:00 PM	ITR Mtg. at the hotel Badging; Training; Lunch General Briefings - Mission and Capabilities - DP Commitments - EM Plans and Commitments - Liabilities - Economic Development/ Privatization	
3-15	08:00 AM 01:00 PM	Classified Materials And Wastes Briefings Bldg. List A Walkdown	Machining Economic Dev./Privatization and Liability Briefings Bldg. Walkdowns
3-16	08:00 AM 01:00 PM	Bldg. List A Walkdown Bldg. List A Walkdown	Explosives ED/P and Liability Briefings Bldg. List B Walkdowns
3-17	08:00 AM 01:00 PM	Bldg. List A Walkdown Bldg. List A Walkdown	Bldg. List B Walkdowns Bldg. List B Walkdowns
3-18	08:00 AM 01:00 PM 04:00 PM	Interviews Interviews	Batteries, Lasers, And Plastics ED/P Briefings Bldgs. Walkdowns Depart

MOUND ITR AGENDA

<u>DATE</u>	<u>TIME</u>	<u>SUB TEAM 1</u>	<u>SUB TEAM 2</u>
3-28	07:00 AM	ITR Mtg. at the hotel	
	10:00 AM	Bldg. List C Walkdowns	Joining/Welding and Ceramics ED/P and Liability Briefings
	01:00 PM	Bldg. List C Walkdowns	Bldg. Walkdowns
3-29	07:00 AM	Bldg. List C Walkdowns	Isotopes, Testing & Conditioning, and Analytical ED/P and Liabilities Briefings
	01:00 PM	Bldg. List C Walkdowns	Bldg. Walkdowns
3-30	07:00 AM	Bldg. List C Walkdowns	Bldg. List D Walkdowns
	01:00 PM	Bldg. List C Walkdowns	Bldg. List D Walkdowns
03-31	07:00 AM	Bldg. List C Walkdowns	Bldg. List D Walkdowns
	01:00 PM	Interviews	Interviews
04-01	07:00 AM	ITR Mtg. at the Hotel	
	04:00 PM	Depart	

BUILDING LIST A: NUCLEAR MATERIALS LIABILITY

<u>BLDG</u>	<u>ED/P</u>	<u>DESCRIPTION</u>	<u>SIZE</u> (ft2)	<u>LOGIC</u> <u>PHASE</u>	<u>LIAB.</u>
R		Tritium	55,000		
SW		Tritium	43,000		
T		Tritium	173,000		
30		Pu Contamination	700		
35		Non-Destructive Test Sources	?		
38		Rad. Contamination	44,000		
58		SW Support	6,100		
59	?	Rad. Contamination	700		

BUILDING LIST B: EXPLOSIVES LIABILITY

<u>BLDG</u>	<u>ED/P</u>	<u>DESCRIPTION</u>	<u>SIZE</u> (ft2)	<u>LOGIC</u> <u>PHASE</u>	<u>LIAB.</u>
I	?	Explosive Actuator Production	25,700		
DS	?	Production and Metrology	47,800		
1		Energetic Materials Packaging	1,000		
2		Explosives Development - Destructive Test	6,300		
3	?	Explosives Development - Destructive Test	12,400		
5	?	Magazine	300		
7		Magazine w/Inert Atm.	400		
10	?	Magazine	100		
20	?	Magazine	300		
27	?	Process Operations	5,300		
42		Production	2,900		
43	?	Thermite Development	1,500		
48		Analysis	8,000		
49	?	Production	15,000		
51		Thermite Production	3,500		
52		Magazine	100		
53		Magazine	200		
54		Magazine	300		
64		Magazine	100		
67	?	Support for 27 and 42	3,800		
74		Explosives Packaging	400		
80	?	Magazine	300		
81	?	Magazine	300		
82	?	Magazine	300		
83	?	Magazine	300		
84	?	Magazine	300		
85	?	Powder Processing	3,200		
87	?	Destructive Test & Tester Development	38,900		
89		Energetic Materials Storage	4,800		

BUILDING LIST C: DEACTIVATION ?

<u>BLDG</u>	<u>ED/P</u>	<u>DESCRIPTION</u>	<u>SIZE</u> (ft2)	<u>LOGIC</u> <u>PHASE</u>	<u>LIAB.</u>
B	?	Production	27,800		
C		Records, Storage, Offices	13,400		
COS	?	Production Support	64,700		
E	?	Analytical and Production	47,800		
G		Vehicle Repair and Maint.	7,500		
GW		DP Bonded Stores	9,800		
H		Misc.	17,300		
HH		Isotopes Separation	15,300		
M	?	Shops	45,300		
PH		Parts Storage	600		
PS		Paint Shop and Storage	2,300		
W		Shops	32,500		
16		I Bldg. Storage	500		
17		Chem. Storage	1,100		
19		Partially Used Warehouse	4,500		
22		Storage	9,100		
25		Weather Station	400		
26		Maint. Shop for SW/R/COS/DS/E	800		
28	?	Ceramics Development	11,300		
29	Y	Plastics Formulation (in standby)	?		
31/31 A		D&D and Waste Ops	8,700		
30		Offices and Storage for ES&H	700		
36		GPHS testing	4,300		
37		U.S. Battery Work and Haz. Mat. Processing	2,500		
39		Maint. Shop	3,500		
40	?	Printing, Microfilm	12,200		
44		Old Cafeteria	2,500		
46		Welding Development	2,400		
60	?	Ceramics Development	4,000		
61		Procurement, Ship & Rec., Transp.	45,500		
63E	?	Tester Development	13,400		
63W	?	Environmental Conditioning	3,000		

BUILDING LIST C: DEACTIVATION ?

<u>BLDG</u>	<u>ED/P</u>	<u>DESCRIPTION</u>	<u>SIZE</u> (ft2)	<u>LOGIC</u> <u>PHASE</u>	<u>LIAB.</u>
65		Offices	2,400		
66		Office	600		
68		D&D Ops.	2,000		
69		Production Ops	1,600		
70		General Offices	3,400		
79		Waste Mgt. Offices	1,600		
91		Training and Offices	8,100		
92		Empty	1,600		
93		Standards	2,900		
94		Materials Compatibility Studies	1,200		
101		Offices	1,800		
102		D&D Offices	11,000		
104	?	Maint. Shops	1,800		
105	Y	Misc. Machining	?		
106		Storage	200		
120		Storage	400		

BUILDING LIST D: LANDLORD ?

<u>BLDG</u>	<u>ED/P</u>	<u>DESCRIPTION</u>	<u>SIZE</u> (ft2)	<u>LOGIC</u> <u>PHASE</u>	<u>LIAB.</u>
A		Administration	55,600		
GH	Y	Training	5,400		
GIS		Unused Security Check Point	200		
GPI		Security	7,800		
GP44		Security	400		
OSE		Engineering	90,100		
OSW		Admin. & Computing	54,300		
SST		Salt Storage	600		
6		Security	100		
8	?	Security	100		
11		Empty Magazine	400		
23		Waste Storage	3,400		
45		Rad. Instrumentation and Dosimetry	9,500		
47		Security	3,600		
55		Environmental Sample Equipment Storage	300		
71		Flammable Liquid Storage	800		
72		Haz. Waste Storage	2,400		
73		Gas Cylinder Storage	2,200		
96		Security	400		
98		Fire Dept.	8,500		
99		Security	11,400		
100		Security	6,300		
110		Fuel Storage	-		

BUILDING LIST E: USED BY OTHERS ?

<u>BLDG</u>	<u>PROG</u>	<u>DESCRIPTION</u>	<u>SIZE</u> (ft2)	<u>LOGIC</u> <u>PHASE</u>	<u>LIAB.</u>
34	D&D	Fire Training	1,100		
21	D&D	? (Rad Contaminated)	4,100		
33	D&D	? (Rad Contaminated)	1,300		
SM	?	?	?		
88	NE	RTG Ops.	7,200		
38	NE	RTG Assembly	44,300		
50	NE	RTG Assembly	14,800		

Review Questions

Safe Shutdown/Deactivation Questions

- How well do we know the Mound system?
- What is the state of the facilities?
 - code and standards
 - repairs
 - configuration control
- How are the building shutdown and deactivation plans being integrated?
- What are the nuclear materials liabilities?
 - characterization
 - disposition; shipping containers; transportation receiver sites
 - safeguards and security
- What are the explosive materials issues?
 - characterization/disposition
 - economic development
- What are the Tritium issues?
 - Can the material be shipped off-site?
 - What are the programmatic capabilities and needs?
 - Can the facilities be commercialized; at what cost?
 - What is the nuclear material and ES&H authorization basis for a commercial enterprise?
- What is the site funding and assumptions to do the deactivation and ED/P work?
- What codes and standards apply for excess/wastes materials – same as production?
- How do we apply codes and standards for one-time operations?
- What is the availability of off-site receiver for materials/wastes?
- What will the impact be of the projected FY95 funding?
- What drives the safeguards/security requirements?

Economic Development Questions

- What do I have that I can call a product or service (not knowledge)?
- Who are the key technology players and what are their stake in the proposals?
- How has competition with private industry been addressed?
- How will permitting and environmental compliance be dealt with for economic development?
 - DOE/EG&G/City
- How has this facility interfaced with the real world in the past?
 - companies which came and looked
 - feedback other than yes/no
- What are the roles of the other government agencies?

- What intellectual property issues exist?
- How will an orderly transition be made from DOE orders to commercial codes and standards?
- How will the liability be dealt with?
- Are there DOE/State Department proliferation issues?
- Will use be allowed by foreign nationals?
- How does one separate the real and imaginary parts of ED/P?
- How will the DP shortfall impact ED/P?

C.3 Capability Assessment Forms

C.3.1 Capability Audit

I.	Product (Maximum Score - 35 points, Required Score - 28 points)	
	a. acceptable product definition (10 points)	_____
	b. proof of principle (25 points)	_____

	Section Total	_____
II.	Market (Maximum Score - 40 points, Required Score - 32 points)	
	a. clear market definition (10 points)	_____
	b. commercial potential (10 points)	_____
	c. national and/or international market (10 points)	_____
	d. market trends, size, competition (10 points)	_____

	Section Total	_____
III.	Competitive Advantage (Maximum Score - 70 points, Required Score - 56 points)	
	a. costs saving measures (10 points)	_____
	b. price positioning (10 points)	_____
	c. customer benefits (10 points)	_____
	d. competitive influences (10 points)	_____
	e. adequate project budget (10 points)	_____
	f. location (10 points)	_____
	g. distribution (10 points)	_____

	Section Total	_____
IV.	Ability to Execute (Maximum Score - 110 points, Required Score - 88 points)	
	a. technical know-how (25 points)	_____
	b. business management experience (25 points)	_____
	c. leverage financial risks (25 points)	_____
	d. multiple assistance programs available (5 points)	_____
	e. skill mix (25 points)	_____
	f. organizational structure (5 points)	_____

	Section Total	_____
V.	Benefits to area economy (Maximum Score - 35 points, Required Score - 18 points)	
	a. jobs (10 points)	_____
	b. revenue (10 points)	_____
	c. leverage concurrent R&D (5 points)	_____
	d. use of area natural resources 10 points)	_____

	Section Total	_____
VI.	Overall likelihood of Success (Maximum Score - 25 points, Required Score - 20 points)	
	a. realistic project schedule (5 points)	_____
	b. economic factors (10 points)	_____
	c. environmental restraints (10 points)	_____

	Section Total	_____
	FINAL TOTAL	_____

Reviewer: _____ Date: _____

ECONOMIC DEVELOPMENT & PRIVATIZATION

GROUP NAME:		DATE:
BUILDING NAME(S) & NUMBER(S):		
GROUP MANAGER:		
FACILITY MANAGER:		
EMPLOYEE DATA	Evaluate the contribution (positive or negative) to the economic viability of the group. List comments, concerns, problems, and questions. Be as specific as possible. Use the reverse of this page for additional space.	
Number of employees		
Retirement age (Skills)		
Other terminations (Skills)		
List of technical qualifications		

ECONOMIC DEVELOPMENT & PRIVATIZATION

GROUP NAME:		DATE:
BUILDING NAME(S) & NUMBER(S):		
FACILITIES DATA	Evaluate the contribution (positive or negative) to the economic viability of the group. List comments, concerns, problems, and questions. Be as specific as possible. Use the reverse of this page for additional space.	
<i>Building</i>		
Square feet		
Age		
Special Improvements		
Liabilities		
Location		
Logistics		
<i>Equipment</i>		
Age		
Types		
Special capabilities		
Liabilities		
Location		

ECONOMIC DEVELOPMENT & PRIVATIZATION

GROUP NAME:		DATE:	
BUILDING NAME(S) & NUMBER(S):			
PRODUCT/SERVICE/PROCESS		Evaluate the contribution (positive or negative) to the economic viability of the group. List comments, concerns, problems, and questions. Be as specific as possible. Use the reverse of this page for additional space.	
Does the group have an acceptable product definition?			
What is the product's proprietary position?			
Are there any legal, safety, or environmental problems associated with the production, marketing, or use of the product?			
What is the estimated maximum monthly production level using the current facilities and employee configuration?			
MARKET AND COMPETITIVE ADVANTAGE		Evaluate the contribution (positive or negative) to the economic viability of the group. List comments, concerns, problems, and questions. Be as specific as possible. Use the reverse of this page for additional space.	
Does the group have a clear market definition?			
Does the product have commercial potential?			
Is the market local, national, or international?			
Check the areas in which the product has a competitive advantage .	Costs savings measures		
	Price positioning		
	Customer benefits		
	Competitive influences		
	Adequate budget		
	Distribution		
	Location		

ECONOMIC DEVELOPMENT & PRIVATIZATION

GROUP NAME:	DATE:
BUILDING NAME(S) & NUMBER(S):	
ABILITY TO EXECUTE	Evaluate the contribution (positive or negative) to the economic viability of the group. List comments, concerns, problems, and questions. Be as specific as possible. Use the reverse of this page for additional space.
Does the group have the technical know-how to produce the products?	
Does the group have the business management experience to support the venture?	
Can the group leverage the financial risks of the venture?	
Does the group have the proper skill mix to support the business venture?	
Does the group have the proper organizational structure to support the business venture?	
COMMERCIALIZATION INTERESTS	Evaluate the contribution (positive or negative) to the economic viability of the group. List comments, concerns, problems, and questions. Be as specific as possible. Use the reverse of this page for additional space.
Outside	
Employee	
City	

DRAFT EM-60 FACILITY EVALUATION

CRITERIA: To be used in ranking buildings and creating a site-wide deactivation logic. The input for the rating is the data gathered in the attached 10 forms.

DEACTIVATION IMMEDIATE
PHASE I:

- Deactivation work can be accomplished in one year or less.
- Little or no coordination with other programs or facilities.
- Excess materials can be reapplied or sold; are not RCRA waste.
- Facility liabilities mandate immediate action.

DEACTIVATION NEAR TERM
PHASE II:

-
- The facility is currently required for storage of productive equipment or materials
-

DEACTIVATION DEFER
PHASE III:

-
- Reasonable deactivation technology is not available.
- Deactivation requires waste disposal capability which is not available.
- Facility has unrealized economic development potential.

**ECONOMIC
DEVELOPMENT**

**DEFER FOR BUSINESS DEVELOPMENT/
PRIVATIZATION**

- A. Asset of national significance
 - Product of national significance
 - Viable business plan in place
- B. Asset of regional or local significance
 - Product of regional or local significance
 - Business plan being developed

-

LANDLORD:

**DEFER TO SUPPORT SITE DEACTIVATION AND
D&D**

-
-
-

I. LIABILITIES - EXTERIOR BUILDING CONDITION : Provide a brief description of the key issues, the location, and estimate the quantity.

BLDG. _____

BY: _____

	DESCRIPTION/ISSUES
USE AS;	
PORT	
.?	
LL	
ION &	
TIES	
INATION	

II. LIABILITIES - INTERIOR BUILDING CONDITION: Provide a brief description of the key issues, the location, and estimate the quantity.
BLDG. _____ BY: _____

	DESCRIPTION/ISSUES
USE AS;	
ROL	
EMS	
MS	
ION	
S	
ION	
ODES and	
'LIANCE	

BLDG. _____

BY: _____

USE

IV. **LIABILITIES - WASTES:** Provide a brief description of the key items/categories, their condition, and estimate the quantity.

BLDG. _____

ROOM _____

BY:

[illegible]

V. LIABILITIES - CONTAMINATION: Provide a brief description of the key issues, the location, and estimate the quantity.

BLDG. _____

ROOM _____

BY:

[illegible]

VI. LIABILITIES - OTHER: Provide a brief description of the key issues, the location, and estimate the quantity.

BLDG. _____ ROOM (?) _____ BY: _____

[illegible]

VII. PRODUCTIVE EQUIPMENT: Provide a brief description of the key items, the estimated value, and issues.

BLDG. _____

ROOM _____

BY:

[illegible]

VIII. EXCESS EQUIPMENT: Provide a brief description of the key items, the estimated value, and issues.

BLDG. _____

ROOM _____

BY:

	DESCRIPTION (function, quantity , make, model, age, condition)	EST. VALUE (current)	DEACTIVATION ISSUES (contamination, hazards, classification)
S			

IX. **PRODUCTIVE MATERIALS:** Provide a brief description of the key items/categories, their condition, and estimate the quantity.

BLDG. _____

ROOM _____

BY:

[illegible]

X. **EXCESS MATERIALS:** Provide a brief description of the key items/categories, their condition, and estimate the quantity.

BLDG. _____

ROOM _____

BY:

[illegible]

APPENDIX D

GUIDANCE

D.1 Hall Amendment

From "Congressional Record-House, November 10, 1993."

SEC. 3154. LEASE OF PROPERTY AT DEPARTMENT OF ENERGY WEAPON PRODUCTION FACILITIES

Section 646 of the Department of Energy Organization Act (42 U.S.C. 7256) is amended by adding at the end of the following new subsections:

"(c) The Secretary may lease, upon terms and conditions the Secretary considers appropriate to promote national security or the public interest, acquired real property and related personal property that –

"(1) is located at a facility of the Department of Energy to be closed or reconfigured;

"(2) at the time the lease is entered into, is not needed by the Department of Energy; and

"(3) is under the control of the Department of Energy.

"(d) (1) A lease entered into under subsection (c) may not be for a term of more than 10 years, except that the Secretary may enter into a lease that includes an option to renew for a term of more than 10 years if the Secretary determines that entering into such a lease will promote the national security or be in the public interest.

"(2) A lease entered into under subsection (c) may provide for the payment (in cash or in kind) by the lessee of consideration in an amount that is less than the fair market rental value of the leasehold interest. Services relating to the protection and maintenance of the leased property may constitute all or part of such consideration.

"(e) (1) Before entering into a lease under subsection (c), the Secretary shall consult with the Administrator of the Environmental Protection Agency (with respect to property located on a site of

the National Priorities List) or the appropriate State official (with respect to property located on a site that is not listed on the National Priorities List) to determine whether the environmental conditions of the property are such that leasing the property, and the terms and conditions of the lease agreement, are consistent with safety and protection of public health and the environment.

- “(2) Before entering into a lease under subsection (c), the Secretary shall obtain the concurrence of the Administrator of the Environmental Protection Agency or the appropriate State official, as the case may be, in the determination required under paragraph (1). The Secretary may enter into a lease under subsection (c) without obtaining such concurrence if, within 60 days after the Secretary requests the concurrence, the Administrator or appropriate state official, as the case may be, fails to submit to the Secretary a notice of such individual’s concurrence with, or rejection of, the determination.
- “(f) To the extent provided in advance in appropriations Acts, the Secretary may retain and use money rentals received by the Secretary directly from a lease entered into under subsection (c) in any amount the Secretary considers necessary to cover the administrative expenses of the lease, the maintenance or repair of the leased property, or environmental restoration activities at the facility where the leased property is located. Amounts retained under this subsection shall be retained in a separate fund established in the Treasury for such purpose. The Secretary shall annually submit to the Congress a report on amounts retained and amounts used under this subsection.

Lease of property at Department of Energy weapon production facilities (sec. 3154)

The House bill contained a provision (sec. 3140) that would allow the Secretary of Energy to leave or transfer surplus real or personal property to a public agency at no less than 50 percent of the fair market value of the property. The provision would also prevent the Secretary of Energy from moving personal property from a facility if the property could be useful in converting the property to civilian use.

The Senate amendment contained no similar provision.

The Senate recedes with an amendment that would allow the Secretary of Energy to lease, at less than fair market value, property at Department of Energy facilities that are being reconfigured. This provision is designed to provide broad discretion to the Secretary to assist local

communities adversely impacted by the reconfiguration of Department of Energy facilities.

The amended provision also would require the Secretary to obtain the concurrence of the Administrator of the Environmental Protection Agency for leases at sites that are on the National Priority List.

Authority to transfer personal property and equipment to support reutilization are included elsewhere in this act. The conferees believe that the provision is consistent with the Secretary of Energy's guidance regarding the relocation of personal property and equipment.

Nothing in this section should be interpreted to affect or constrain the disposal of surplus property by the Department of Energy, as defined in section 3(g) of the Federal Property and Administrative Services Act of 1949 (40 U.S.C. 472(5)). Nor is this provision intended to alter or contravene existing or future federal facilities agreements under the Comprehensive Environmental Response Compensation and Liability Act of 1980 (42 U.S.C. 9601 et seq.) or any other provision of law.

In addition, the conferees recognize the need for a more comprehensive and long-range approach to leasing property at closing and reconfigured DOE facilities. Therefore, the Secretary is directed to report to Congress regarding additional changes that may be necessary. The report shall be submitted at the time the defense committees consider the fiscal year 1995 budget.

Finally, the conferees agree that it is in the public interest for the Department of Energy to facilitate the economic recovery of communities that experience adverse economic impact from the closure of reconfiguration of a Department of Energy facility. The Secretary of Energy should assist the communities, where possible, to alleviate such adverse impact. Delay in the reutilization of DOE property, facilities, and equipment for commercial use could contribute to the loss of a highly skilled work force from reduced business opportunities.

SEC. 3155. AUTHORITY TO TRANSFER CERTAIN DEPARTMENT OF ENERGY PROPERTY

(a) AUTHORITY TO TRANSFER –

- (1)** Notwithstanding any other provision of law, the Secretary of Energy may transfer, for consideration, all right, title, and interest of the United States in and to the property referred to in subsection (b) to any person if the Secretary determines that such transfer will mitigate the adverse economic consequences that

might otherwise arise from the closure of a Department of Energy facility.

- (2) The amount of consideration received by the United States for a transfer under paragraph (1) may be less than the fair market value of the property transferred if the Secretary determines that the receipt of such lesser amount by the United States is in accordance with the purpose of such transfer under this section.
 - (3) The Secretary may require any additional terms and conditions with respect to a transfer of property under paragraph (1) that the Secretary determines appropriate to protect the interests of the United States.
- (b) COVERED PROPERTY – Property referred to in subsection (a) is the following property of the Department of Energy that is located at a Department of Energy facility to be closed or reconfigured.
- (1) The personal property and equipment at the facility that the Secretary determines to be excess to the needs of the Department of Energy.
 - (2) Any personal property and equipment at the facility (other than the property and equipment referred to in paragraph (1)) the replacement cost of which does not exceed an amount equal to 110 percent of the costs of relocating the property or equipment to another facility of the Department of Energy.

Authority to transfer certain Department of Energy property (sec. 3155)

The Senate amendment contained a provision (sec. 9133) that would permit the Secretary of Energy to transfer personal property that would mitigate the adverse economic consequences of the closure of a Department of Energy facility, at less than fair market value, if such personal property is excess to the needs of the Department. In addition, the provision would allow the Secretary to transfer any other property that is excess to the needs of the Department, if the replacement cost of such equipment does not exceed 110 percent of the cost of transporting the property to another Department of Energy facility.

The House bill contained no similar provision.

The House recedes with a technical amendment that would clarify the property includes personal property and equipment belonging to the Department of Energy.

D.2 Interim Guidance For Support Of Economic Development

I. PURPOSE

The end of the Cold War has reduced the country's need for national security activities. As a result, the Department of Energy's (DOE) defense nuclear production capacity is decreasing. The Department is accomplishing this by reconfiguring, downsizing, and closing many of its facilities. The Department realizes that these actions may adversely affect the economies of the communities nearby. Therefore, the Department will cooperate with the recognized representative of each affected community to plan and execute economic development initiatives to offset those impacts. These guidelines were devised to highlight the key aspects of this effort.

II. APPLICABILITY

This guidance applies to DOE sites and facilities that are, or are expected to be, scheduled for termination or other significant transition due to the downsizing of the Department's defense production mission. Emphasis will be on situations where reductions are occurring in the near term as covered by Section 3161 of the National Defense Authorization Act of 1993. The program presented here is also intended to be consistent with all other appropriate policies, laws, and regulations affecting the Department.

It describes the procedures and responsibilities expected from organizations representing the economic development interest of DOE-impacted communities as well as those of the Department. This is done by addressing three interdependent processes integral to DOE's support of local economic development activities. These processes are:

- Community Involvement
- Funding and Resource Allocation
- Use of Real and Related Personal Property

Finally, this guidance may be amended as required to reflect changes in laws, regulations, and policies that affect DOE's economic development mission and/or changes in needs for its support of local economic development.

III. COMMUNITY INVOLVEMENT IN ECONOMIC DEVELOPMENT ACTIVITIES

A. SCOPE

The department of Energy believes that broad-based participation and community involvement is essential to achieving local

economic development. To this end, the Department will encourage communities affected by the downsizing of nearby DOE facilities to establish a Community Reuse Organization (CRO). The CRO's primary mission will be to determine the actions the community will take to offset the local consequences of DOE's downsizing.

B. PROCEDURES AND RESPONSIBILITIES

1. Community Reuse Organizations

- a. As the Department's agent on economic development issues, the CRO will serve as the community's voice. The CRO will coordinate local efforts and resources to perform local economic development planning and management.
- b. They should encompass a broad representation of the affected community, with consideration of membership given to groups such as:
 - individual residents and representatives of community-based organizations;
 - business, academic, and financial – individual or organizational – representatives;
 - site workers and their labor organizations;
 - key local elected officials;
 - key established economic development organizations; and
 - public interest, citizen, environmental, diversity or indigenous groups having members located in the community.
- c. They will function independently of other community-based entities. They will develop and submit local plans and proposals to the appropriate DOE Operations or Area Office, receive DOE funding (if appropriate), and participate in the management of economic development projects. The CRO will submit a Public Participation Plan in conjunction with proposals that describes how public involvement in their activities will take place and who will be involved in the process.

- d. They must publicly describe the purpose, scope, and method of their economic development efforts. These efforts should reach a broad segment of the community in a broad and timely way. This will assure fairness of opportunity in participating in the planning and subsequent projects they support.
 - e. They will coordinate their activities with Site Specific Advisory Boards (SSAB) at DOE sites, particularly with regard to future site planning. These two organizations, however, will have different functions and roles and should remain independent. CROs are not intended to be chartered as Federal Advisory Committees under the Federal Advisory Committee Act.
2. Department of Energy Operations or Area Offices
- a. They will work within their community to establish the local CRO and secure its formal recognition.
 - b. They will assure that policies and guidelines of the Department – for open access, broad community involvement, fairness of opportunity and avoidance of individual and organization conflict of interest – are known and used by the community in both the establishment of the CRO and in formulation of proposals for DOE assistance.
 - c. They will develop a series of general and specific announcements describing the purpose, scope and method of how the public can obtain information about and participate in local economic development planning. These communications should reach a broad segment of the affected community and provide open, timely and complete communications. Information about the Department's economic development program should be communicated in a variety of appropriate formats.

IV. FUNDING AND RESOURCE ALLOCATION FOR ECONOMIC DEVELOPMENT PROJECTS

A. SCOPE

The Department will help mitigate the local economic impacts of its downsizing actions by providing a broad range of resources to support communities' initiatives. Economic development program plans should normally be submitted as part of each site's Work Force Restructuring planning process. However, special consideration should be given to time-sensitive economic opportunities that cannot well be accommodated by this process. To the extent possible, local economic development planning will be integrated with existing economic development efforts and infrastructure.

B. PROCEDURES AND RESPONSIBILITIES

1. The Operations or Area Office will be the lead in developing and administering the Department's economic development program in the impacted community.
2. The DOE Working Group on Economic Development will be responsible for providing economic development recommendations to the Task Force for program support.
3. The Task Force on Worker and Community Transition will be responsible for approving Department support and oversight of its economic development activities.
4. The Operations or Area Offices should work with the CRO to prepare a local economic development program plan. This plan should describe the community's overall approach in offsetting the effects of Departmental actions. It should also include descriptions of specific economic development projects to be accomplished.
5. The Operations or Area Office should submit the CRO's economic development program plan to the Task Force on Worker and Community Transition for approval. Members of the DOE Working Group on Economic Development will review the plan and make appropriate recommendations to the Task Force within thirty days of receipt. The task Force Chair will make final project funding decisions and allocate funds or other authority as appropriate.

6. It is desirable that economic development and funding requests to the Department include an estimate of the intended contribution to specific projects from other entities, both public and private.
7. Awards of funding will be prioritized according to the proposed project's ability to (1) create jobs that will employ dislocated DOE personnel, (2) stimulate local economic growth, (3) promote the commercialization of site-developed technology, and (4) reuse Department facilities compatibly with the site's continuing mission in a manner consistent with environmental requirements.

Funding will be determined on a case-by-case basis for activities such as equipment transfer and facility consolidation. Funding proposals for construction activities, including architectural and engineering design and infrastructure support, will not be encouraged.

8. Performance indicators should be identified cooperatively by the Operations or Area Office and the CRO to measure the effectiveness of supported activities.
9. Financial assistance can be provided in two primary ways:
 - a. Grants. Grants are used by the Department to transfer money (and property) to an eligible recipient where no substantial involvement between the Department and the recipient is expected during performance of the funded activity. The Department may wish to provide grants for each specific project proposal identified for the community or provide a single grant to the CRO, or its designee, with authority to award subgrants for individual projects. In those cases, subgrantees would then have the responsibility to meet the grant requirements. Funds for administering subgrants may be included in the grant award. 10 CFR Part 600, Subpart B, governs the Department's grant procedures and regulations.
 - b. Cooperative Agreements. Cooperative agreements anticipate substantial involvement between the Department and eligible recipients during the performance of the funded activity. Cooperative agreements also provide the Department with

greater administrative control over project implementation. The Department may choose to establish a separate cooperative agreement for each project, or establish a single cooperative agreement with the recipient to award subagreements for individual projects. If the Department sets up a single cooperative agreement with the recipient, the Department may have final approval authority for the subsequent projects initiated under that agreement. In that case, the administration of the individual subagreements will be left to the recipient. 10 CFR Part 600, Subpart C, governs the Department's cooperative agreements regulations.

10. Operations or Area Offices will make the public aware of various other Departmental resources that may support local economic development. They should issue notices describing both Department-wide and site-specific opportunities. They may use a program opportunity notice, a notice of interest, or similar vehicle. This procedure may be open-ended, allowing for the continual generation and submission of project proposals. The activities to be notice include, but are not limited to:
 - a. Cooperative Research and Development Agreements (CRADA) with other institutions to collaborate on a particular research and development program.
 - b. Work for Others Program to provide available facilities and resources for non-Department work; the customer underwrites the full cost of the work performed.
 - c. R&D Consortia that collaborate to achieve a common R&D objective.
 - d. Exchange Programs that permit both government personnel to work in industry facilities and industry personnel to work in government facilities.
 - e. User Facilities Programs that permit others to use government laboratories and facilities.

- f. Licensing to permit the commercialization of government owned intellectual property.

V. USE OF REAL AND RELATED PERSONAL PROPERTY AT DOE FACILITIES

A. SCOPE

The Department may lease or grant permits and easements (the "lease") on its available real and related personal property identified as necessary for economic development.

B. PROCEDURES AND RESPONSIBILITIES

1. The Department may lease directly to:
 - a. Community Reuse Organizations (CROs); and
 - b. any entity recommended by the CRO using the process agreed to by the Department and the CRO for developing prospects for economic development.
2. In general, the order of precedence for use of Department sites is (1) Department of Energy missions not related to economic development; (2) the purposes of economic development; (3) Federal, state and local agency use not related to economic development; and (4) private use not related to economic development. The Operations or Area Office is responsible for resolving conflicting proposed uses of the Department's assets under its jurisdiction.
3. Terms and Conditions of a lease to the CRO or its designee (the "tenant") will include but not be limited to:
 - a. Leases for economic development will specify that, initially, the consideration will be care and custody of the leased premises by the tenant. The lease may provide for payment of full or partial fair market rent by the tenant if it subleases portions of the space. The tenant may charge its subtenants more or less than the rent it owes to the Department. The Operations or Area Office will require the tenant to make available for public record written documentation justifying all decisions to sublease at less than fair rental value.

- b. The tenant will maintain the interior of the premises, the interior of any outbuildings, and all related personal property in "good repair and tenantable condition." Safety concerns and the practical aspects of cost of maintenance will determine whether the Department or the tenant maintains building exteriors. The lease will also specify whether the Department or the tenant will perform the required maintenance, inspections, servicing, record keeping, etc. to comply with applicable laws if certain hazardous materials are present.
- c. Local zoning, appropriate ordinances, and commercial standards will apply, i.e. the tenant will also be required to comply with any rules and regulations that would apply if the tenant were operating on privately-owner land in the community and subject to normal land use regulations. The lease must reference those uses that are restricted under identified Federal, state, or local flood plain and wetland regulations. Leases should also explicitly identify any sacred sites, burial grounds, Native American subsistence areas, archeological resources, historic properties, or other cultural resources that exist on the property, and provide for compliance with laws protecting them.
- d. Where appropriate, application of Department of Energy Orders will be waived to minimize potential conflict between commercial standards and departmental Orders.
- e. The CRO will be given a set of broad criteria developed by the Operations or Area Office. These criteria should take into consideration the priorities listed above and any others developed by DOE Headquarters. The CRO will demonstrate to the Operations or Area Office that its process to select tenants/subtenants meets those criteria, including provisions for fairness of opportunity.
- f. No lease may exceed 10 years, including all available options, without DOE Headquarters approval.

- g. An environmental baseline survey must be prepared and jointly agreed to by the Department and the tenant. The environmental baseline survey results will:
 - (1) document the nature, magnitude, and extent of any environmental contamination of property or interests in property considered for lease;
 - (2) define potential environmental contamination liabilities associated with the lease; and
 - (3) develop sufficient information to assess the health and safety risks – and ensure adequate protection – to human health and to the environment that may be caused by work in the leased premises.
- h. A physical condition report will be jointly issued by the parties entering into the lease agreement prior to occupancy.
- i. An occupational safety and health survey (OSHA baseline survey) should be conducted prior to any change in use of the facility. This survey should examine the proposed new use of the facility and focus on fire protection, ventilation systems, etc. Any restrictions resulting from the survey shall also be contained in subleases.

D.3 Draft EM-60 Facility Acceptance Criteria

1. Definitions

Facility	An entire main building structure and all support structures, out buildings, equipment, tanks, pads, and utility support systems which are dedicated to the main building; soil within a five foot perimeter of the parts. Portions of main building structures are not acceptable to EM-60 as facilities.
Donor Program	The DOE HQ organization which: 1) is providing primary funding for facility operations or 2) has landlord responsibility for the site where the facility is located.
Safe Shutdown State	Conformance to EM-60 acceptance criteria described in Section 2.
Surplus Facility	A facility which has been certified by the donor program to have no further programmatic use. Safe shutdown conditions have been implemented and funded by the donor program.
Orphan Building	A building or portion of a building which has been physically or financially abandoned by the using program or the site landlord program.
Deactivation	The process of transitioning a facility from a safe shutdown to a deactivated storage state.
Deactivated Storage	A safe, stable, minimum mortgage state for a facility awaiting ultimate disposition, typically D&D. The criteria for deactivated storage is normally locked, lights out, quarterly surveillance and acceptance by the EM-40 Program.

Productive Material Inventory	A listing of materials procured and used by the donor program in accomplishing work which have on-going value to the donor program. Productive materials include but are not limited to: 1) raw materials and feed stock, 2) in-process and partially processed or used materials, and 3) completed, stored, archived materials, components, subassemblies, and assemblies, and 5) production and process drawings, records and documentation.
Excess Material Inventory	A listing of former productive materials with no further value to the donor program.
Productive Equipment Inventory	A listing of machinery, tools, fixtures, spare parts, tools, die, masters, shapes, and jigs which have on-going value to the donor program.
Excess Equipment Inventory	A listing of formerly productive equipment with no further value to the donor program.
Liability	The potential to incur a loss of credibility and/or assets as encompassed by all aspects of risk, feasibility, safety, security, finances, and the physical and political environment.
Liability Inventory	A listing of all known, facility specific liabilities and risks including but not limited to: 1) residual hazards such as solid, liquid, and gaseous hazardous materials, and wastes ignition sources, combustibles, energetic and pyrophoric materials and wastes, radioactive and mixed materials and wastes, and special nuclear materials, residues, and wastes, 2) residual classified equipment, materials, or documents, 3) unresolved safety questions, 4) criticality potentials, 5) spill and contamination sites, 6) statutory commitments, 7) financial commitments, 8) open assessment and audit findings and issues, 9) unresolved issues with stakeholders, and 10) pending notices of deficiencies, fines, and penalties.

2. Acceptance Criteria

To be accepted by EM-60, facilities shall first either be brought down to or up to a safe shutdown state per the following criteria:

2.1. Non-EM programmatic use has stopped.

Either productive use of the facility has ceased or a current fiscal year milestone for cessation has been established in the turn-over Memorandum Of Agreement (MOA). Turn-over or the cessation milestone is the trigger for initiating deactivation.

2.2. Future facility programmatic uses have been formally eliminated.

The donor program PSO has certified to EM that it has no known future use for the capability represented by this facility or for the facility itself.

2.3. Productive material and equipment inventories have been removed.

Either the productive material and equipment inventories have been removed or a current fiscal year milestone for removal has been established in the turn-over Memorandum Of Agreement (MOA). If the donor program can not remove the material and equipment during the current fiscal year, it must provide EM-60 with the residual inventory and concomitant out-year funding for storage. If funding is not provided, residual materials and equipment will be treated as excess and dispositioned accordingly.

2.4. The following inventories have been completed: 1.) An excess materials inventory, 2.) an excess equipment inventory, and 3.) a liability inventory

Excess productive equipment and materials as well as liabilities left in the facility at turn over must be inventoried (type, quantity, and location) by the donor program. The inventories are to be appended to the turn-over MOA. Out year donor program funding may be required for disposition of some liabilities.

2.5. Applicable historical records have been inventoried, consolidated and stored for safe keeping.

Historical facility, equipment, and process records which may have value to facility economic development, deactivation, or D&D have been inventoried and consolidated.

Depending on economic development implications, the following may be required before turnover:

2.5. Programmatic waste generation within or movement to the facility has stopped.

After completion of the liability inventory, programmatic waste generation within the facility or movement of wastes to the facility is prohibited.

2.7. Non-EM occupants have been relocated.

The program direct and support work force has been moved out of the facility. The remaining occupants must be essential for surveillance and maintenance of the safe shutdown safety and environmental envelope, or future deactivation activities.

2.8. Non-essential equipment and systems have been de-energized.

Equipment and systems not essential to maintenance of the safety and environmental envelope has been de-energized through established lock-out, tag-out procedures.

2.9. Surveillance and Maintenance (S&M) requirements reduced or brought up to shutdown levels.

Surveillance and maintenance requirements and procedures have either been reduced to or brought up to (orphan building) those essential for the safe shutdown condition. Typically, safe shutdown S&M activities are limited to: maintenance of the facility environmental and safety envelope and monitoring systems, assets protection security, and radiological protection.

3. Exceptions

Exceptions to the ten criteria are possible and will be considered by EM-60 on a case-by-case basis.

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APPENDIX E

INFORMATION SOURCES

E.1 Documents

MOUND/Doc. Cont. #:

1. Surface Characterization (Problem Solving for Industry), EG&G Mound Applied Technologies Business and Industry Day, 11/30/93.
2. EG&G Mound Applied Technologies Flexible Circuit Processing Facility, no date.
3. Mound Metrology Program, EG&G Mound Applied Technologies, no date.
4. Anderson, H.F., DeSando, R. J., Pardieck, W. D., and Woltermann, H. A., Planning Manual to Transition Mound Defense Program Facilities to Alternate Uses, (Draft), MLM-3792, 12/21/93.
5. EG&G Mound Applied Technologies Organization Charts, 1/94.
6. EG&G Visitor Safety Information Handout, 1/93.
7. Audit Number/Audit Description Listing, 2/24/94.
8. Status of the Update of the RSAD Database (Document #1), 2/24/94, and Corrective Action Commitments from Compliance Schedule Approval Requests (CSAs) (Document #2), 11/26/93.
9. Mound Site Environmental Report for Calendar Year 1992, EG&G Mound Applied Technologies, 7/93.
10. Deactivation and Compliance Actions for Labs/Bldgs at Mound, no date.
11. Future Use Plan Mound Plant, 12/21/93.
12. Site-Specific Transition Implementation Plan Milestones (Draft), no date.
13. Transfer of Mound and Pinellas Plants from Defense Programs to Environmental Restoration and Waste Management (with cover note from W. Bixby to Don Pearman), 2/8/94.
14. Comments on Technical Presentations 1/18-19/94 w/cover letter from P. Wagner (Chadds Ford Technologies, Inc.) to P. Marx , 1/24/94.
15. ITR Familiarization Visit, Mound Plant, Agenda, 2/22/94.
16. Dayton Area Office Visitor Assistance Sheets, no date.
17. Environmental Restoration and Waste Management Five-year Plan, FY1994-1995, Installation Summaries, USDOE, #DOE/S-00097P Vol. 2, no date.

18. Production Workload Analysis Letter (w/attachments), G. Morris to D. Eckman, USDOE, 2/24/94.
19. Cover Memo on Documents Requested by the ITR, to D. Weaver, 2/24/94.
20. Mound's New Explosive Component Test Facility, EG&G Mound Applied Technologies, MLM-3579, UC-38.
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65. Building Transition Data - Bldgs. A, C, COS, DS, E, G, and GH, prepared by EG&G Mound, no date.
66. Building Transition Data - Bldgs. GW, GIS, GP1, GP44, H, HH, I, M, OSE, and OSW, prepared by EG&G Mound, no date.
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90. Facility Survey of GH Building at the U. S. Department of Energy Mound Plant for the City of Miamisburg, prepared by Barge Waggoner Sumner and Cannon, 2/28/94.
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93. Report for Phase I Environmental Assessment EG&G Mound Plant Building 105, prepared for the City of Miamisburg by Roy F. Weston, Inc., 1/00/94.
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E.2 Interviews/Meetings

Name:

Abrahamson, S. G.	Mound	Facility Management
Alexander, M. L.	Mound	D&D Program
Allison, J. L.	Mound	Environmental Testing
Anderson, H. F.	Mound	Operations
Armstrong, K. P.	Mound	Explosives Technology
Austin, M. A.	DAO	Health Physics
Bauer, L. R.	Mound	Effluent Permitting
Benner, D. E.	Mound	Environmental Testing
Bernard, R. A.	Mound	Explosives Technology
Bruggeman, T. M.	Mound	Explosives Technology
Buckner, D. A.	Mound	Ceramics
Carleton, J. J.	Mound	Explosives Technology
Cheng, S. C.	DAO	Waste Management
Clark, J. L.	Mound	President
Critz, T. G.	Mound	Physical Metallurgy
Demana, T. A.	Mound	Explosives Technology
DeSando, R. J.	Mound	Batteries
Dickman, P. T.	DOE-AL	Facility Rep.
Dosser, L. R.	Mound	Laser Applications Lab
Draut, C. F.	A-Plus	Deactivation Program
Egleston, E. E.	Mound	Ceramics
Eppley, R. E.	Mound	Isotope Separation Manager
Finney, R. J.	Mound	Waste Management
Firsich, D. W.	Mound	Applied Technologies
Flanagan, T. M.	Mound	Safety Analysis
Gilliat, M. D.	Mound	NEPA
Goss, R.	Mound	Operations
Grauwelman, M.	Mound	Transition Manager
Gregosky, R. J.	Mound	Health Physics
Grice, T. A.	Mound	Nuclear Materials Rep.
Halderman, T. L.	Mound	Nondestructive Testing
Herman, R. C.	Mound	Plant Engineering
Hodapp, A. J.	Mound	Machine Shop
Hudak, R. L.	Mound	Metrology
Johnson, P. L.		Consultant to Mound/ Transition - City Hall
Kirk, E. T.	Mound	Tritium Technology
Kwiatkowski, J. J.	Mound	Joining and Welding
Kramer, D. P.	Mound	Ceramics
Marx, P. J.	Mound	Vice President
Miller, R. G.	Mound	Joining and Welding
Marion-Moss, L. A.	Mound	ES&H

O'Guin, P. E.	DOE-AL	WQL
Ohler, C. K.	Mound	Facilities Management
Pardieck, W. D.	Mound	Operations
Park, W. K.	Mound	Sr. Research Specialist
Peeples, T. D.	Mound	Explosives Technology
Raisor, S. A.	Mound	Facility Management
Robinson, H. A.	Mound	Classification Officer
Rogers, D. R.	Mound	Sr. Science Fellow
Schumacher, R. J.	Mound	Materials Analysis
Scott, C. C.	DOE-HQ	Site and Facility Transfer
Sellers, M. J.	Mound	RCRA Permitting
Sullivan, T. P.	DAO	Facilities Management
Teynor, T.	DOE-HQ	Facility Rep.
Tonne, W. R.	Mound	CAMP/CAS
Wiedenheft, C. J.	Mound	Materials Analysis

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APPENDIX F

INDEPENDENT TECHNICAL REVIEW TEAM MEMBERSHIP AND CREDENTIALS

F.1

Independent Technical Review Team Members

Dr. Philip Thullen, Co-leader Red Team
Doug Weaver, Co-leader Red Team

Members

Marsha Bartlett
Rita Bowser
Jeffrey Bradford
Tim Campbell
Charles Gregg
George Toto
Richard Vallee

Consultants

Steven Barnhart
Narayan Doddapaneni
Richard Huber
Joe Machurek
John Murray
Arthur Nobile
Tommy Simpson
Randy Watkins
David Wilkey

F.2**ITR Member Credentials**

Name: Steven Barnhart

Position: MOUND ITR

Education: 1977, B.S. Chemistry, University of New Mexico
1980, M.S., Analytical Chemistry, U. of Wisconsin, Madison
1983, Ph.D., Analytical Chemistry, U. of Wisconsin, Madison

Affiliation: Sandia National Laboratories

Experience: Dr. Barnhart has been employed by Sandia National Laboratories since 1983. From 1983 to 1985 he was a member of the technical staff of the Explosive Diagnostics and Testing Division. During that time he had responsibility for the development of new diagnostic techniques for use in explosive component testing and the development of a product tester to test and accept a new type of detonator (slapper). From 1986 until 1992 he was a senior member of the technical staff of the Explosive Components Department. He led several component development projects. These include: The detonating components on the Trident II, W88 (Slapper Detonator, Explosive Timer, Slapper Cable and Timer Assembly); the detonating components on the SRAM II, W89 (Slapper Cable, Explosive Timer, Slapper Cable and Timer Assembly); the MC4217 EBW detonator; detonators for several DoD; conventional munition fusing systems such as the Navy's Advanced Bomb Family (ABF), A remote fuel-air explosive (RFAE) system, the Advanced Medium Range Air-to-Air Missile (AMRAAM), and the Programmable Ordnance Technology (PROTEC) system. In addition, he maintained an advanced development research program focused on making measurements on slapper detonator systems to improve understanding of these systems and the ability to model them. From 1993 to the present date he has been on a temporary duty assignment at the US Department of Energy, Washington, DC in the Division of Chemical Sciences within the Office of Basic Energy Sciences, Office of Energy Research. He is a special projects manager responsible for an advanced battery research and development program and certain aspects of both the Strategic Environmental Research & Development Program (SERDP) and the Environmental and Molecular Sciences Laboratory (EMSL) at the Pacific Northwest Laboratory.

Name: Marsha Bartlett

Position: MOUND ITR

Education: Bachelor of Arts, Mathematics, 1977
Arizona State University

Masters of Business Administration, 1986
University of New Mexico

Affiliation: Private Consultant

Experience: Ms. Bartlett currently works as a private consultant specializing in professional groups, small manufacturers, and business start-ups. She was Manager of the Communications and Management Information Systems Departments at an environmental remediation firm from 1991 through 1994. Her business start-up experience includes positions as the Deputy Director of Operations and the Director of Marketing at a research and development firm, and as a Business Analyst for a technology commercialization and business development office at the University of New Mexico.

Name: Rita C. Bowser

Position: MOUND ITR

Education: B.S., Mathematics, Clarion University
M.S., Health Physics, Georgia Institute of Technology

Affiliation: VECTRA (formerly Pacific Nuclear)

Experience: Ms. Bowser is the Director of Decommissioning Services for VECTRA. Her responsibilities include impact assessment of permanent spent fuel disposal on plants facing decommissioning. She also serves as the Project Manager for the Mescalero Apache MRS technical effort. Prior to joining Pacific Nuclear in 1992, Ms. Bowser worked at the Rancho Seco Nuclear Generating Station for 12 years. She served on the NUMARC Decommissioning Taskforce, and represented the utility during NRC presentations on licensing issues during plant operations and Decommissioning. Ms. Bowser served as a utility public affairs spokesperson working with the media as well as the internal plant staff. Prior to these assignments, she supervised radiochemistry, secondary chemistry, and health physics personnel. Ms. Bowser was responsible for the technical and supervisory programs to minimize radiation exposure during the tenure when the group received an INPO Good Practice for ALARA Job Planning. She organized a Chabot College branch campus work/study program for radiation technologists at Rancho Seco and continues to serve on the Curriculum Advisory Committee.

Name: Jeffrey D. Bradford

Position: MOUND ITR

Education: MS Chemical Engineering, University of Idaho, 1988
BS Chemical Engineering, Montana State University, 1983

Affiliation: SCIENTECH, Inc.

Experience: Mr. Bradford has been with SCIENTECH since 1993 as the Environmental Group Manager responsible for environmental restoration, waste management, and ES&H support to various DOE facilities. Prior to joining SCIENTECH Mr. Bradford held a number of technical and supervisory positions with EG&G Idaho, Inc. at the Idaho National Engineering Laboratory over the past ten years. From 1992 to 1993 he was the manager of ES&H activities for the 1500 person Facilities and Maintenance Department. From 1991 to 1992 he was the manager of a 200 person maintenance organization providing maintenance and operations support to INEL landlord, waste management, and reactor programs at the INEL. From 1989 to 1991 he was the manager of waste management operations at the INEL responsible for all low level radioactive waste treatment, mixed and hazardous waste treatment and storage and disposal, and sanitary and industrial waste collection and disposal. From 1985 to 1989 he was the manager of the DOE Defense Low Level Waste Management Program providing policy development, technology development and technical support to DOE-HQ. Mr. Bradford has been responsible for the activities of over 200 engineers, scientists, and hourly personnel with annual budgets of \$20M.

Name: Timothy Campbell

Position: MOUND ITR

Education: B.S., Environmental Health, Old Dominion University, 1975
Master of Public Health, University of Tennessee, 1976

Affiliation: WASTREN, Inc.

Experience: Mr. Campbell has been employed by WASTREN since 1989. Mr. Campbell provides management and consultation to occupational and environmental health and safety programs for the Federal Government and government operating contractors. Currently he is providing support to Operational Readiness Reviews (ORRs) for the disposal of low-level waste, shipment of transuranic waste, the operation of vitrification facilities, deactivation of former DOE weapons facilities, authoring safety analysis reports and advising waste stream characterization at the Rocky Flats Plant. Mr. Campbell has over 18 years of experience in nuclear plant safety and environmental protection.

Prior to joining WASTREN, Mr. Campbell was employed by the Westinghouse Electric Corporation as the Manager of Environmental Safety and Health at the Waste Isolation Pilot Project and by EG&G Idaho as the Operational Safety Manager at the Idaho National Engineering Laboratory. In these positions Mr. Campbell managed staff and budgets for criticality safety, health physics, industrial safety, industrial hygiene, fire protection, environmental protection, emergency preparedness, safety analysis, and regulatory compliance. Mr. Campbell has extensive experience with regulatory interface and permitting.

Name: Narayan Doddapaneni

Position: MOUND ITR

Education: Ph.D., Case Western Reserve University, Cleveland, 1972

Affiliation: Sandia National Laboratories (SNL)

Experience: Dr. Doddapaneni has been employed by Sandia National Laboratories since 1990. As a member of the technical staff, he initiated research work in fuel cells, and aqueous and non-aqueous batteries and directs battery work for the United States Air Force, Kirtland AFB. He is a member of both Red Team and Technical Advisory Committee of the United States Advanced Battery Consortium (USABC). He directs and monitors battery work being conducted at national laboratories and battery developers. He is also a member of the 2200 Center Strategic Planning Team.

Prior to joining Sandia, Dr. Doddapaneni was employed first at Gould Inc., Rolling Meadows, IL and then at Honeywell Inc., Horsham, PA. At both places he conducted and directed research in aqueous and non-aqueous power sources. He is a member of the Electrochemical Society and a Fellow of the American Institute of Chemists. He has published more than 30 scientific papers and was awarded 12 United States' patents.

Name: Charles T. Gregg

Position: MOUND ITR

Education: B.S., Physics, MS and Ph.D., Chemistry

Affiliation: B. I. Scientific Services (a Division of Bethco, Inc.)

Experience: Chuck Gregg was employed by the Los Alamos National Laboratory (LANL) from 1963 to 1985 except for 15 months when he was a visiting professor at the Free University of Berlin. From 1985 to 1990, he was Scientific Director of Mesa Diagnostics and later Vice President for Research at Los Alamos Diagnostics. In 1990, he reorganized Bethco, Inc. and is President of that firm. In 1992, he started Innovative Surgical Technology, Inc. and remains as its President. He is a member of honor societies in physics, chemistry, and research. He is a Fellow of the American Association for the Advancement of Science and was elected to the Society for Biochemistry and Molecular Biology. In 1985, he was given a Distinguished Performance Award by LANL for his role in bringing \$8 million of venture capital money into the Laboratory. He currently holds five patents. Gregg was elected to the Board of Directors of Likens Medical Corp. in 1993. He is an author of some 40 scientific papers and book chapters.

Name: Richard Huber

Position: MOUND ITR

Education: BS Chem., Michigan State University
MS Met. Eng., Rensselaer Polytechnic Institute

Affiliation: Retired 1992 from Oak Ridge Y-12 Plant (MMES)

Experience: Mr. Huber was employed at the Oak Ridge Y-12 Plant from 1959 until his retirement in July 1992. During that time he worked almost exclusively on metallurgical joining welding in the Development and Assembly Divisions at the Y-12 Plant. During 1960 he was assigned for one year in Program Management and in 1968 was promoted to Group Leader in the Development Division Process Metallurgy Section. In the early 1960's, he was responsible for the introduction of electron beam welding in the plant, first in Development and then in Production. In 1972 he became supervisor of the Assembly Division Metallurgical Joining Section where he was responsible for production welding support and supervised two to four engineers, two welding specialists and a secretary. In 1986, the Development and Assembly Welding Groups were combined under Mr. Huber's leadership. The Group (8 engineers, 3 technicians and one secretary) was responsible for the Operation of the Development Welding Laboratory in addition to production support. Major projects included the development of electron beam welding procedures and technicians for nuclear weapon components, the development of inertial welding techniques for the joining of dissimilar metals, establishing methods for vacuum brazing special components and the development of adaptive control for cold wire fed gas tungsten arc welding. In 1979, Mr. Huber was elected District #8 Director of the American Welding Society, became a Vice President in 1987 and was AWS National President in 1990-1991. He continues to serve on several AWS Committees although he is no longer a member of the Board of Directors.

Name: Joseph E. Machurek

Position: MOUND ITR

Education: B.S., Chemistry, City College of New York, 1948;
Two years graduate study (chemistry), Brooklyn College
Graduate School; Two years study, Business Administra-
tion, Alexander Hamilton Institute; Two years study,
Business Law and Procedure, Alexander Hamilton
Institute

Affiliation: The Machurek Group

Experience: Mr. Machurek served for over 20 years at AEC/ORO and AEC
Washington Headquarters as Chief, Isotope Production and
Distribution Branch and Assistant Director for Program
Planning and Commercial Development, Division of
Isotopes Development, exercising Agency-wide management
oversight of medical, industrial and research radioisotopes
production and distribution, development and
implementation of related production facilities and design
and implementation of production, distribution and
commercialization policies. Subsequently, he served in the
Senior Executive Service as Executive Director, Office of
Assistant Administrator for Solar, Geothermal and
Advanced Energy Systems (ERDA), Deputy Assistant
Secretary (Acting), Office of Conservation and Solar
Applications (DOE) and completed his Federal career as
Deputy Director, Office of Field Operations Management
(DOE). Mr. Machurek was a U.S. Delegate to the
International Conferences on Applications of Large Radiation
Sources in Industry in Warsaw, Poland and Salzburg, Austria
and also was a U.S. Delegate to the Third United Nations
International Conference on Peaceful Uses of Atomic Energy,
Geneva, Switzerland. He is a member of the American
Nuclear Society and the American Association for the
Advancement of Science. Currently, he operates his own
consulting business.

Name: John Murray

Position: MOUND ITR

Education: B.S., Metallurgical Engineering Technology, University of Southern Colorado, 1979.

Affiliation: Sandia National Laboratories (SNL)

Experience: My work experience encompasses some 20 years in the welding, metal fabrication and non-destructive inspection. This included production welding, process control, welder and welding procedure qualification, and teaching welding. I have worked in the Nondestructive Inspection Laboratories at Sandia National Laboratories since 1981, primarily as an industrial radiographer, and hold current American Society for Nondestructive Testing (ASNT) Level III Certifications in Radiographic Testing (RT), Neutron Radiographic Testing (NRT), Liquid Penetrant Testing (PT) and Leak Testing (LT).

Name: Arthur Nobile

Position: MOUND ITR

Education: Ph.D. Chemical Engineering, University of South Carolina, 1986

Affiliation: Los Alamos National Laboratory

Experience: Art Nobile has been employed by Los Alamos National Laboratory (LANL) since January 1993. He is responsible for management of R&D and operations activities in the Tritium Science and Fabrication Facility (TSFF) at LANL. In this capacity, he is responsible for execution of weapons and fusion energy tritium R&D programs, and operation of the TSFF in accordance with DOE nuclear facility orders and requirements. His R&D interests are in the areas of metal hydrides, tritium processing technology, chemical process modeling, and chemical reaction engineering. From 1986 to 1992, Art Nobile was employed at Savannah River Site. While there he worked on the development of process technology to support the design and construction of a new \$400 million tritium facility. In the area of tritium technology, he has published seven papers in reviewed technical journals. He has also published five papers in the area of reaction engineering, catalysis, and process modeling.

Name: Tommy M. Simpson

Position: MOUND ITR

Education: A.S. Mechanical Engineering
SNL, TIE

Affiliation: Sandia National Laboratories

Experience: Mr. Simpson has been employed by Sandia National Laboratories since 1964. He is presently Manager of a Mechanical Processing Department in the Manufacturing Technologies Center. His responsibilities include the supervision of a wide range of mechanical processing areas and a variety of machining operations. He is responsible for the activities of over 70 people, several large facilities, and several million dollars worth of complex mechanical processing equipment. Tom has served on several Technical Safety Appraisals and served as a counterpart for the DOE Tiger Team. During his time at Sandia he has been involved in almost all areas of manufacturing, not only from the technical view point but also from safety and environmental considerations.

Name: Philip Thullen

Position: MOUND ITR (Red Team Co-leader)

Education: B.S., Mechanical Engineering, Purdue University, 1965
M.S., Mechanical Engineering, MIT, 1967
Sc.D., MIT, 1969

Affiliation: Los Alamos National Laboratory (LANL), N-DO/RT

Experience: From 1969 through 1976, prior to joining the Los Alamos National Laboratory, Dr. Thullen was Associate Professor of Mechanical Engineering at MIT. He was a member of the Thermal and Fluid Sciences Division performing research on the application of superconductors to electrical power equipment, and teaching classical thermodynamics; cryogenic engineering and related subjects. Since 1976 he has been at Los Alamos where he has been a staff member, Deputy Group Leader and Program Manager working principally in energy related fields. He continued to work on engineering applications of superconductivity and the design of electromagnetic systems for plasma fusion applications. From 1985 to 1991 he was the Program Manager for Construction of the Confinement Physics Research Facility (CPRF), an \$80M, seven year construction project employing 70 FTEs. This experience has given Dr. Thullen a depth of experience in both applied research and in the organization and management of R&D facility construction. From January to June 1991 he was a member of the Los Alamos New Production Reactor, Safety Project Office working in the area of system integration. Since June 1991 he has been the Los Alamos Program Manager for Red Team Reviews and Hanford Support. His principle activity is management of Independent Technical Reviews for DOE-EM.

Name: George Toto

Position: MOUND ITR

Education: B.S., Electrical Engineering and Special Studies, Mechanical Engineering, University of Pennsylvania, 1953
Various Advance Studies at University of Pittsburgh, Pennsylvania State University and Westinghouse Graduate Schools.
P.E., Ohio
P.E., Pennsylvania
P.E., Tennessee

Affiliation: Principal and Head of Inglewood Group Inc.

Experience: Mr. Toto has 41 years of quality performance and achievement in management, engineering including analysis, design, licensing, construction, decontaminating and decommissioning, testing, start up, operation, maintenance, quality assurance, training, technical sales, marketing and project program management of complex facilities. He has directed the design of mechanical, fluid, and electrical systems and components for plant operation, maintenance, and decontamination and decommissioning. Mr. Toto has provided his special skills in turning around troubled facilities and poor management performance at several nuclear facilities. He improved field tooling, operations, and procedures, personnel qualification and job execution for Westinghouse Nuclear Services.

Mr. Toto has most recently been a senior consultant to the Department of Energy (DOE) in matters of operations and training D&D. He has published case studies and programs for teaching Management, Operations, Maintenance and support elements in performing in a safe, efficient and cost effective manner, and is a leader in implementing formality in operations including RCRA and CERCLA programs for waste and site remedial actions.

Name: Richard Vallee

Position: MOUND ITR

Education: BS Chemistry, University of Cincinnati, 1951
MS Chemistry, University of Cincinnati, 1952
Ph.D. Chemistry, University of Cincinnati, 1962

Affiliation: Consultant

Experience: Dr. Vallee was employed by Monsanto and later EG&G at the Mound facility from 1952 through 1992. During that time he held a number of technical, supervisory, and management positions. His initial duties as a research chemist were to help develop substitutes for the Po-210 initiator for use in nuclear weapons at that time. Subsequent technical experience was in isotope separation and in tritium systems. As a supervisor he was responsible for weapon component development. Management responsibilities included Pu-238 fuel form development & production, nuclear safeguards R&D, material science studies, and isotopes separation and sales. He served as Director for nuclear operations for Mound from 1985 to 1986, as Director for development and production of weapon components from 1986 to 1988 and as Associate General Manager for Mound from 1988 to 1992. As Associate General he was responsible for nuclear operations, weapon component development and production, and for plant engineering. The latter function was responsible for the plant D&D operations. He currently serves on a Technical Advisory Board at the Kennedy Space Center and manages two partnerships which he started in the 1980's.

Name: Randall D. Watkins

Position: MOUND ITR

Education: M.S. Ceramic Engineering, Ohio State University

Affiliation: Sandia National Laboratories (SNL)

Experience: Randy Watkins is a senior member of technical staff in the Environmentally Conscious Life Cycle Systems Department, Sandia National Laboratories, Albuquerque, New Mexico. He joined Sandia in 1983 with BS and MS degrees in ceramic engineering from the Ohio State University. Prior to 1991, he was a member of Sandia's Ceramics and Glass Processing Department. There, he conducted research on glass-ceramic and glass/metal interfacial chemistry and bonding, and developed several glasses for hermetic packaging of Sandia-designed components, such as explosive actuators and ambient temperature lithium batteries. During this period, Randy authored eight technical publications and received four patents in the area of glass science. Since 1991, Randy has been a member of Sandia's Environmental Program. His current efforts aim to implement environmental life cycle analysis (LCA) principles into the DOE design and manufacturing community. Special emphasis is placed on the development of an environmental impact analysis methodology to support LCA. Randy is project manager of ECM Design, a project that has developed EcoSys™, a knowledge-based decision tool to support a life cycle approach to concurrent engineering. ECM Design is supported under DP's Integrated Manufacturing and Design Initiative, IMDI. Randy has authored four technical papers in the areas of environmentally conscious manufacturing and life cycle analysis.

Name: Douglas Weaver

Position: MOUND ITR (Red Team Co-leader)

Education: BSET, DeVry Technical Institute, 1966

Affiliation: Sandia National Laboratories (SNL)

Experience: Mr. Weaver has twenty-four years experience in management and operation of complex manufacturing facilities. He is presently supporting a DOE Environmental Restoration and Waste Management Program need for Independent Technical Reviews (ITR) of programs and projects.

Mr. Weaver led the DOE Office of Facility Transition, EM-60, chartered to recommend a new, integrated path forward for the Rocky Flats Plant. He led a similar Red Team review of the Oak Ridge National Laboratory Isotopes Facilities Shutdown Program. The comprehensive assessment and recommendations of both review teams were endorsed by DOE EM-60 and adopted by the DOE field offices. He played a key role in reviews of the Hanford Waste Vitrification Plant, the Savannah River Defense Waste Processing Facility, the Hanford tank waste operations, and the Hanford PUREX deactivation project. He recently led a Sandia ITR of its environmental restoration project. He has also provided planning, management, and operations consulting support to EM-60, DP-20, and several DOE field and area offices.

In previous assignments at Sandia, Mr. Weaver managed the Microelectronics Component Development program, including technology and process development, conduct-of-operations and maintenance, statutory compliance, manufacturing, DoD and industrial microchip development projects, and advanced microelectronics packaging development. He was also responsible for developing microelectronics technology and process clean room and facility concepts for a 176,000 sq. ft., \$67M microchip manufacturing facility. He has managed the activities of over 100 Ph.D., M.S., and B.S. engineers, technicians, and hourly personnel with an annual budget of \$15M.

Name: David Wilkey

Position: MOUND ITR

Education: BS, Chemistry, University of Kansas, 1963
Ph.D., Chemistry, University of Wisconsin, 1968
MBA, University of Illinois, Chicago, 1983

Affiliation: Los Alamos National Laboratory (LANL)

Experience: Dr. Wilkey has been employed at LANL since 1992, and has worked in both Operational Safeguards (OS-Division) and Safeguards Systems (NIS-Division). His prior experience includes 13 years working in safeguards and security with DOE and LANL. From 1989 to 1992 he served as MC&A Branch Chief for the DOE-Idaho field office. In this capacity he was responsible for oversight of contractor's nuclear material safeguards for the Idaho National Engineering Laboratory (INEL). He is currently a Technical Staff member in the Safeguards Systems Group. His primary responsibilities are providing technical support in the area of nuclear material control and accountability (MC&A) to DOE-HQ and DOE field offices, and assisting in the design of safeguards and security systems for proposed weapons complex reconfiguration (WCR) facilities.

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APPENDIX G

LIST OF ACRONYMS

ABF	Advanced Bomb Family
ADA	Arming Device Assembly
AEA	Atomic Energy Act
ALARA	As Low As Reasonably Achievable
AMRAAM	Advanced Medium Range Air-to-Air Missile
APE	Ammunition Peculiar Equipment
ASNT	American Society for Nondestructive Testing
AWS	American Welding Society
BVA	Buried Valley Aquifer
CBD	Commerce Business Daily
CECE	Combined Electrolysis Catalytic Exchange
CERCLA	Comprehensive Environmental Assessment and Response Program
COM	Computer Output Microfiche
CPRF	Confinement Physics Research Facility
CRADA	Cooperative Research and Development Agreements
CRD	Confidential Restricted Data
CRO	Community Reuse Organization
DAO	Dayton Area Office
D&D	Decontamination and Decommissioning
DOD	Department of Defense
DOE	Department of Energy
DOE-AL	Department of Energy - Albuquerque Operations Office
DOT	Department of Transportation
DP	Defense Program
ECS	Effluent Cleanup System
ECTF	Explosive Component Test Facility
EM	Environmental Management
EMSL	Environmental and Molecular Sciences Laboratory
EPA	Environmental Protection Agency
ER	Environmental Restoration
ERDA	Energy Research and Development Administration
ERS	Effluent Removal System
ES&H	Environment, Safety and Health
FFCA	Federal Facility Compliance Agreement
GSA	Government Services Administration
HISS	Hydrogen Isotope Separation System
HVAC	Heating, Ventilation, and Air Conditioning
IMDI	Integrated Manufacturing & Design Initiative
INEL	Idaho National Engineering Laboratory

ITR	Independent Technical Review
KLF	Kyle Loading Facility
LANL	Los Alamos National Laboratory
LCA	Life Cycle Analysis
LLW	Low Level Waste
LSA	Low Specific Activity
LT	Leak Testing
MB	Miamisburg Area Office
M&O	Manage and Operate
MC&A	Material Control and Accountability
MCE	Maximum Credible Event
MDF	Mild Detonating Fuze
MMES	Martin Marietta Energy Systems
MOA	Memorandum of Agreement
NDA	Nondestructive Analysis
NDE	Nondestructive Evaluation
NDT	Nondestructive Test
NE	Nuclear Energy
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
NRT	Neutron Radiographic Testing
NTS	Nevada Test Site
NVO	Nevada Operations Office
OH	Ohio Field Office
ORNL	Oak Ridge National Laboratory
ORR	Operational Readiness Review
OSHA	Occupational Safety and Health Act
OSR	Operational Safety Report
OU	Operable Units
PCB	Polychlorinated Biphenyl
PROTEC	Programmable Ordnance Technology
PSO	Program Senior Officials
PT	Liquid Penetrant Testing
PUREX	Plutonium Uranium Extraction
PVT	Pressure, Volume, Temperature
QA	Quality Assurance
QC	Quality Control
R&D	Research and Development
RCM	Radition Control Manual
RCRA	Resource Conservation and Recovery Act
RFAE	Remote Fuel-Air Explosive
RFP	Request for Proposal
RTG	Radioisotope Thermoelectric Generator
SAR	Safety Analysis Report
SERDP	Strategic Environmental Research & Development Program

SNL	Sandia National Laboratories
SNM	Special Nuclear Materials
SRP	Savannah River Plant
SRS	Savannah River Site
SSAB	Site Specific Advisory Board
TAWRS	Tritium Aqueous Waste Recovery System
TERF	Tritium Emissions Reduction Facility
TRU	Transuranic
TSFF	Tritium Science and Fabrication Facility
USABC	United States of Advanced Battery Consortium
USQ	Unreviewed Safety Questions
VOC	Volatile Organic Compound
WAD	Work Authorization Document
WCR	Weapons Complex Reconfiguration
WFO	Work for Others
WR	War Reserve

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