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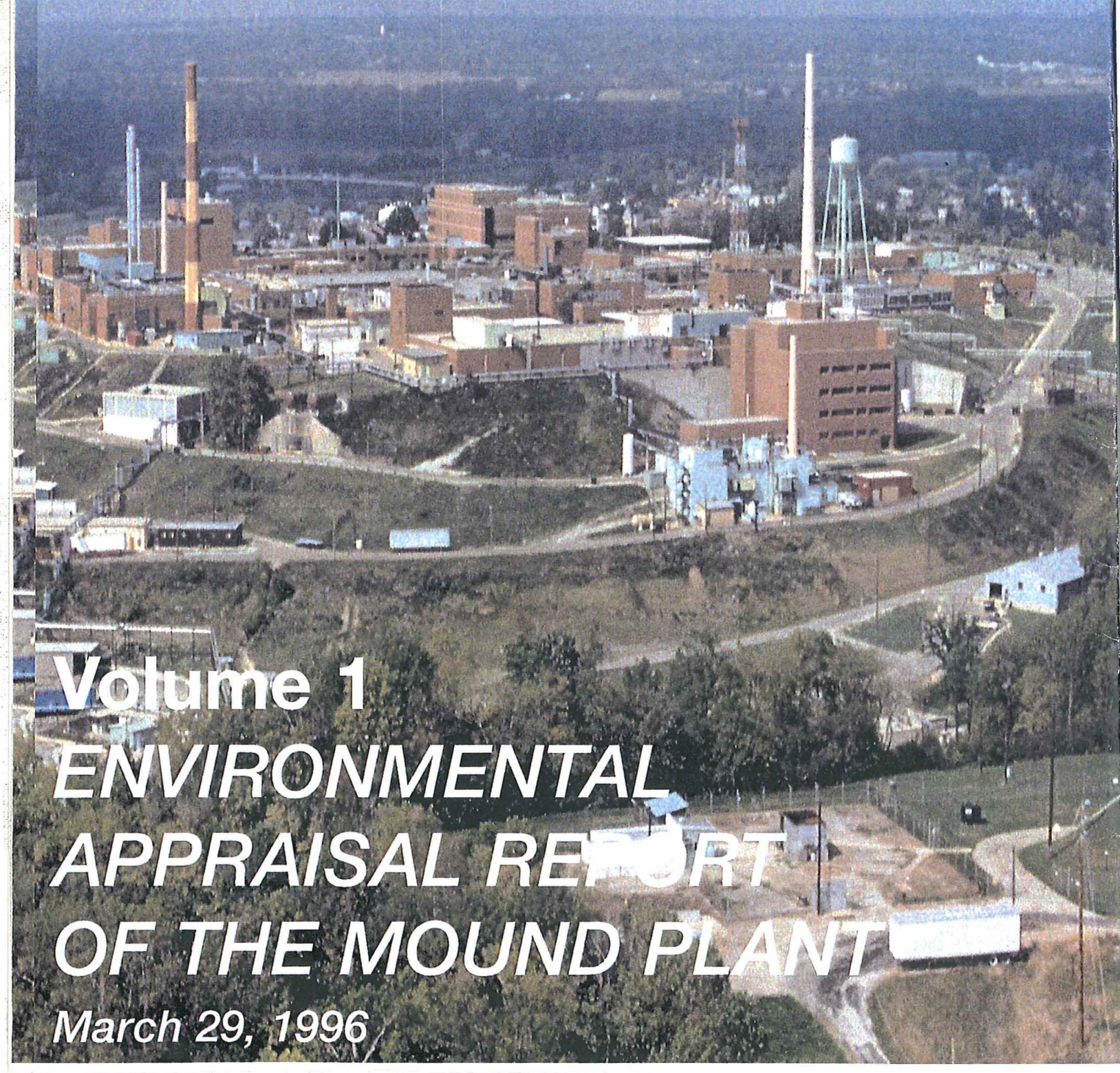

Volume 1
ENVIRONMENTAL APPRAISAL REPORT OF THE MOUND PLANT

March 29, 1996

MLM-ML-96-43-0001

ENVIRONMENTAL APPRAISAL REPORT OF THE MOUND PLANT

Volume 1

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Environmental Appraisal of the Mound Plant

Report Layout

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Environmental Appraisal Report of Mound Plant

1.0 EXECUTIVE SUMMARY

From late 1995 through March 1996, EG&G Mound Applied Technologies (EG&G MAT) performed a focused management-directed self-appraisal of the environmental conditions at the Mound Plant. This effort is part of the company's continuous improvement initiatives. It is EG&G MAT's desire to provide the Department of Energy (DOE) with an updated site evaluation to facilitate site regulatory compliance and establish an environmental baseline to facilitate transition to a new operating contractor at the termination of EG&G MAT's contract.

EG&G MAT reviewed 132 buildings. The appraisal was not conducted for 33 buildings which were leased or sold to third parties by DOE or which were actively undergoing decontamination and decommissioning (D&D). Building information was obtained from reviews of records and reference material, and from personal interviews with building and process managers and key environmental compliance staff. Buildings and process activities were assessed for compliance with applicable federal and state laws and regulations, DOE orders, and conformance with best management practices. Certain findings were common across the site and were defined as sitewide issues and are addressed in Volume 1 of this report. A report on each building appraised, including an Environmental Appraisal Checklist (EAC) and a Building Manager's Questionnaire (BMQ) is contained in Volumes 2 through 11. Findings are presented by function or media: general findings; air; wastewater; potable water and service water; chemical storage and hazardous materials; solid, hazardous, and radioactive wastes; and waste minimization and pollution prevention.

These appraisals were completed by an Integrated Environmental Management Program (IEMP) Project team which consisted of EG&G MAT, DOE/MB and independent environmental experts. A formal documented protocol was followed. The sequence of the project began with the assembly of available reference information for such buildings. This information was assembled into a BMQ specifically for each building. The appropriate building manager reviewed this document and supplied/corrected data as required. A physical inspection of the building was completed by project team members who were normally escorted by the building manager and/or the process owner. A debriefing of observations was completed and any findings/observations which were not corrected within 72 hours were documented in the individual reports. The sitewide issues were then derived from a consensus of the individual project team members.

This appraisal provides an overview of the status of the environmental compliance at the Mound Plant at a fixed point in time and for the activities which were reviewed. It is important to note that a significant portion of the site and several environmental programs were outside of the scope of this effort. The appraisal was not conducted for 33 buildings which have been leased or sold by DOE to third parties; for the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) program activities and management systems; for Resource Conservation and Recovery Act (RCRA) site treatment facilities including the landfill and the burn area; for some low specific activity (LSA) waste storage facilities; for the underground storage tank (UST) management program; and for groundwater contamination identification and treatment activities. In order to determine the environmental compliance status of the entire site, appraisal of these programs is required.

EG&G MAT's building managers and process owners contributed substantially to the ability of the appraisal teams to complete the environmental appraisal effectively in an extremely short period of time. A number of environmental issues identified in individual building reports which could be resolved by building managers or process owners are already being addressed. Management and culture issues, which pervade in all environmental media areas, will require the development of a more comprehensive plan to achieve and maintain compliance. The team believes that management needs to both communicate more proactively and reinforce environmental policy objectives through all levels of the organization, and generate greater rigor in operations through more formal management systems.

As part of this project, a database has been designed for use as a management tool for tracking corrective actions. All site and building findings and recommendations have been loaded into the database. A sorted printout of this database is being provided to management as part of this report.

There are 48 sitewide issues and 360 building findings and recommendations which will require evaluation and additional resources to achieve full compliance with regulatory requirements. However, it is the opinion of the team that a generally responsible environmental regulatory management program exists. The team noted that EG&G MAT has achieved notable success in maintaining positive relationships with the City of Miamisburg, the State of Ohio, and the U.S. Environmental Protection Agency.

2.0 SCOPE OF REPORT

EG&G Mound Applied Technologies (EG&G MAT) is the managing and operating contractor for the Department of Energy (DOE) Mound Plant. In November of 1995 through March of 1996, EG&G MAT performed a focused, management-directed review of the environmental conditions at the Mound Plant as part of the company's continuous improvement initiatives. A report of onsite conditions including findings and continuous improvement actions was submitted to DOE to provide the agency with an updated site evaluation to facilitate transition to a new operating contractor at the termination of EG&G MAT's contract.

EG&G MAT reviewed 132 buildings on the 306-acre Mound site. Information was also obtained from reviews of records and reference materials, and from personal interviews. Findings have been documented in a report, with one report generated for each building reviewed. A summary of generalized sitewide findings and recommendations was also developed.

The appraisal was conducted to evaluate operations to assure that best management practices were in place and to initiate continuous improvements related to the following federal environmental regulations and comparable State of Ohio requirements:

- Clean Air Act (CAA)
- Safe Drinking Water Act (SDWA)
- Clean Water Act (CWA)
- SARA Title III (Community Right to Know)
- Resource Conservation and Recovery Act (RCRA)
- Toxic Substances Control Act (TSCA)
- Bio-Medical Waste Management
- Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)
- Executive Order 12088 on Pollution Prevention

The appraisal did not include any sampling or analysis. Regulations governing underground storage tanks (UST's) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) were not included in this appraisal. A review of the location and condition of underground storage tanks was completed in 1994. The CERCLA program management systems and site facilities including the site landfill, the site burn area, and groundwater contamination identification and treatment, were under the scrutiny of an independent contractor, Rust Geotech, Inc.

The appraisal did not include a review of health and safety issues, unless an operation or the action of an employee could cause a condition Immediately Dangerous to Life and Health or unless the operation or action could cause an immediate environmental hazard, such as an accidental release.

The Occupational Safety and Health Administration (OSHA) requirements that were considered in the appraisal were those regulations, standards, management controls, and work practices related to hazardous chemicals that could have an impact on the environment and/or human

health or could be a source of contamination. One example of this is 29 CFR 1910.1200, the Hazard Communication Standard which requires labeling of chemicals and piping, necessary for an environmental management program. Items referenced in this standard are included in the Environmental Appraisal Checklists (EAC's) under Hazardous Materials. An EAC is found as an attachment to most of the building reports.

The appraisal was not conducted for all buildings at the Mound Plant. Thirty-three buildings which have been leased or sold by DOE to third parties, or which are being actively decontaminated and decommissioned (D&D) were reviewed but not appraised. These buildings include: Buildings COS, SM, 3, 14, 16, 17, 21, 26, 27, 28, 49, 60, 63-E/63-W, 65, 66, 69, 70, 90, 92, 96, 100, 104, 105, 106, and Magazines 7, 11, 52, 64, 80, 81, 82, 83, and 84.

Recommendations and suggestions for areas of improvement were made by the environmental appraisal team as buildings were inspected. A detailed corrective action plan and schedule will be developed. EG&G MAT will address active environmental and waste management issues which can be completed by the termination of EG&G MAT's contract. The company will also perform initial scoping for actions necessary to address issues which cannot be completed by the termination of EG&G MAT's contract. A database was developed to assist in tracking findings.

This appraisal was conducted, and this report was prepared, in general accordance with the accepted standard of care for environmental appraisals existing at the time the investigation was performed. Some general practices and standards were modified to reflect the specific needs of the Mound Plant at the direction of EG&G MAT management. The findings and conclusions of this report are based on professional judgment concerning the significance of the limited data gathered during the appraisal and should not be considered scientific certainties. It should not be construed that this report, or any follow-on actions derived from observations or recommendations made herein, will certify that the facility is in complete compliance with all environmental regulations.

3.0 HISTORY OF THE MOUND PLANT

The Mound Plant is a 306-acre technology resource center located within the city limits of Miamisburg, Ohio, 10 miles south, southwest of Dayton, Ohio, and 45 miles north of Cincinnati, Ohio. The exact location is 39°37'42"N and 84°17'15"W, and is shown on the Site Location Map included as Exhibit 1 (Section 8.1). The location of the individual buildings is shown in Exhibit 2, Building Location Map (Section 8.2). The facility is government-owned and contractor-operated. The facility was operated by Monsanto Research Corporation from 1946 until 1988, when EG&G Mound Applied Technologies (EG&G MAT) became the management contractor. A progression of federal agencies administered the program at Mound: the Atomic Energy Commission (AEC) from 1946 to 1975, the Energy Research and Development Administration (ERDA) from 1975 to 1977, and the Department of Energy (DOE) from 1977 to present. The history of Mound is provided in the report, "*Operable Unit 9, Site Scoping Report: Volume 7-Waste Management Mound Plant*, (9-92).

Established in 1946 as a research facility in support of the Manhattan Project, the facility's mission has been integrated research, development, and production activities in support of weapons and energy programs, with an emphasis on explosives and nuclear technologies.

Early Mound programs investigated the chemical and metallurgical properties of polonium-210 and its applications, including the fabrication of neutron and alpha sources for weapons and non-weapons use. Mound also developed and patented radioisotopic thermoelectric generators (RTG's) in the early 1950s. These units have been used on a variety of space missions including several lunar missions, weather satellites, navigational satellites, and deep space missions such as Voyager I and II. The most recent missions for use of radioisotopic thermoelectric generators have been Galileo, which is studying the planet Jupiter, and Ulysses, which is looking at the polar regions of the Sun. RTG's are currently being developed for the Cassini mission in 1997, where the planet Saturn will be examined. The units provide heat and electrical power for the spacecrafts.

In 1957, Mound was assigned a new mission to develop, produce, and provide surveillance of detonators for military applications. Development of explosive timers in 1959 led to their manufacture at the plant starting in 1963. The development and manufacture of ferroelectrical transducers and firing sets components that control initiation of detonators began at Mound in 1962.

The first of several programs requiring tritium-handling technology was initiated at Mound in the mid-1950s. The plant has extensive capabilities for handling and studying tritium and tritium compounds for weapon and non-weapon applications. Plant facilities exist for the recovery and purification of tritium from all types of wastes generated at Mound.

In the early 1970s, as national concerns about the environment and the conservation of resources mounted, Mound expanded its programs in environmental monitoring and waste management, as well as continuing work on detonator surveillance, energy-related activities, separation,

purification, and worldwide sales of noble gas isotopes, the development of measurement technologies for nuclear materials, and RTG fabrication and testing.

Mound has been involved in the decontamination and decommissioning (D&D) of facilities, completing the dismantling of Building SM, a former plutonium-238 handling facility, during 1994. In 1989, Mound was named to the Environmental Protection Agency's (EPA's) National Priorities List. Mound was placed on the list following EPA's evaluation of the site, noting the necessity of cleanup of volatile organic compounds around the site and the contamination of the Miami-Erie Canal, due to the settling of plutonium-238 in the canal bed following a 1969 waste transfer line break. The spill was originally contained on the plant site, but was washed off the site due to unexpected heavy January rains. The material was washed into the canal through natural drainage and then adhered to clay particles in the bed of the canal. The canal is located on City of Miamisburg property, part of which is a city park. The Agency for Toxic Substances and Disease Registry also indicated in 1994 that there was no health risk to area residents by the plutonium-238 in the canal in its current state. Plans are in place to bring the site to established standards by 2005. In 1991 DOE announced plans to reconfigure the Nuclear Weapons Complex and called for an end to production work at the Mound Plant by 1995.

4.0 CURRENT STATUS OF THE MOUND PLANT

Mound is one of the most technologically sophisticated government facilities, largely due to its role in nuclear weapons development and production. With the reduction of weapons production activities in the United States, Mound's mission has changed. Mound's focus is now on leveraging its legacy of advanced technology for other applications of critical importance, including:

- chemistry;
- ceramics and glass ceramics;
- physics;
- energetic materials applications;
- metal hydrides;
- destructive, environmental, and non-destructive testing;
- flexible circuits;
- analytical services;
- laser applications;
- welding/joining; and
- standards and calibration.

It is the mission of Mound to integrate advanced technology and mature business acumen to foster programs of lasting significance: to make Mound real property, equipment, and facilities available for development as a commercial industrial site as safely, economically, and timely as possible. A wealth of available buildings and equipment have been identified for use in commercial applications. This effort is spearheaded by the Miamisburg Mound Community Improvement Corporation (MMCIC), an arm of the City of Miamisburg. MMCIC has worked with a number of newly-formed high technology companies to locate at Mound in order to utilize buildings, technology, and in many cases, the experience of former Mound employees.

It is anticipated by the Department of Energy (DOE) that by the year 2001, 90 percent of site activities will be related to commercial sector ventures. While it is envisioned that some of the commercial activities will be related to areas in which Mound has historically performed, many new and different initiatives may be launched. EG&G Mound Applied Technologies (EG&G MAT) has no management responsibilities for the DOE-leased facilities.

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5.0 APPRAISAL METHODOLOGY

One hundred thirty-two buildings were reviewed. They included all buildings at the Mound facility. Environmental appraisals were conducted for only 99 buildings as the remainder had been leased or sold by the Department of Energy (DOE) or were sealed by decontamination and decommissioning (D&D) operations and were unsafe to enter.

- The Building Manager's Questionnaire (BMQ) was completed by the building manager and included as an attachment for most buildings. The BMQ contained a set of questions regarding the physical condition of the building, as well as activities that occurred in the building, both historically and currently, that would allow environmental professionals to better understand potential hazards. To complete the questionnaire, data were extracted from reference documents, the titles of which are included in the bibliography of this report, and information was solicited from process managers and other knowledgeable sources. Except for those included in the appendices, reference documents are available for review at the Mound facility.

- A walk-through was conducted by a team of environmental professionals. In most cases, the appraisers were escorted by the building manager and/or the process manager. If the manager was not available, the appraisal team inspected the building without escort, then debriefed the building manager at a later time. The appraisal team was drawn from a pool of professionals that included EG&G Mound Applied Technologies (EG&G MAT) environmental professionals and environmental appraisers selected for their expertise and responsibility for various environmental program areas, a DOE environmental scientist, and environmental engineers from Nancy Hurst & Associates (NHA). NHA, a contractor to EG&G MAT, has had extensive experience in appraising DOE facilities. Credentials of the appraisal team are included as Exhibit 3, Qualifications of Personnel (Section 8.3).

  The walk-through was conducted methodically, with notes made on the standard Environmental Appraisal Checklist (EAC) and on floor plans of the building. The team developed and used a standard checklist to ensure depth and consistency of reviews. Pictures were taken of the buildings' exterior as well as issues of interest or concern.

  During the walk-through, concerns were discussed with the building manager, or in his/her absence, the process manager. This included specific suggestions to improve operating and management practices. In some cases, changes were initiated immediately, before the team left the building. Any concerns which were corrected within 72 hours of the appraisal were not included in the appraisal report, except if the issue could cause an immediate environmental hazard. At the conclusion of the walk-through, a debriefing was conducted with the building manager. Additional issues of concern were discussed, and suggestions were made as to appropriate corrective actions.

- Following the walk-through, the appraisal team reviewed each appraiser's notations and listed tentative conclusions reached and areas of potential concern that required further attention. A summary of these conclusions was clearly labeled and identified and

includes the relative acceptable risk or the need for further investigation. Subsequently, a draft report of findings was generated. The draft report was reviewed by building and/or process managers, EG&G MAT environment and waste management professionals and EG&G MAT management. The purpose of the review was to confirm factual information, and to provide the opportunity to initiate corrective action planning prior to formal publication of the Environmental Appraisal Report. Some building managers responded to issues identified in the draft report; responses were included with the EAC's. Corrections were integrated and the report was finalized.

- A review of systems that affect all buildings was conducted independently. The review included air emissions; wastewater emissions; potable and service water; chemical storage and hazardous materials; solid, hazardous, and radioactive wastes; and waste minimization and pollution prevention. A separate report addressing sitewide issues was prepared.

6.0 SITEWIDE OVERVIEW

An appraisal of the Mound Plant was conducted to provide EG&G Mound Applied Technologies (EG&G MAT) and the Department of Energy (DOE) with information about environmental conditions at the site. Walk-throughs of 99 buildings were conducted. The buildings and activities therein were assessed for compliance with applicable federal and state regulations, DOE Orders, and conformance with best management practices as defined by accepted industry practices. Certain findings were common to several buildings. These were defined as sitewide issues, and are addressed in this section of the report. For detailed information about each building, refer to Volumes 2 through 11. Findings are presented by function or media: general findings; air; wastewater; potable water and service water; chemical storage and hazardous materials; solid, hazardous, and radioactive wastes; and waste minimization and pollution prevention.

This appraisal provides an overview of the status of environmental compliance at the Mound Plant at a fixed point in time and for the activities which were reviewed. It is important to note that a significant portion of the site and several environmental programs were outside of the scope of this effort.

The appraisal was not conducted for 33 buildings which were leased or sold to third parties by DOE or which were actively undergoing decontamination and decommissioning; for program activities and management systems under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA); for Resource Conservation and Recovery Act (RCRA) site treatment facilities including the landfill and the burn area; for some low specific activity (LSA) waste storage facilities; for the Underground Storage Tank (UST) Management Program; and for groundwater contamination identification and treatment program activities. In order to determine the environmental compliance status of the entire site, appraisals of these programs are required.

A generally responsible environmental regulatory management program was found at Mound. However, the appraisal identified a large number of issues that will require attention and resources to achieve full compliance with regulatory requirements. One problem identified was significant enough that management temporarily curtailed waste disposal from the site.

EG&G MAT environmental and waste management professionals were integral members of the appraisal team. Prior to the appraisal they had independently identified many of the issues which are discussed as sitewide findings. Several sitewide findings are managerial and cultural issues which pervade all environmental media areas. For that reason they are listed in the section entitled "General Findings." Also included in that section are several significant issues of concern which have resulted from the rapid changes at the Mound Plant. As the mission has changed, many production activities have ceased, and resources have dwindled. Some of the controls and formalized processes necessary to ensure safe and effective operations have not been instituted.

The appraisal team recognizes that following the DOE decision to close the Mound Plant, the Mound site has been in a dynamic state of transition. In the last four years, the mission of the

site has changed from that of an active manufacturing facility that was part of the Nuclear Weapons Complex. The new missions are economic development for a commercial industrial site, environmental restoration of the site, and the continued production of radioisotope thermoelectric generators (RTG's). Over half of the 1992 census of 2,074 employees has been lost in layoffs or retirements. Senior EG&G MAT managers have changed twice. Some processes have been discontinued in a matter of hours; buildings are being closed in a "cheap-to-keep" mode, leased or sold, and in some cases, integrated with independent groups under user agreements. New building occupants have no legal or contractual relationship to EG&G MAT. With these changes comes a predictable loss of memory, knowledge, experience, and expertise about the site as it functioned earlier. Many of the findings of this report reflect the dynamic changes which have occurred during the last four years.

Mound building managers and process managers exhibited a commendable attitude and initiative during appraisals of buildings. Corrective action planning was initiated immediately, as findings were identified to building managers and process managers. In many cases, corrective action was underway within hours. The most significant immediate positive responses related to: (1) eliminating the storage together of incompatible chemicals; and, (2) correcting discrepancies identified with the storage and improper marking of compressed gas cylinders. By the middle of the third week of site appraisal visits, more than 300 gas cylinders had been collected, sold, and removed from the Mound site.

In reviewing the results of the environment appraisal of 99 active buildings, the team members identified seven buildings to be recognized as EG&G MAT model sites. While individual concerns may have been identified, the overall operation, building and process managers' knowledge, and personnel attention to environmental regulatory compliance are considered in making this determination. The seven buildings are 37, 46, B, GP-1, P, PS, and MWWTP (the wastewater treatment plant).

General Findings and Recommendations

Observations and recommendations in this General Findings section address management and professional conduct and good maintenance and operating practices that result in appropriate attention toward enhancing the probability of maintaining environmental compliance with state and federal regulations. During the appraisal, ten issues were identified which impact all media and many buildings.

General Finding Issue 1

Management controls for surveillance or monitoring to detect improper systems or activities are inadequate. Formal feedback systems are not in place or are not widely used. Those which are in place, such as performance assurance functions, do not receive support at all levels of management.

It is EG&G MAT's policy to ensure safe and effective operations that comply with environmental regulatory requirements. The appraisal team found, however, that formal procedures and controls

may not exist; they may exist and be in conflict with one another; or they may not be followed. Informality exists in daily operations at the Mound Plant.

In past audits and appraisals, environmental compliance deficiencies have been identified. Subsequently, corrective action plans have been developed by Mound. In some cases, plans were not implemented; in other cases, plans which were implemented have not resolved root causes. Some findings of this appraisal team had also been identified in past audits tracing to the Tiger Team review of 1989. Again, formal feedback procedures are not in place or are not used to assure quality.

Corrective actions plans have been developed to solve problems identified during past internal and external audits, appraisals, and regulatory agency inspections. In some cases, plans have not been implemented.

General Findings Issue 2

Engineering support for operating activities is not integrated into operational activities. Engineering support includes traditional engineering, as well as process safety, environmental compliance, and waste management disciplines.

Line management is expected to request engineering support when needed. During the appraisal, many situations were identified for which engineering review should have been requested, but was not. One example, which has significant impact, is the lack of review of Safe Shutdown procedures by environmental and waste management professionals. This may result in insufficient integration of regulatory requirements into the Safe Shutdown program.

General Findings Issue 3

Except for the 1989 DOE Tiger Team Appraisal, audit, appraisals, and regulatory inspection records related to environmental compliance issues, received prior to 1994, were not available for review by the appraisal team.

Wherever possible the appraisal team compared issues and findings with previously conducted audits and appraisals and identified regulator inspection records. Resolution of issues and findings identified in this appraisal should be addressed along with the subject matter from prior audits and appraisals.

General Findings Issue 4

The division of environmental management responsibilities among DOE and EG&G MAT and the lessees/sub-lessees remains unclear. The lessee's/sub-lessee's regulatory agency permit status, discharges, relevant activities, and environmental compliance with common permits are unknown.

The General Purpose Lease between the Department of Energy and the City of Miamisburg requires the sub-lessee to obtain and comply with regulatory agency permits. Although EG&G has requested the City of Miamisburg to provide information on waste streams which is necessary to accurately document and assure compliance with common permits, much of this information has not been provided.

In a letter to DOE dated February 17, 1994, EG&G MAT requested information regarding activities at leased facilities, including a summary of lessees' operations, waste streams, and discharges; a determination by DOE if lessee operations could result in potential new or increased discharges; notice of required modifications for sampling and monitoring; and pretreatment requirements. DOE has not responded to the request for information.

General Findings Issue 5

In several situations, building managers did not recognize that there were potential and real environmental concerns.

Building managers were most responsive to the appraisal teams and began to take immediate corrective actions on those items which were identified during the walk-through and within their immediate control. Despite the high turnover and unplanned reassignment of personnel to become building managers, the appraisal team found generally that competent individuals had been selected. However, many lacked sufficient knowledge about building characteristics and the respective process operations. Without the benefit of changeover training, and with the lack of adequate documentation of building descriptions and process operations, the appraisal team observed that individuals were inadequately trained and prepared to recognize potential and real environmental non-compliance actions and activities. One building manager indicated that he did not even have a written description of his duties and responsibilities and had no prior experience managing a building operation. Managers in the electrical and utilities areas were exceptions as they have not been rotated as have others.

First indications that building managers were unfamiliar with assigned structures were the contents of the Building Manager's Questionnaires (BMQ's). Prior to the actual appraisals, BMQ's were provided to the building managers to be completed and to serve as a summary document about the building. Information returned by the building managers was either incomplete or erroneous, or a combination of both. The appraisal teams were led to believe, and this was confirmed by discussions with the building managers, that they were unfamiliar with the history and current operations of the building, and had not been provided sufficient information when assigned to the structure. Additionally, specific building managers received no information on any of their assigned buildings when appointed as manager.

The appraisal team concluded that adequate controls are not in place to assure that new building managers receive building management training nor are they provided adequate inventory and physical historical information such as drawings, equipment and maintenance records, and product and process records.

General Findings Issue 6

A review of building Safe Shutdown operations in progress and the cessation of previous process operations in active buildings revealed there are no procedures in place which call for reporting the identification of changes to Mound regulatory permits and/or permit applications submitted but not issued. Examples are: (1) the cessation of air discharges resulting from the removal of vent hoods and filtered air safety exhaust systems; (2) discontinuance of point source discharges resulting from the removal of vent hoods and filtered air safety exhaust systems; and (3) discontinuance of point source discharges into the stormwater collection system (whether listed or not in the National Pollutant Discharge Elimination System (NPDES) permit.

A hindrance to both Safe Shutdown process managers and building managers is the apparent lack of adequate management direction requiring process managers to clearly identify regulatory compliance parameters that existed prior to cessation and conditions that exist when operations are terminated. Essential information includes, but is not necessarily limited to: (1) an accurate inventory (characterization and labeling) of chemicals and wastes not processed for reuse or disposal; (2) regulatory permits in effect; (3) a description of the cessation of discharges; and, (4) potential or real contaminants remaining in idle equipment, piping, aboveground storage tanks, and air handling systems.

Management direction is not included either in MD-10361, *Issue 6, EG&G Mound Conduct of Operations* or in Phase 1 Activities within Technical Manual, MD-10431, Issue 1, (nor in Issue 2 which is at the printers) *Safe Shutdown Standard Operating Procedures*.

General Findings Issue 7

On several site visits to buildings which had completed Safe Shutdown or were nearing completion of Safe Shutdown, the appraisal team noted that equipment, barrels containing unknown substances, storage containers, and other items had been placed in buildings without the building manager's knowledge.

The objective of the Safe Shutdown policy should be to make a building as environmentally friendly as possible while attaining the DOE goal of "cheap-to-keep" status. The placement of items of unknown condition and status, by unknown individuals is counterproductive to the objective. Moreover, it has the potential for violating an environmental or Occupational Safety and Health Administration (OSHA) regulation. Among the examples observed during site visits were: unlabeled drums containing waste of some type; containers labeled as energetic and pyrotechnic materials placed in a former administrative or maintenance shop; and equipment containing hazardous materials, although subsequently determined to be empty although no record existed of its being cleaned or tested.

General Findings Issue 8

Mound's conduct of operations has not established administrative and work controls which consider environmental compliance requirements or best management practices. It also does not require monitoring of operational activities for compliance with federal, state, or Mound procedural environmental requirements.

Operations must include consideration of environmental issues. Formal requirements must be in place to make inclusion of environmental issues become routine. There are many examples at Mound to illustrate the lack of consideration of environmental requirements: the *Conduct of Operations* includes the word environment but five times; Safety Analysis Reports (SAR's) often do not include environmental compliance considerations. Segment Readiness Reviews do not include a review of environmental control equipment prior to start up of processes; process procedures are changed without documentation or review; and engineering changes occur without documentation or review.

While there is some evidence that environmental professionals are included in reviews of some new activities or processes, they are included at the discretion of line management. For example, Safe Shutdown procedures were developed without the review or input of environmental professionals. In a second example, 193 boxes containing LSA waste sludge were modified without any record of review or approval. It appears there was no objective or independent review by safety, engineering, or environmental management prior to modification. In discussions with Mound personnel, many did not appreciate the need for formal and disciplined conduct of operations.

Systems establishing formal, disciplined, and routine review of operations, as well as monitoring to ensure compliance with requirements of operations, are essential. Such systems are required by federal law and DOE Orders.

General Findings Issue 9

Mound procedures are not properly developed and reviewed, and they are not effectively used to promote operations.

Procedures and other documents should provide clear, appropriate direction, and should be used to promote safe operations, as discussed in DOE Order 5480.19, and 29 CFR 1910. All Mound procedures were not specifically reviewed as part of this appraisal. However, the appraisal team used those related to environmental compliance as guidelines for performance. In several instances, conflicts were found in procedures, and in practice. For example, MD 10019, *Radiological Control Manual*, calls for radioactive materials to be placed in yellow bags. MD-81240, *Low Level Waste Management Procedures*, calls for LSA waste to be placed in properly marked bags, but does not specify a color requirement. In practice, LSA waste is generally placed in clear plastic bags. In non-radioactive areas the appraisal teams found more than 10 bags of trash in yellow plastic bags and placed in dumpsters. Professionals in Health Physics and Waste Management, the organizations which authored the procedures, were questioned regarding

procedures. Neither organization had reviewed the other's procedures as part of their own procedural development. Employees in non-rad areas were unaware of the color code convention of yellow bags for radioactive materials and that a procedure existed which called out the use of yellow bags. Nor did they recognize that using yellow bags for office trash could be confusing and could indicate improper waste disposal.

There is no formal or disciplined requirement for affected disciplines to review procedures during the developmental phase. In fact, in several cases investigated during the appraisal, affected disciplines were not identified or considered. There is no requirement for review by safety or environmental disciplines.

General Findings Issue 10

Contractors and vendors performing repair or maintenance work at the Mound Plant were found to improperly handle and store chemicals; store and dispose of waste; and perform and maintain good housekeeping habits.

Contractor inspectors and building and process managers performing contract oversight must ensure that contractors and vendors perform work safely and in accordance with environmental regulatory requirements. Examples include, but are not limited to storage and handling of chemicals and safety in Building WH-3. The subcontractor left the site with the well casing open after treating water with chemicals. In Building 95, the subcontractor performed improper handling and storage of compressed gas cylinders and chemicals. In Building 34, general housekeeping and handling and use of chemicals were improper. The building manager was not aware that the contractor was working in the building. In Building 19, handling and storage of chemicals and characterization, storage, and disposal of hazardous waste were not proper.

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6.1 Air Emissions

6.1.1 Observations

The Mound Plant has many sources of radioactive and non-radioactive emissions. The *Mound Site Environmental Report for Calendar Year 1994* provides an overview of the program and a summary of monitoring data.

Radiological emissions are subject to the NESHAPS for radionuclides, 40 CFR 61, Subpart H. In 1994 the U.S. Environmental Protection Agency (USEPA) and DOE developed a Federal Facility Compliance Agreement (FFCA) which details specific actions and schedules to bring the facility into compliance with NESHAP's requirements. These requirements include continuous monitoring of stack systems whose releases represent an effective dose equivalent greater than, or equal to, 0.1 mrem/year, a strategy for evaluating minor point sources to verify emissions; modeling and dose calculations; and development of a Quality Assurance Project Plan.

As a part of NESHAP's compliance, Mound operates an onsite and offsite network of ambient air samplers to monitor levels of tritium and plutonium. Also, ten exhaust stacks are monitored continuously for tritium, plutonium, and/or uranium, or a combination of both. Minor point sources are not monitored continuously but they are subject to periodic confirmatory monitoring. Administrative limits and Health Physics procedures govern the quantity of radionuclides present to ensure that the potential for release remains very low. Mound Plant stack emissions monitoring data and ambient air monitoring data indicate that emissions are substantially below EPA and DOE radionuclide health criteria.

Non-radiological emissions are subject to the Clean Air Act (CAA), as well as state and regional air pollution regulations. Based on Mound's calculation of total emissions, the facility falls well below the regulatory threshold of the CAA, Title V. Compliance with State of Ohio regulations requires that all applicable operations be permitted, registered, or exempted. Emissions sources at Mound include 11 fuel-burning sources, over 500 ventilation hoods, and other sources which can emit a variety of pollutants. Not all require permits or are registered. Mound has 11 air permits and 5 registered sources. Ambient air quality is measured for particulates at 7 onsite and 15 offsite locations.

6.1.2 Findings and Recommendations

6.1.2.1 Air Emissions Issue 1

The calculations of total air emissions is not accurate as all sources are not included.

Without complete and adequate identification of sources and related documentation, Mound may not claim many exemptions which are now claimed. Fewer than 60 percent of the buildings surveyed had complete or correct information about locations of sources and emissions loading on the BMQ's. Many sources were not included. A detailed inventory has not been conducted since 1992. The facility is rapidly changing, with production activities being discontinued, and

buildings undergoing Safe Shutdown. Many other buildings are being leased to the City of Miamisburg or sold to third parties by DOE. As a stationary source is modified a new applicability determination must be made under new source requirements (40 CFR 60.14). Modifications can include increased or decreased emissions resulting from Safe Shutdown, D&D, or other cleanup activities, or the emission of a new pollutant. The inventory must be updated to determine the nature, sources, and quantity of controlled or uncontrolled emissions. This procedure should substantiate that Mound air emissions fall well below regulatory thresholds. OAC 3745-15-05(E) requires that emission data be reviewed annually. Permit documentation should be changed to reflect actual site conditions. At any time the state may require a complete record of all emissions from any and all potential sources (OAC 3745-15-03 and OAC 3745-78).

OAC 3745-15-05(H) requires that *de minimis* sources be included in calculating site emissions. They must be considered in determining whether the facility constitutes a major source, or is otherwise regulated under Title V OAC 3745-77. Mound does not currently include all *de minimis* sources in calculations of site emissions.

As part of the appraisal process, as each building was visited, information was provided to update the Mound Air Emissions Database. This will allow the inventory of sources to be brought current, with no additional cost to DOE.

6.1.2.2 Air Emissions Issue 2

Air permit requirements have not been evaluated for all sources at Mound.

Mound is operating several hundred air emissions sources without a permit, registration, or exemption, as required by OAC 3745-35. This finding was also identified as a Priority 1 action item (A/BMPF-4) in the 1989 Tiger Team report.

While many sources at Mound may qualify for a *de minimis* exemption, it is required in OAC 3745-15-05 that each source be evaluated to determine if it is *de minimis*. Documentation and rationale to support the determination are not available for all sources as required by OAC 3745-15-05. (*De minimis* is defined as potential emissions that do not exceed 10 pounds/day of particulate matter, SO_2, NO_x, organic compounds, CO, lead, or any other air contaminant, and that all similar sources do not exceed 25 pounds/year.) While it appears that Mound falls well below the threshold, without complete and adequate documentation, the facility may not claim a *de minimis* exemption for the source.

There were many sources for which applications for permits were submitted in 1992 and no response was received from the state. Mound did not request written confirmation of permit award, or document emissions as *de minimis*. Mound must identify and document changes to those sources.

A number of buildings at Mound have been leased and others contain individuals or private corporations operating under user permits. Information regarding emissions from sources in these buildings has not been obtained. EG&G MAT has asked DOE for guidance on whether or not

the Mound air permits are all-inclusive. It is EG&G's opinion, as stated to DOE, that air permits for tenants are the tenant's responsibility under the terms of the lease. Pending DOE response, EG&G MAT is on record that it will not include lessee sources into the inventory and emissions calculations.

6.1.2.3 Air Emissions Issue 3

Mound has made a *de minimis* exemption for a number of air emission sources which emit radionuclides. *De minimis* exemptions do not apply to sources which emit radionuclides (OAC 3745-15-05(C)).

Those sources which emit radionuclides for which no permit or registration has been issued, but have in the past been considered *de minimis*, must be reevaluated. Some exemptions for *de minimis* sources which emit radionuclides have been granted by the state. The circumstances and conditions contained in the applications, as well as the circumstances under which the exemption was granted, and the effectiveness of those exemptions should be reviewed.

6.1.2.4 Air Emissions Issue 4

Documentation and documentation practices are not sufficient; inconsistent documentation exists at Mound related to air emission sources.

Due to inconsistent and conflicting information on file at Mound and obtained from environmental professionals, it is difficult to identify sources and the associated permit status. Documents on file which are in conflict include the Operable Unit 9 Site Report; the Mound Air Emissions Database; the DOE listing of sources and permit status; the Compilation of PTI/PTO applications, and the *Mound Site Environmental Report for Calendar Year 1994*. The appraisal team was unable to verify the permit status of several sources.

Documentation and documentation practices should be sufficient to enable audits and independent verification of data. DOE Order 5400.1 states that the objectives of monitoring programs are: to demonstrate compliance with legal and regulatory requirements imposed by applicable regulations; to confirm adherence with DOE environmental protection policies; and, to support environmental management decisions. It further states that a critical element of monitoring is quality assurance and verification. Also, auditable records must be established.

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6.2 Wastewater Emissions

6.2.1 Observations

The Mound Plant releases treated sanitary wastewater, treated process wastewater, and storm water to the Great Miami River via three permitted outfalls. Discharge limits are set in the Plant's NPDES permit, which is effective until 1997. The Mound Site Environmental Report for Calendar Year 1994 provides an overview of the program and a summary of monitoring data. In 1994, site effluent was within permit limits with one exception; residual chlorine exceeded limits on one occasion due to a mechanical failure. Corrective action was taken, and a notice of violation was not issued. The 1995 report was not available at the time of the appraisal, but according to Environmental Monitoring Group personnel and a random check of monthly test results, data showed that effluent quality was within permit limitations. This was also indicated in the monthly reports submitted to the State.

6.2.2 Findings and Recommendations

6.2.2.1 Wastewater Emissions Issue 1

Mound has not identified and quantified all point source discharges which discharge to the surface waters of the state, and has not identified and included them in the NPDES permit application in conformance with OAC 3745-33 and 40 CFR 122.1.

Mound is required to identify all operations contributing wastewater to the effluent, report the average flow of each, and describe the treatment received by the wastewater. There are three categories of sources that are not identified: those in buildings controlled by EG&G MAT; those in buildings, such as Building 87, under EG&G MAT control in which organizations with "User Agreements" generate wastes; and those buildings which are leased. In the latter case, in the absence of accurate and complete information DOE and EG&G MAT can not assume that records are properly maintained and that discharges conform to regulatory and permit requirements (OAC 3745-81-99 and 3745-33).

In a letter to DOE dated February 17, 1994, EG&G MAT requested information regarding activities at leased facilities, including a summary of lessees' operations, waste streams, and discharges; a determination by DOE if lessee operations could result in potential new or increased discharges; notice of required modifications for sampling and monitoring; and pretreatment requirements. DOE has not responded to the request for information, and lessees have provided minimal or no qualitative or quantitative discharge information.

In those buildings controlled by EG&G MAT, potential additional sources were identified during the building appraisals. Investigations are underway to determine flow patterns. Site drawings of underground lines do not always reflect "as-built" condition. Modifications to underground lines made since 1990 have not been incorporated into engineering record drawings. Therefore, it is difficult to determine flow patterns based on drawing records.

OAC 3745-33 requires identification and quantification of all point source discharges which discharge to the surface waters of the state, not only those which the state regulates. Sumps located in control areas overflow to the storm system. They are not identified as potential radiological point sources in the NPDES permit application. It is the opinion of the Environmental Monitoring Group that inclusion of sumps is not necessary, as the State of Ohio does not regulate radioactive constituents in the effluent.

6.2.2.2 Wastewater Emissions Issue 2

Adequate treatment and other controls are not in place to prevent a release of hazardous substances or oily wastes to the Great Miami River, although in certain situations storm water containing hazardous substances can be diverted to the retention basin located next to Building 61 or the overflow pond west of Building 85.

Although dye or smoke tests were not conducted to confirm drainage patterns, during the appraisal of buildings several point sources were identified which appear to discharge improperly to the storm collection system in conflict with requirements of 40 CFR 122. In addition, there is the potential for spilled chemicals in process areas and laboratories in several buildings to enter the storm collection system and in some cases the sanitary wastewater collection system through floor drains. One example is in Building 95.

Two examples of point sources which enter the storm system include by-products of vehicle maintenance including oils and hazardous chemicals from Building G (Garage), and Building 33, maintenance of equipment potentially contaminated by LSA waste. Another point source discharge into the sanitary wastewater collection system occurs from oil/water separators, grease traps, sumps and interior building catch basins and floor drains in newer structures in a number of buildings. The quantity discharged has not upset the treatment plant since early 1991; however, there is nothing to preclude a recurrence which could cause a violation of the NPDES permit. The sludge has been analyzed and found to contain diluted quantities of heavy metals, chemicals, and LSA contaminants. This finding is a continuation of the 1989 Tiger Team finding SW/CF-3 (Priority 1). It should be noted that sludge quality is not governed by NPDES. Also, constituents of the sludge are in concentrations which do not qualify sludge as RCRA hazardous waste.

A number of sumps located in buildings which have radiological control areas have been installed so that overflows drain into the storm collection system for transport into the SM retention basin next to Building 61. Examples are Buildings 50, and 95. Other sumps in control areas, such as Building 22, overflow into an open ditch for transport to the Great Miami River. This spillway can be diverted into the overflow pond west of Building 85. When the SM retention basin overflows, the discharge joins the stormwater streams from Building 22 and other buildings in the area. Since both ponds have overflowed during severe storm conditions, it is possible that a sump overflow would not be contained.

DOE Order 6430.1A states that there should be no connections between sanitary and storm systems, and radiological or hazardous materials systems or areas. The overflow of sumps located in control areas provides a connection.

6.2.2.3 Wastewater Emissions Issue 3

There is no evidence of routine field surveillance to identify, confirm, or verify point sources, or other potential surface water contaminants such as improperly stored or disposed of materials and chemicals.

Inspection for quality assurance is an accepted industry practice. As explained in DOE Order 5400.1, a critical element of monitoring is quality assurance and verification. Mound has no routine field surveillance to verify qualitative or quantitative information regarding discharges from buildings to wastewater collection and treatment systems, or to identify potential hazards that could lead to surface water contamination. Since activities at the site are changing at a fast pace, it is increasingly important to formalize pathways for operating and emissions information to be provided to environmental professionals, and for verification of assumptions.

Examples of issues of concern that should have been identified during routine field surveillance include actual and potential discharges of process sources to the stormwater and sanitary collection systems, and storage of hazardous materials in such a fashion that they posed a threat to wastewater quality (40 CFR 122). During the appraisals of buildings, improperly stored materials were observed at many locations onsite. For example, over 200 drums containing hazardous materials or unidentified materials exhibited at least one sign of improper storage. These instances included: storage outdoors and unprotected from the elements; not stored on pallets; showing signs of rust; and/or having no secondary containment. Improper management and control of hazardous materials may lead to release and contamination of surface water, soil, and groundwater.

6.2.2.4 Wastewater Emissions Issue 4

Building managers, process managers, and building occupants have insufficient knowledge about wastewater drainage systems or treatment processes to assure proper response and reporting should a spill occur.

Building and process managers, and technicians could identify drainage systems for fewer than 10 percent of the buildings inspected. Floor drains are not plugged in laboratories or process areas to prevent spilled materials from entering drains. Once a spill has entered the drain, management and other personnel are unsure of the potential problem and know only that they are required to call the fire department at 911. It is Mound practice that the fire department alerts the Environmental Monitoring Group, who in turn alerts Maintenance to divert wastewater to one of two containment ponds. While there is evidence that this system has worked on occasion, there also is evidence that it has not. For example, during the appraisal, an ethylene glycol leak was not identified, and it continued uncontained for over two weeks.

6.2.2.5 Wastewater Emissions Issue 5

Sewage sludge at the MWWTP is contaminated by chemicals and heavy metals found in process areas and laboratories.

It is important to note that sludge is not a RCRA hazardous material. Sludge routinely tests positive for a spectrum of chemicals. The concentration and variety of constituents found in the sludge indicates that some chemicals and LSA waste may be entering the drain through disposal or spills.

6.3 Potable and Service Water

6.3.1 Observations

Potable water used at the Mound Plant is pumped from one or more of three deep wells at the site and is treated by ion exchange softening and chlorination. An average of 400,000 gallons per day of water is pumped, treated, and distributed at Mound. Normally, one well is sufficient to meet plant needs. Well Nos. 2 and 3 have auxiliary power supplies to ensure the continuous availability of water. Potable water is sometimes referred to as domestic water on drawings and in reports.

There were no regulatory deficiencies identified in the potable water program. There were several noteworthy findings.

6.3.2 Findings and Recommendations

6.3.2.1 Potable and Service Water Issue 1

The Utilities Group is to be commended for their innovative and dedicated efforts related to supplying water to the site.

Reduced potable water demand caused by the cessation of building and process operations has required a significant effort by the Utilities Group to prevent waterlines and the water towers from freezing during severe weather conditions. This is especially true during the lowest demand periods from Friday to Monday mornings. Although demand has been reduced by 40 percent, distribution has been maintained with fewer breaks than are found in many full-capacity systems.

6.3.2.2 Potable and Service Water Issue 2

Mound intends to identify and replace water fountains and coolers which have been listed by the EPA as being suspected of lead contamination.

As part of the appraisal process, as buildings were visited, information was collected for that purpose. This resulted in a cost savings, as additional personnel were not required to make a second visit to buildings to inventory fountains and coolers. At Mound, water fountains are not routinely tested. They do not contain lead. The source of lead contamination is either in the solder or the brass of the fittings.

6.3.2.3 Potable and Service Water Issue 3

Overall, the appraisal team found that the current backflow prevention and cross-connection control program at Mound was consistent with the requirements of the OAC, Chapter 3745-95. This program had been found to be a Priority I deficiency in the 1989 Tiger Team Report SW/CF-1.

6.3.2.4 Potable & Service Water Issue 4

Requirements for and process use of potable water by the lessee and sub-lessees of DOE Mound buildings are not known. This information is required in order to ensure that the potable water system is not compromised.

There are two concerns related to the consumption of potable water by lessees and sub-lessees. First, in the event new processes are activated without prior warning, the potential exists that a significant increase in the demand rate could cause a system imbalance affecting the entire Mound site. The most severe situation would be the loss of the water head in either or both of the water towers. Second, modifying the internal building potable water system without installing appropriate backflow preventors or modifying, or bypassing, the existing backflow preventor(s) could jeopardize the quality of potable water within the building or to the distribution system.

EG&G MAT has proposed to DOE that lessees and sub-lessees provide information on potable water requirements in support of a new process and that EG&G MAT be permitted to conduct sampling and analysis as changes are made to building potable water systems. No response has been received from DOE.

6.4 Chemical Storage and Hazardous Materials

6.4.1 Observations

Chemicals are stored in nearly every building at Mound, in laboratories, production areas, and in magazines. A number of EG&G MAT organizations are involved in programs related to chemical use and safety. The appraisal team's interest was focused by the scope of the appraisal to consider compliance issues related to OSHA, TSCA, FIFRA, SARA Title III, DOE Orders, and best management practices.

PCB's are used in transformers and capacitors at Mound. Although nearly two years behind schedule, an active program to remove substation and stepdown transformers and capacitors is nearing completion, with only five PCB-containing substation transformers remaining to be replaced. Replacement transformers are at the Mound site. Plans call for phasing out of all PCB transformers and capacitors prior to the end of the current fiscal year. A licensed contractor removes and disposes of the PCB's and the casings. An annual record is maintained.

Mound has performed an asbestos survey for many buildings. The appraisal team determined that fewer than 5 of 99 buildings had not been surveyed. The asbestos management plan addresses requirements for work practices in buildings in which asbestos is suspected or known to be present. The appraisal team observed work practices in one building and contractor repairs to the steam distribution system near Building PH; they were consistent with requirements. The asbestos survey did not include utility distribution systems such as aboveground chilled water, condensate, and steam lines.

A review of compliance with regulations related to underground storage tanks was not within the scope of the appraisal. However, during appraisals of buildings, it was observed that several tanks had been removed and/or replaced. A survey of sumps and tanks in and around buildings was completed as part of the appraisal. Mound has a partial inventory of sumps listed in Appendix A to the Active Underground Storage Tank Plan.

Fuels and bulk chemicals are stored in interior and exterior aboveground tanks, and in 55- and 30-gallon drums. There is no consistent pattern on providing secondary containment.

Mound has an Emergency Response Plan. It was reviewed as it relates to hazardous materials and requirements of TSCA, SARA Title III, DOE Orders, and best management practices. The plan is limited in scope and has not been updated annually as required by DOE.

6.4.2. Findings and Recommendations

6.4.2.1 Chemical Storage and Hazardous Materials Issue 1

Adequate secondary containment is not provided for bulk chemical storage inside and outside of numerous buildings.

Aboveground storage tanks, 30- and 55-gallon drums, and other bulk storage units that contain oil, fuels, or chemicals must have adequate secondary containment to prevent or minimize the release of the hazardous materials to surface water, soil, or ground water.

Several deficiencies were observed. These included: inadequate sizing of containment areas; visible cracks in containment barriers; and no secondary containment. The only aboveground tanks which were observed during the appraisal were those which are located inside or next to buildings. CERCLA storage, except for Building 19, and D&D sites were not surveyed. This finding is a continuation of the Priority 2 deficiency, TSCA/BMPF 1, reported in the 1989 Tiger Team Report.

6.4.2.2 Chemical Storage and Hazardous Materials Issue 2

The PCB management program has not met schedules set forth in the PCB Management Plan and, therefore, does not meet all requirements of 40 CFR 761.

PCB transformers and equipment are still located at five substation sites, although site management plans called for removal five years ago. Subject to fund availability, the replacement transformers and equipment onsite are planned to be installed by the end of the fiscal year. In the event sufficient funds are not available this year, a contingency plan identifies delaying the installation of the substation in the Test Fire Area. The plan was never amended to reflect the delay.

A program has been developed to address disposal of ballast from fluorescent lights which may contain PCB's. The plan addresses the removal, storage, and disposal. However, at least two of the electricians who remove ballasts from fluorescent lights were not familiar with the plan, and did not follow practices specified. The training program in this area should be reviewed.

6.4.2.3 Chemical Storage & Hazardous Materials Issue 3

Management of below-grade tanks and sumps is not consistent with requirements of State of Ohio regulations.

Underground storage tanks were not reviewed for compliance with BUSTR (Bureau of Underground Storage Tanks) regulations. However, the general management of tanks was considered as it relates to regulations governing Clean Water Act (CWA) requirements and the storage of hazardous materials.

Only a partial inventory of sumps located in or around buildings at Mound is available. Most building managers were not knowledgeable of the type, location, or function of building sumps. Sumps are not routinely inspected nor tested. Some of the sumps contain utility services or are designed to collect groundwater seepage. These pose a low risk. However, those which have been installed to contain chemical spills or radioactive wastewater such as sumps in Buildings 61, 50, H, and HH pose a more serious risk of being a point source discharge, and violating the NPDES permit. Failure to maintain adequate containment of hazardous or radioactive wastewater

in sumps can result in a discharge infiltrating the sanitary treatment system. The same holds true for the pass-through of chemicals and substances discharging into the Great Miami River. A sump inventory must be completed, and those which are high-risk sumps must be routinely inspected for tightness and function.

The Active Underground Storage Tank Plan includes only a few sumps. The selection of sumps for inclusion is inconsistent. The report states that several tanks have "interstitial monitoring." There is no documentation to support the assertion that such monitoring occurs. Technicians and line managers are not aware of any technique or equipment which would allow such testing. Under Ohio regulations, there should be a daily inventory of tanks in operation, and a weekly inventory of tanks not in operation. For buildings that were surveyed, most line managers were not aware of requirements for surveying or inspecting tanks, and most did not perform a survey or inspection.

6.4.2.4 Chemical Storage and Hazardous Materials Issue 4

While a large number of preventive maintenance programs and a hierarchy of response priorities for maintenance and repair of systems and equipment are established, there is not a current proactive maintenance program to ensure environmental compliance.

Maintenance support for building and process managers appears to be coming more attuned to crisis management than to a formal conduct of operations process. Maintenance includes traditional preventive maintenance, scheduled maintenance and less effective breakdown maintenance. Process managers, working through building managers, and building managers themselves are expected to identify and request maintenance support when the need is identified and then to identify relative priorities based on established guidelines.

Guidelines are not well-known or perhaps understood by most building managers. Key environmental considerations may be omitted when requesting maintenance and repair work to be performed. From experience, the service clerk or responsible planner and estimator may identify a maintenance or repair request to be related to environmental compliance. This knowledge apparently causes a higher priority to be assigned to the work effort, subject to fund availability. However, in many cases and because of changes in building or process operations, the maintenance department could prioritize in a vacuum.

There are two examples which could have significant impact upon environmental compliance. First, there is no inventory of building sumps having influent from controlled rad spaces and which have overflow discharge capability into the stormwater collection system. There is no corresponding planned preventive maintenance program to periodically inspect and test for integrity. Second, except for aboveground storage tanks serving standby generators, maintenance does not have an inventory of location and content, nor a preventive maintenance program for inspecting and testing the integrity of aboveground tanks and associated valves and lines.

6.4.2.5 Chemical Storage and Hazardous Materials Issue 5

Chemical storage in laboratories does not meet the requirements of the MD-10347, *Mound Hazard Communication Program*, and MD-10405, *Mound's Chemical Hygiene Plan.*

Although there is a general knowledge and awareness of the standards and requirements of hazardous chemicals, the program requirements are generally not met. MSDS's are not updated or one manufacturer's MSDS is substituted for that of another manufacturer for the chemical at hand. Chemicals are stored with equipment in flammable storage containers or stored with incompatible chemicals. Procedures are not updated to reflect downsizing or any change in processes. In several labs, labels are worn or nonexistent. As a generally noted practice, containers were observed with hazardous chemicals not labeled. An oversupply of chemicals is stored by the laboratories, and outdated chemicals remain on shelves. When a process is changed, chemicals no longer required remain in the inventory.

Supervisors generally lacked training in chemical hazard recognition and how to know which chemicals are compatible. In some cases, employees are not adequately informed of the hazards of chemicals. For example, in Building GW, a refrigerator containing acetic acid has warning signs posted by Industrial Hygiene. However, supervisors and employees were not aware of the chemical's potential hazards. In Building H, a process requiring a chemical had been discontinued but the chemical had remained on the shelf. In Building DS, chemicals were left unaccounted for and discovered by the Safe Shutdown team. In Buildings DS, H, and HH, outdated chemicals were stored in cabinets. Some had stratified and others had crystallized. This increases the risk of exposure or release.

It is necessary for chemicals to be managed properly for many reasons beyond traditional chemical safety issues. Chemicals in out-of-service areas could be considered abandoned and meet the definition of solid waste. Costs for characterization and disposition increase with time as chemical owners leave the site. Chemicals with quality assurance dates that expire cannot be used elsewhere onsite, and must be considered a waste.

9.4.2.6 Chemical Storage and Hazardous Materials Issue 6

Chemicals that have high potential for health and environmental hazard are in use in many areas at Mound.

For many of these chemicals, substitutes have been used in industry for over 10 years. For example, trichloroethylene (TCE) was observed in use in over 20 buildings at Mound. It has been recognized as a health hazard, and has been largely unavailable for use by industry .

Use of hazardous chemicals is commonly controlled in several ways: (a) identification of hazardous chemicals during an annual chemical inventory; (b) training the workforce regarding hazards and acceptable substitutes; and, (c) limiting purchase to a list of approved chemicals. There is no evidence that such controls are in place at Mound, or if they are, they are ineffective, based on field observation during the appraisal.

The use of petroleum naphtha solvents increases waste and emissions from volatile organic compounds (VOC's). They are in use in the paint shop, vehicle maintenance, maintenance operations, and many other site facilities. There are a number of alternative, environmentally friendly compounds available for substitution.

6.4.2.7 Chemical Storage and Hazardous Materials Issue 7

Common and specialty compressed gas cylinders were observed throughout the site with improper labeling and improper storage. Quantities exceeded program needs.

Hundreds of gas cylinders were observed in production areas. Most were no longer in use. Many were stored without proper labels and tags. As the appraisal team inspected buildings, building and process managers were encouraged to inventory their areas to establish current requirements, then arrange to transfer unneeded cylinders to the gas cylinder storage building for return to vendors, sale, or disposal. Building managers were most responsive, and within three weeks of the appraisal over 300 cylinders had been collected, sold, and removed from the Mound site. Warehouse personnel have continued to implement plans for storage and removal of unneeded cylinders.

6.4.2.8 Chemical Storage and Hazardous Materials Issue 8

The Mound Emergency Management Program (EMP) does not ensure effective emergency response to an operational emergency. Emergency Management has minimal staffing and training which is insufficient in light of the changes caused by the Mound transition to a commercial facility. Building managers have not been trained in over two years in emergency response procedures.

The change in Mound's mission, coupled with reduced resources dedicated to emergency response planning and training, new federal requirements, and the recently completed Hazard Assessment for Emergency Planning (HAEP), all require that the EMP be re-evaluated for adequacy. Although management has improved emergency response operations by recently reassigning a full-time manager, the overall program has not fully addressed the change in the site and resulting changes in personnel and in processes.

There has been a slow response to the needs identified in the hazard assessment to shift the focus from the possibilities of a release within the fenced perimeters to a release 5 kilometers beyond the Mound Plant boundary. Other considerations have not been addressed. These include an evaluation of: the basic causes of credible accident release events; employee training requirements; requirements that a full participation drill with outside agencies is planned; and, proactive preparedness for other potential releases.

The EPA's draft of the Risk Management Program (RMP), due to become final in June 1996, mandates hazard and operability studies to determine if extremely hazardous materials above threshold quantity will impact the community in the event of an accidental release. Such

considerations will impact on the Emergency Management program, as the program has yet to initiate programs to respond to new requirements.

Emergency Management has minimal staffing and training which is insufficient in light of the changes caused by the Mound transition to a commercial facility. The Emergency Management Manager, recently reassigned to provide full-time coverage in ERM has not received related training in the past two years. With an increased federal and state focus on emergency preparedness, the manager of the program must be trained at a depth of knowledge to meet the requirements, including knowledge of hazardous chemicals, hazard analysis, transportation analysis and other emergency management technologies.

Building managers have not been trained in over two years in emergency response procedures. There has been a high turnover of building managers, and increased responsibility. For example, building managers have acquired responsibility for more than one to three buildings, and most building managers assigned high-risk facilities have not received emergency response training.

6.4.2.9 Chemical Storage and Hazardous Materials Issue 9

EG&G's ability to respond to a lessee or sub-lessee HAZMAT emergency is impaired by the lack of accurate and updated information concerning chemicals, hazardous materials and processes which may generate hazardous wastes.

Under the terms of the lease agreements between DOE and the City of Miamisburg (including sub-lessees), the EG&G Fire Department is responsible for responding to EMT, HAZMAT, and other waste containment and cleanup emergencies. In order that the Fire Department can be adequately prepared to respond to any emergency and assure itself that it can protect personnel specific information must be provided. As of February 19, 1996, of 18 current leases, only 5 of the signatories have responded to lease terms to provide a complete inventory of all chemicals, hazardous materials, and processes which may generate hazardous waste (SARA Title III, Ohio Code 3750).

6.4.2.10 Chemical Storage and Hazardous Materials Issue 10

The asbestos management plan is incomplete. It does not identify several significant sources of asbestos at Mound, or address management of those sources.

Technical Manual MD-10391, Issue 3, *Asbestos Program Manual* (9-14-95) applies to all Mound facilities and work processes where asbestos and/or asbestos-containing materials (ACBM) are present. The manual identifies the results of the 1995 building survey; however, the survey did not include utility distribution systems such as aboveground chilled water, condensate, and steam lines. In addition, approximately 10 percent of the manholes associated with underground 12.5 KV primary power distribution contains significant quantities of ACBM and is not identified in the Technical Manual.

Maintenance and repairs to aboveground utility systems are normally accomplished by contract in accordance with Mound prepared plans and specifications which include the identification of ACBM on a case-by-case basis. However, the health and safety of responding high voltage electricians to underground power problems may be jeopardized. The pulling of power cable and splicing activities is bound to create a situation where ACBM can be disturbed.

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6.5 Solid, Hazardous, and Radioactive Wastes (SHRW)

6.5.1 Observations

Current activities at the Mound Plant generate hazardous wastes, radioactive mixed wastes, solid and liquid LSA radioactive wastes, and non-hazardous, non-radioactive solid wastes. Mound is a large quantity generator of RCRA regulated hazardous waste. There are approximately six routine processes with approximately 30 routinely generated waste streams. The majority of wastes generated are from minor processes, Safe Shutdown operations, and D&D activities. Wastes are accumulated onsite in Satellite Accumulation Areas (SAA's), and stored onsite in an interim status storage units, then shipped offsite for disposal at permitted commercial disposal facilities. The use of onsite thermal treatment units had been discontinued at the time of the appraisal. Bio-remediation activities continue.

Radioactive mixed wastes are accumulated onsite and stored in SAA's and in an interim storage unit. There are projects to reduce volumes of mixed wastes which have been stored onsite for several years. Liquid LSA radioactive wastes are treated onsite and discharged, or solidified and shipped to the Nevada Test Site or Envirocare for disposal. Sludges generated during wastewater treatment are also solidified and shipped to the Nevada Test Site or Envirocare.

Solid LSA waste, of which the majority is contaminated soils, is stored onsite and shipped to Envirocare for disposal. An active program to ship this waste is in place as a moratorium has recently been lifted. Transuranic wastes are stored onsite, and at the current time, have not been designated for offsite disposal. Nonhazardous, non-radioactive wastes are collected onsite, segregated for recycling, and shipped to a local landfill for disposal.

The site operates under a RCRA Part A application and 40 CFR 265 interim status requirements. The Part B RCRA permit application is submitted and a draft permit has been returned by the State of Ohio. Final negotiation and issuance of a permit is expected by July of 1996. There are nine Interim Status units at Mound for storage and treatment of hazardous waste and the destruction of reactive waste. They include: Building 72 Hazardous Waste Treatment Unit; Building 23 Radioactive Mixed Waste Storage Unit; Magazine 53 Energetic Materials Storage Unit; Pyroshed Energetic Materials Waste Storage Unit; Retort Thermal Treatment Unit; Open Burn Energetic Materials Unit; Building 27 Filtration System; Energetic Materials Pretreatment Unit; and the Thermal Treatment Unit. DOE and EG&G MAT have applied for permits for only two of these storage facilities in the Part B permit: Building 72 for hazardous waste, and Building 23 for mixed waste. The other units will be closed under Part 265 Interim Status requirements.

Appraisals were conducted to evaluate accumulation areas of less than 90 days, satellite accumulation areas, Building 72 and Building 23 storage units, onsite treatment of liquid LSA waste in Building WD, and procedures for characterizing, packaging, and shipment. The appraisal included a review and assessment of the Waste Management Plan, RCRA Parts A and B Permit Applications, OEPA Inspection reports, and a detailed review of major hazardous, mixed, and LSA waste generation, treatment, storage, and disposal activities and documents.

The appraisal did not include a review of onsite transportation of hazardous waste; RCRA closure plans for the units not to be permitted under the Part B permit, UST's other than to identify those associated with a particular building, or treatment and disposal sites such as the Burn Area, Land Fill, LSA Waste Storage Trailers, or offsite disposal sites.

6.5.2 Findings and Recommendations

6.5.2.1 Solid, Hazardous, and Radioactive Wastes Issue 1

There are numerous pieces of idle equipment at the Mound site which contain hazardous waste. RCRA regulations require that waste be removed from idled manufacturing process and waste producing equipment within 90 days (40 CFR 261.4).

"Idle" is defined as occurring either from the cessation of production or idled between production runs. There is no procedure in place, including reference in MD-10361, Issue 6, *EG&G Mound Conduct of Operations*, requiring the owner/operator of the equipment to clean the equipment at the time it is shut down nor to notify EG&G MAT regulatory permit managers of the equipment change in status.

The Safe Shutdown and D&D programs have functions which address idle equipment. However, these programs do not affect idle equipment until schedules and resources allow, often years after equipment is idled. In the interim, hazardous material is not managed properly. As Mound is discontinuing many processes, it is important to properly manage equipment at the time it is idled.

6.5.2.2 Solid, Hazardous and Radioactive Wastes Issue 2

The content of training classes meets the minimum regulatory requirements; however, it is not effective in assuring compliance with hazardous waste regulations or Mound procedures.

As a hazardous waste treatment and storage facility operator, EG&G MAT must provide training to personnel so that they can understand requirements related to characterization, storage, and disposal of hazardous waste streams. Not all employees have received necessary training. Also, while well-designed environmental training courses are offered at Mound, there are many examples to show that training is not effective in improving waste management activities.

The sitewide method for identifying personnel for training is not completely implemented. Managers have been tasked with development of organizationally specific training plans. Many plans are still in development and not all managers have submitted training plans.

Appraisers noted that all generators have not been identified, and those generators have not received training as required by OAC 3745-65-16. Also, several process managers of hazardous waste generating activities have not received training. Some EG&G MAT employees with oversight responsibility for subcontractors that generate hazardous wastes have not received the

necessary training. As a result, some personnel participating in process operations were not aware that they were generating hazardous waste. The EG&G MAT stand down which occurred during the environmental appraisal included an effort to identify all process hazardous waste generation streams and associated personnel.

Appraisers also noted several examples of individuals who were trained and were knowledgeable about hazardous waste management requirements who did not follow requirements. There appeared to be no consequences to correct this behavior. Management involvement and oversight is a determining factor in regulatory and procedural compliance.

6.5.2.3 Solid, Hazardous, and Radioactive Wastes Issue 3

Some of the building processes at Mound use small quantities of solvents for cleaning or degreasing parts. Solvent-containing wipes or rags contain solid waste or LSA waste. In several cases, the wipes or rags were not being stored or disposed of properly.

Wastes which contain spent solvents may be hazardous or mixed wastes as defined under 40 CFR 261.3(a) (2) (iii) and (iv). If these are hazardous or mixed wastes, they are not being stored or disposed of properly. Examples include, but are not limited to: Buildings G, 33, 30, 50, T, and HH.

This assessment was also listed in the 1989 Tiger Team Assessment, Finding WM/CF-1.

6.5.2.4 Solid, Hazardous, and Radioactive Wastes Issue 4

Procedures for storage of waste materials inside and outside of buildings are of concern.

In several buildings, containers holding wastes that are incompatible with any other wastes or other material stored nearby in other containers were found not to be properly separated from the other materials or protected from them. Secondary containment was not used. Containers were not protected from the elements, and showed signs of rust with labels worn off.

Building 72 serves as an excellent example of proper waste storage procedures. Waste stored in the field, awaiting transfer to Building 72 or Building 23, must be stored with the same level of care.

6.5.2.5 Solid, Hazardous, and Radioactive Wastes Issue 5

There are over 250 unlabeled containers stored inside and outside of buildings at Mound. At the exterior of several buildings, drums containing apparently hazardous materials are being stored and/or used in a manner which does not prevent or minimize the potential for release of their contents to the environment.

The storage of drums and other containers containing hazardous materials improperly stored outside buildings can lead to the contamination of surface water, soil, and groundwater. A

number of drums and smaller containers were observed that were outside (unprotected) their point of use/generation, which could provide the opportunity for release to the environment.

This is a recurrence of the 1989 Tiger Team Finding TSCA/BMPF-2.

6.5.4.6 Solid, Hazardous and Radioactive Wastes Issue 6

All waste is not characterized by generators at the time of generation, or evaluated to determine if it is hazardous in accordance with OAC 3745-52-11.

Some waste generated at the Mound Plant is not evaluated by generators to determine if it is hazardous, as required by OAC 3745-52-11. For example, the presence of unknown wastes at Buildings DS, T, HH and 50 was noted to be of concern during the site visits. Some of the containers were not properly stored or labeled to identify the process owner. This is also evidenced by the volume of uncharacterized excess chemicals, materials idled equipment, and waste observed in and around buildings.

The generator must complete a waste determination for all wastes generated at Mound at the time of generation, either through detailed and documented process knowledge or analysis in accordance with 40 CFR 262.11 and OAC 3645-52-11. For several wastes appraisers noted a lack of Waste Profile Declarations on file with Waste Management and the generators' lack of characterization data on the Chemical/Waste Disposal Requests.

Several individuals indicated that a waste determination and associated operating record documentation is required only for RCRA-regulated wastes. Waste generators and Waste Management personnel do not have adequate documentation for those wastes that are considered to be non-RCRA-regulated. Materials including LSA waste, general sanitary waste sludge and investigation derived materials are characterized as non-RCRA waste and stored accordingly. There was a lack of adequate documentation to support these characterizations.

There is a large quantity of uncharacterized waste stored in buildings and outdoors. On many occasions, process generators expressed a belief that Waste Management personnel were responsible for backlogged waste. As required by Mound procedure and state regulations, Waste Management does not accept waste for storage at Buildings 23 and 72 if it is not characterized. As a result, since waste is not characterized by generators, it remains improperly stored in process areas. Waste Management personnel have indicated a willingness to assist waste generators. However, there are insufficient personnel within the organization to perform characterization for generators.

6.5.4.7 Solid, Hazardous, and Radioactive Wastes Issue 7

The waste characterization process at Mound is inconsistent with the process defined in the Draft RCRA permit, Section C-O.

In Section C-O of the permit it is explained that process knowledge at Mound is available through careful control of waste producing processes and is believed to be more accurate than lab analysis. The permit indicates that through internal quality control, knowledge of process mechanics, and Process Waste Assessments that include accurate mass balance data, precise determination of process products can be made. This is not supported by discussions with process managers. Few generators had data to support process knowledge statements, and there was no evidence available that mass balance calculations have been made. Only some of the generators had data to support process knowledge statements.

There is a general lack of knowledge among generators regarding waste characterization. Few generators had data to support process knowledge statements and no evidence was available to indicate that mass balance calculations have been made. Few generators had copies of Waste Profile Determinations or Chemical Disposal Request Forms. The manager of the hazardous waste storage unit indicated chemical disposal request forms rather than waste profile declarations may be submitted for non-routine wastes, infrequent processes, or quantities of waste less than 10 gallons.

6.5.2.8 Solid, Hazardous, and Radioactive Wastes Issue 8

There are discrepancies between descriptions of Mound processes in the draft RCRA permit application, Section C, Waste Characteristics, and activities at Mound.

Section C of the permit application includes descriptions of routine waste generating processes at Mound and includes process flow diagrams. Processes included are as follows: vehicle maintenance, painting, printing, photographic, and radiography, chemical and environmental analysis, Security Force Operations, Safe Shutdown, and D&D activities.

A review of the processes and waste streams identified some discrepancies between descriptions of processes in the application, and those observed during the appraisal. In addition, there are processes onsite that are not identified in the permit.

The Mound RCRA permit application identifies individual waste streams. As a result, the site will be required to submit a Class 2 permit modification each time a waste stream changes. In addition, a mischaracterization at the process level could be considered to be a permit violation once the permit is issued.

6.5.2.9 Solid, Hazardous, and Radioactive Wastes Issue 9

Waste oil at the Mound site is managed as hazardous and non-hazardous waste. The site does not take advantage of the used oil recycling regulations contained in 40 CFR 279 of the Federal Regulations that encourage resource conservation.

There is a large cost reduction that may be realized by taking advantage of these requirements as well as liability reduction. Discussions with Waste Management personnel indicated that a cost comparison was performed, and management decided that it was more cost effective to

manage waste oil as hazardous. This is contrary to the resource recovery intent of RCRA and to common industrial practice and experience.

6.5.2.10 Solid, Hazardous, and Radioactive Wastes Issue 10

There is little evidence of an active program to recover precious metals from RCRA regulated wastes.

Precious metal recovery, as described in 40 CFR 266, provides opportunity for financial and liability reduction opportunities to be realized through recovery of silver and other precious metals from regulated wastes. Additionally, federal property management regulations require that facilities owned or operated by agencies of the federal government must reclaim silver from spent radiographic and photographic solutions and scrap film. The regulations contain provisions for disposal if reclamation is not economically feasible, however, the government owner facility must document and notify the regional Government Services Administration (GSA) Federal Supply Service Bureau. Regulations regarding federal property management are in 41 CFR 101-45. There is no evidence that Mound has submitted such documents.

There are several potential opportunities for metal recovery. Waste containers of plating solutions are being stored for recovery of gold. Although site personnel are aware of electronic circuit boards containing regulated amounts of silver, most are being accumulated as RCRA waste due to lead content. Statements by the manager of Hazardous Waste Management indicated that there are no contracts to recycle these materials. There is no documentation indicating that Mound has evaluated the economic benefits of recovery of precious metals.

A silver recovery system was installed in the radiography area in Building T to recover silver prior to waste being disposed of into the sanitary waste system. However, silver sponges from the unit are being managed as hazardous waste instead of being recycled. This may constitute unpermitted treatment of a hazardous waste or pre-treatment of waste water which is not documented in the site's NPDES permit.

6.5.2.11 Solid, Hazardous, and Radioactive Wastes Issue 11

RCRA operating records are incomplete.

Numerous records are required by RCRA operating record requirements contained in 40 CFR 265.73. Additional requirements are found in the draft RCRA permit. A cursory review of waste characterization records, training records, hazardous waste manifests, certificates of destruction, disposal and treatment, and inventory records was performed.

Waste Profile Declarations and Chemical/Waste Disposal Forms were not retained on file by waste generators for all waste streams. EG&G MAT requires that they be maintained by Waste Management. It appears that there is a lack of documentation for supporting waste profiles and characterization for some waste streams at the generator level to support the information contained on the Waste Profile Declarations or Chemical/Waste Disposal Forms. Small routine

waste streams are not documented with a Waste Profile Declaration. According to the Hazardous Waste management, streams less than 10 gallons and all excess chemicals are transferred on a Chemical/Waste Disposal Form regardless of their process or non-process origin. Specifically, in Building HH there is no current Waste Profile Declaration for carbon disulfide waste streams. There are also routine waste streams in other buildings in which acetone and alcohol wastes are generated in small quantities but are not documented.

In studying the characterization of some wastes observed in buildings and noted on the Waste Operations Log of wastes received from buildings, it appears that the application of EPA codes is conservative and may contribute to increased disposal costs. Examples include the application of EPA "F" codes to excess process chemicals and non-waste process wastes, and use of "P" and "U" commercial waste codes for process waste. As an example, excess commercial chemical product wastes were noted in the hazardous waste storage unit that had "F" codes on the labels and in the operating record. Carbon disulfide wastes had "P" and "F" codes as well as a characteristic code of ignitability. These wastes were not generated as a result of a lifted process and application of the "P" code may be inappropriate for all but a small portion of these wastes.

Shipping profiles to waste treatment and disposal facilities were accurate, complete, and well-maintained. Hazardous waste manifests were complete and well-maintained. Training records were complete with exceptions noted in Solid, Hazardous, and Radioactive Wastes Issue 2 above (Section 6.5.2.2). There is also a lack of documentation to support the generator's Land Disposal Restriction designation.

There is a lack of documentation to demonstrate characterization of non-regulated waste.

Inventory records for waste management units are inconsistent. They do not appear to represent a system for tracking waste from generator to storage units. However, there are good records from storage unit to shipment offsite. It does not appear possible to track records from the waste management area to a container in a waste storage area. The three different waste management groups (hazardous, mixed, and low level) use three different data systems and formats for recordkeeping.

It does not appear possible to track inventory records from waste generators to their respective storage areas as inventory records are inconsistent among waste generators. There does not appear to be a system which ensures waste inventory is properly tracked from process and non-process generation to acceptance by one of the waste management units. Although three waste tracking systems exist, each system provides good records for inventory control from the waste management unit, storage, shipment, and final disposition.

There is no standard identification document to identify what records are maintained, where they are located, and who maintains them.

6.5.2.12 Solid, Hazardous, and Radioactive Wastes Issue 12

Management of LSA waste does not conform to requirements of DOE Order 5280.2A, or OAC 3745-52.

There is a general lack of effort and knowledge by waste generators and building personnel to ensure proper characterization, packaging, and transfer of wastes generated in radiological areas. The generator must document the waste determination and control the waste container to ensure compliance with the waste acceptance criteria at radioactive waste disposal facilities.

Observations in several buildings indicate that waste is not properly managed. Of special concern were waste generator's activities in Buildings R, T, 38, 58, and 30, where violations of numerous requirements were observed.

Some waste is bagged but not placed in containers. No documentation was available to indicate characterization of waste as LSA or RCRA. Several buildings had waste containers which had incomplete waste logs. The generator did not identify contents or state for the record if the container included RCRA waste. Several containers in radiological areas were not locked and were not under the control of the generator. Some of these containers were open and personnel were allowed to place waste into the container without characterization review or documentation.

Radiological content of tritiated waste containers is estimated since there are no direct reading instruments onsite for tritium waste. Estimating was inconsistent, ranging from 0.05 Ci to 0.5 Ci to less than 1 Ci for the same materials, and failed to meet the intent of waste acceptance criteria for radioactive waste disposal facilities.

6.6 Waste Minimization and Pollution Prevention

6.6.1 Observations

The Waste Minimization and Pollution Prevention Program at the Mound site has been successful in increasing the awareness of managers and employees in programs such as aluminum can and paper recycling and reductions in solvent use, CFC's and programs for the reduction and substitution for more hazardous chemicals. However, with the unique problems of loss of key personnel and the shutdown of facilities, the program has stagnated. Aggressive programs and management commitment could result in a corresponding economy of scale. Management emphasis appears to be on environmental compliance and waste management without equal or substantial weight being placed on pollution prevention and waste minimization. Opportunities include: metals, oils, oil filters and oil soaked rags, waste oils, ozone depleting compounds, gas cylinders, hazardous substance reduction, antifreeze, etc.

DOE's Waste Reduction Policy Statement requires a waste reduction policy to reduce the total amount of waste that is generated and disposed of by DOE operating facilities through source reduction and recycling. The policy, according to the *Mound Waste Minimization Plan*, MD-81501 requires waste reduction to be a "prime consideration" in research activities, process design, and facility design and operations. Regulations 40 CFR 26, as well as DOE Orders 5400.1 and 5820.2A require programs that contain goals for minimizing volume and toxicity of wastes that are generated and to implement waste minimization measures.

6.6.2 Findings and Recommendations

6.6.2.1 Waste Minimization and Pollution Prevention Issue 1

Mound is not exploring all available options for waste reduction. This is evidenced by the many opportunities observed by the appraisal team throughout the site. For example, new and surplus chemicals were stored for an indefinite period and turned over to Waste Management for disposal. Several drums of ferric chloride were stored in a room by a tenant in Building DS unknown to the process manager. Metals such as copper and brass were left in vacated laboratories, for solid waste disposal.

Because of the high demand for waste disposal support, Waste Management is not in a position to attempt to contact supervisors or communicate the acquisition of chemicals which still have remaining shelf lives and are usable materials rather than waste, that may be useful to other facility operations. The Waste Minimization staff has been reduced to one manager and the overall program lacks rigor and commitment. There appears to be a lack of integration between environmental management, ES&H and waste minimization in conflict with Mound's objective to "promote integration and coordination of waste generators and waste managers on waste minimization matters." The many opportunities for waste reduction include: recycling and selling metals such as brass weights, copper railings and scrap metals; using an oil analyzer to reduce the amount of oil used based on the principle of replacement of oil, recycling used oil filters,

removing ozone depleting compounds such as 1,1,1-trichloroethane from the inventory and using a wringer unit and reusable absorbent pads.

6.6.2.2 Waste Minimization and Pollution Prevention Issue 2

Supervisors are not trained adequately to perform a comprehensive waste minimization program.

Supervisors do not integrate waste minimization into their environmental programs. Supplies are abandoned without an attempt to recycle or communicate the surplus to those facilities that may have a use for them. In addition, supervisors do not assess wastes systematically to determine other uses, nor are there materials available such as worksheets that include waste assessment overviews, process information, source suppliers, product summary, waste stream summary, options and feasibility analysis to assist supervisors in their evaluations. This contradicts Mound's objectives to develop and implement employee pollution prevention awareness training programs.

6.6.2.3 Waste Minimization and Pollution Prevention Issue 3

The current policy concerning use, recycling, and disposal of protective clothing appears to have a significant negative impact upon reduction of waste.

Current Health Physics requirements for the disposal of protective clothing contributes to an apparent significant annual expenditure which might be reduced if re-evaluated in terms of alternative solutions in a waste minimization perspective.

7.0 REFERENCES

This list represents general references used by the Environmental Appraisal team. In some instances, additional specific references were used to complete a building appraisal. If so, that reference is included in the building report.

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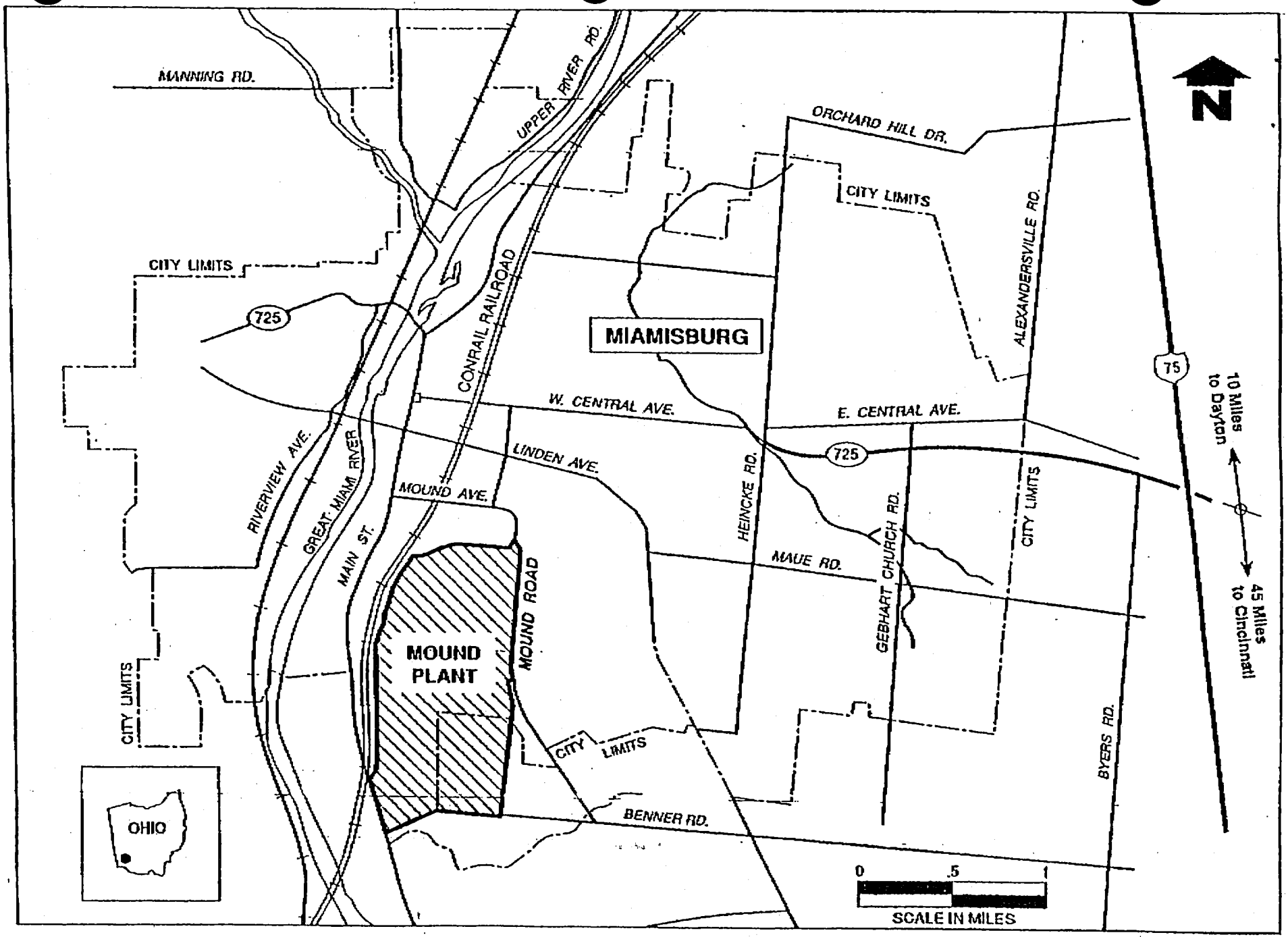

8.1 SITE LOCATION MAP

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8.3 QUALIFICATIONS OF PERSONNEL

This exhibit includes resumes of the environmental appraisal team. The appraisal team was drawn from a pool of environmental engineers and scientists that included EG&G Mound Applied Technologies (EG&G MAT) professionals selected for their expertise & responsibility for various program areas, a Department of Energy (DOE) scientist, and environmental engineers from Nancy Hurst & Associates (NHA). NHA, a contractor to EG&G MAT has extensive experience in appraising DOE facilities. Brief summaries of the qualifications of personnel are included. Team members are presented in alphabetical order.

Billie J. Adkins, Project Manager/Coordinator for corrective actions and compliance audits, EG&G Mound Applied Technologies. Adkins is a Professional Environmental Auditor (NASHP) with 28 years of increasing responsibility and experience at Mound related to quality control systems and configuration control associated with high-technology products and processes. Her experience includes: managing schedules, providing direction for corrective actions and performing adequacy and compliance audits; creating and maintaining production acceptance procedures; auditing production processes during manufacturing; and analyzing routine environmental samples for various radioactive isotopes.

Mark S. Gilliat, Project Manager, Environmental Technology and Monitoring Group, EG&G Mound Applied Technologies. Gilliat provides technical and professional lead for NEPA compliance activities at the Mound facility with seven years experience in environmental compliance, safety/risk analysis and metallurgical engineering. He presently is responsible for coordinating and preparing the *Mound Facility Annual Environmental Report*; conducting Phase I Environmental Assessments in accordance to ASTM STD E 1527-94(1); and developing/ conducting NEPA training courses for senior DOE (Ohio Field Office) and preparation of safety documentation for Environmental Restoration/Decontamination and Decommissioning activities at several DOE sites. As a Metallurgical Engineer, he conducted failure analyses of components of radioactive process systems and developed plans for minimizing costs associated with non-destructive testing of plant water supply lines. His education includes a B.S. in Metallurgical Engineering and a B.S. in Geology. Advanced studies are in the field of Hydrogeology.

Terry L. Glander, Senior Technical Quality Assurance Analyst, EG&G Mound Applied Technologies. Glander is a Registered ISO-9000 Lead Assessor, Certified Quality Auditor, Certified Lead Auditor, and Certified Professional Environmental Auditor with 13 years' technical experience in various aspects of Quality Assurance, Health and Safety, and Environmental Law. Her experience includes: investigating compliance of processes and all other operations to General, State and other local ES&H regulations, security and conducting compliance auditing training; conducting audits and appraisals; and developing database controlling and tracking systems. Glander's education includes a B.S. in Criminal Justice and an A.A.S. in Law Enforcement.

John R. Hausfeld, Senior Analytical Chemist, EG&G Mound Applied Technologies is the technical lead for storm/waste water effluent compliance analysis with 13 years experience. He directed the preparation of the application for the NPDES permits; has conducted sitewide environmental compliance appraisals and audits; processed over 150 state air permit applications; has validated organic and inorganic data prior to submission to the Ohio EPA; and has participated in stakeholder interaction including Federal and state agencies.

Floyd R. Hertweck, Jr., Senior Waste Management Engineer, EG&G Mound Applied Technologies. Hertweck is Certified Professional Geologist, Registered Environmental Professional, and Registered Professional Environmental Auditor with 16 years of professional experience. For the past nine years he has been providing oversight of, and guidance for, compliance issues related to hazardous and mixed waste management and CERCLA environmental restoration activities. Efforts include addressing issues related to conducting treatability studies, waste acceptance, generated wastes, weapons component testing and evaluation, and preparation of legal agreements and orders. Hertweck interfaces with state and Federal regulatory personnel; and has conducted workshops on CERCLA compliance addressing the RI/FS process, remedial action, ARAR's, legal agreements and RCRA compliance. His education includes a B.S. in Geology and he is working toward Master of Science degrees in Geology and Environmental Management.

Mary-Louise Hoagland, NHA, specializes in ES&H and OSHA auditing, performing risk and site assessments, and training in hazardous materials, RCRA, OSHA and state compliance. She is a Registered Environmental Assessor (Cal-EPA) with 18 years experience in risk management, industrial safety, environmental, occupational health and hazardous waste operations. Her experience includes consulting with firms in environmental and safety compliance issues, chemical handling and storage, risk assessment, hazard analysis, accident investigations, emergency response, and chemical spills. Compliance audits number in the hundreds for all types of facilities in the public and private sectors. As a Safety and Occupational Health Specialist for the Air Force Logistics Command, she was responsible for developing and reviewing hazardous materials and hazardous waste policies and procedures. She currently serves as an environmental representative on the EPA Region IV Local Environmental Planning committee (LEPC) and is Chairperson of the LEPC Hazard Analyses Subcommittee.

Michael J. Merker, Environmental Compliance Assessment and Management Program (ECAMP) Director, Ohio Field Office, Department of Energy (DOE). Merker is a former Ohio State Regulatory inspector with 11 years experience in conducting ECAMP audits and inspections for the DOE, Air Force (Wright Patterson Air Force Base) and the State of Ohio. He has extensive compliance experience obtained in developing and implementing government/state strategies focused in areas of TCTA and OSHA, incorporating requirements of the CAA, CWA, CERCLA, TSCA, and DOT. He conducted ECAMP audits for the Air Force at six major air bases. As an Air Pollution Control Specialist for the Ohio Regional Air Pollution Control Agency, Merker negotiated compliance agreements with Federal agencies and private corporations in matters concerning enforcement of state air regulations. His education includes a B.S. in Environmental Health.

Laurie Morissette, M.A., J.D., Chief Environmental Counsel, NHA. Morissette is a nationally recognized environmental attorney with 27 years experience in application, interpretation, enforcement, and litigation of environmental laws and regulation. She is known as an effective negotiator (operating conditions, permit terms, zoning variances and requirements, DOT and HMTA requirements, and Consent Orders under CAA, CWA, RCRA, and TSCA, and CERCLA settlements) with experience in 33 states and numerous Federal and international agencies. Her experience includes five years as Chief Environmental Counsel for a Fortune 200 with operations and manufacturing divisions in 33 states and 23 foreign countries ($2.7 billion in sales and 36,000 employees). Morissette has professional affiliations including the Virginia, District of Colombia, and American Bar Associations.

Phillip Parker, Senior Waste Management Engineer, EG&G Mound Applied Technologies. Parker is a multi-disciplined chemist with 10 years experience, including eight years in explosive surveillance and environmental waste management. He is currently responsible for the Mound site implementation of the Hazardous Waste Certification System, including system development, documentation, and training. He is responsible for developing, providing, and tracking schedules and budgets for the Hazardous Waste Treatment facilities. He is recognized for developing new testing fixtures and procedures to resolve quality deficiencies on the Mound explosive valve program. As a process engineer, Parker was responsible for production of the Burgess-Rhinehamer Tritium Monitor to meet Mound requirements. His experience also includes in depth knowledge of material control database systems. He is recognized for having developed, documented and implemented material control systems for new production projects. Parker's education includes a B.S. in Chemistry and numerous environmental technical and management courses.

Ronald P. Paulick, Groundwater Coordinator, EG&G Mound Applied Technologies. Paulick is a multi-disciplined chemist with 16 years experience in analytical chemistry and environmental program management. He is currently responsible for the development and implementation of the Groundwater Protection Management Program and the Safe Drinking Water Program, including the coordination of activities among EG&G Mound departments. His experience includes conducting safety and compliance inspections of five laboratory and production facilities as Area Safety Committee Chairperson. Paulick's education includes a B.S. in Chemistry and several technical training courses, including Groundwater Pollution and Hydrology, Environmental Data Validation, Fundamentals of Environmental Sampling, and Field Sample Screening.

John K. Puckett, an Environmental Engineer, EG&G Mound Applied Technologies, has eight years combined experience in Quality of Production Oversight and Environmental Engineering at the DOE operations at both Mound and Savannah River. He is currently responsible for Mound's air permit program and SARA Title III compliance. Mr. Puckett's experience includes reviewing and commenting on quality plans and procedures; conducting employees' RCRA training; and quality oversight of two production lines. Previously, he was responsible for the Savannah River Tritium hazardous waste storage areas and the waste minimization program. His responsibilities have included management of satellite accumulation areas (SAA's); preparation of Waste Minimization plans, conducting training, and preparing inventory reports. His education includes a B.S. in Chemical Engineering.

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John Ross, Jr., Environmental Program/Compliance and Liability Manager, Los Alamos Technical Associates, Safe Sites of Colorado. Ross is a Registered Environmental Manager—National Registry of Environmental Professionals, with thirteen years experience, specializing in environmental compliance and regulatory affairs and in the handling and disposal of hazardous and radioactive materials. His experience includes: program manager for environmental and safety compliance programs for six industrial facilities and support areas (five with radioactive contamination and four with extensive RCRA regulated systems); facility liaison to EPA, Colorado Department of Public Health and Environment, and DOE for negotiating action plans, conducting tours and inspections, and resolving programmatic deficiencies. He has performed over 250 unit surveillances for RCRA- and TSCA-regulated wastes (providing guidance for corrective actions and implementing best management practices); and performed program assessments on sanitary waste streams, RCRA operating records, underground storage tanks, recovery/reclamation/recycling, emergency preparedness, and sitewide assessment of RCRA permitted storage units, TSCA units, mixed residue storage units, and mixed residue tank systems. In addition, he is a Certified Chemical Operator and Certified Environmental Quality Auditor.

Mary Ellen Sizemore, Senior Engineer, EG&G Mound Applied Technologies. Sizemore is a chemical engineer with 15 years experience, specializing in regulatory compliance and environmental technical support. Her experience includes: performing evaluations of effectiveness of management systems to ensure continuing compliance with regulatory requirements; performing integrated environmental assessments; and providing technical and other engineering support to plant personnel in areas of hazardous waste management, process waste assessments, waste minimization, and regulatory application. At Mound she has worked in designing, fabricating, modifying, and operating complex isotope separation, purification, and chemical conversion systems. Sizemore is currently in a Masters of Science, Environmental Science, program and holds a B.S. in Chemical Engineering.

Myron K. Smith, Jr., Senior Facilities Engineer, NHA. Smith is an Executive Advisor to senior level management personnel of small and small disadvantaged and Fortune 500 companies with over 34 years of experience, of which 14 career years are at the Senior Executive Management level. Business area specialties include: energy, environmental compliance, alternative fuels, facilities maintenance and operations, systems engineering, and contract compliance auditing. Smith, a former Deputy Assistant Secretary, Fossil Energy, DOE, and a retired Captain, Civil Engineer Corps, U.S. Navy, has developed and implemented environmental protection plans, Emergency Response plans, ES&H reviews of analytical laboratories; has overseen cleanup operations of major emergency response actions; and has been on "both sides" of DOE Tiger Team audits. His education includes an M.S. in Financial Management and a B.S. in Petroleum Engineering.

Marcia Dee Vannet, is a Senior Research Chemist with 15 years of experience in research and development, ES&H, with training related to energetic materials and waste management. At EG&G Mound, Vannet is responsible for all training programs related to Waste Management activities, having designed, developed, and delivered RCRA training for 1,600 employees. Ms. Vannet evaluates vendor training in areas such as HAZWOPPER and DOT regulations. Ms. Vannet also participates in company efforts to maintain compliance with all applicable state and Federal regulations, including RCRA, OSHA, and DOE Explosive Safety. Her education includes the Ph.D. in Inorganic Chemistry and a B.A. in Chemistry.

Nancy H. Vyas, Senior Environmental Engineer and President, NHA. Vyas is a registered environmental engineer with 19 years of professional, technical, and managerial experience, 10 of which were with EG&G. She has participated in over 100 ES&H audits for government and industry, including most DOE nuclear and non-nuclear facilities and EG&G manufacturing sites. Vyas has designed multi-media pollution control for wastewater, stack gases, solid and hazardous waste, and has designed and constructed a state-of-the-art wastewater treatment system. Her education includes a B.A. in Chemistry, a B.A. in Biology, a B.S. in Civil Engineering, and an M.S. in Environmental Engineering. Vyas also serves as the U.S. Small Business Administration's advisor to small and disadvantaged businesses.

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LIST OF ACRONYMS

ACBM	asbestos-containing building material
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
D&D	decontamination and decommissioning
DOD	Department of Defense
DOE	Department of Energy
DOT	Department of Transportation
EA	environmental assessment
EMSOC	Energetic Materials Safety Overview Committee
EPA	Environmental Protection Agency
ER	environmental restoration
ES&H	environment, safety and health
FY	fiscal year
HAZWOPPER	hazardous waste operation and emergency response training
HEPA	high-efficiency particulate air
HP	health physics
LDR	Land Disposal Restricted
LSA	low specific activity
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollution
NIOSH	National Institute for Occupational Safety and Health
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NTS	Nevada Test Site (DOE)
OAC	Ohio Administrative Code
OEPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
OSP	Orphan Source Program
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RTG	radioisotopic thermoelectric generator
SAR	Safety Analysis Report
SARA	Superfund Amendments and Reauthorization Act
SPCC	spill prevention, control, and countermeasures
TRU	transuranic
TRUESOC	Transuranic Environmental and Safety Overview Committee
TSCA	Toxic Substances Control Act
UST	underground storage tank
UCNI	unclassified controlled nuclear information
VOC	volatile organic compounds

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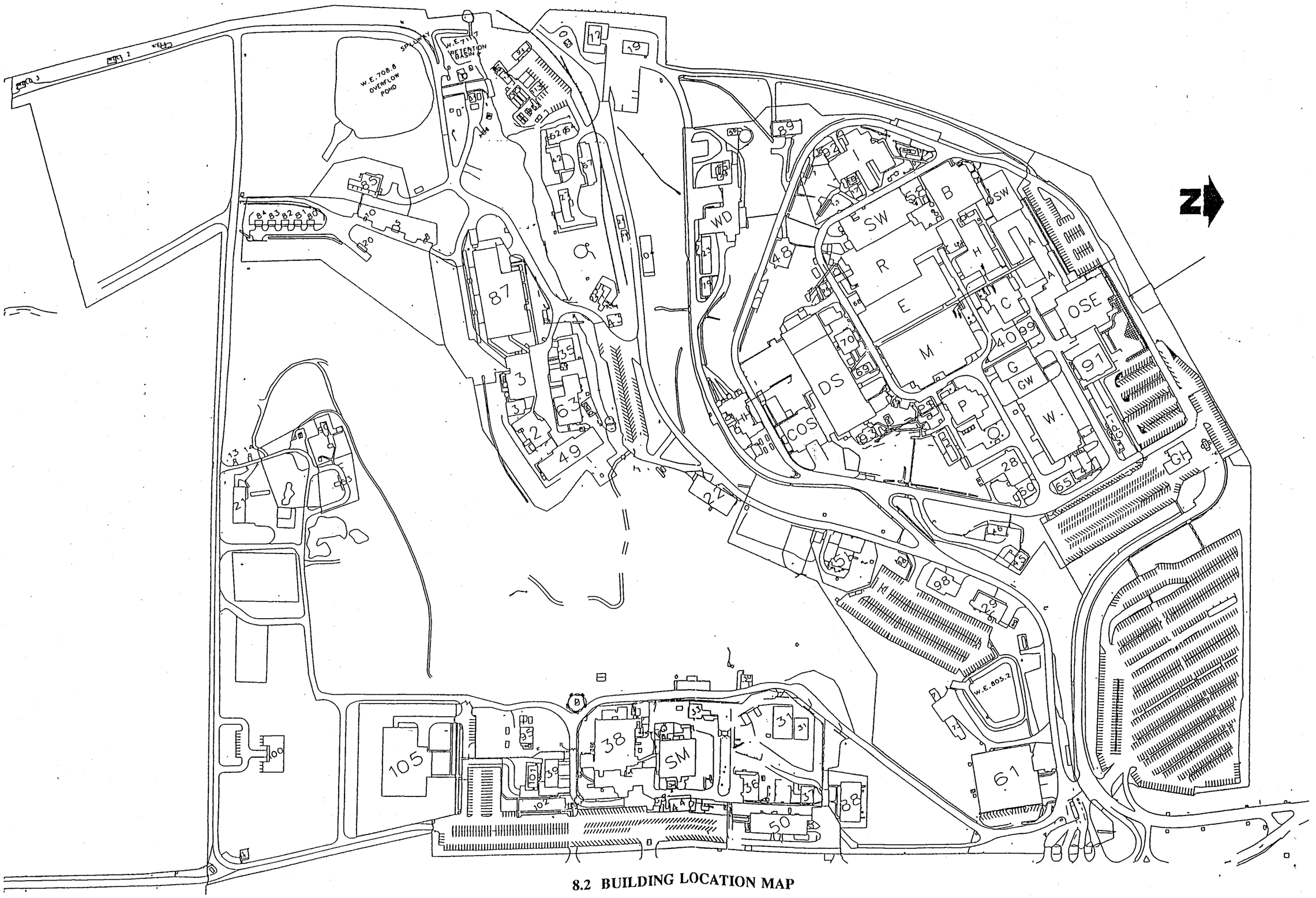

8.2 BUILDING LOCATION MAP