3001 0405250009

CH2M HILL
Mound, Inc.
1 Mound Road
P.O. Box 3030
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45343-3030

CH2MHILL

SM-092/03
December 4, 2003

Mr. Dewain Eckman, Acting Director
Miamisburg Closure Project
U. S. Department of Energy
500 Capstone
Miamisburg, OH 45342

ATTENTION: Paul Lucas

SUBJECT: Contract No. DE-AC24-03OH20152
BUILDING 48, BUILDING DATA PACKAGE, PUBLIC REVIEW DRAFT
Bldg 48 GFS/I: Planning Document Complete – Activity ID EBDEE048AK

REFERENCE: Statement of Work Requirement 055 - Regulator Reports

Dear Mr. Eckman:

Frank Schmaltz from your office has approved the following document to be released for public and regulator review:

- Building 48, Building Data Package, Public Review Draft

The review period will be from 5 December 2003 until 4 January 2004, and the site contractor will respond to any comments received and incorporate the responses into the final document. If you or members of your staff have any questions regarding the document, or if additional support is needed, please contact Bob Ransbottom at 865-4220.

Sincerely,

K. L. Kehler
SMPP/TFV Project Manager

KLK/VKD

Enclosures

cc: David Seely, USEPA, (1) w/attachments
Brian Nickel, OEPA, (4) w/attachments
Ruth Vandegrift, ODH, (1) w/attachments
Mary Wojciechowski, Tetra Tech, (1) w/attchs
Frank Schmaltz, DOE/MCP, (1) w/attachments
Lisa Rawls, DOE/MCP, w/o attachments
Randy Tormey, DOE/OH, (1) w/attachments
Dann Bird, MMCIC, (3) w/attachments
Jim Bonfiglio, MESH, (1) w/attachments
Public Reading Room, (4) w/attachments
Kurt Kehler, CH2M Hill, (1) w/attachments
Val Darnell, CH2M Hill, (1) w/attachments
DCC (1) w/attachments
John Fulton, CH2M Hill, w/o attachments
Bob Ransbottom, CH2M Hill, w/o attachments
Dave Rakel, CH2M Hill, w/o attachments

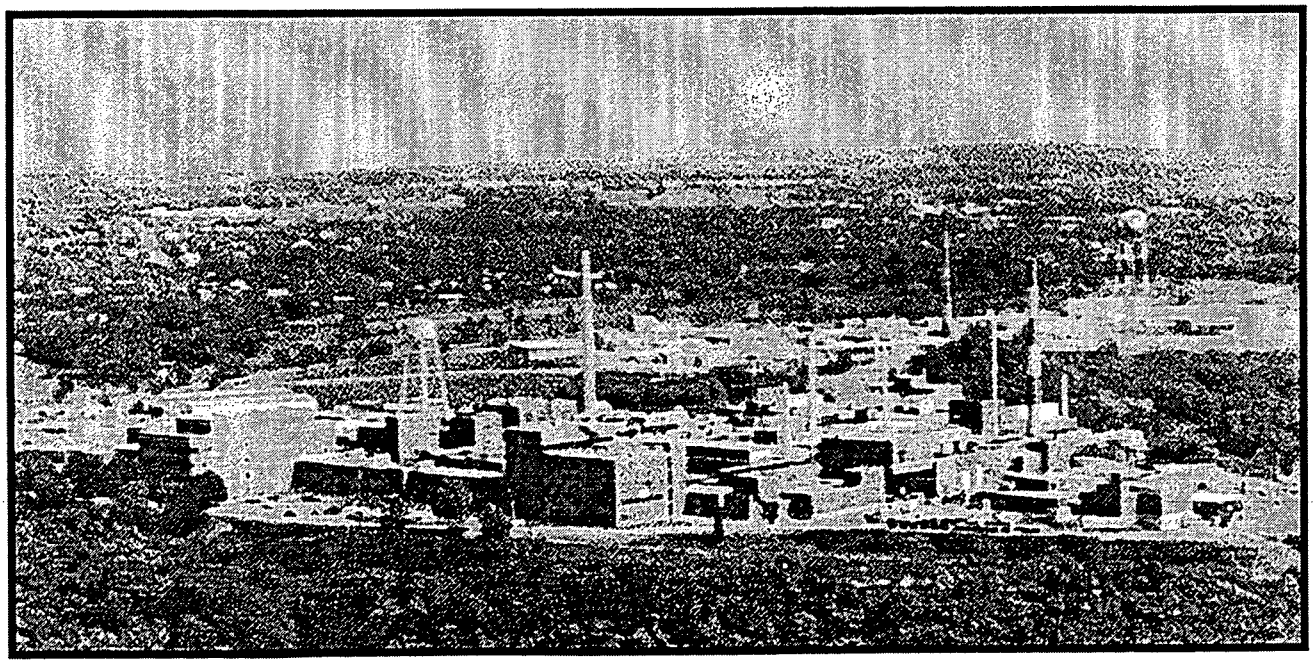
Environmental
Restoration
Program

Miamisburg Closure Project
Building Data Package

Building 48

(Demolition)

Public Review Draft
December 2003



MIAMISBURG CLOSURE PROJECT

BUILDING DATA PACKAGE

The following document is available (December 5, 2003) for public information in the CERCLA Public Reading Room, 305 E. Central Ave., Miamisburg, Ohio.

BDP Building 48: Process Mechanization Facility/Explosive Surveillance

Questions can be referred to Paul Lucas at (937) 847-8350 ext. 314

U.S. Department of Energy
U.S. Environmental Protection Agency
Ohio Environmental Protection Agency

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BDP Building 48

REV	DESCRIPTION	DATE
WORKING DRAFT (to DOE)		**December 2003**
DRAFT (to Core Team)	BDPs for construction demolitions undergo simultaneous review by the Core Team and public.	**N/A**
DRAFT PROPOSED FINAL (incorporates Core Team comments)		**N/A**
PUBLIC REVIEW DRAFT	The public review period is 5 December 2003 through 4 January 2004.	**December 2003**
FINAL		

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1.0 GENERAL OVERVIEW

1.1 Introduction

The purpose of this Building Data Package (BDP) is to prepare for the demolition of Building 48 (Process Mechanization Facility/Explosive Surveillance) and to identify, if possible, any recognized environmental conditions (defined below) that may affect the subject property and building.

Recognized Environmental Condition: The presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a likely release, a past release, or a material threat of a release of any hazardous substances or petroleum into structures, or into the air, ground, groundwater, or surface water near the building.

1.2 Scope

This document has been prepared in accordance with the agreements and requirements as specified in the *Work Plan for Environmental Restoration of the DOE Mound Site, The Mound 2000 Approach*. This document is a BDP for Building 48 located at the Department of Energy (DOE) Miamisburg Closure Project (MCP) in Miamisburg, Ohio. The investigation performed to support this BDP models procedures found in *ASTM Standard Practice for Environmental Site Assessments; Phase I Environmental Site Assessment Process* (Designation E 1527-97).

The scope of the investigation included Building 48, the soil beneath, and a 15-foot wide perimeter border around the building. The investigation of Building 48 included the following:

A) A building and perimeter inspection.
B) An examination of historical aerial photographs and maps.
C) A review of federal and state regulatory agency records.
D) Personnel interviews.
E) A review of site records for:

   1) History of spills, releases and chemical inventories
   2) Past sampling data

      - Radiological survey
      - Soil sampling
      - Lead-based paint
      - Asbestos
      - Radon

In addition to the building investigation conducted by site contractor personnel, documents were reviewed. Information used to compile BDPs includes the following:

- Characterization of Mound's Hazardous, Radioactive, and Mixed Wastes, August 1990
- Operable Unit 9 (OU-9) Site Scoping Report, Volumes 1-12
- Mound Facility Physical Characterization, December 1992
- Active Underground Storage Tank Plan, November 1994
- OU-9 Hydrological Investigation, Bedrock Report, January 1994
- OU-9 Hydrological Investigation, Buried Valley Aquifer Report, March 1994
- Environmental Appraisal Report of the Mound Plant, March 1996
- Title Search
- Lease Information
- EDR Report - Radius Map
- Building Prints
- Potential Release Site (PRS) information
- MD-22153, Mound Site Radionuclides By Location, June 1995 Contaminant Surveys
- MLM-3791, Mound Facility Physical Characterization, December 1993

2.0 BUILDING 48 OVERVIEW

Constructed in 1970, Building 48 is located on the west central portion of the site (Figure 1). The facility is a two-story, slab-on-grade structure constructed of poured concrete and concrete block with the exception of the corrugated, galvanized metal "blow-out panels" stretching across the south side of the second story (photos provided in Appendix C, and floor plans provided in Appendix D). These non load-bearing wall panels (south wall of Rooms 203, 204, and 205) were designed to blow outward in the event of an explosion. The exterior walls of the building are constructed of one-foot thick poured concrete, and the interior walls are constructed of eight-inch thick concrete block except in areas designated for high explosives. The poured concrete floor between the first and second floors is thicker in the areas designated for high explosives. Being built into a hillside, the second floor of Building 48 is wider than the first floor. The north wall of the first floor of the building is completely below grade and the north wall of the second floor is partially below grade. Also, due to its hillside construction, Building 48 is set on caisson type footers that range in depth from about one foot to almost twelve feet. The footers have a stair step-like construction and are set below the shale line, anchoring the building to the hillside. Building 48 has not had any major modifications, other than reconfiguration of some of the interior rooms, and contains 7,950 square feet of floor space.

The building uses central steam for heating and a chilled water for cooling. Electric service is 480 volts. The building has potable and service water, a fire sprinkler system, sanitary services, and storm drains.

2.1 Past Uses of Building 48

Building 48 was built as a Process Mechanization Facility, although it was also used for other purposes (Table 1). As the Process Mechanization Facility, the first floor of the building was used for administrative offices, records storage, and housing the building mechanical equipment; the second floor rooms were operated as an analytical laboratory, machine shop facilities, a packing and shipping room, a receiving area, and a high explosive storage cell. The building was constructed to handle energetic materials as indicated by design provisions such as blow-out panels, thickened concrete walls and floors, and the grounding of areas where high explosives were to be used, including a copper bus through the walls and conductive floors.

Table 1 - Programs and Processes Housed in Building 48

Timeframe	Process or Function
1970 to 1986	Process Mechanization Facility (investigation of processes, materials, components, and instrumentation for the in-house production of pyrotechnic devices)
1982 to 1996	Explosive Surveillance (disassembly of the explosive components from weapons [primarily those that were old or faulty] for visual inspection and physical/chemical analysis)
1996 to 1998	Underwent safe shutdown for conversion to a "user agreement" facility
1998	Short-term RCRA Treatment of Reactive (Explosives) Waste.
1999 to 2003	Environmental Laboratory Facility (measure the concentrations of radiological elements in substances using laboratory analytical techniques)

Processes involved in the Explosive Surveillance function included visual inspection of components, electrical testing (resistance and static discharge) of components, mechanical testing of components, mechanical disassembly of components, Polaroid photography of whole components and component parts, removal of energetic materials from disassembled components, solvent cleaning of disassembled components to remove any remaining energetic materials, scanning electron microscope (SEM) analysis of components parts, preparation of components for test firing, and cleanup from these various operations.

In the late 1990s, Building 48, because of its past uses as an explosives surveillance facility, was used as a short-term RCRA treatment facility for reactive (explosive) wastes. In the first phase of this treatment process, the energetic components were demitilarized. Components containing energetic materials were processed in a mill press in Room 203. The mill was situated behind a wall and was remotely controlled by the operator on the other side of the wall. The projection wall between rooms 202 and 203 has an observation window constructed of bullet-proof glass to allow the operator to monitor the operation. The wall on the opposite side of the mill is a "blast wall" (the second floor south wall) that was designed to blow away upon impact, focusing the released energy outward away from the operator and the building interior in the unlikely event of an explosion. In the second phase, powders, pellets, and other energetic materials were dissolved in appropriate solvents to stabilize the hazardous waste constituents. This process took place under an explosives management fume hood, using appropriate solvents.

In early 1999, Building 48 was remodeled to accommodate the Environmental Laboratory Facility, which was moved to Building 48 from E Building. The Environmental Laboratory functions included many operations involving radiological samples. The Environmental Laboratory function continued in Building 48 until October 2003 when the lab function was relocated to Trailer 24.

2.2 Current Uses of Building 48

Building 48 is currently inactive. The equipment is in the process of being removed. All required equipment will be removed from the building, and any remaining equipment will be left in place and demolished/disposed of with the building. Safe Shutdown activities will be conducted prior to the commencement of demolition.

2.3 Summary of Environmental Concerns and Findings - Building 48

Table 2: Summary of Environmental Concerns and Findings

Description	Comment	Resolution
Lead-Based Paint	No previous lead surveys or sampling data could be found for Building 48. (Appendix J)	No paint analysis would be necessary to protect worker health during demolition activities unless any coatings were to be disturbed by close worker contact (sanding, grinding, scraping, torch cutting, etc.). If these types of activities are planned, the affected paint coatings should be tested to verify the absence of lead. Per Waste Management, building debris containing lead-based paint can be disposed of in a sanitary landfill.

Table 2: Summary of Environmental Concerns and Findings

Description	Comment	Resolution
Chemicals	Appendix K provides a list of chemicals reportedly used or stored in Building 48. Applicable pages from the CY2001 Emergency and Hazardous Chemical Inventory Report (dated March 2002) are also provided.	All chemicals will be removed prior to demolition, and dispositioned by Waste Management.
Fluorescent Lamps and PCBs	Fluorescent lamps were used in the building. Ballasts may contain polychlorinated biphenyls (PCBs).	Ballasts that may contain PCBs will be removed prior to demolition, and disposed of by Waste Management.
Air Emissions	Air emissions for Explosive Surveillance operations in Building 48 were *de minimis.* During the building's use as an Environmental Laboratory,there were 13 fume hoods present. None of the fume hoods required an air permit by the Ohio EPA, but they were under Registration Status. The fume hoods in Building 48 were exposed to radionuclides so there is the potential that the fume hoods and exhaust ductwork could contain radiological contamination.	All processes have been discontinued. Radiological surveys will be conducted to determine the extent, if any, of radiological contamination. The survey results will be documented in the Final Status Report.
Asbestos	Previous asbestos surveys for Building 48 were completed in 1989 and 1993. These surveys identified pipe insulation, transite cement panels, tank insulation, ceiling tiles, and floor tiles as asbestos-containing materials (ACMs). During October of 2003, Mr. Christopher Ahlquist, an Industrial Hygienist with CH2M Hill Mound, Inc., performed a comprehensive walk-through survey of all areas of Building 48 in order to identify all ACMs prior to demolition of the facility (Appendix I). Some of the asbestos referred to in earlier surveys had been removed during previous abatement projects. Remaining ACMs requiring removal prior to demolition include: pipe insulation, transite cement panels, fire doors, fire-stop putty, and cement board.	ACMs requiring removal before building demolition will be removed by a licensed asbestos hazard abatement contractor. The asphalt roofing is assumed to contain asbestos, but as a Nonfriable Category II material in accordance with NESHAP, it will remain in place during demolition and be disposed of as construction waste. All work will be performed in accordance with current state and federal regulations.
Drainage Sumps	There are no drainage sumps.	N/A
Lead	N/A	N/A
Mercury	N/A	N/A

Table 2: Summary of Environmental Concerns and Findings

Description	Comment	Resolution
Radiological	The Building 48 Predemolition Survey Plan is provided in Appendix G. Radiological surveys are not yet complete.	Survey results will be documented in the Final Status Report, which will be reviewed by the Core Team prior to commencement of demolition activities. The report will be included in the Final BDP.
Septic System	N/A	N/A
Wastewater	Handled by site wastewater facility.	N/A
Stains & Corrosion/HVAC	N/A	N/A
Storage Tanks	There are no aboveground or underground storage tanks within 15 feet of the perimeter of Building 48.	N/A
Solid Waste Disposal	N/A	N/A
Migratory Hazards	N/A	N/A
Radon	Radon level is not applicable for open air demolitions.	N/A
HVAC	HVAC refrigerant will be drained and disposed of during Safe Shutdown.	No further action required.
Energetic Materials	The exhaust ductwork and structural cracks may contain trace amounts of loose energetic materials. Energetics present in the building may have included TNT, PETN, lead styphnate, HNS, HNAB, RDX, TATB, HMX, HNS, CP, LX-10, LX-13, PBX, PBX9407, PBX9487, XTEX, MDF, lead azide, N-lead styphnate, and TIHX/KCIO4TI/B. (*energetic acronyms defined at end of table)	Issues associated with potential energetic material hazards were mitigated when the building previously went through safe shutdown activities and was remodeled for use as an Environmental Laboratory. Subsequent to the initial safe shutdown activities, a temporary process involving the dissolution of energetic materials was housed in Building 48; however, because that process did not introduce loose energetics into the building, the subsequent use does not pose any concern for worker safety during building demolition. Heavy-duty equipment will be used for demolition and debris handling. No additional precautions are indicated.

Table 2: Summary of Environmental Concerns and Findings

Description	Comment	Resolution
Soil Contamination	Appendix L contains a graphic showing all soil sample locations within 15 feet of the Building 48 perimeter, and provides tables for detected compounds (results above laboratory detection limits) and non-detected compounds (results below laboratory detection limits). Maximum exceedances to screening levels (Core Team approved or the more stringent of either 10^{-6} Risk-Based Guideline Value [RBGV] plus background or Hazard Index = 1) are listed in Table 3. The analytes listed in Table 3 also exceed the site Cleanup Objective, which is based on 10^{-5} RBGV plus background. All other results are below applicable screening levels.	Borehole locations for elevated levels of plutonium-238, thorium-230, thorium-232, and uranium-238 are located within PRS 429 (north of Building 48), which was binned a Removal Action. After the Removal Action is complete, the results of soil analysis verifying that the Cleanup Objectives (CO) were met at these locations will be reported in the UGL On-Scene Coordinator Report. Borehole location C0063 (elevated cobalt-60 result) is not within a PRS boundary. The sample location is beneath a concrete walkway and there is no visible borehole. C0063 was sampled as part of the radiological site survey (RSS), which had a location variance of +/- 25 feet. Based on this, it is technically unfeasible to locate where the data came from in order to assess or remove the potential contamination. Therefore, no sampling is planned as part of the Building 48 demolition activities and this data point will be evaluated during the Residual Risk Evaluation (RRE) process. Potential cobalt-60 soil contamination will not affect worker safety during demolition activities because the elevated result (1.6×10^{-5} RBGV) is within the acceptable CERCLA risk range. The Work Plan includes information about the soil contamination, and instructs workers to minimize disturbance of the surrounding soil. Much of the north wall of Building 48 will be left in place to stabilize the hillside and prevent disturbance of the hot waste line and contaminated soil in that area.

N/A: Not applicable

*TNT trinitrotoluene; PETN pentaerythritol tetranitrate; HNS hexanitrostibene;
HNAB hexanitroazobenzene; RDX cyclotrimethylenetrinitramine; TATB triamino-trinitrobenzene;
HMX cyclotetramethylenetetranitramine; HNS hexanitrostibene; CP cobalt pentamine perchlorate;
TIHX/KClO4TI/B titanium subhydride/potassium perchlorate/titanium/boron;
LX-10, LX-13, PBX, PBX9407, PBX9487 are the designations for particular plastic bonded explosive formulations;
XTEX is a paste extrudable explosive formulation;
MDF is an acronym for mild detonating fuse.

Table 3 - Maximum Results Exceeding Screening Levels (pCi/g)

Analyte	Maximum Result	Background	RBGV (10^{-6})	Screening Level
Cobalt-60	1.10*	NC	0.07	0.07
Plutonium-238	2,902**	0.13	6.10	55
Thorium-230	5.23**	1.9	0.09	2.00
Thorium-232	182.2**	1.4	0.07	1.47
Uranium-238	5.37**	1.2	0.1	1.3

RBGV: most stringent of construction and office worker scenarios per Risk-Based Guideline Values, March 1997, Final, as performed using April 2001 HEAST slope factors.

NC: Not calculated for as part of background soils investigation.

* See Table 2, Soil Contamination for discussion of sample location C0063.

** These sample locations are located within the boundary of PRS 429, which is binned Removal Action (RA). Authorization for the removal of the contaminated soil is per the UGL Action Memorandum. The removal of contaminated soil at PRS 429 will be documented via the UGL On-Scene Coordinator Report.

2.4 Radiological Information for Building 48

A radiological assessment of Building 48 was performed by reviewing its operational history and preliminary radiological survey information. Building 48 has been home to three different or distinct processes: first to support the Process Mechanization Program, later to support explosives work, and most recently to house the environmental laboratory operations.

In 1970, there was a wasteline break in the area where Building 48 is located, and in 2001, there was a tritium contamination incident that affected rooms 211, 204, and 208 in Building 48. Since there is a potential for residual contamination to be present, Building 48 is designated as impacted.

The radiological status of all building surfaces will be determined to facilitate a free release of the structure consistent with project goals and site procedures. The Predemolition Survey Plan for Building 48 was prepared commensurate with operational history and in accordance with the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), and is presented in Appendix G. The survey plan will be implemented and will provide the necessary data to dictate appropriate demolition and disposal. A Final Status Report (FSR) will summarize results from implementation of the survey plan and provide justification for the designated disposal of debris. The FSR will be reviewed by the Core Team prior to proceeding with building demolition, and will be included in the final BDP.

3.0 SITE DESCRIPTION

3.1 Site/Vicinity Location and Characteristics

Building 48 is located at the DOE MCP site, formerly known as the Mound Plant. The MCP site is situated in the City of Miamisburg, Miami Township, Montgomery County, State of Ohio as shown in Appendix B.

The Mound Plant at one time was situated on approximately 300 acres of land and contained approximately 130 buildings with a total of approximately 1.4 million square feet of floor space (the number of buildings is constantly diminishing as buildings are decommissioned and either sold or demolished). The original 182-acre site, purchased by the Manhattan Engineering District in 1946, consisted of two hills and an intervening valley that runs approximately east and west. The 124-acre tract acquired in 1981 was an undeveloped mixture of fields and woods that undulates and slopes downward to the west, away from the main site. This area was acquired to serve as a buffer and has been used as a staging area and parking area for contractors working onsite.

To the west lie a railroad line and the north south trending Miami-Erie Canal. The northern boundaries of the site abut the residential area of Miamisburg, Ohio. Mound Road marks the northern half of the eastern perimeter of the facility then veers east, away from the southern half of the eastern boundary. A public golf course (belonging to the City of Miamisburg), the Miamisburg Mound Memorial Park, old agricultural fields, residential lots, and vacant wooded lots border the facility along Mound Road. Benner Road formed the southern property line of the Mound Plant (at the 300-acre stage), with agricultural fields and farms occupying the lands beyond.

3.2 Description of Structures, Roads, and Other Improvements in Proximity to Building 48

Building 48 is bordered by an up gradient, grass covered hillside, an asphalt roadway and R Building on the north; an up gradient, grass covered hillside, an asphalt roadway, and SW Building on the northwest; an up gradient, grass covered hillside and Buildings DS and T on the northeast; an asphalt roadway, a down gradient, grass covered hillside and Building WD on the south; and a concrete driveway and a grassy area on the west (Figure 3).

3.3 Current and Past Uses of Buildings in Proximity to Building 48

Buildings in proximity (Figure 1) to Building 48 include:

- R Building (Research Building), located north of Building 48, is a 55,003 square-foot single-story structure with a penthouse constructed in 1948. The building contains laboratories for radioactive and non-radioactive work. The "hot" side of the building contains areas used for tritium recovery and plutonium work. The cold side of the building contains research and development, and analytical laboratories. R Building

is in the process of being decontaminated per an Action Memorandum, and is anticipated to be demolished in 2004.

- SW Building (Semi-Works Building), constructed in 1950 and located northwest of Building 48, is a 43,066 square-foot two-story structure with a penthouse. The building was used for tritium recovery and purification, component development, component evaluation, and analysis of materials. SW Building is in the process of being decontaminated per an Action Memorandum, and is anticipated to be demolished in 2004.

- DS Building (Development/Standards Building), built in 1965 and located northeast of Building 48, is a 47,810 square-foot single-story structure with three penthouses. The facility was used for metrology, laser technology processes, and laboratories for research and development of nuclear components. DS Building is located directly above T Building, and is expected to be demolished as a construction demolition project in late 2004.

- T Building (Technical Building), located northeast of Building 48, is a 173,000 square-foot heavily reinforced, underground structure constructed in 1948. The building was used for Polonium-210 purification, bismuth and beryllium extraction, tritium operations, recovery and purification, calorimetry production, heat source calibration, and x-ray and safeguards gamma scanning. T Building is in the process of being decontaminated per an Action Memorandum, and is anticipated to be transitioned to MMCIC.

- WD Building (Waste Disposal Building), constructed in 1948 and located south of Building 48, is a 28,222 square-foot multi-story building with penthouses, a full basement, and a partial sub-basement. The building was the treatment facility for low specific activity (LSA) radioactive wastes generated by process activities at Mound. WD Building is in the process of being decontaminated per an Action Memorandum, and is anticipated to be demolished in 2004.

- Building 26 was an 800 square-foot single-story steel frame, metal building that was located north of Building 48. The building was constructed in 1965 and used as a welding shop, storage, and office area. It was dismantled and removed in 1996.

- Building 89 was a 4,830 square-foot two-story reinforced concrete block structure that was located west of Building 48. The building was constructed in 1985 and was used for the storage of sealed energetic materials. In 1999 it was leased to MMCIC and used for general storage. The building was demolished in 2003.

- Building 92 was a 1,600 square-foot wooden modular structure on concrete pillars that was located west of Building 48. The building was installed in 1984 and used as a training facility in support of production operations. Later it was converted to offices for Industrial Hygiene. The building was shut down in 1994, and sold and removed from the site in 1996.

- I Building (Isolated Laboratory Building) was a 25,736 square-foot single story facility with a basement that was located west of Building 48. It was used for radiological bioassay and environmental analysis, and later, for the production of inert and/or plastic components of weapons devices and detonators. The building was constructed in 1948 and demolished in 2002.

- Magazines 7 and 11 were 387 and 372 square-foot (respectively) reinforced concrete structures with reinforced concrete roofs covered with earth that were located west of Building 48. The magazines were both constructed in 1957 and used for the storage of pyrotechnics and energetic materials. Both magazines were demolished in 1998.

These structures are believed to have had no adverse environmental impact on Building 48.

4.0 RECORDS REVIEW

4.1 General/Historical CERCLA Information

In compliance with permit requirements under Resource Conservation and Recovery Act (RCRA), the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA), and the Clean Air Act (CAA), Mound Plant has applied for or has received permits for its surface water discharges, air emissions, and hazardous waste program. The site is currently operating a hazardous waste storage facility under a RCRA Part B permit dated October 18, 1996. The site also maintains a National Pollutant Discharge Elimination System (NPDES) surface water discharge permit with Facility I.D. number OH 0009857. Operations that produce particulate or vaporous emissions are either permitted or registered with RAPCA and the Ohio Environmental Protection Agency (OEPA). The site also submits annual Emergency and Hazardous Chemical Inventory forms to OEPA, pursuant to the Superfund Amendment and Reauthorization Act (SARA), Title III, the Emergency Planning and Community Right-to-Know Act. The March 2002 version of this report indicates that reportable chemicals were stored in Building 48 (Appendix K).

The Mound Plant was identified as a contaminated site on the National Priorities List (NPL) under CERCLA (Superfund) in 1989. The Mound Plant was originally listed due to volatile organic compound (VOC) contamination in the western end of the lower valley area. The cleanup of the site was originally to be accomplished under the CERCLA mandated procedures for regulating Superfund Sites using the operable unit (OU) system to define and characterize cleanup areas. As the cleanup effort went forward, it became apparent that the site did not fit the profile for a cleanup strategy based on the operable units. The DOE, the United States Environmental Protection Agency (USEPA), and OEPA designed a new decision making process for the cleanup of the site.

The new process is known formally as a "removal site evaluation process" and informally as the "Mound 2000 Process." For a more detailed description, refer to the *Work Plan for Environmental Restoration of the DOE Mound Site, the Mound 2000 Approach*. The Mound

2000 Process system divided the site into geographical parcels containing more than 400 PRSs with approximately equal numbers of PRSs concerned with potentially contaminated soil and with potential contamination in or associated primarily with building operations. A PRS is an area where knowledge of historic or current use indicates that the site may have had releases of radioactive and/or hazardous materials. The PRSs were initially identified and documented as part of the Mound site scoping process under the Federal Facility Agreement (FFA). The original list of PRSs can be found in the OU9- Site Scoping Report Volume 12, Site Summary Report, 1994. One of the objectives of the Site Scoping report was to provide a comprehensive summary of PRSs identified through the scoping process. Subsequent to the 1994 Site Scoping Report, additional PRSs have been identified as information became available, bringing the site total to 440 PRSs. The assignment of a PRS does not necessarily mean that there is a threat to human health or the environment. The tabulation of all PRSs simply provides an explicit means of tracking and evaluating all potential releases onsite, the need for further action, and the identification of the authority responsible for action.

Through the process described above, the specific PRSs in the vicinity of Building 48 (Section 4.2.3) are listed in Table 4 along with their binning status. Their locations are shown on Figure 2. Of the thirteen PRSs in the vicinity of Building 48, eleven have been binned Removal Actions (RAs) by the Core Team, and the remaining two have been determined by the Core Team to require No Further Assessment (NFA). For a PRS to be binned NFA, the Core Team has reviewed the PRS data and agrees that all existing environmental issues associated with that PRS have been resolved and the PRS is protective of human health and the environment. No other PRSs associated with Building 48 have been identified.

4.2 Specific Record Sources for Building 48

4.2.1 Occurrence Reports

A search of the occurrence reporting system revealed nine reports, all of which were minor and without environmental impact:

- tritium contamination found in Building 48 fumehood (Appendix M),
- discovery of tritium contamination outside radiological area (Appendix M),
- storage of explosive materials in unapproved area (Appendix M),
- curtailment of tritium operations due to disablement of the Emergency Containment System (Appendix M),
- alpha contamination discovered in abandoned waste transfer manhole (Appendix M),
- activation of Emergency Containment System (ECS),

- precautionary evacuation of an explosive facility,
- alarm system failure – Building 48, and
- near miss accident during core drilling operations in Building 48.

4.2.2 Spills and Releases

- None

4.2.3 Associated PRS Overview

As a result of the investigations and documentation accomplished to comply with the CERCLA cleanup process via the Federal Facilities Agreement (FFA)/DOE Environmental Restoration (ER) Program, DOE and the site contractor tabulated all the PRSs identified under the various regulatory programs in effect at the site. Of these 440 PRSs, thirteen are at or near Building 48, as identified in Table 4. The PRS locations are shown on Figure 2, and recommendation sheets are provided in Appendix N.

Table 4 - PRSs in Proximity to Building 48

PRS	CERCLA or Bldg. Related	Binning Status	Comments
123	CERCLA	Removal Action (RA)	Area 5, Radioactive Waste Line Break
124	CERCLA	RA	Building 48 Hillside
125	CERCLA	No Further Assessment (NFA)	Underground Sanitary Sewer Line G24
236	CERCLA	NFA	Site Survey Project Potential Hot Spot Location S0166
426	CERCLA	RA	Under Ground Rad Waste Line–Segment 5
427	CERCLA	RA	Under Ground Rad Waste Line–Segment 6
428	CERCLA	RA	Under Ground Rad Waste Line–Segment 7
429	CERCLA	RA	Under Ground Rad Waste Line–Segment 9
430	CERCLA	RA	Under Ground Rad Waste Line–Segment 9a
434	CERCLA	RA	Under Ground Rad Waste Line–Segment 13a
438	CERCLA	RA	Under Ground Rad Waste Line–Segment 4
439	CERCLA	RA	Under Ground Rad Waste Line–Segment 4a
440	CERCLA	RA	Under Ground Rad Waste Line–Segment 8

4.3 Review of Building Prints

Building prints were reviewed and no significant items were identified. Floor plans are included in Appendix D.

4.4 Aerial Photographs

Aerial photographs from 1968 (prior to construction), 1973 (following construction), and 1996 (most recent aerial photo) were reviewed and no significant items were identified. Aerial photographs are presented in Appendix E.

4.5 Interviews

Past Building Manager, J. L. Boston, was interviewed via a building manager questionnaire (included in Appendix F). The current Building Manager, Gary Weidenbach, was also interviewed regarding past facility operations and current conditions. No significant items in the building were identified based on the questionnaire or interviews

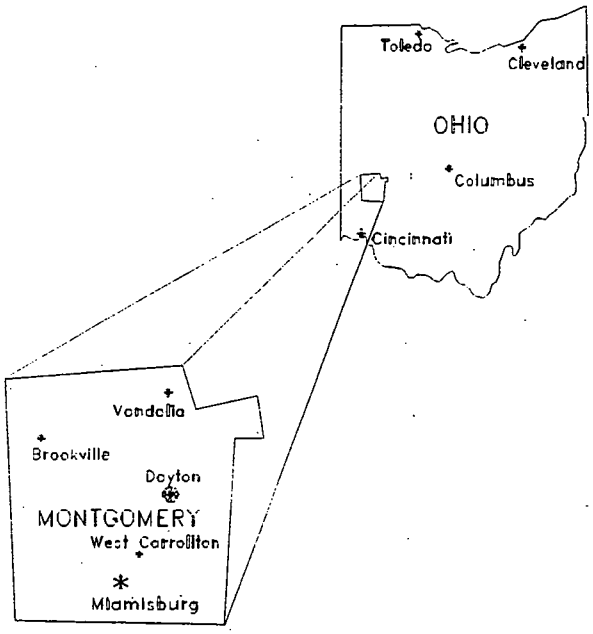
Appendix A

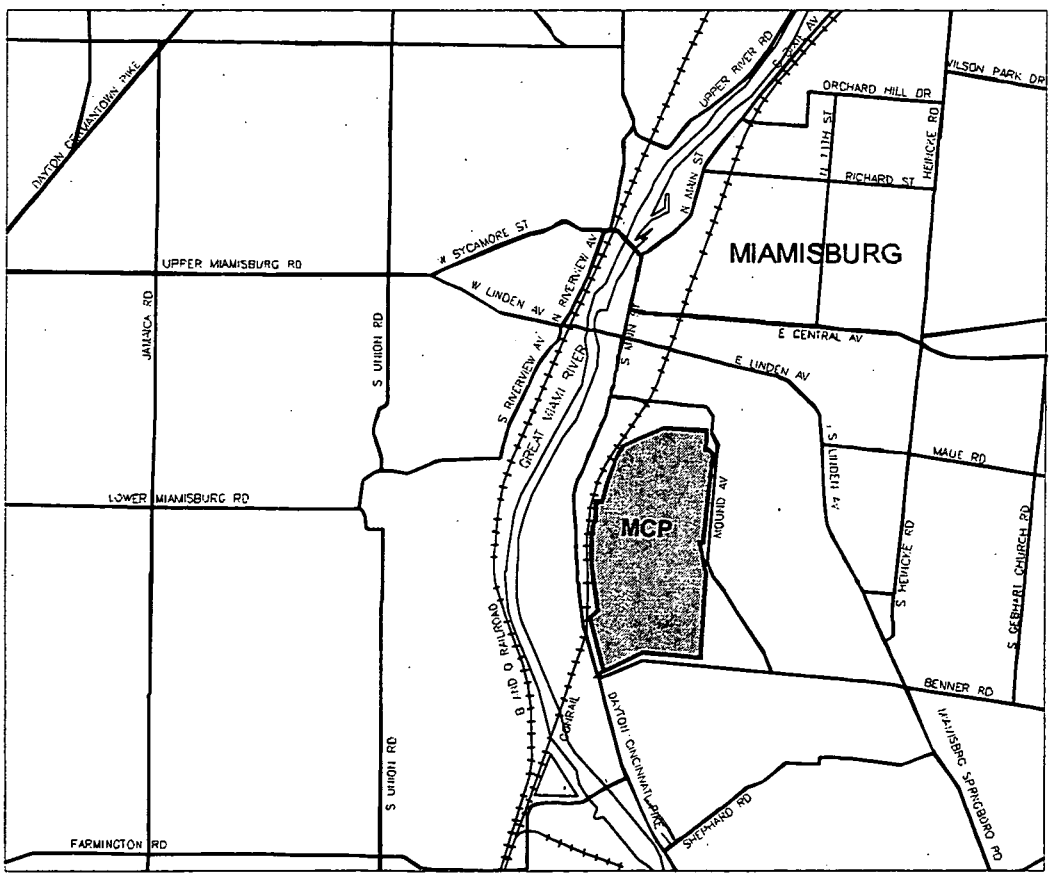
General Listing of Acronyms

ASTM	American Society for Testing and Materials
BDP	Building Data Package
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation & Liability Act
cm^2	centimeters squared
CWA	Clean Water Act
DOE	United States Department of Energy
DPM	disintegrations per minute
EPA	United States Environmental Protection Agency
ER	Environmental Restoration (Program)
FFA	Federal Facility Agreement
HAZMAT	hazardous materials
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MCP	Miamisburg Closure Project
N/A	not applicable
NPDES	National Pollutant Discharge Elimination System
OEPA	Ohio Environmental Protection Agency
OU	Operable Unit
PCB	polychlorinated biphenyl
pCi/L	picoCuries per liter
PRS	Potential Release Site
RI/FS	Remedial Investigation/Feasibility Study
RAPCA	Regional Air Pollution Control Agency
RCRA	Resource Conservation and Recovery Act
RSDS	Radiological Survey Data Sheet
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

Appendix B

Map of Montgomery County


Toledo
Cleveland
OHIO
Columbus
Cincinnati
Vandalia
Brookville
Dayton
MONTGOMERY
West Carrollton
Miamisburg


DAYTON CINCINNATI PIKE
UPPER MIAMISBURG RD
LOWER MIAMISBURG RD
FARMINGTON RD
JAMACA RD
S UNION RD
N SYCAMORE ST
W LINDEN AV
N RIVERVIEW AV
S RIVERVIEW AV
GREAT MIAMI RIVER
B & O RAILROAD
CONRAIL
UPPER RIVER RD
S MAIN ST
N MAIN ST
S MAIN AV
ORCHARD HILL DR
WILSON PARK DR
N HILL ST
RICHARD ST
HEINCKE RD
MIAMISBURG
E CENTRAL AV
E LINDEN AV
S LINDEN AV
MAUE RD
MCP
MOUND AV
S HEINCKE RD
S GEBHART CHURCH RD
BENNER RD
DAYTON CINCINNATI PIKE
SHEPHARD RD
MIAMISBURG SPRINGBORO RD

B 1 of 1

Appendix C

Figures

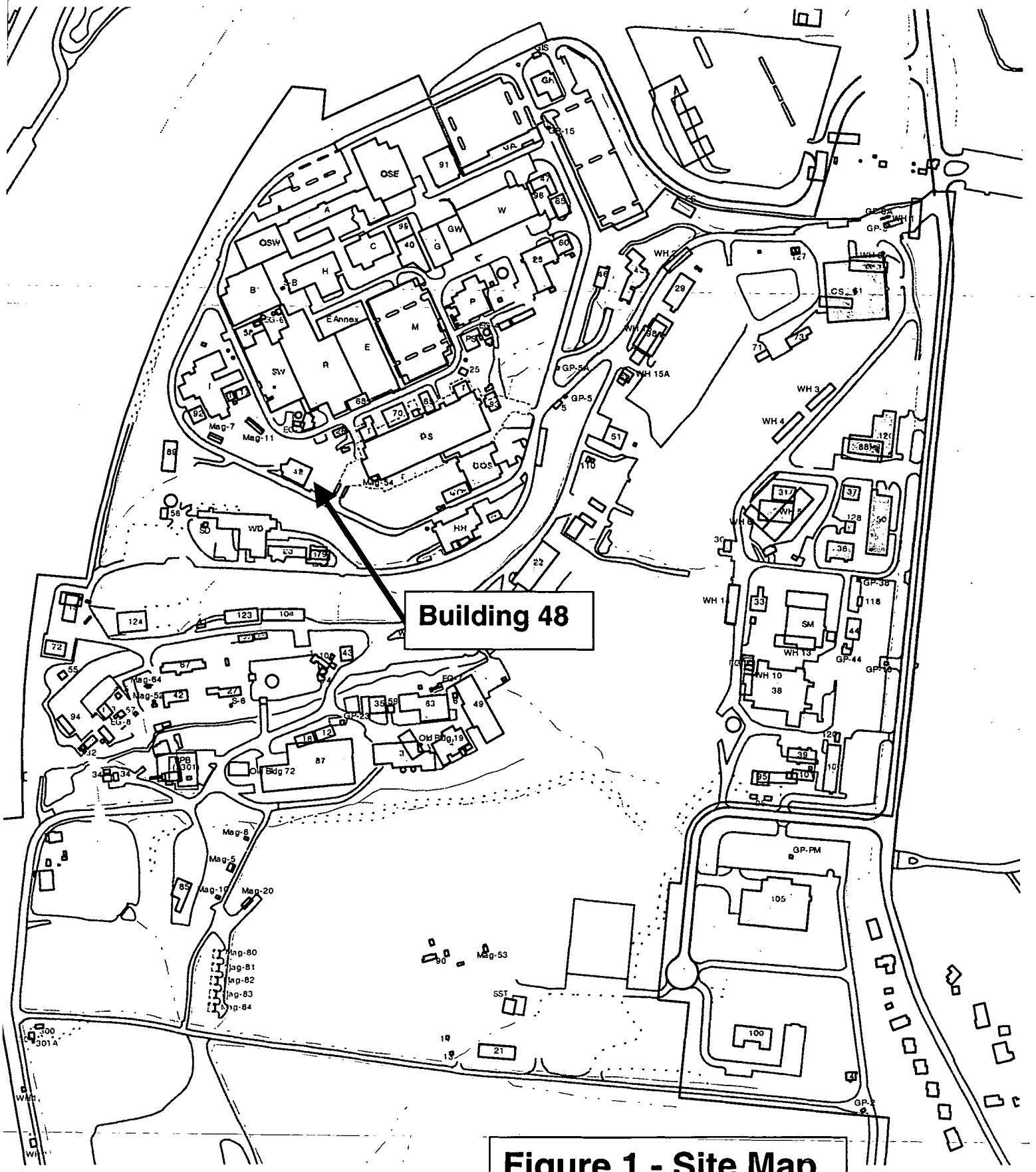
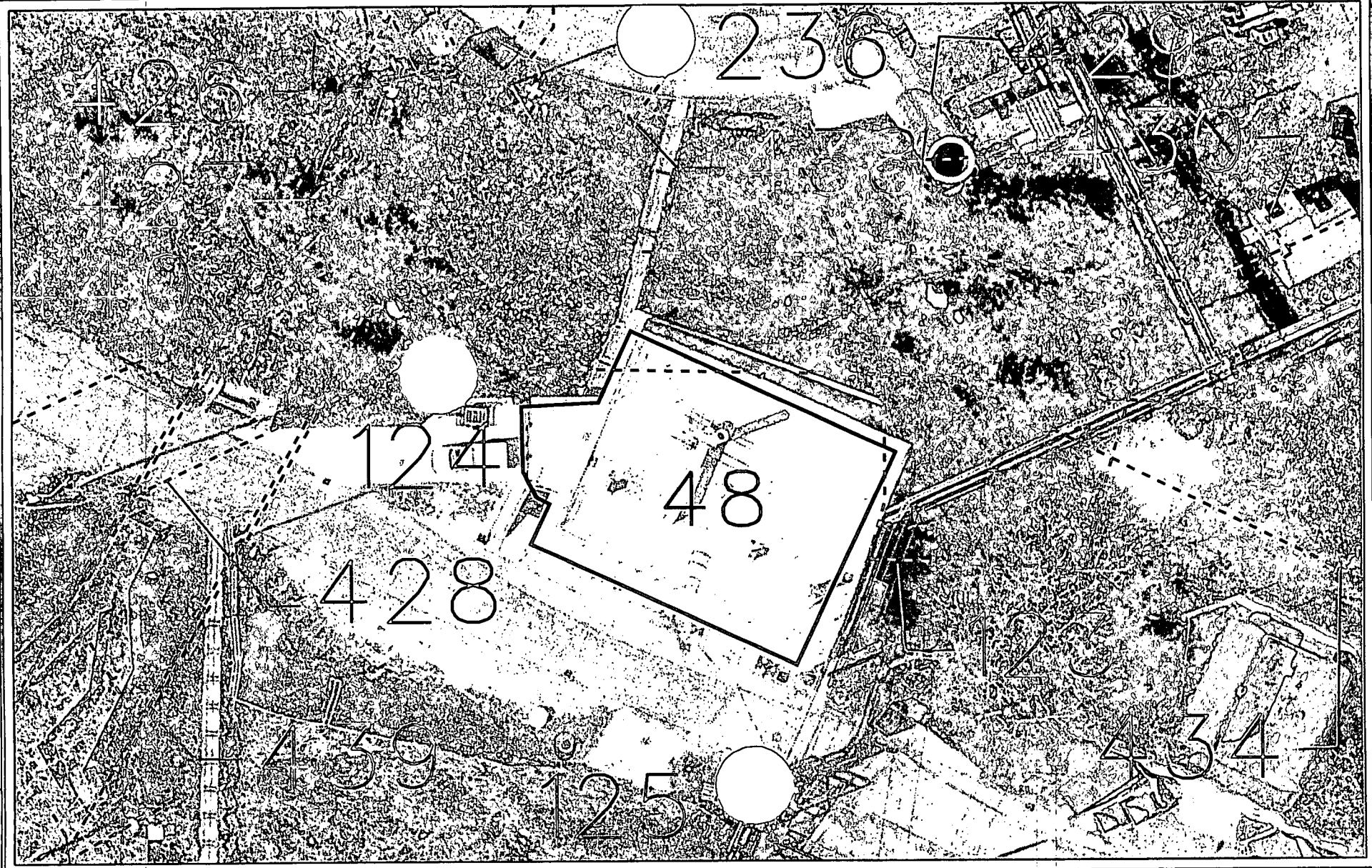


Figure 1 - Site Map

C 1 of 4



PRS Point

PRS Area

PRS Line

20 10 0 20 40FT

GRAPHIC SCALE

MOUND

Environmental Restoration Geographic Information System

10/10/03		SSF							
ISS	DATE	REVISION	BY	CHKD	ENG	LPDEC	APVD	D	

SHEET 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	
ISSUE	
SHEET 1 2 3 4 5 6	Figure 2 Building 48 and Vicinity
ISSUE D	
PART CLASSIFICATION	
DRAWING CLASSIFICATION UNCLASSIFIED	SIZE / DRAWING NUMBER vicinity.dgn / JOB NUMBER
DGN TYPE STE / PROJ ER-GIS	CHKD / SCALE / SHEET 1 OF 1
STATUS MD-REL-09/08/03	ORIGIN MSTATION / J

Copy 4

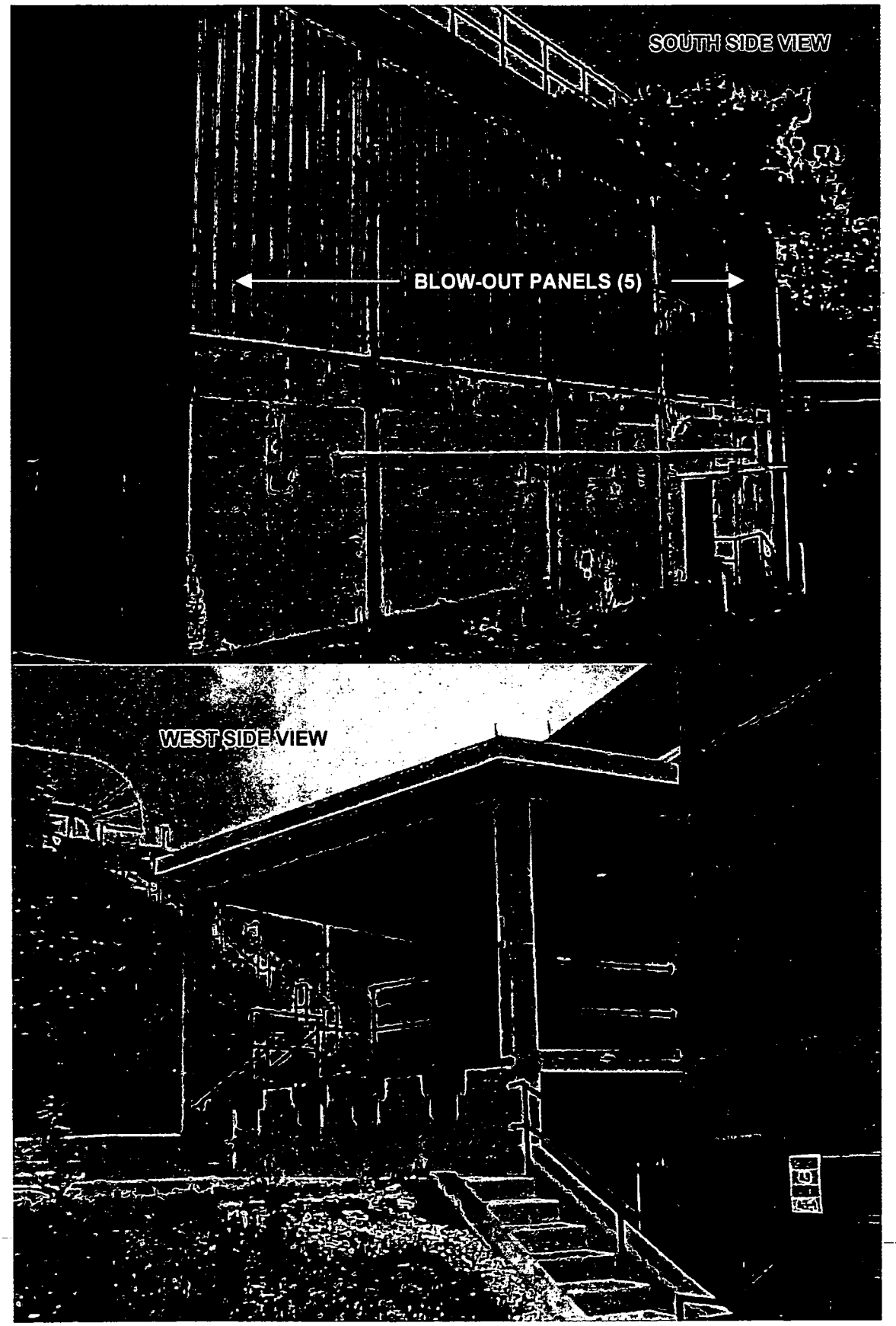


Figure 3A – Building 48

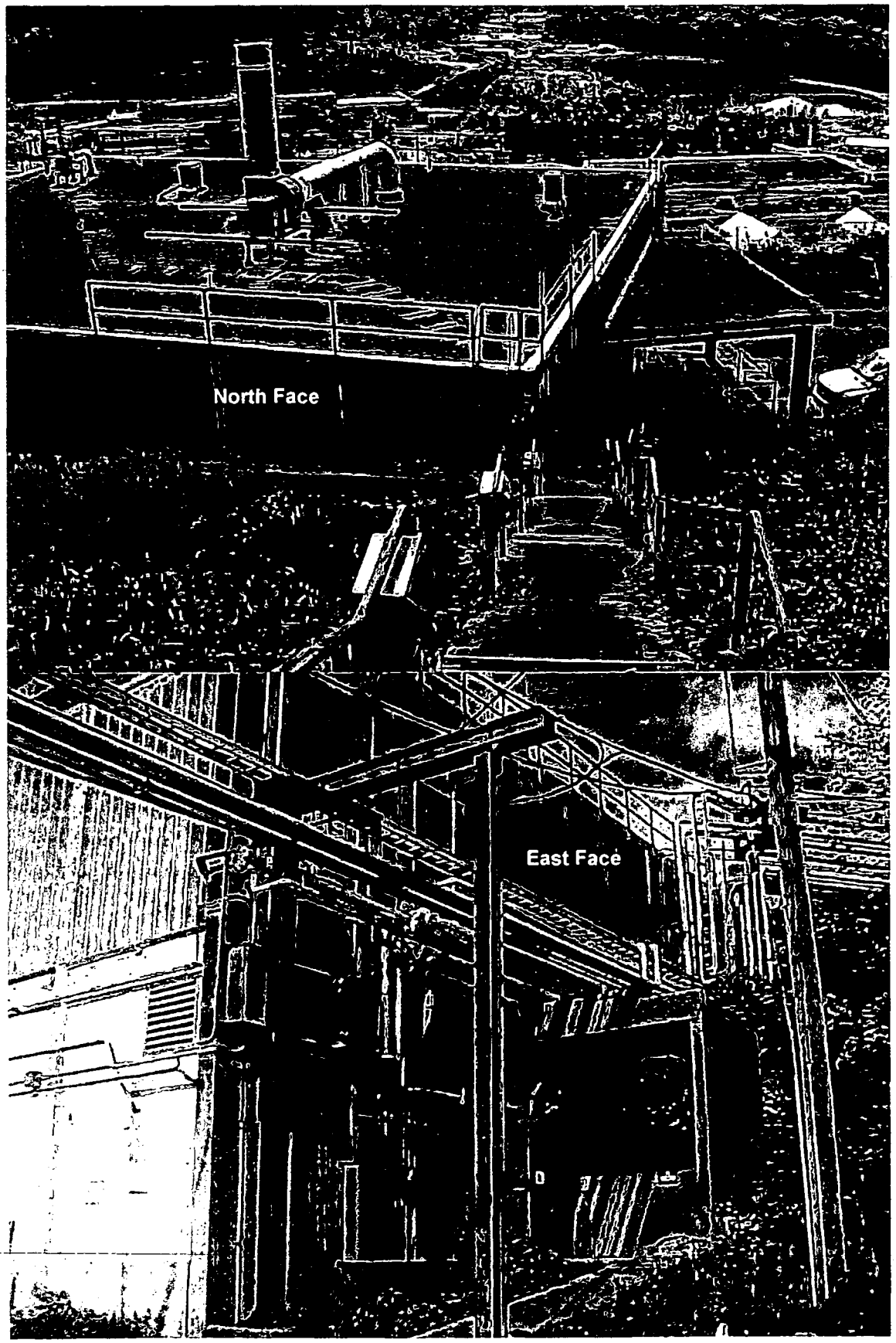


Figure 3B – Building 48

C4064

Appendix D

Floor Plans

During the building's use as an Explosive Surveillance building (1982 to 1996) room functions were as follows:

FIRST (LOWER) FLOOR ROOM FUNCTIONS:

Room	Function
101	Vestibule
102	Mechanical Room
103	Women's Rest Room
103A	Women's Lounge
104	Janitors Closet
104A	Pipe Space
105	Men's Toilet
106	Office
107	Office
108	Storage
109	Conference Room
110*	Technical Data Area
111	Corridor

*Four adjacent rooms, each divided by a partition, bearing the numbers 110, 110A, 110B, and 110C

SECOND (UPPER) FLOOR ROOM FUNCTIONS:

Room	Function
201	Corridor
202	Cell Operation Room
203	Press Cell
204	High Explosive System Tryout
205	High Explosive Storage Cell
206	Shop Office
207	Inert System Tryout
208	Storage
209	Electrical Tryout Room
210	Vestibule

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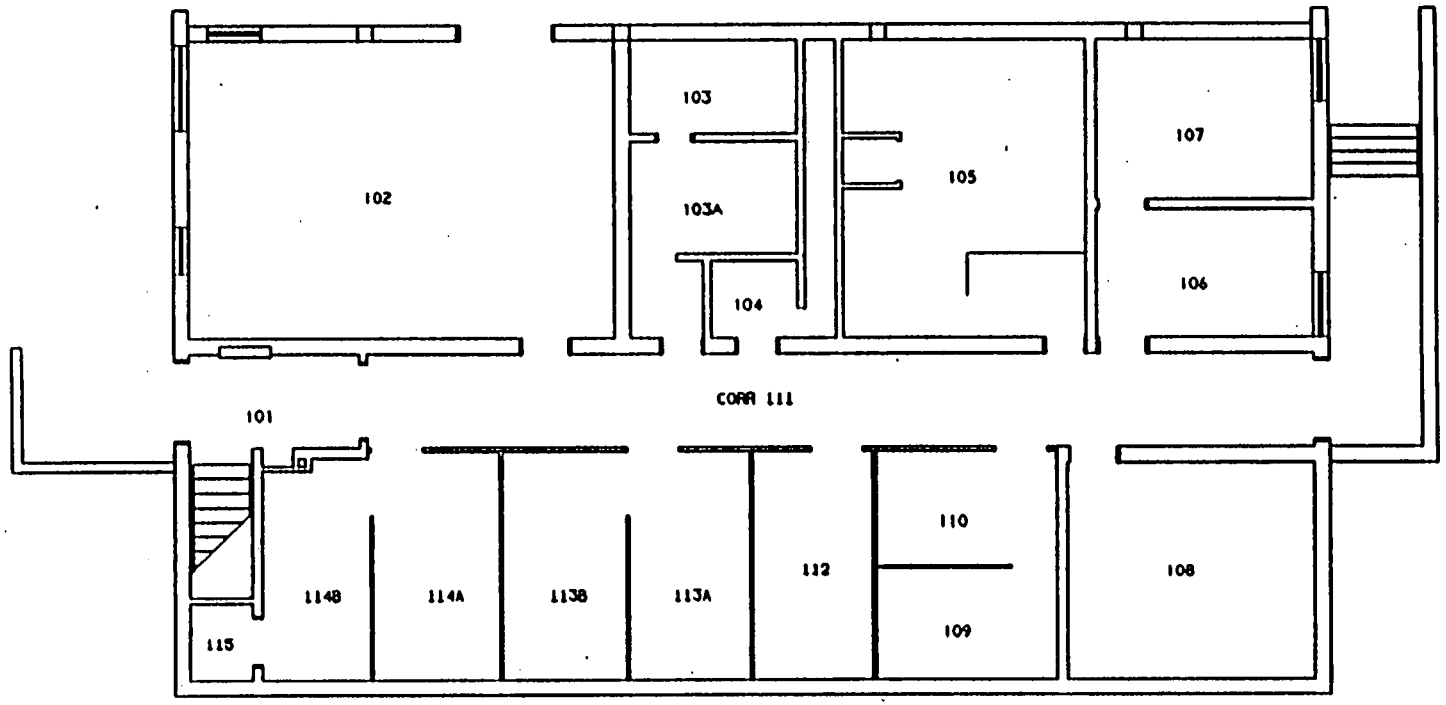
ISS	DATE	REVISION	BY	CHKD	ENG	LPMGR	APVD	IN
0	12/12/91	ASBUILT ISSUE	DCB				DVD	



BLDG #48
FIRST FLOOR
BLDG CODE:3048

APPROVALS:	DATE:
SAFETY COMMITTEE REQUIRED:	
___ NONE ___ TRUEDOC ___ TEDOC ___ DVDOC	
TECH. REP.	
GR. MGR.	
TRUEDOC	
TEDOC	
DVDOC	

SECTION CHIEF	PROJ MGR
BPCS/IP	CHIEF SUPV
LP & DC	PROJ REV
CHIEF ENGR	
APVD	DATE

SHEET	1	2	3	4	5	6
ISSUE	0	0				

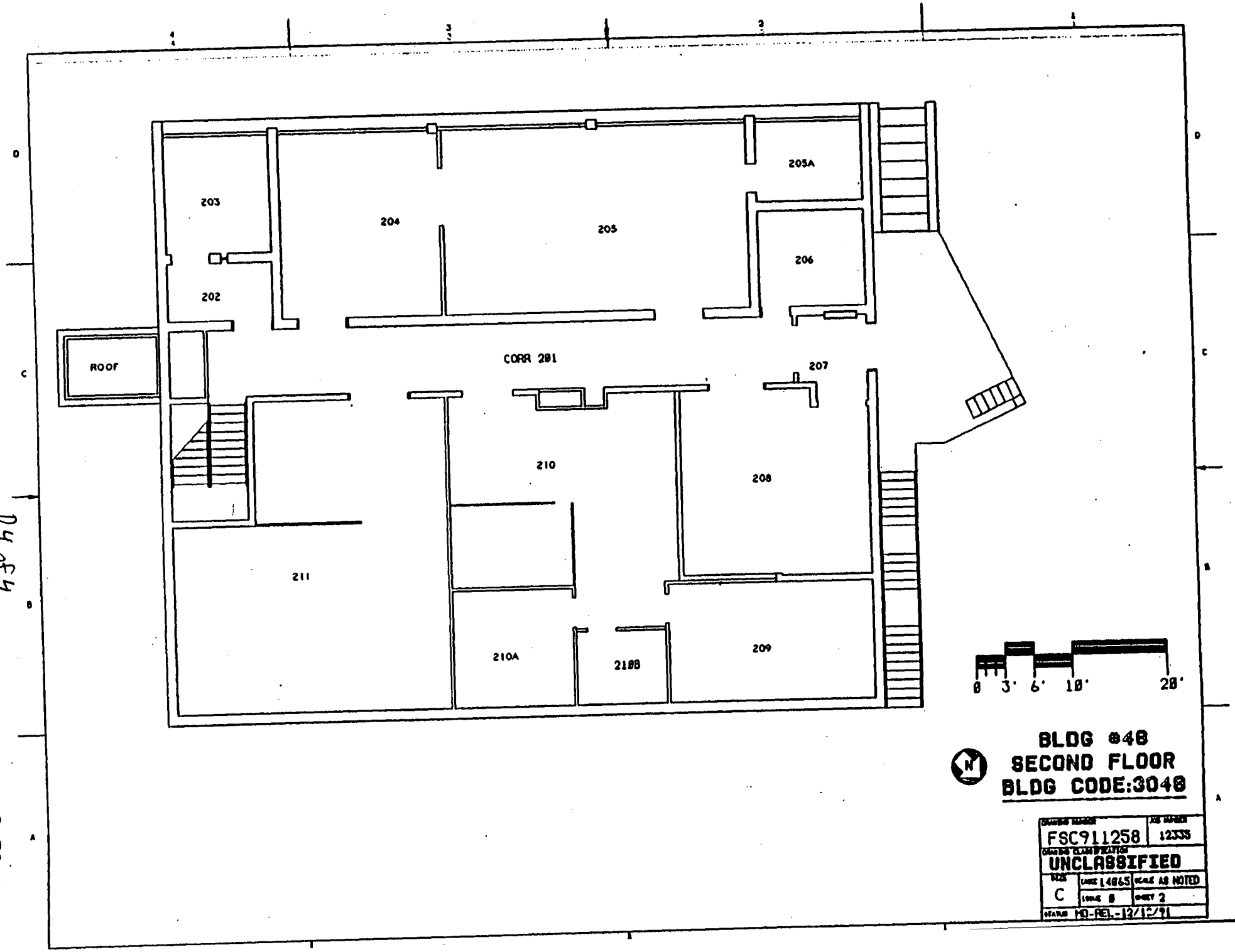
PART CLASSIFICATION

TITLE (U) TITLE CLASSIFICATION
BLDG #48
FLOOR PLANS

DRAWING CLASSIFICATION: UNCLASSIFIED
SIZE: C
DRAWING NUMBER: FSC911258
JOB NUMBER: 12335
DWG TYPE: SFP
FROM: BLDG #48
CADRE: 14065
SCALE AS NOTED
SHEET 1 OF 2
STATUS: MD-REL.-12/12/91
ORIGIN: MD-BRJ-V3.0

D3 of 4

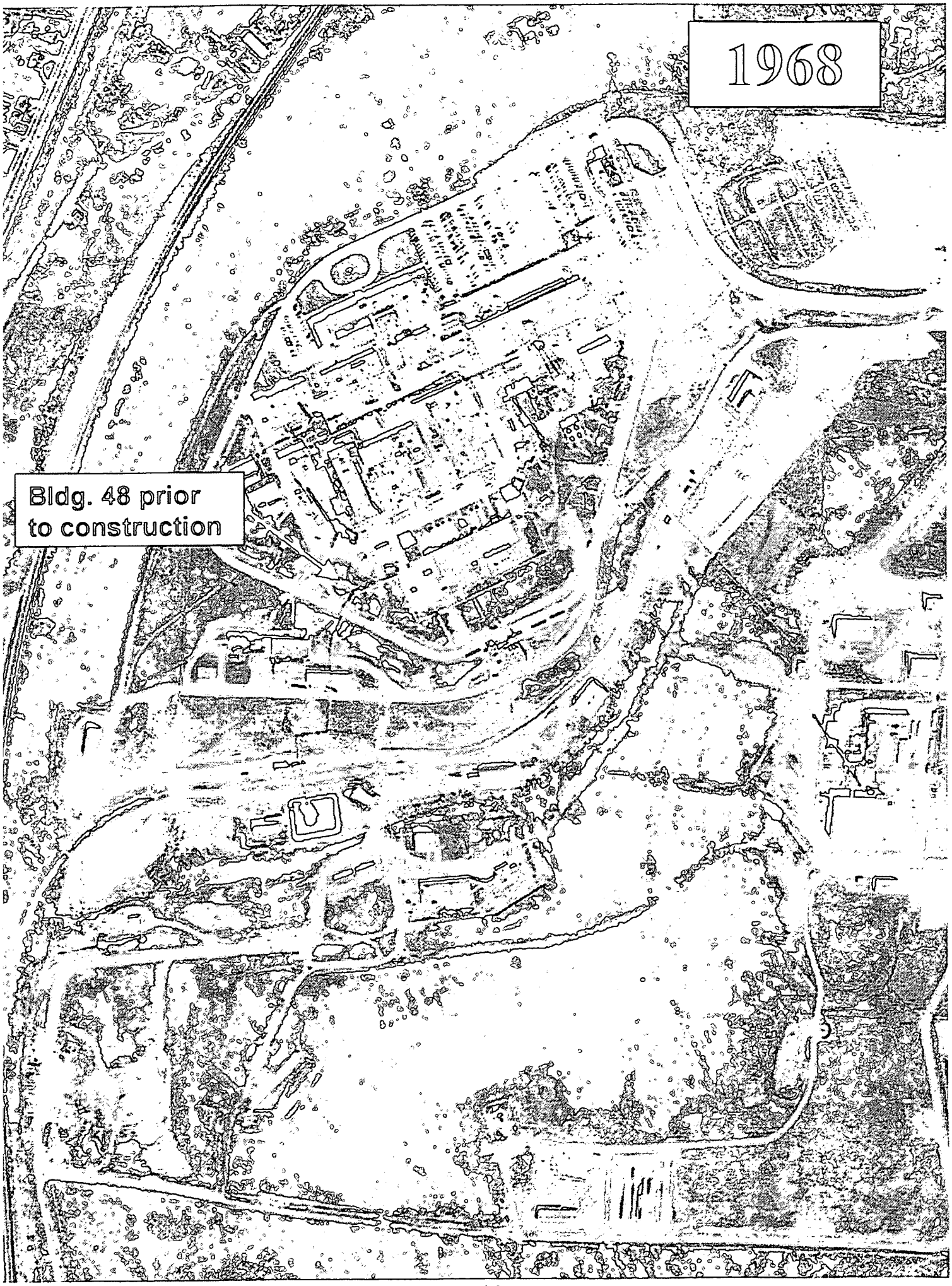
9.70-59

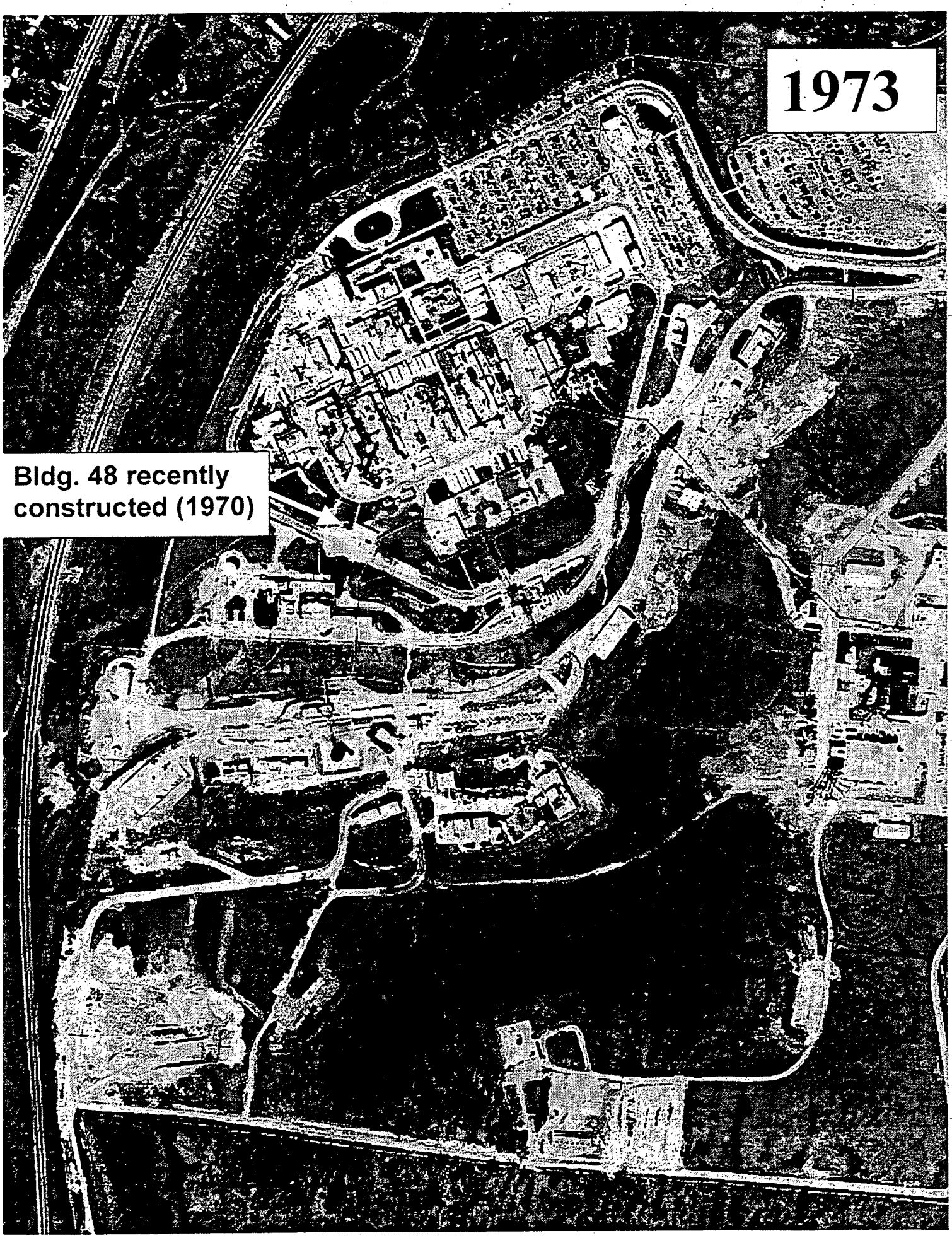

203
204
205
205A
206
202
ROOF
CORR 201
207
210
208
211
210A
210B
209
0 3' 6' 10' 20'
BLDG #48
SECOND FLOOR
BLDG CODE:3048
FSC911258
12335
UNCLASSIFIED
C
14865
SCALE AS NOTED
2
NO-REL.-12/12/91

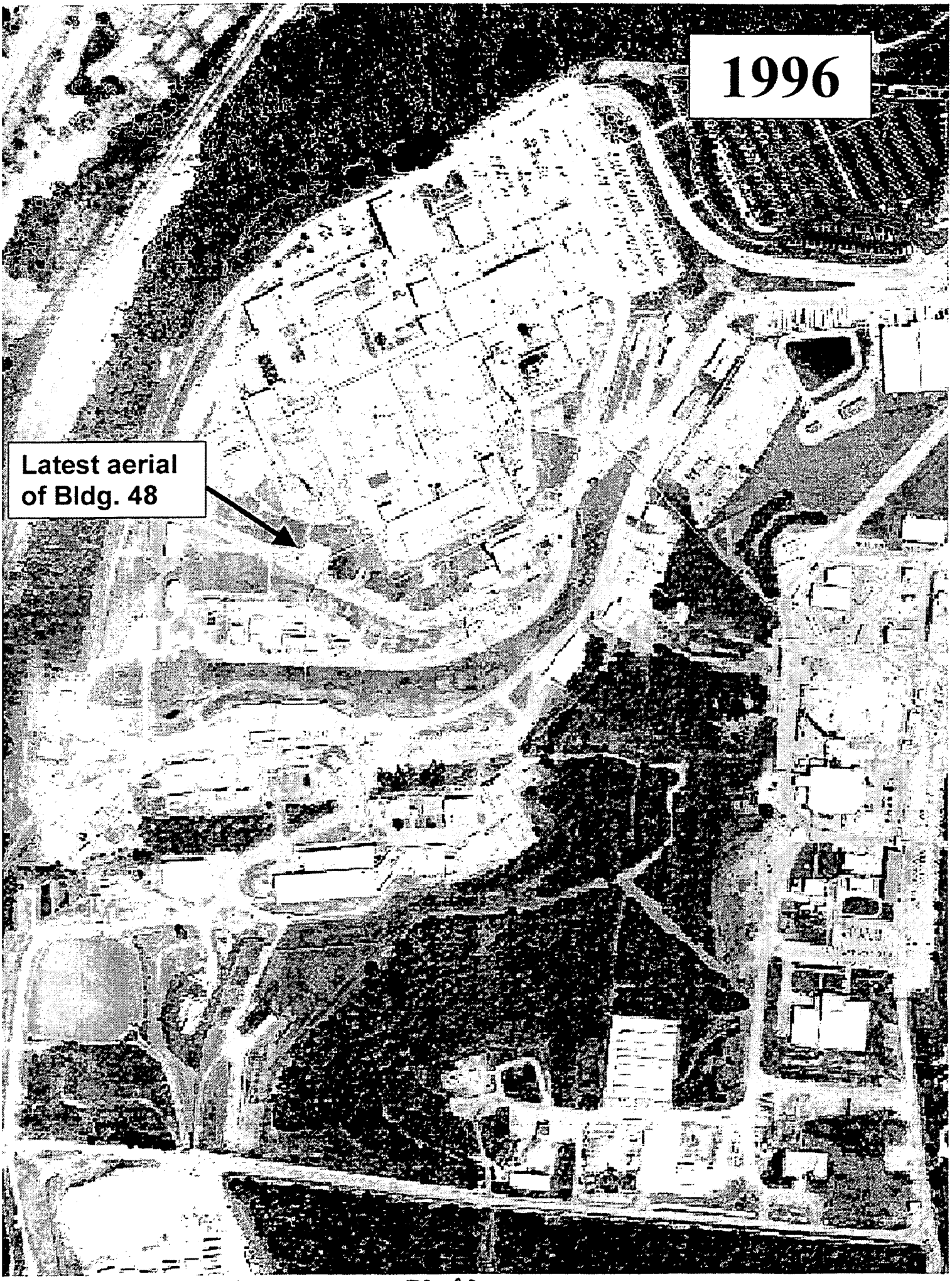
9.70-61

Appendix E

Aerial Photographs


1968
Bldg. 48 prior to construction


1973
Bldg. 48 recently constructed (1970)


1996
Latest aerial of Bldg. 48

Appendix F

Environmental Appraisal Report of the Mound Plant (excerpt)

Based on a review by subject matter experts, hand-written corrections have been made to the report provided in this appendix.

9.70 BUILDING 48

9.70.1 Scope of Building 48 Report

In late 1995 and the early months of 1996, EG&G MAT performed a review of environmental conditions at the Mound Plant. The purpose was to develop a performance baseline, and to identify areas for improvement on a building and a sitewide basis. EG&G MAT did not perform a "due diligence" or Phase I Environmental Site Assessment as specified by ASTM 1527 or ASTM 1528. The scope of the appraisal effort and a discussion of the appraisal methodology are detailed in Sections 2.0 and 5.0, found in Volume 1 of this report.

The appraisal team performed a walk-through of Building 48 on January 29, 1996. The Environmental Appraisal Checklist (EAC) was used to record findings. The EAC is found in Attachment 1 (Section 9.70.6.1). Escorting the appraisers was the building manager and other knowledgeable personnel such as the process owner. Other information was supplied by the building manager and recorded on the Building Manager's Questionnaire (BMQ), included as Attachment 2 (Section 9.70.6.2).

9.70.2 Description of Building 48

Building 48 is a two-story 7,950-square-foot reinforced concrete building with a built-up membrane roof. The building is bordered by Building WD to the south, Building DS to the east, a plant roadway to the south and Building SW to the north. Its location is shown in Attachment 3 (Section 9.70.6.3). Offices are located on the first floor and analytical labs and a machine shop were located on the second floor. Floor plans are shown in Attachment 4 (Section 9.70.6.4). The building is serviced with central steam for heat, chilled water, and electrical service. The building has fire sprinkler service *(Mound Facility Physical Characterization*, 12-1-93).

Building 48 was constructed in 1970. The building contains asbestos in the thermal insulation and is contaminated with energetic materials *(Mound Facility Physical Characterization*, 12-1-93). Signs posted on doors going into the laboratories and machine shop indicate the presence of energetic materials. Energetic materials were removed from the building subsequent to this report. From 1996 to 1998 the building went through safe shutdown activities to remove energetics contamination. VKD 11-13-03

9.70.3 Summary of Findings

According to the process owner, the building was originally built to house offices, a machine shop, and an automation development lab. The automation development area was converted to analytical labs for testing, development, and surveillance of energetic materials, as stated by the process owner.

Building 48 now contains office areas, analytical labs, and a machine shop. The analytical labs and machine shop are no longer in operation. The building is well-maintained, but has several issues of environmental concern that were identified during the walk-through or review of reference materials.

9.70.4 Observations

9.70.4.1 Air Emissions

At the time of this Environmental Appraisal, (VKD) 11/13/03

There was one fumehood; a *de minimis* determination is not necessary if the hood is out of service according to the EG&G Environmental Technology and Monitoring Group. The fumehood (IH# 048205000) is not in service. No air emission permit applications have been submitted to the Regional Air Pollution Control Agency (RAPCA) for activities in the building. The status of Mound's air emissions inventory is documented in the EAC presented in Attachment 1 (Section 9.70.6.1). There may be the potential for energetic material contamination to be present in the exhaust prior to removal. Further investigation needs to be done to determine if energetic materials are present or not. (*) There are no fuel-burning units in the building. There is no evidence of fugitive dust, as none of the processes would be expected to generate it.

(*) see comment on page F1

9.70.4.2 Wastewater Emissions

The Mound Facility has three wastewater collection systems: a sanitary wastewater system; a storm water system; and a radioactively contaminated process wastewater system. Sanitary wastewater is treated at an onsite tertiary treatment plant and subsequently discharged by hard pipe to the Great Miami River. Storm water and any non-process wastewater, single pass cooling water, and softener backwash may be discharged directly to the Great Miami River, via the Miami-Erie Canal, or may be diverted to a 3.1-million-gallon holding pond for settling prior to discharge. Radioactively contaminated wastewater is treated in Building WD by physical-chemical treatment. If appropriate, wastewater may be discharged by hard pipe to the Great Miami River. If concentrations of radioactive contaminants cannot be reduced to acceptable levels, wastewater is solidified and shipped to the Nevada Test Site or Envirocare for disposal. All outfalls are permitted under an active NPDES permit. Routine monitoring activities are in place. Based on NPDES monitoring report data reviewed, it appears that the facility is in compliance with qualitative and quantitative conditions of the permit.

9.70.4.2.1 Sanitary Wastewater

The building does have sanitary services. According to a diagram of underground utility lines, presented as Attachment 5 (Section 9.70.6.5), the building is serviced by a sanitary line. Confirmation of drainage of sanitary waste into sanitary conveyance lines was not within the scope of this effort, therefore, neither dye tests nor smoke tests were conducted.

Sanitary effluent is conveyed to the onsite tertiary wastewater treatment facility, and subsequently discharged to the Great Miami River. There is no monitoring of building effluent. Based on operations data, supplied by the process owner, effluent from Building 48 does not deviate from that expected by the sanitary treatment plant manager.

9.70.4.2.2 Storm Wastewater

The building is also serviced by storm drains according to the underground diagram located in Attachment 5 (Section 9.70.6.5). Exterior grates and drains were not tested to confirm that they connect to the storm drainage system. Inspection showed no sign of odors, colored discharges, or scarring which would indicate that any materials other than storm water has entered the storm drainage system. One storm drain on the south side of the building was discolored by rust. Further investigation determined that the discoloration was due to the flushing of the fire sprinkler system. Ferrous minerals from piping discolor the water and drainage of this water can discolor the pavement. It was determined that this has no impact on the environment.

9.70.4.2.3 Chemicals

Janitorial supplies are stored and used in Building 48. A list of chemicals residing in Building 48 is included in the BMQ in Attachment 2 (Section 9.70.6.2). The information was gathered as part of the chemical inventory which is conducted annually. The inventory information dates to 1994. Confirmation of the 1994 inventory was not attempted as 1995 data were being compiled at the time of the appraisal. Storage, handling, and disposal of chemicals listed in the BMQ were reviewed to assure conformance to regulations related to 40 CFR 122, 40 CFR 261-265, 40 CFR 268, and 29 CFR 1910.

There is asbestos in the building. Asbestos is identified as a Clean Water Act (CWA) toxic pollutant in 40 CFR Part 122, Appendix D, Table V. There is no evidence that chemicals enter the storm or sanitary drains. There have been no reported spills from Building 48.

9.70.4.3 Potable and Service Water

Potable water is supplied to the building. There were two water fountains, one on each floor of the building. The water fountains were Oasis brand. The fountains which supply drinking water have not been tested for lead. According to Environmental Protection Agency (EPA) protocol, annual sampling criteria do not require testing of each fountain. Potable water is supplied to the building where it is separated with a backflow preventer into potable and service water and then distributed throughout the building.

9.70.4.4 Chemical Storage and Hazardous Materials

Chemicals used in janitorial services are stored in Building 48. There is a flammable storage cabinet outside the facility which meets standard National Fire Protection Association (NFPA) requirements. Chemicals are stored in the building in accordance with applicable standards. Material Safety Data Sheets (MSDS's) are available in the building, but need to be reviewed to see which ones are no longer applicable.

The building is equipped with appropriate emergency response equipment such as fire extinguishers and sprinklers. Extinguishers are bar-coded. The inspection date database is maintained in the fire station, Building 98. There is an Emergency Evacuation Plan, and signs were posted in the areas.

There are no aboveground storage tanks in or around the building and no underground storage tanks are associated with this building. There are no sumps, separators, or catch basins, in or around the building.

The building was tested and does contain asbestos-containing building materials (MD-10391, *Asbestos Program Manual*, 9-14-95). There was no evidence of friable asbestos. Pipe lagging was intact.

There are no capacitors or transformers containing polychlorinated biphenyls (PCB's) located in the building (1995 Annual PCB Document Log).

9.70.4.5 Solid and Hazardous Wastes

Solid wastes generated are primarily paper. There is paper and aluminum can recycling to minimize solid waste. Solid wastes, i.e., trash, paper, glass, and cardboard are removed by janitorial personnel to a local collection point, then shipped offsite to a local landfill or recycling center by a contractor. Scrap metal is collected at specific sites, then sent offsite for recycling by a contractor. These service contracts are maintained by Waste Management. Classified paper is collected by Security and incinerated at the Montgomery South Incinerator. This contract is maintained by Security. There is no evidence that hazardous materials or wastes are mixed with solid waste streams.

The processes that generated hazardous wastes in Building 48 are no longer in operation.

9.70.4.6 Waste Minimization and Pollution Prevention

At Mound there is an active program to minimize waste streams in accordance with state and federal requirements and Executive Order 12856. Programs for waste minimization are in place including aluminum can and paper recycling. Processes in this building are no longer active, therefore they were not reviewed for waste minimization or pollution prevention techniques.

9.70.5 Findings and Recommendations

Photographs were taken to document the environmental appraisal. They are included as Attachment 6 (Section 9.70.6.6). The environmental appraisal of Building 48 indicates that the following action items in order of priority should be planned and scheduled for accomplishment thus assuring the best management and operating practices are in place.

48-1 Signs posted on the doors indicating energetic material presence should be removed, if the room has been decontaminated.

48-2 MSDS displays should be updated to include only materials that are currently in the building. In accordance with 29 CFR 1910.1200, MSDS's were prominently displayed, clearly labeled, and readily available. A visitor to the area is able to walk into the room and find them immediately.

48-3 The exhaust system on top of the fumehood in Room 205 could potentially contain energetic materials. However, only pellets and not powders were used in this facility. Collect and document process knowledge and/or analytical data to provide information on potential contamination of exhaust system.

ENVIRONMENTAL APPRAISAL CHECKLIST

Building Name 48

Appraisers:

Mary Louise Hoagland
Name Discipline

Name Discipline

Mary E. Symond
Name Discipline

Terry L. Glander
Name Discipline

Building Manager: JEFFREY L. BOSTON J.L. Boston 2/27/96

Process Manager: DANIEL J. GORMAN

TERRY L. HALDERMAN Terry L Halderman 2/27/96

Date: 1/29/96

9.70-9

ENVIRONMENTAL APPRAISAL CHECKLIST

Table of Contents

Checklist	Page
Clean Water Act	1
Clean Air Act	2
Hazardous Materials	4
Safe Drinking Water Act	7
RCRA Hazardous Waste	8
TSCA and NESHAP Requirements for Asbestos	13
TSCA—PCB	14
Low-level and Transuranic Waste	17
Waste Minimization/Pollution Prevention Activities	22

Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

Clean Water Act (CWA) Screening Checklist

Question	Response	Comments
Does the outside drain spouting of the building discharge directly to a storm sewer/sanitary system?	(Y) / N	If the answer to any of these questions is yes, proceed with the following checklist.
Are there sinks, toilets and floor drains in the building?	(Y) / N	
Are chemicals being used in the building?	Y / (N)	
Is there a process which discharges to the storm or sanitary system?	(Y) / N	

CWA Checklist

Regulatory Guideline	Question	Response	Comments
40 CFR 122 Appendix D Table V	If chemicals are used/stored in the building, are they on the attached list? Are they properly contained?	Y / N Y / N	N/A
	Is the building in operation? What are the processes and where do they discharge to?	(Y) / N _____ _____	GENERAL OFFICE AREA WASTE
	Do the floor drains, sinks & toilets appear to be draining properly?	(Y) / N	
OAC 3745-33	Do the floor drains and sinks drain to a sanitary or storm sewer?	Sanitary Storm	STORM - ROOF DRAINAGE SANITARY - ALL ELSE
	Is there a sump/pit in the building? If so, what does it contain? How often is it pumped out? Does water collect in sump? Does sump have secondary containment?	Y / (N) _____ _____ ~~Y / (N)~~ ~~Y / (N)~~	N/A VKO 11-13-03
	Are there any manholes, catch basins, drains, or fill pipes in or around the building? If so, are there any unusual appearances, colors, and/or odors? Describe in comment section. Can chemicals flow into the drain?	(Y) / N Y / (N) Y / (N)	

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9.70-11

9.70-12

Building Name: 48 Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore Date: 1/29/96

Clean Air Act (CAA) Screening Checklist

Regulatory Guideline	Question	Response	Comments
	Are there any rooms that have air emissions sources that vent to the outside of the building, e.g., fumehoods, equipment? If so, note the rooms.	(Y) / N	NOT IN CURRENT USE
OAC 3745-35	Using the air emissions inventory reference for this building, are there any sources in the building that are not documented?	Y / (N)	
	Is there evidence of fugitive dust emissions inside or outside of the building	Y / (N)	

CAA Checklist

Regulatory Guideline	Question	Response	Comments
	Are there existing air permits or applications applicable to the building?	Y / (N)	
OAC 3745-31,35	If yes, are the terms and conditions of the permit or the information included on the application (see air emissions database) being followed? Note any differences and update the air emissions database.	~~Y / (N)~~	N/A VW 11-13-03
OAC 3745-31	Are there any sources that are not included in the air emissions database? If so, note the room, hood number, active or not, POC, and applicable air emission database information on Table B.	Y / (N)	
OAC 3745-31-03	Are there sources which are lab equipment of lab fumeheads used exclusively for chemical or physical analyses and bench scale lab equipment? These sources do not require a permit. However, the air emissions database should be updated.	Y / (N)	
	Has there been any release of air contaminants from this building?	Y / (N)	

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Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

CAA Checklist - NONE IN CURRENT USE

Comments: Note the number of sources/hoods per room, the number that are active, and the POC on the reference document.

TABLE A

Process Source	Room Number	Hood Number	In Database	Active	Chemicals Used	Quantity Used	Quantity to Waste Management	Hours/Yr. Operation	Air Emissions
			Y / N	Y / N					
			Y / N	Y / N					
			Y / N	Y / N					
			Y / N	Y / N					
			Y / N	Y / N					

Source: _____

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9.70-13

Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

Hazardous Materials (HM) Screening Checklist

Question	Response	Comments
Are any chemicals used or stored in this building, now or in the past?	(Y) / N	If the answer is yes, proceed with the following checklist.

HM Checklist

Regulatory Guideline	Question	Response	Comments
29 CFR 1910.1200(b,f)	All containers of hazardous chemicals shall be labeled as to the identity of the chemical and the appropriate hazard warnings.	(Y) / N	
29 CFR 1910.1200(g)	MSDS shall be available to the employees in close proximity to the work area.	(Y) / N	
29 CFR 1910.22, 1910.106, 1910.176	All places of employment, passageways, storerooms and service areas shall be kept clean and orderly and in a sanitary manner. Aisles shall be unobstructed. Drums and containers are not leaking and are tightly sealed.	(Y) / N	
29 CFR 1910.106	Storage cabinets for flammable materials are constantly kept closed, are fire resistant and are labeled "FLAMMABLE - Keep Fire Away". Containers inside should be labeled and closed. No spills inside cabinet.	(Y) / N	
29 CFR 1910.106(d)(7)	Incompatible chemicals are not stored together.	(Y) / ~~N~~	
29 CFR 1910.106(d)(4)	Inside Flammable/combustible storage rooms must meet the following: 4 in. raised sill or trench that drains to a safe area, liquid tight wall/floor joints, self-closing doors, gravity or mechanical exhaust providing 6 room changes/hr., exhaust switch located outside room, at least one 3 ft. aisle; no cracks in secondary containment.	Y / N	N/A

Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

HM Checklist

Regulatory Guideline	Question	Response	Comments
29 CFR 1910.106(d)(7)	All flammable/combustible storage locations have at least one 12-B portable fire extinguisher located outside and within 10 ft. of a door opening into any room for storage. No smoking signs are posted.	Y / N	
29 CFR 1910.151	Eyewashes/showers shall be provided within the work area. Ensure unit is operational.	Y / N	
CGA P-1 3.3 & 3.3.10	All gas cylinders (full or empty) shall carry a legible label or marking identifying the contents.	Y / N	
CGA P-1 3.5.3	Full and empty containers should be stored separately with the storage layout planned so that containers comprising of old stock can be removed first with a minimum handling of other containers.	Y / N	
CGA P-1 3.5.8	All compressed gas containers in service or in storage shall be stored standing upright and the container shall be secured.	Y / N	
CGA P-1 4.2.2	Oxygen cylinders shall be separated from flammable gas containers or combustible materials a minimum of 20 ft. or a noncombustible barrier 5 ft. high.	Y / N	
29 CFR 1910.104(2)(10)	Oxygen stored as a liquid shall be on a noncombustible surface. Asphalt is considered combustible. Wood and long dry grass shall be cut back 15 ft. from the container.	Y / N	
29 CFR 1910.104	Bulk oxygen storage shall be permanently placarded "OXYGEN - NO SMOKING - NO OPEN FLAMES".	Y / N	
	Is there a sign posted in each work area regarding emergency egress and emergency response action?	(Y) / N	
	Is there an emergency response plan available?	(Y) / N	

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Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Marsha Vannet, Mary-Louis Hoagland, Mary Sizemore

Date: 1/29/96

HM Checklist

Regulatory Guideline	Question	Response	Comments
	Is there a process area?	Y / N	
	Does it have proper containment?	Y / N	
	Is there a liquid bulk transfer area?	Y / N	
	Is there proper containment?	Y / N	
	Is there an above ground storage tank? If so, complete Table B.	Y / N	

Above Ground Storage Tanks Inventory – N/A

TABLE B—Above Ground Storage Tanks Inventory

Building	Capacity (Gal.)	Contents	Estimated Volume	In Service	Containment	Visual Stains/ Contamination	If Empty, Flushed
				Y / N	Y / N	Y / N	Y / N
				Y / N	Y / N	Y / N	Y / N
				Y / N	Y / N	Y / N	Y / N
				Y / N	Y / N	Y / N	Y / N
				Y / N	Y / N	Y / N	Y / N
				Y / N	Y / N	Y / N	Y / N
				Y / N	Y / N	Y / N	Y / N

Source: _____

Environmental Appraisal Checklist

Building Name: 48 Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore Date: 1/29/96

Safe Drinking Water Act (SDWA) Screening Checklist

Does this facility have potable water?	(Y) N	If yes, conduct the following survey.

SDWA Checklist

Regulatory Guideline	Question	Response	Comments
OAC 3745 95-02 (A)	Do actual or potential cross-connections exist between potable (light green) and service water (dark green)?	Y / (N)	
OAC 3745 95-04 (B)(C)	Are backflow prevention devices installed where cross connections (hoses connected to faucets, hot water tank vented directly to a drain) exist?	Y / N	N/A (JKD) 11-13-03
	Are sources of service water (janitorial and laboratory faucets, or outdoor spigots) posted as non-potable water sources?	Y / (N)	
	Does the facility contain any water coolers or fountains that are not lead free? Complete Table C.	Y / N	UNKNOWN - SEE TABLE

TABLE C—Water Fountain Survey

Building	Location	Model #	Comments / Date of Analysis for Lead
48	CORRIDOR 201	Ø64681	
48	FRONT OF ROOM 115	Ø64673	

Source: _____

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Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

RCRA Screening Checklist

Does this facility generate waste or use chemicals?	Y / N	If yes, conduct the following survey:

RCRA Checklist

Regulatory Guideline	Question	Response	Comments
OAC 3745 52-11	Has any material generated been characterized RCRA hazardous? Was charactarization by analysis or by process knowledge? Are lab results or documentation of process knowledge readily available? Note any uncharacterized material in comment section. Is it waste? If yes, proceed with next section.	Y / N analysis / process Y / N Y / N	
OAC 3745 52-11	Are any of the materials noted RCRA hazardous waste? If no, note and stop here. If yes, note the location of the management unit, and the method of management, and proceed with the appropriate section below.	Y / N	

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Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

RCRA Checklist

Regulatory Guideline	Question	Response	Comments
I. HAZARDOUS WASTE STORED IN CONTAINERS			
	Is there an area in the building that could qualify as a Satellite Accumulation Area? Is it treated as such?	Y / N Y / N	
OAC 3475-52-34 (C)	Has any of the RCRA hazardous waste in this building been managed in Satellite Accumulation Areas? If no, proceed to the next section. If yes, answer the following.	Y / N	
	Are the containers marked with the words hazardous waste, or other words denoting the hazard?	Y / N	
	Are the containers in good condition?	Y / N	
	Are the waste compatible with the containers?	Y / N	
	Are containers managing ignitable hazardous waste stored at least 50 feet from the plant site boundary?	Y / N	
	Are containers kept closed and locked except during filling?	Y / N	
	Are containers moved within 3 days of being filled?	Y / N	

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Building Name: 48 Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore Date: 1/29/96

RCRA Checklist

Regulatory Guideline	Question	Response	Comments
OAC 3745-52-11 (A)	If a Satellite accumulation area has been abandoned and/or if waste left in place, and the containers may be subject to the 90-day-storage exclusion. If this exclusion does not apply, go to the next section. If the containers have been in storage under this exclusion, answer the following:		
	Are the containers in good condition?	Y / N	
	Are the waste compatible with the containers?	Y / N	
	Are the containers kept closed except during filling?	Y / N	
	Are the containers managed in such a way, that they are not ruptured, or leaks caused?	Y / N	
	Is the area inspected at least once weekly?	Y / N	
	Is the inspection recorded? Where is the log? Is it properly completed, dated, and signed?	Y / N _____ Y / N	
	Are containers managing ignitable hazardous waste stored at least 50 feet from the facility boundary?	Y / N	
	Are incompatible wastes managed in such a way that they will not react with another incompatible waste?	Y / N	
OAC 3745-52-34(B)	Has any of the waste (except in Building 23, Building 72 and the Burn Area) been managed in excess of 90-days?	Y / N	
	If no go to next section.		
	If yes, note.		
	For Building 23, Building 72 & Burn Area use special checklist.		

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Environmental Appraisal Checklist

Building Name: 48 Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore Date: 1/29/96

RCRA Checklist

Regulatory Guideline	Question	Response	Comments
II. HAZARDOUS WASTE STORED IN TANKS			
OAC 3745-52-32 (B)	Has any chemical waste stored in a tank, piece of process equipment or ancillary equipment been in storage in excess of 90-days?	Y / N	
	If the answer was no, then proceed with the following:	Y / N	
	Has the tank or piece of equipment had an integrity assessment?	Y / N	
	Is there a sump?	Y / N	
	Is it dry?	Y / N	
	Does the tank or equipment have secondary containment?	Y / N	
	Does the tank or equipment have leak detection device(s)?	Y / N	
	Has spill control prevention been enacted?	Y / N	
	Has any hazardous waste stored in a tank, piece of process equipment or ancillary equipment been in storage in excess of 90-days?	Y / N	
	If the answer was no, then proceed with the following:		
	Has the tank or piece of equipment had an integrity assessment?	Y / N	
	Does the tank or equipment have secondary containment?	Y / N	
	Does the tank or equipment have leak detection device(s)?	Y / N	
	Has spill control prevention been enacted?	Y / N	
	Is there a closure plan?	Y / N	
	If yes, then note.		
OAC 3745-67	Has any of the waste been managed in a surface impoundment? If yes, then note. Go to the next section.	Y / N	

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Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

RCRA Checklist

Regulatory Guideline	Question	Response	Comments
OAC 3745-68	Has any of the waste been managed in a Landfill? If yes, then note. Go to the next section.	Y / N	
OAC 3745-68	Has any of the waste been managed in an Incinerator (other than Burn area units)? If yes, then note. Go to the next section.	Y / N	
OAC 3745-68	Has any of the waste been managed in a Thermal treatment Unit (other than Burn area units)? If yes, then note. Go to the next section	Y / N	
OAC 3745-69	Has any of the waste been managed in a Miscellaneous Treatment Unit (other than Burn area units)? If yes, then not. Go to the next section.	Y / N	
OAC 3745-56	Has any of the waste been managed in a Waste Pile? If yes, then note. Go to the next section.	Y / N	

General Comments:

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Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

Asbestos Screening Checklist

Does this facility contain ACBM?	(Y) N	If yes, conduct the following survey

Asbestos Checklist

Asbestos information in Appendix I supercedes this section. VKO 11/13/03

Note: Routinely, the asbestos standard for ACBM in schools has been applied to facilities for purpose of cleanup. In addition to AEHERA, there are additional standards in the NESHAPS that may be of importance.

Regulatory Guideline	Question	Response	Comments
ADAPTED FROM TSCA ACBM IN SCHOOLS:			
	Has this building been characterized either through process knowledge, by analyses, or by inspection to determine if it contains asbestos?	(Y) N	ALL PIPING HAS BEEN WRAPPED
	If no for this building or area note this conclusion in the comment section.		
	Is there any evidence of friable asbestos?	Y / (N)	
	Is the asbestos removal properly managed? (See questions listed below)	Y / N	If there is no asbestos removal, do not complete the following section.
NESHAPS FOR ASBESTOS FOR ANY ONGOING ASBESTOS REMOVAL:			
40 CFR 61.156	There are no discharges of visible emissions to the outside air from collection, processing, packaging, transporting, or deposition of ACBM during the removal.	Y / N	
40 CFR 61.152(b) (1)	ACBM is treated with water in accordance with 40 CFR 152(b)?	Y / N	
40 CFR 61.154	Is friable asbestos adequately wetted during stripping? Or, has an adequate ventilation and collection system been installed?	Y / N	
40 CFR 61.152	Is wetting continued until the waste friable asbestos is collected for disposal?	Y / N	

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Building Name: 48 Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore Date: 1/29/96

Toxic Substances and Control Act (TSCA) PCB's Screening Checklist

Does this facility potentially contain any PCB's or PCB contaminated equipment?	Y / N	If yes, are transformers labeled (Blue or Yellow stickers)? If yes, conduct the following survey.

TSCA Checklist

Regulatory Guideline	Question	Response	Comments
40 CFR 761	Has any waste generated in, or from, this building been characterized either through process knowledge or by analyses to determine if it contains PCB's ? If the answer is no, note . If the answer is yes, proceed with next section.	Y / N	
	Based on an inspection, are any of the materials or equipment potentially PCB contaminated? If no, note and stop here. If yes, note the location of the management unit, and the method of management, and proceed.	Y / N	
40 CFR 761.65 (c) (5)	Are PCB articles or containers stored in this building checked for leaks at least once every 30 days?	Y / N	
	If yes, are auditable records maintained.	Y / N	
40 CFR.30 (a) (1) (ix)	Are any PCB transformers in use, or stored for possible reuse, that contain PCB's at concentrations of 500 ppm or greater?	Y / N	
	Are they visually inspected quarterly? If yes, are auditable records maintained?	Y / N	

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Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

TSCA Checklist

Regulatory Guideline	Question	Response	Comments
40 CFR 761.30 (a) 1,viii	Are all combustible materials (i.e., paints, solvents, plastics, paper, sawn wood, etc.) cleared from areas containing PCB transformers to a distance of five meters?	Y / N	
40 CFR 761.65 (b) (8)	Are all PCB articles and containers labeled with the date they were placed in storage?	Y / N	
	Are labeled PCB articles and containers stored so that the labels can be referenced?	Y / N	
40 CFR 761.65 (a)	Are all PCB's and PCB contaminated items at concentrations above 50 PPM, that are stored for disposal, stored no longer than one year from the date they were placed in storage?	Y / N	
40 CFR 761.62 (b) (1) (i)	Do all PCB storage areas have an adequate roof and walls to prevent rainwater from reaching the stored items?	Y / N	
40 CFR 761.62 (b) (1) (iv)	Are storage are floors curbed and constructed of continuous smooth and impervious materials?	Y / N	
40 CFR 761.62 (b) (1) (i)	Are the curbs at least 6 inches high?	Y / N	
40 CFR 761.62 (b) (1) (iii)	No drains are allowed in storage areas. Are there drains in the storage areas?	Y / N	

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Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

TSCA Checklist

Regulatory Guideline	Question	Response	Comments
40 CFR 761.65 (c) (2)	Only non-leaking and undamaged large high voltage PCB's capacitators and PCB-containing electrical equipment are allowed to be stored outside of PCB storage areas, on pallets if stored outside, with containment for 10 percent of the volume of the equipment. Do all PCB's stored in this configuration conform with this requirement?	Y / N	
40 CFR 761.45 and .65	Are all PCB storage areas marked with a large PCB mark as described in 40 CFR 761.45 (a)?	Y / N	
40 CFR 761.65 (c) (5)	Have all leaking PCB articles and containers been transferred to non-leaking containers?	Y / N	
40 CFR 761.65 (c) (6)	Do all PCB storage containers for the storage of liquid and non-liquid PCB's comply with DOT shipping container specifications?	Y / N	

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GENERAL COMMENTS:

Environmental Appraisal Checklist

Building Name: 48 Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore Date: 1/29/96

Low-Level Waste and Transuranic Waste Screening Checklist

Does this facility contain radioactive waste ?	Y / N	If yes, conduct the following survey.

Radiological-related processes were introduced in 1999. See Appx G.

Low-Level Waste and Transuranic Waste Checklist

Regulatory Guideline	Question	Response	Comments JVH 11/14/03
Low-Level Waste			
DOE Order 5820.2A Chapter III	Can any waste generated in, or from, this building be characterized either through process knowledge or by analyses to determine if it is LLW ? If the answer is no, note. If the answer is yes, proceed with next section.	Y / N	
DOE Order 5820.2A Chapter III.	Are any of the materials noted by inspection LLW? If no, The audit would stop here, because there are no LLW. If yes, note the location of the management unit, and the method of management, and proceed with the section below.	Y / N	
DOE Order 5820.2A Chapter III, 3.a.	Have the storage configurations in use in this area been taken into account for keeping external exposures to the general public below 25 mrem/yr?	Y / N	
	Is the waste stored in a configuration that protects ground-water resources?	Y / N	
DOE Order 5820.2A Chapter III, 3.b.	Has monitoring been conducted in this area in accordance with DOE Order 5820.2A in order to evaluate the area against the performance standard?	Y / N	
	Based on field data, does the monitoring conducted in this area conform to the performance standard?	Y / N	

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Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

Low-Level Waste and Transuranic Waste Checklist

Regulatory Guideline	Question	Response	Comments
DOE Order 5820.2A Chapter III, 3.d.	Based on field data, is the characterization of the materials in this area sufficient to assure proper segregation to assure proper segregation, treatment, storage, and disposal?	Y / N	
	Based on field data does the characterization as documented at the time of generation of the waste ensure that the actual physical and chemical characteristics, and major radionuclide content of this material are recorded and known at all stages of the waste management process?	Y / N	
	Do characterization data include the following:		
	Physical and chemical characteristics of the waste?	Y / N	
	Volume of the waste (including solidification and absorbent material)?	Y / N	
	Weight of the waste (including solidification and absorbent material)?	Y / N	
	Major radionuclides and their concentrations?	Y / N	
	Packaging date, package weight, external volume?	Y / N	
	How were the concentration of radionuclides determined? Direct methods?	_____	
	How were the concentrations of radionuclides determined? Indirect methods?	_____	
DOE Order 5820.2A Chapter III, 3.h	Is the storage configuration in long term storage sufficient to meet the performance standard?	Y / N	
	Are records maintained at the facility enabling this waste to be traced from its origin?	Y / N	

Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

Low-Level Waste and Transuranic Waste Checklist

Regulatory Guideline	Question	Response	Comments
TRU WASTE			
	Can any waste generated in, or from this building be characterized either through process knowledge or by analyses to determine if it is TRU waste? If no, note and stop. If yes, proceed with the next section.	Y / N	
	Are any of the materials noted as being TRU waste during an inspection? If no, note and stop. If the answer is yes, note the location of the management unit, and the method of management and proceed with the appropriate section below.	Y / N	
DOE Order 5820.2A, Chapter II, 3.a	Was this material evaluated as soon as possible in the generating process, to determine if it is TRU (>100nCi/g), if it is recoverable, or if it is waste? (Note if the activity level is less than 100nCi/g, the waste is not TRU, and can be managed as LLW.)	Y / N	
	Did the determination of TRU radionuclide concentration include the mass of the container, including shielding? These should be included in calculating the specific activity of the waste.	Y / N	

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Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

Low-Level Waste and Transuranic Waste Checklist

Regulatory Guideline	Question	Response	Comments
DOE Order 5820.2A, Chapter II, 3.b	Has the TRU waste been assayed or otherwise evaluated to determine its radioactive content prior to storage?	Y / N	
	Has the TRU waste been characterized or otherwise evaluated to determine if hazardous waste is present?	Y / N	
	Has classified TRU waste been treated to destroy the classified characteristics?	Y / N	
DOE Order 5820.2A, Chapter II 3.d	Has all newly generated TRU waste been packaged in non-combustible packaging that meets DOT requirements?	Y / N	
	Have all Type A TRU waste packages been equipped with a method to prevent pressure buildup?	Y / N	
	Have all TRU packages been marked, labeled and sealed in accordance with 40 CFR 261 Subpart C and 49 CFR 172 Subparts D, E and 49 CFR 173 Subpart I?	Y / N	

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Environmental Appraisal Checklist

Building Name: 48 Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore Date: 1/29/96

Low-Level Waste and Transuranic Waste Checklist

Regulatory Guideline	Question	Response	Comments
DOE Order 5820.2A, Chapter II 3.e	Has the TRU waste been segregated in manner that will not permit commingling of TRU waste with LLW or high-level waste?	Y / N	
	Has the TRU waste been protected from unauthorized access?	Y / N	
	Has the TRU waste been monitored periodically to ensure that it is not releasing its radioactive and/or hazardous constituents?	Y / N	
	Has this TRU waste storage area been designed, constructed, maintained, and operated to minimize the possibility of fire, explosion, or accidental release of its radioactive and/or hazardous constituents?	Y / N	
	Does the facility have a contingency plan designed to minimize the adverse impacts of fire, explosion, or accidental release of its radioactive and/or hazardous constituents?	Y / N	

GENERAL COMMENTS:

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Building Name: 48 Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore Date: 1/29/96

Waste Minimization/Pollution Prevention Activities Screening Checklist

Does this facility generate waste or use chemicals?	(Y) N	If yes, conduct the following survey.

Waste Minimiaztion/Pollution Prevention Activities Checklist - ONLY JANITORIAL SUPPLIES

Regulatory Guideline	Question	Response	Comments
	Based on available information and a walk through, are there any apparent opportunities to curtail the consumption of raw materials (including but not limited to paper, chemicals, electricity, and etc.). If yes, list candidate areas in the comment section.	Y / N	
	Are there solvent wastes?	Y / N	
	Is vehicle maintenance performed?	Y / N	
	Are oils used ?	Y / N	
	Are these corrosive wastes?	Y / N	
	Are there sludges?	Y / N	
	Are there halogenated organic (nonsolvent) wastes?	Y / N	
	Are metals recovered from wastewater?	Y / N	
	Is waste sludge generated?	Y / N	
	Are any waste minimization practices used that reduce the generation of sludge?	Y / N	
	Ion exchange process?	Y / N	
	Lead in gasoline lowered to reduce tank sludge toxicity?	Y / N	
	Storage tank agitators installed?	Y / N	
	Corrosive resistant materials used?	Y / N	
	Prevention of crude oil oxidation ?	Y / N	
	Drying?	Y / N	

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Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

Waste Minimization/Pollution Prevention Activities Checklist

Regulatory Guideline	Question	Response	Comments
HALOGENATED ORGANIC (NONSOLVENT) WASTES			
	Are halogenated organic wastes used as fuel in cement kilns?	Y / N	
	Are baghouse filters used to collect pesticides and pesticide intermediates?	Y / N	
	Are solid wastes generated from the collection of baghouse dust?	Y / N	
	Wet instead of dry grinding used?	Y / N	
	The output spray dried?	Y / N	
	Has baghouse emptying and recycling of baghouse fines been scheduled?	Y / N	
	Have operations been evaluated to improve procedures such as handling, storage and spill prevention for increased efficiency?	Y / N	
METAL WASTES			
	Are any technologies for the recovering of metals from waste rinsewater used?	Y / N	
	Evaporation of waste rinsewater?	Y / N	
	Reverse osmosis?	Y / N	
	Ion exchange?	Y / N	
	Electrolysis?	Y / N	
	Agglomeration?	Y / N	
CORROSIVE WASTES			
	Are acidic or basic cleaning solutions used as treatment for pH adjustment chemicals?	Y / N	

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Building Name: 48 Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore Date: 1/29/96

Waste Minimization/Pollution Prevention Activities Checklist

Regulatory Guideline	Question	Response	Comments
	Are ion exchange resins used to remove heavy metals and cyanides from acid and base solutions?	Y / N	
	Is crystallization used to remove corrosives from solution by cooling?	Y / N	
	Is the process of evaporation of liquid wastes by heating used to leave behind a more concentrated solution?	Y / N	
CYANIDE AND REACTIVE WASTES			
	Has non-cyanide or low concentration of cyanide process replaced zinc cyanide bath ?	Y / N	
	Are any of these processes used to recycle cyanide wastes?	Y / N	
	Refrigeration/crystallization?	Y / N	
	Evaporation?	Y / N	
	Ion exchange?	Y / N	
	Membrane separation which includes reverse osmosis or electrodialysis?	Y / N	
VEHICLE MAINTENANCE			
	How are auto parts cleaned?	Y / N	
	Solvent sink?	Y / N	
	Solvent dunk bucket?	Y / N	
	Solvent dip tank?	Y / N	
	Are parts cleaning solvents used for anything else besides cleaning parts?	Y / N	
	Are spills reduced by locating sinks or dunk buckets near auto service bays?	Y / N	

Environmental Appraisal Checklist

Building Name: 48 Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore Date: 1/29/96

Waste Minimization/Pollution Prevention Activities Checklist

Regulatory Guideline	Question	Response	Comments
	Are cleaned parts drained on the sink to minimize solvent spills?	Y / N	
	Are drip tanks used to capture losses?	Y / N	
	Is a solvent sink used for mineral solvents rather than a dunk bucket or dip tank?	Y / N	
	Does a waste hauler collect solvent waste for recycling or treatment?	Y / N	
OILS			
	What kind of oils are used?		
	Hydraulic oil?	Y / N	
	Transformer oil?	Y / N	
	Metal working fluids?	Y / N	
	Spent lubricating oils?	Y / N	
	Can the process be modified or changed to use water-based fluids?	Y / N	
	Are these good housekeeping and operation practices used to minimize oil waste production?		
	Use oils not contaminated with other liquids?	Y / N	
	Oil spills prevented?	Y / N	
	Drip pans installed?	Y / N	
	Oil soaked rags laundered?	Y / N	
	Rags and absorbants used to their limit?	Y / N	

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Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

Waste Minimization/Pollution Prevention Activities Checklist

Regulatory Guideline	Question	Response	Comments
	Are these treatment techniques used to promote separation of oil/water wastes?		
	Reclaiming process to remove water and solvents by heat?	Y / N	
	Gravity setting?	Y / N	
	Screening?	Y / N	
	Centrifugation?	Y / N	
	Filtration?	Y / N	
SOLVENT WASTES			
	Has there been an attempt to reduce volume or toxicity by:		
	Eliminating solvents?	Y / N	
	Reducing the use of solvents?	Y / N	
	Reducing the loss of solvents?	Y / N	
	Increasing recyclability?	Y / N	
	Are solvents segregated?	Y / N	
	Are waste solvents free from water and garbage?	Y / N	
	Are recycled solvent containers labeled as such?	Y / N	
	Are containers kept closed?	Y / N	
	Free and sheltered from the elements?	Y / N	
	Are solvent tanks kept as free from contaminations as possible so that the waste can be recycled?	Y / N	
	Is a method used to minimize the use of new materials such as a countercurrent process?	Y / N	

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Environmental Appraisal Checklist

Building Name: 48

Appraisers: Terry Glander, Mary-Louis Hoagland, Marsha Vannet, Mary Sizemore

Date: 1/29/96

Waste Minimization/Pollution Prevention Activities Checklist

Regulatory Guideline	Question	Response	Comments
	If there is a recycling program, what technique is used?	Y / N	
	Distillation?	Y / N	
	Solids removal?	Y / N	
	Dispersion breaking?	Y / N	
	Dissolved and emulsified organics recovery?	Y / N	
	Are any of these housekeeping procedures used to minimize the production of solvent wastes?		
	Separators cleaned and checked?	Y / N	
	Parts not allowed to enter the degreaser while wet?	Y / N	
	Sludge from the bottom of the tank not allowed to accumulate?	Y / N	
	Lids kept on tanks?	Y / N	
	Freeboard space on tanks increased?	Y / N	
	Are better operating practices used to reduce waste?	Y / N	
	How long is solvent waste stored and where?	_____ _____	

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9.70-37

Building Manager's Questionnaire

Building Name: 48 Building Manager: J.L. Boston Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

1. What are the access requirements (training, clearance, etc.)?

None

2. What protective equipment is required to enter the building?

NONE

3. Are there any restricted areas? Yes (No)
Where are they?

4. Provide a physical description of the building.

This two-story building contains 7,950 ft^2. It is constructed of reinforced concrete with a BUM roof (coal tar). HVAC systems are central steam and chilled water. The building was built in 1970. It contains asbestos in the thermal insulation and is contaminated with energetic materials. There is no radiological contamination. Offices are on the first floor; analytical laboratories are on the second floor.

See Appx G + I for current information. (RM) 11/14/03

Source: Mound Facility Physical Characterization, 12-1-93

5. Provide a drawing of the building.

Attached

6. What is the current building use?

The building is used for analyzing energetic materials from the stockpile. Energetic materials are also analyzed for the Department of Defense.

Source: Mound Buildings, 5-9-95

7. What is the history of building use other than that described in #6?

Source: Mound Buildings, 5-9-95

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Building Manager's Questionnaire

Building Name: 48 Building Manager: J.L. Boston Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

8. What are ongoing operations or processes? What are the raw materials and waste streams from each process? Who is the best contact for each process?

Process(es) Housed: Surveillance of weapons components *

How Wastes Are Generated:

When explosive components of weapons are cut apart for inspection and testing, some of the explosive must be removed. Any explosive not held for long-term storage or required for analysis is put in boxes for explosive wastes along with any paper, cloth, etc. which may be contaminated with explosives. These wastes are sent to be burned onsite.

Acetone is used to dissolve pentaerythritol tetranitrate (PETN). Any waste acetone is poured into a red waste can for Waste Management to pick up.

DMSO dissolves cyclotetramethylenetetranitramine (HMX). Waste DMSO is poured into a separate red waste can.

Ethyl alcohol is used to rinse off parts which have been cleaned in acetone or DMSO. Waste alcohol goes into a third waste can.

Valves in the scanning electron microscope are cleaned with Freon. Any waste Freon is kept in a separate waste can for pickup by Waste Management.

Quantities of all wastes are small. It may take more than a year to fill any one 5-gal waste can.

Contact:
Phone #:

Source: Characterization of Mound's Hazardous, Radioactive, and Mixed Waste, (8-15-90).

* Currently there are no ongoing operations or processes, so there are no wastes being generated.

Building Manager's Questionnaire

Building Name: 48 Building Manager: J.L. Boston Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

9. In the last six months, have any modifications been made to the building or to processes in the building? Yes (No)

10. Does the building have air emission sources? No

Process Source	Room Number	Hood Number	Active	Chemicals Used	Quantity Used	Quantity to Waste Management	Lbs./Yr. Operation	Air Emissions
			Y / N					
			Y / N					
			Y / N					
			Y / N					
			Y / N					

Source: Mound Air Emissions Database 11/30/95

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9.70-43

Building Manager's Questionnaire

Building Name: 48 Building Manager: J.L. Boston Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

11. Describe air pollution control equipment used to reduce emissions for each source. None Listed

Process Source	Emissions	Control Equipment	Functioning
			Y / N
			Y / N
			Y / N
			Y / N
			Y / N

Source: Air Permits 2/4/95

12. For existing permits are emissions monitored? At what frequency? Where are the records maintained? None Listed

Process Source	Permit	Log	Permit Conditions & Frequency of Monitoring
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	

Source: Air Permits 2/4/95

13. Does the building have domestic water service? (Yes) No
Is there bottled water? Yes (No)

14. Does the building discharge to the storm sewer? Yes (No)
Where?

15. Does the building discharge to the sanitary sewer? (Yes) No
Where?

16. Has an asbestos survey been conducted? Yes
What are the results? Yes

Source: Technical Manual MD-10391, Issue 3 Asbestos Program Manual 9/6/95

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Building Manager's Questionnaire

Building Name: 48 Building Manager: J.L. Boston Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

17. Does the building contain transformers or capacitors? No

Source: PCB ANNUAL DOCUMENT LOG

18. Has the building been identified as containing PCBs? No

Source: PCB ANNUAL DOCUMENT LOG

19. What chemicals are used or stored inside or outside of the building? Include compressed gasses not in large tanks.

Chemical Name	State	Amount (MAX)
NONE		

Source: Chemical Inventory 1994

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9.70-45

Building Manager's Questionnaire

Building Name: 48 Building Manager: J.L. Boston Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

20. Has there been a reported spill, leak, or other release of any chemical? Yes
What, how much, and what clean-up measures were followed?

Chemical	Amount	Clean-up Measures

Source: _____

21. Where do waste chemicals go?
Waste Mgmt.

22. What janitorial supplies are stored inside or outside of the building?
mops, mop buckets, disinfectant, Soap, cleaner, brooms, + Trash bags.

23. Where do excess janitorial supplies go?
To Custodial Services (Jean Blevins)

Source: _____

24. Are pesticides or herbicides stored or used in or around the building? Yes (N)

Chemical	Amount	Chemical	Amount

Source: _____

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9.70-46

Building Manager's Questionnaire

Building Name: 48 Building Manager: J.L. Boston Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

25. Does the building contain active or inactive above ground storage tanks? (Yes) No
For each tank, list the content, quantity, last inspection, registration number.

Registration Number	Content	Quantity	Last Inspection Date	Preventive Maintenance Performed	Inside Or Outside
68476-34-6	diesel fuel	30 gal		Y/N	outside
				Y/N	

Source: Emergency and Hazardous Chemical Inventory Form - Chemical Storage Tanks on EGG Mound Site Owned and Maintained by Outside Contractors 8/8/94

26. Is there a sump or pit or underground tank in or around the building?
Yes No (Unknown)
Is it double-walled? What does it contain? How many days per year is it filled?
Is there an emergency overflow tank? Have there been previous overflows?

Double-Walled	Contents	Days/Year in Use	Overflow Tank	Previous Overflow
Y / N			Y / N	Y / N

Source: _____

27. Does the building generate, store, or dispose of hazardous waste? Yes (No)

Materials	Amount
EPOXYLITE 8822 PART A	1.8
EPOXYLITE 8822 PART B	0.7
ETHYL ACETATE	2.4
FREON TF	5.0
FREON WASTE	114.2
LEAD DEBRIS	0.3
LEAD DEBRIS	3.0
MICROPAC GOLD ETCHANT	18.1
~~NITRIC ACID~~ TLH	10.6
~~SILICA GEL~~ TLH	257.9
~~SILICA GEL~~ TLH	20.0
~~SILICA GEL~~ TLH	20.9
~~SILICA GEL~~ TLH	24.0
~~SILICA GEL~~ TLH	58.8
~~SILICA GEL PACKETS~~ TLH	30.0
~~SILICA GEL PACKETS~~ TLH	64.9
~~SILICA GEL PACKETS~~ TLH	30.0
~~SILICA GEL WASTE~~ TLH	234.0
~~SILICA GEL WASTE~~ TLH	257.3

Building Manager's Questionnaire

Building Name: 48 Building Manager: J.L. Boston Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

Materials	Amount
SIL~~ICA GEL WAS~~TE TCH	240.5
SIL~~ICA GEL WAS~~TE TCH	87.2
SIL~~ICA GEL WAS~~TE TCH	250.8
SIL~~ICA GEL WAS~~TE TCH	244.3
SIL~~ICA GEL WAS~~TE TCH	262.8
~~EXPLOSIVE PPROCESS WASTE SOLVENTS~~ TCH	95.9
~~EXPLOSIVE PROCESS WASTE SOLVENTS~~ TCH	123.8

Source: Characterization of Mounds Hazardous, Radioactive, and Mixed Wastes 08/15/90

9.70-48

Building Manager's Questionnaire

Building Name: 48 Building Manager: J.L. Boston Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

28. Does the building have abandoned process equipment such as tanks, piping, containers, etc.? Yes (No)

29. Is waste material stored in or around the building for more than 90 days?
Yes (No)

30. Has the building been identified as a 90-day waste accumulation area?
Yes (No)

31. Has any area in the building been identified as a satellite accumulation area?
(Yes) (No) TLG 1/27/96

32. Is mixed waste generated, stored, or disposed of from the building? Yes (No)
Where are logs found?

Process	Waste	Stored	Disposed	Logs
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N

Source: _____

Building Manager's Questionnaire

Building Name: 48 Building Manager: J.L. Boston Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

33. Is TRU radioactive waste generated, stored, or disposed of from the building?
Yes (No)
Where are logs found?

Process	Waste	Stored	Disposed	Logs
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N

Source: _____

Building Manager's Questionnaire

Building Name: 48 Building Manager: J.L. Boston Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

34. Is low-level radioactive waste generated, stored, or disposed of from the building? Yes (No)
Where are logs found?

Process	Waste	Stored	Disposed	Logs
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N

Source: _____

35. Identify all administrative orders, temporary or permanent injunctions, civil administrative penalties, or criminal activities issued against the building.

None

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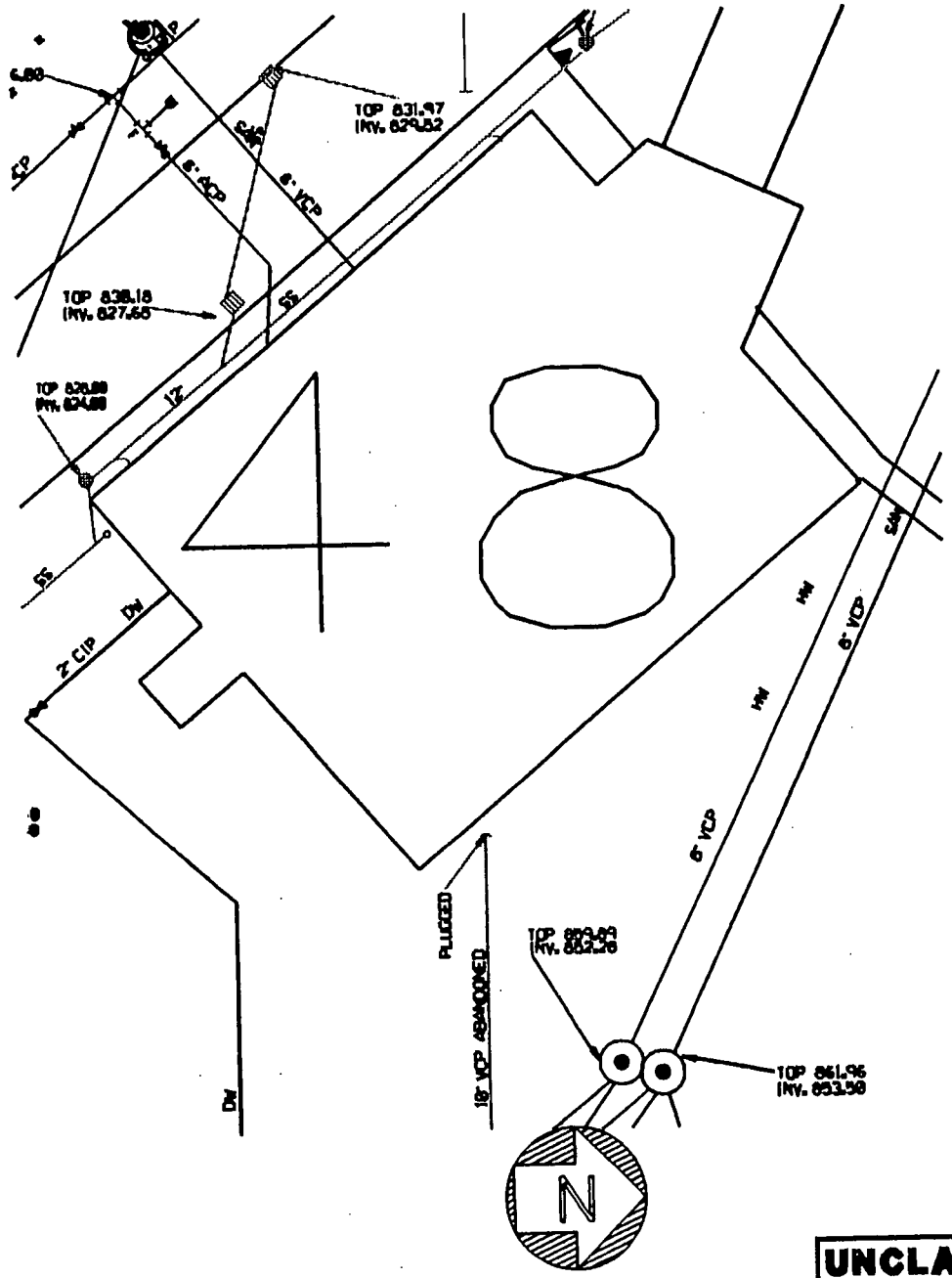
Building Manager's Questionnaire

Building Name: 48 Building Manager: J.L. Boston Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

36. Is there a waste minimization program in the building? Yes (No)
Discuss your ideas about how to minimize waste.

37. Has a pollution prevention program been developed for the building? Yes (No)



FIRE
POTABLE
RAW
SANITARY
STORM
RADIOLOGICAL

E.G. & G. - MOUND

UNDERGROUND WATER & WASTE LINES
BLDG. 48

DATE: 5-5-96

UNCLASSIFIED

F47847

9.70-65

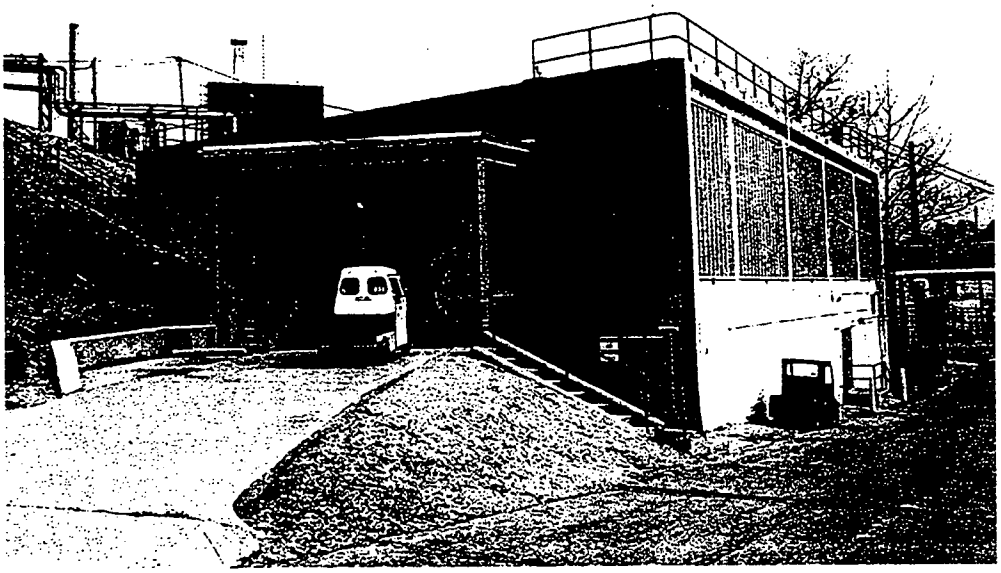
Appendix G

Radiological Information

Pre-demolition Survey Plan

For

Building 48



Prepared By:	**Roderick C. Case** /	**Date:**	**11/6/03**
Reviewed By:	**Kevin Doody** CHP	**Date:**	**11/9/03**
Approved By:	**A. Stephen Collas** /	**Date:**	**11/7/03**

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1.0 Historical Overview

Building 48 has been home to three different or distinct processes. From the time of its construction in 1970, into the mid-1980s its mission was in support of the "Process Mechanization" or "Automation" Program. By 1986, Building 48 had been converted into a facility to support the explosives work at Mound as a "quality Assurance" or surveillance facility. With this mission, explosive devices were mechanically disassembled for visual inspection and for physical/chemical analysis. These activities drew to a close in the mid-1990's, and the building was in the process of being converted to a "user agreement" facility, where the building would be leased to private industry. In 1999, in anticipation of the demolition of E Building, Building 48 was remodeled, and the environmental laboratory operations from E Building and the associated office areas were moved to Building 48. With this new mission assignment, Building 48, much like the laboratories that had been located in E Building, received radiological postings in the active laboratory areas. The actual processes in Building 48 are described in a Mound procedure manual that is discusses in a section that follows.

The square footage of Building 48 is noted in contemporary documents as 7,950-ft^2. Based upon a comparison of construction era drawings to the current floor plans, the building footprint has remained as it was, when constructed. Room configurations, however, have been changed.

No documented prior uses of the Building 48 footprint were found. However, a waste-line break occurred in 1970 in the area where Building 48 is located. In 2001, there was a tritium contamination incident that affected rooms 211, 204, 208. The affected area included 2 proportional counters, a fumehood and a furnace. Documentation was found that indicated that the areas were successfully decontaminated.

Since there is a potential for residual contamination to be present, Building 48 is designated as impacted. A complete history of Building 48 can be found in Reference 1.

1.1 Current Status

Building 48 is scheduled for demolition in accordance with the Miamisburg Closure Project goals. The radiological status of building surfaces must be determined to facilitate a free release of the structure in accordance with site procedures. A characterization study of the radiological condition of this building will direct the appropriate decisions of its final status.

2.0 Data Quality Objectives

The Data Quality Objectives (DQO) process is a series of planning steps that have been defined by the EPA (USEPA, 1994) to ensure that the type, quantity, and quality of survey data used in decision making are appropriate for the intended application. The DQO's for this survey plan are derived from Mound procedures and consistent with the Mound 2000 Approach for building disposition (Reference 2).

2.1 Problem Statement

Determine whether or not the residual radioactivity of the surfaces of building materials associated with Building 48 satisfies the release criteria specified in DOE Order 5400.5.

2.2 Decision Statement

The radiological impact of site operations on structural surfaces will be determined by hypothesis testing the survey data in accordance with Reference 5. The null hypothesis is stated as:

H_0 = The average concentration of residual radioactivity in the survey unit is greater than the release criteria.

The alternate hypothesis is:

H_a = The average concentration of residual radioactivity in the survey unit is less than the release criteria.

If all the measurements are below the $DCGL_w$, the release criteria will be met and the survey unit passes. Any measurement from the survey unit will be considered elevated if it exceeds the $DCGL_w$. However, the elevated measurement alone does not indicate that the survey unit fails to meet the release criterion, only that further investigation will be necessary to determine the extent and concentration of the elevated area.
This survey plan will provide the necessary data to make this decision.

2.3 Inputs to the Decision

The Historical Site Assessment and current survey data are initial inputs to determine area classifications. Gross surface activity measurements for alpha and beta activity will be performed. Removable alpha, beta, and tritium activity will be counted. Sediments will be analyzed for radioisotopes and compared to site screening values. Analysis MDA's will be adequate to observe activity below the screening values.

The instrumentation selected for this survey plan will be appropriate for the radionuclides typical for the Mound site.

Surface scanning will be performed to locate anomalies that might indicate elevated areas of residual activity and that require further investigation or remedial action. A floor scan for alpha contamination will be performed using a Ludlum 2350/43-37 Floor Probe at a scan speed of 1 inch per second, with the probe located within 1/4 inch to the surface being scanned. The minimum detectable activity (MDA) is 85 dpm/100 cm^2 with 95% detection probability, at a background level equal to or less than 10 cpm. A 30 second integrated count will be performed at locations where elevated measurements are observed. The MDA in the integrated mode is 49 dpm/100 cm^2 or 286 dpm/probe.

Direct measurements of building surfaces will be made at fixed locations using a Ludlum 2350/43-68 gas flow proportional probe (or equivalent) for alpha and beta contamination. The integrated count time is two minutes. The alpha MDA is 50 dpm/100cm^2 at a background of less than 3 cpm. The beta MDA is 375 dpm/100cm^2 at a background of less than 400 cpm.

The presence of loose surface activity, including H^3 will be determined using coin smears. An area of 100cm^2 will be smeared at each data point. Smears will be counted in an alpha/beta counter. A liquid scintillation counter (LSC) will measure removable tritium. Smear samples with gross activity above the $DCGL_w$ and sediment samples will be analyzed by alpha and/or gamma spectroscopy.

All field and laboratory instrumentation will be specified on the Survey Plan Form (SPF) and shall be operated in accordance with the appropriate Mound procedures.

All surveys and samples collected for this survey plan will be performed in accordance with the Quality Control requirements of Reference 3. Replicate surveys, sample recounts, instrument performance checks, chain of custody for samples, control of field survey data and databases, and QC investigations provide the highest level of confidence in the data collected to support the survey outcome. The SPF will specify the QC requirements for this survey.

2.4 Study Boundaries

Defining the study boundaries helps ensure the data taken during the final status survey are representative of the survey unit. The area under consideration is the physical surfaces inside and outside of the Building 48 structure. Subsurface material (under-slab, footers, etc) and associated soil is not evaluated in this survey, but will be assessed separately when surfaces are accessible in accordance with Mound procedures.

Each survey unit is classified in accordance with Reference 5 based on historical data and current characterization surveys. Class 1 areas are those areas where contamination was found above the $DCGL_w$ prior to remediation and have the greatest potential for residual contamination. Class 1 areas receive the highest degree of survey effort (100% surface scan). Class 2 areas are areas where radioactive material may have been present, but are not expected to exceed the $DCGL_w$. Class 2 areas receive a moderate degree of survey effort (50% surface scan). Class 3 areas are areas that are impacted by building operations, but are not expected to have any residual radioactivity. Class 3 areas may also be buffer areas to Class 1 or 2 areas and receive a smaller degree of survey effort (up to 25% surface scan). Non-impacted areas have no reasonable potential for residual contamination and are judgmentally (bias) surveyed to confirm this designation.

Building 48 is impacted since there is a potential for residual radioactive material to be present. The greatest potential for residual radioactivity is expected on laboratory floor areas. The high-risk areas are given a Class 2 designation and low risk areas and interior walls up to 8 feet are given a Class 3 designation. The remainder of the building surfaces will be judgmentally surveyed. A characterization SPF will be written to specify the survey and sampling requirements.

Building 48 Survey Units

Survey Unit	Room/Area	Class	Area (Sq.Ft.)	Scan %	Floor	Walls	Ceiling
1	202-204	2	504	50	X		
2	205-206	2	864	50	X		
3	201/207	3	1653	50	X	X	X
4	211	2	912	50	X		
5	208-210	2	1376	50	X		
6	101-112	3	10116	25	X	X	X
7	202-204 Walls & Ceiling	3	1008	10		X	X
8	205-206 Walls & Ceiling	3	1680	10		X	X
9	211 Walls & Ceiling	3	1184	10		X	X
10	208-210 Walls & Ceiling	3	968	10		X	X
11	Roof	3	4599	10	X		
12	Exterior Walls	3	6800	10		X	

Sampling of building materials will include removable loose surface contamination (smears) and sediment sampling of floor drains, sumps, fume hoods, and ventilation units. Smears ($100cm^2$) will be collected at survey data point locations. Any areas of elevated activity above the $DCGL_w$ will be evaluated for isotopic content by intrusive sampling or insitu analysis.

In Class 2 survey units, the starting point is randomly selected and data points are located within the survey unit using the triangular grid method. The spacing of data points is determined by:

$$L = \sqrt{\frac{A}{0.866n}}$$

Where: A = Survey unit area
n = # of data points
L = Distance between data points in feet

In Class 3 areas, the location of each data point is determined by multiplying the east-west (Y) and the north-south (X) dimensions of each survey unit by a randomly generated number for each dimension. A calculator, computer, or tables may be used to determine random numbers. If additional surveys are required due to area reclassification or remediation, the survey design parameters will be specified as necessary in accordance with Reference 5 and incorporated into the Final Status Report.

The data points are then located on a scaled drawing and transferred to the survey unit. Professional judgment (biased) surveys will be performed to supplement the random survey data, but will not be combined with the statistical data. Judgmental survey data will be compared directly to the release criteria.

The number of data points is determined by calculating the relative shift (Δ/σ) from the DCGL value, the lower bound of the gray region (LBGR), and the standard deviation of the contaminant in the survey unit (Δ/σ = DCGL-LBGR/σ). The standard deviation is estimated to be $17dpm/100cm^2$ based on characterization surveys of similar building surfaces. The LBGR is set at one-half the release limit. The relative shift is calculated as 2.95. For survey planning, the number of data points (n = 20) in the survey unit was obtained from Table 5.5, Reference 5.

2.5 The Decision Rule

A decision rule relates the concentration of residual radioactivity in the survey unit to the release criterion so that decisions can be made based on the results of the final status survey. Reference 6, DOE Order 5400.5, Radiation Protection of the Public and the Environment, offers generic release criteria for building surfaces. Table 1 lists these permissible surface contamination guidelines which were adapted from NRC Regulatory Guide 1.86. Tritium at the Mound facility is an exception. For tritium, 10,000 $dpm/100cm^2$ was selected based on technical information presented in Reference 4.

Table 1

Allowable Total Residual Surface Contamination (dpm/100cm^2)*				
Radionuclides*		**Average***	**Maximum***	**Removable***
Group 1	Transuranics, I-125, I129, Ra-226, Ac-227, Ra-228, Th-228, Th-230, Pa-231	**100**	**300**	**20**
Group 2	Th-Natural, Sr-90, I-126, I-131, I-133, Ra-223, Ra-224, U-232, Th-232	**1,000**	**3,000**	**200**
Group 3	U-Natural, U-235, U-238 and associated decay products, alpha emitters	**5,000**	**15,000**	**1,000**
Group 4	Beta-gamma emitters (Radionuclides with decay modes other than alpha emission or spontaneous fission) except for Sr-90 and others noted above	**5,000**	**15,000**	**1,000**
Tritium		**N/A**	**N/A**	**10,000**

* Note: Refer to DOE Order 5400.5, Radiation Protection of the Public and the Environment, for specific information on surface contamination guidelines and additional notes.

The average activity levels shown in Table 1 assumes that the residual contamination is uniformly distributed across the survey unit and are designated $DCGL_w$ in this plan. Biased measurements will be taken in non-impacted areas and compared directly to the release criteria to supplement the statistical data. The maximum activity shown in Table 1 represents the $DCGL_{EMC}$. Since Pu-238 is the major contaminant of concern, Group 1 limits are appropriate for alpha measurements. Group 4 limits are used for beta/gamma measurements.

If the average of the measurements is above the $DCGL_w$, the survey unit will not meet the release criterion. If the average surface activity within each survey unit is below the $DCGL_w$ and the maximum activity is less than the $DCGL_w$, then it will be accepted as the Final Status Survey and no further survey action is required.

If the average of the residual activity in the survey unit is less than the $DCGL_w$, but some areas are greater than the $DCGL_w$, the Sign test will be used to determine if the release criteria have been met. Each measured value, when subtracted from the DCGL, will yield a positive or negative number. If the sum of the positive signs (S+) is greater than the Critical Value (Table I.3, Reference 5), then the null hypothesis is rejected and survey unit passes. The power of the Sign test is given in Reference 5, I.9.1. A prospective power curve constructed using MARSSIM Power 2000 software demonstrates sufficient power exists at the LBGR to detect residual contamination (Attachment 1). A retrospective power curve will be used to test the assumptions made in this survey plan.

The decision rule for the elevated measurement comparison will be a two-stage process. In the first stage, areas will be flagged as potentially elevated if the direct measurement or scanning measurement indicates concentrations above the $DCGL_w$. If the elevated activity can not be attributed to naturally occurring radioisotopes, the area will be remediated, and resurveyed in accordance with Reference 5.

2.6 The Limits on Decision Errors

A Type I error is made when the null hypotheses, H_0, is rejected when it is true. A Type II error is made when the null hypotheses is not rejected when it is false. The error rates

are expressed as the probability that a survey unit passes when it should fail (α) or fails when it should pass (β). Because the measurement variability is expected to be small at the DCGL, the α =0.05 and β = 0.01 for this survey.

The concentration range between the Lower Bound of the Gray Region (LBGR) and the DCGL defines the gray region of residual radioactivity concentration in which the consequences of Type II decision errors are relatively minor. The statistical test uses the LBGR to define the level that, above which, false positive rates greater than that specified by the limits on decision errors are accepted. The LBGR is limited by the variability exhibited by the measurements and the decision errors chosen. Because the detection limits expected by the direct field measurements are low relative to the $DCGL_w$, it is estimated that an LBGR equal to one-half of the $DCGL_w$ can be achieved.

2.7 Optimizing the Design

The DQO process is neither static nor sequential. As new information is gathered it will be incorporated into the planning process. In order to facilitate this process, a Survey Plan Form (SPF) is developed for field use to direct the specific details required by the overall survey plan. The SPF will specify the types of samples to be collected and the locations and analysis to be performed. It will define the specific instruments to be used for the survey and the location and type of surveys required. The SPF will specify the Quality Control (QC) requirements of the survey as required by Reference 3. Additional information and comments can be added to clarify or enhance the survey/sample process. The SPF is reviewed and approved prior to beginning the survey and is subsequently reviewed and approved after all data is collected to ensure completeness and accuracy. Data from initial survey efforts may result in altering area classifications. Additional SPF's may be required to complete the final status survey process for a survey unit.

It is critical to the DQO process that the survey units are isolated from the potential for recontamination or disturbances that could lead to invalidating the survey results. Access shall be restricted to all areas where surveys have been completed until such time as the survey unit is released.

2.8 Final Status Survey Report

When all of the DQO's are satisfied, a report of the final status of the building is prepared and submitted for review. This report called a Final Status Survey (FSS) will summarize and document the MARSSIM survey and the final status of the building. The FSS report will be transmitted to the Mound 2000 Core Team for review and approval prior to proceeding with building demolition.

3.0 References

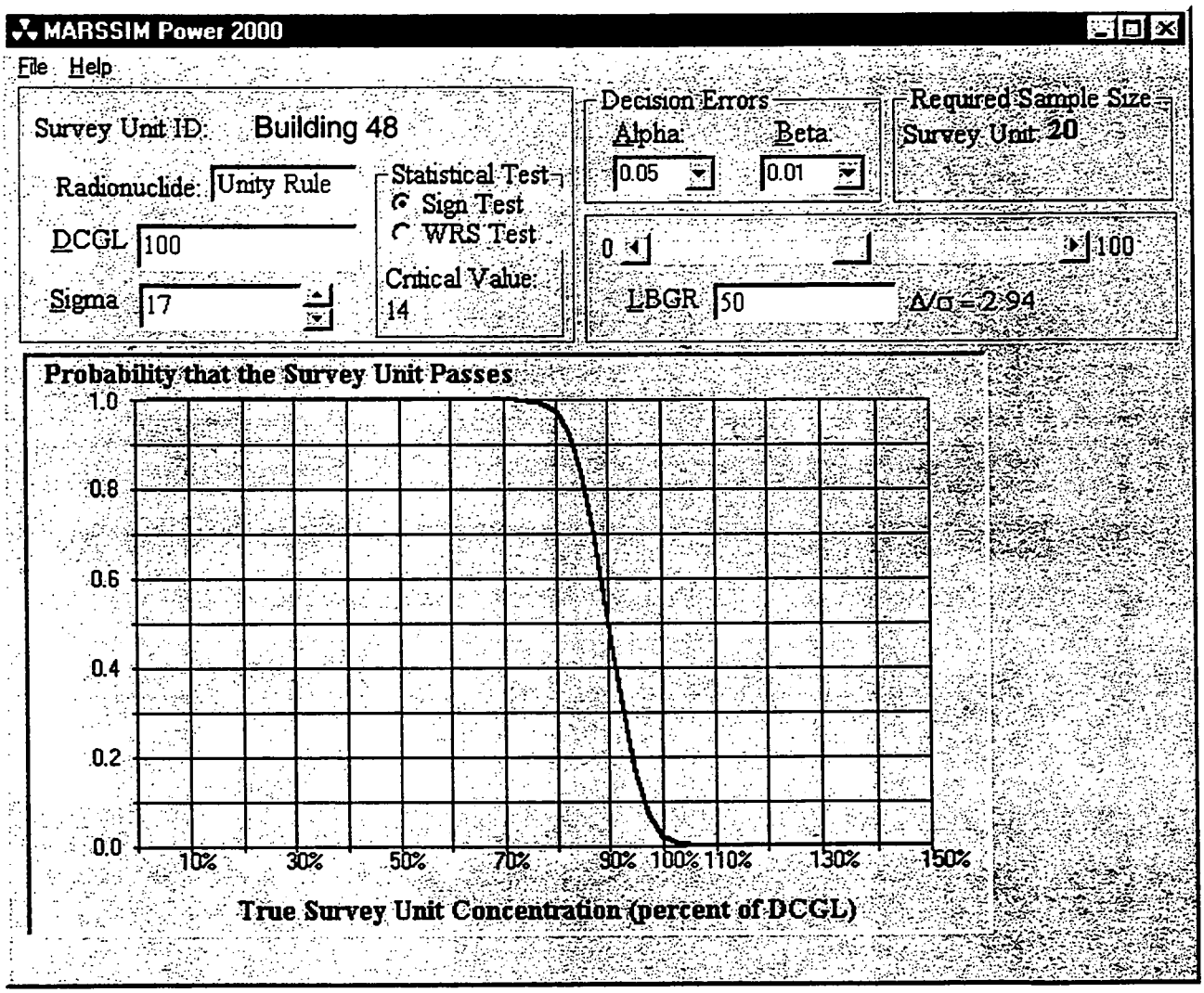
1. CH2MHill, EC&AS Department, White Paper: *Building 48 Structural History and Process History Summary Background Document*, September 2003
2. Work Plan, *Mound 2000 Approach*, DOE/MEMP, 1995
3. MARSSIM Implementing Procedures, *Field Quality Control for Building Contamination Surveys*, MD-80046, Op 402
4. DOE, 1991, *Recommended Tritium Surface Contamination Release Guides,* DOE, EH, 0201T, March, 1991; Mound Tritium Committee, Appendix A, Health-Based Risk Assessment for Unconditional Release of Items Contaminated with Tritium

5. NUREG 1575, Rev 1, Aug 2000, *Multi-Agency Radiation Survey and Site Investigation Manual*, (MARSSIM)

6. DOE Order 5400.5, *Radiation Protection of the Public and the Environment*

G 9-6 25

Sign Test Prospective Power Curve



MARSSIM Power 2000 software developed by Dr. Carl Gogolak, DOE/EML is provided on the Health Physics Society Decommissioning website (http://www.serversolutions.com/decomm_sec/index.htm) and endorsed by the Oak Ridge Institute for Science and Education (ORISE).

SURVEY PLAN FORM

SPF NUMBER	48-01	**DATE OF REQUEST**	November 6, 2003
TYPE OF SP	☐ FSS ☒ CHARACTERIZATION ☐ REFERENCE ☐ OTHER:		
AREA/LOCATION	Building 48		
PURPOSE	The purpose of this SPF is to characterize Building 48 to support decisions on final disposition.		
SURVEY UNIT	(See Attachment 1)	**SURVEY UNIT**	N/A
SURVEY UNIT	N/A	**SURVEY UNIT**	N/A
SURVEY UNIT	N/A	**SURVEY UNIT**	N/A
SURVEY UNIT	N/A	**SURVEY UNIT**	N/A

SAMPLE TYPE

☐ **SURFACE SOIL SAMPLE:**

☐ **SUB-SURFACE SOIL SAMPLE:**

☒ **SEDIMENT SAMPLE:** See specific sediment sampling instructions on page 2.

☐ **Rubbelized Material:**

☐ **OTHER:**

SURVEY TYPE

SURFACE SCAN	☐ BETA ☐ GAMMA ☒ ALPHA	**INST. TYPE**	L-2350	**SCAN RATE & DETECTOR DISTANCE FROM SURFACE**	Scan surface at a rate of 1" per second at a distance of not more than ¼" from surface
		PROBE TYPE	43-37 Floor Probe or 43-68 Hand Probe		
STATIC MEASURE-MENT	☒ BETA ☐ GAMMA ☒ ALPHA	**INST. TYPE**	L-2350	**COUNT TIME & DETECTOR DISTANCE FROM SURFACE**	Perform 2 minute counts at specified locations not more than ¼" from surface
		PROBE TYPE	43-68 Hand Probe		
STATIC MEASURE-MENT	☒ BETA ☐ GAMMA ☒ ALPHA	**INST. TYPE**	L-2360	**COUNT TIME & DETECTOR DISTANCE FROM SURFACE**	Refer to MD-80036, Op. No. 30030, *Operation of the Ludlum 2360 Scaler/Ratemeter with Ludlum 43-89 Alpha/Beta Scintillator*, Section 6.3
		PROBE TYPE	43-89		
DOSE RATE MEASURE-MENT	☐ BETA ☐ GAMMA ☐ ALPHA	**INST. TYPE**		**DETECTOR DISTANCE FROM SURFACE**	
		PROBE TYPE			

OTHER SURVEY TYPES OR COMMENTS

All surveys shall be performed and documented in accordance with Mound Radiological Control procedures.

Rad Con shall document all discrepancies from the above sampling and surveying instructions on the Radiological Survey Data Sheet (RSDS).

Perform sediment sampling and surface scan surveys prior to performing static measurements.

Ensure the surfaces of interest in the survey unit are dry and free of loose debris or other material that may obscure alpha measurement.

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SPF NUMBER	50-01	DATE OF REQUEST	November 6, 2003

SPECIFIC SAMPLING / SURVEY INSTRUCTIONS

Safety Considerations

1. Obtain assistance from the responsible building custodian for access to upper walls, ceilings, roof, etc. Exercise extreme caution when performing surveys from ladders or scaffolds. Follow appropriate site safety procedures when accessing areas requiring fall protection measures.
2. Ensure ventilation units are de-energized prior to attempting to collect a sample. Obtain approval and assistance from the responsible building custodian to dismantle any equipment for sample collection.

Sediment Samples

1. Collect approximately 250ml of debris/water from each accessible ventilation unit opening, floor drain, sump and any other area where debris has accumulated.
2. If insufficient material is present at these sample locations, obtain a representative smear of the location.
3. Document sample information and description of material on Attachment 1.
4. Label sample container with sample number, date and time of collection, and location in accordance with Mound procedures.
5. Perform a static alpha and beta measurement at each sediment sample location.
6. Show sample location and static measurement results on the RSDS map.
7. Submit sediment/water samples to laboratory for gamma spectroscopy analysis. Submit smears for gross alpha and beta analysis.
8. Additional intrusive samples may be collected in areas of elevated activity as determined by the MARSSIM Engineer.

Surface Scan Measurements using a Ludlum 2350 with 43-37 alpha Floor probe

1. Set the Ludlum 2350-1 datalogger to alarm at 75dpm/100cm^2 in the ratemeter mode.
2. Scan at least 50% of the surface in Class 2 Survey Units using a serpentine method with rows spaced one probe width apart.
3. Scan at least 10% of the surface in Class 3 Survey Units using the professional judgment of the surveyor.
4. Perform a 30 second integrated count at every location where an alarm is obtained. In addition, obtain a 30 second integrated count at any point where an audible or visual indication of elevated activity is observed at twice the background rate.
5. Record the location of the area scanned on the RSDS map and document the results of any integrated counts.

Surface Scan Measurements using a Ludlum 2350 with 43-68 alpha Hand probe

1. Scan at least 10% of the surface in Class 3 Survey Units using the professional judgment of the surveyor.
2. Using the audible output of instrument, stop and pause for approximately ten (10) seconds if one pop (click) is heard. If one pop (click) is heard during pause, perform an integrated count for two (2) minutes. Otherwise, if no pop heard during pause, continue scan.
3. Record the location of the area scanned on the RSDS map and document the results of any integrated counts.

Data Point Location

1. Locate the data points in each survey unit using the coordinates shown in Attachment 3.
2. Mark each data point with tape or other non-permanent marking.
3. Document locations on the appropriate RSDS Map.

Continued Next Page

Specific Survey and Sampling Instructions (continued)

Static Measurements Using L 2350 with 43-68 (alpha/beta) probe

1. Perform an integrated alpha and beta measurement at each data point in each Class 2 and 3 Survey Unit.
2. Perform at least 20 integrated alpha and beta measurements on walls and ceilings of each Class 2 Survey Unit. Data points are randomly selected by the surveyor and should be broadly representative of the survey unit.
3. Record location, material type, and results on RSDS map in accordance with Mound Rad Con procedures.
4. Document gross activity for each location (No "<" values). Record instrument background at survey location.

Loose Surface Contamination

1. Obtain a smear of $100cm^2$ at each survey point identified above.
2. Count each smear for alpha, beta, and H^3. H^3 analysis is not required for building external surfaces.
3. Record location and results on RSDS map in accordance with Mound Rad Con procedures.

Fume Hoods and Ventilation Using L2360 with 43-89 alpha/beta probe

1. Perform fixed alpha/beta and loose surface contamination surveys in each fume hood and at accessible locations in the associated ventilation ducting in accordance with MD80036, OP 10002, Section 6.3.4.
2. Record locations and results on RSDS map in accordance with Mound Rad Con procedures.
3. Document gross activity for each location (No "<" values). Record instrument background at survey location.

Quality Control

1. QC measurements will be performed by re-surveying 16 data points. Data points selected for resurvey should include the highest and lowest readings in the data set.
2. Sediment samples or smears with measured activity above the MDA may be resubmitted for replicate analysis. Ensure alpha and beta smear results are obtained before performing H^3 analysis.
3. Record location, material, and results on RSDS in accordance with Mound Rad Con procedures.

APPROVAL SIGNATURES			
MARISSM Engineer	R. Case	**DATE**	November 6, 2003
Technical Reviewer	Kevin R. Doody CHP	**DATE**	11/9/03
Rad Con Manager	S. Cowan	**DATE**	11/17/03
SP CLOSE-OUT SIGNATURES			
MARISSM Engineer		**DATE**	
Technical Reviewer		**DATE**	
Rad Con Manager		**DATE**	
COMMENTS			

Building 48 Survey Units

Survey Unit	Room/Area	Class	Area (Sq.Ft.)	Scan %	Floor	Walls	Ceiling
1	202-204	2	504	50	X		
2	205-206	2	864	50	X		
3	201/207	3	1653	50	X	X	X
4	211	2	912	50	X		
5	208-210	2	1376	50	X		
6	101-112	3	10116	25	X	X	X
7	202-204 Walls & Ceiling	3	1008	10		X	X
8	205-206 Walls & Ceiling	3	1680	10		X	X
9	211 Walls & Ceiling	3	1184	10		X	X
10	208-210 Walls & Ceiling	3	968	10		X	X
11	Roof	3	4599	10	X		
12	Exterior Walls	3	6800	10		X	

SPF 48-01 Attachment 2
Sample Data Collection Sheet

Sample Number	Sample Date	Sample Time	Sample Volume /Weight	Sample Description	Sampled By	Chain of Custody Relinquished to Lab			
						Date	Time	Initials	Rec'd By
48-01-									
48-01-									
48-01-									
48-01-									
48-01-									
48-01-									
48-01-									
48-01-									
48-01-									
48-01-									
48-01-									
48-01-									
48-01-									

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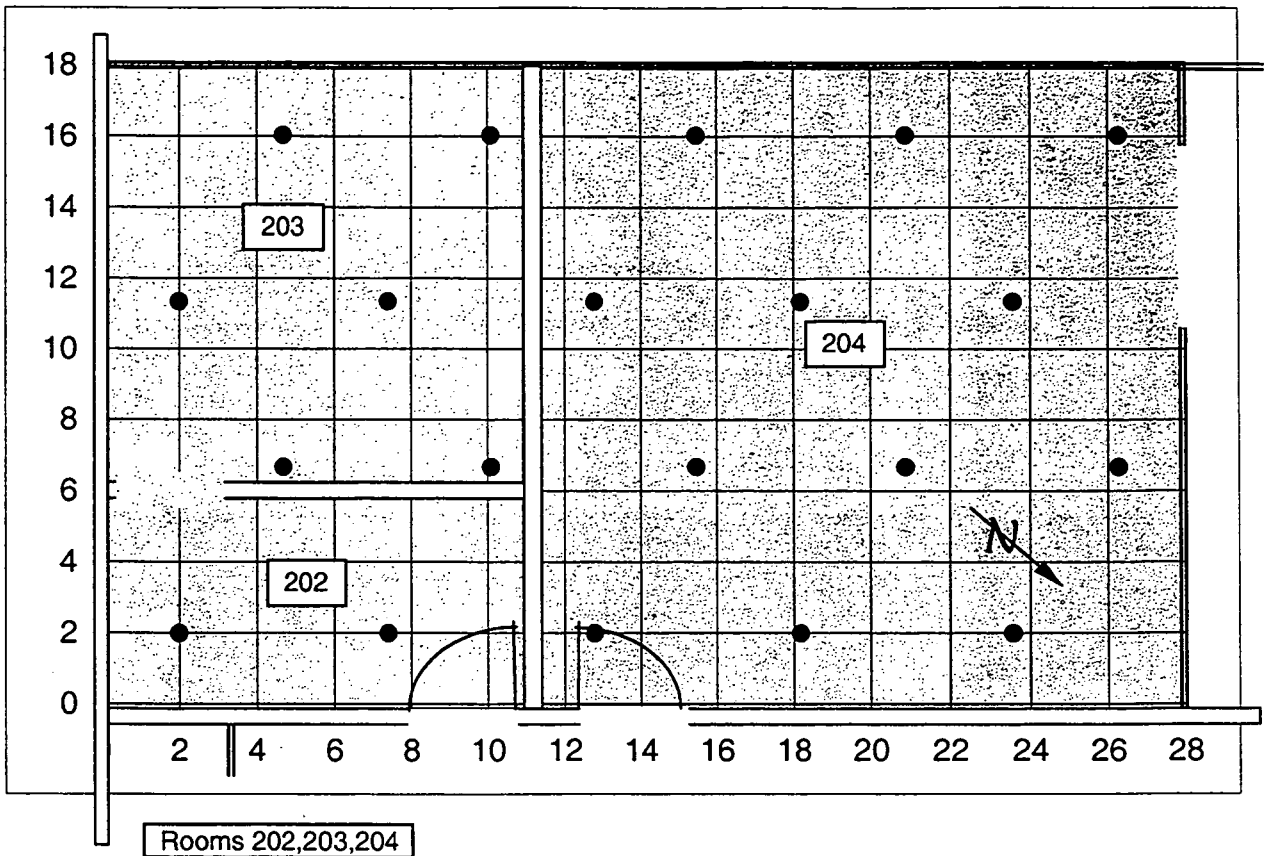
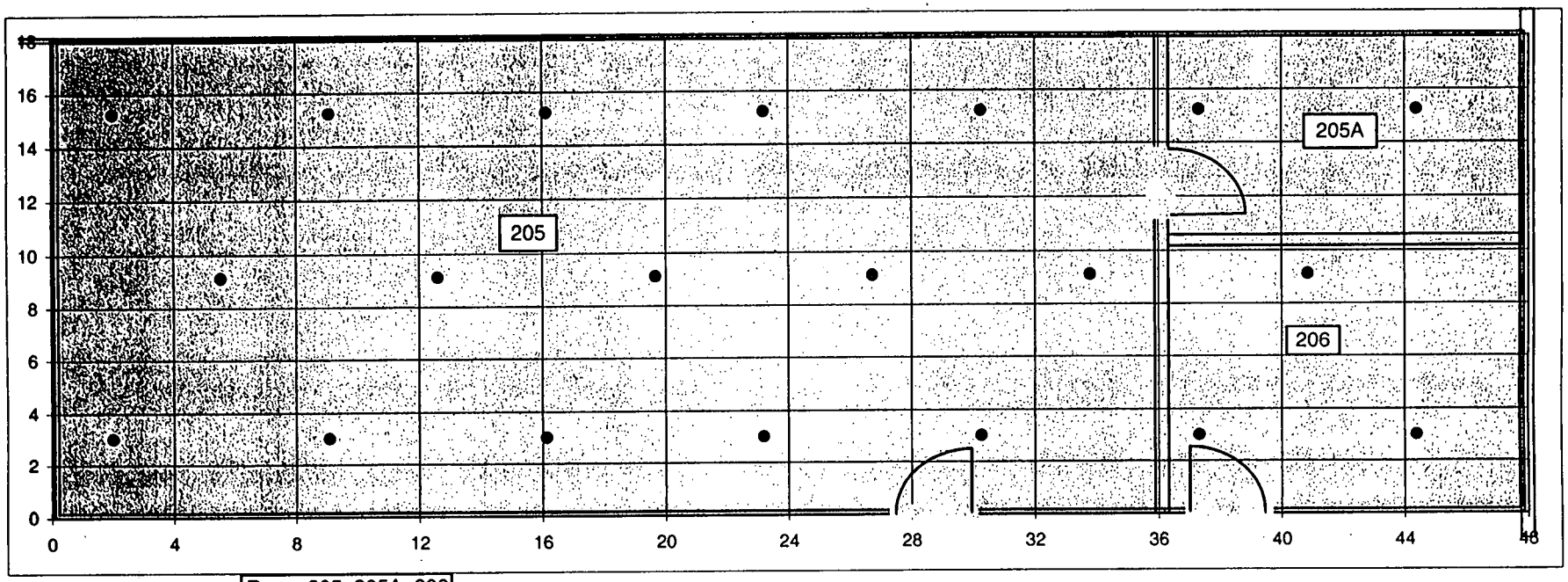


	Rooms 202,203,204	
	SU 1	
	X	Y
	28	18
1	2.0	2.0
2	7.4	2.0
3	12.8	2.0
4	18.2	2.0
5	23.6	2.0
6	4.7	6.7
7	10.1	6.7
8	15.5	6.7
9	20.9	6.7
10	26.3	6.7
11	2.0	11.3
12	7.4	11.3
13	12.8	11.3
14	18.2	11.3
15	23.6	11.3
16	4.7	16.0
17	10.1	16.0
18	15.5	16.0
19	20.9	16.0
20	26.3	16.0

Area	L	L'
504	5.394377	4.671531

Start	X	Y
Rand X:Y	2	2

Not to scale



Room 205, 205A, 206		
Survey Unit 2		
	X	Y
	48.0	18.0
1	2.0	3.0
2	9.1	3.0
3	16.1	3.0
4	23.2	3.0
5	30.3	3.0
6	37.3	3.0
7	44.4	3.0
8	5.5	9.1
9	12.6	9.1
10	19.7	9.1
11	26.7	9.1
12	33.8	9.1
13	40.8	9.1
14	2.0	15.2
15	9.1	15.2
16	16.1	15.2
17	23.2	15.2
18	30.3	15.2
19	37.3	15.2
20	44.4	15.2

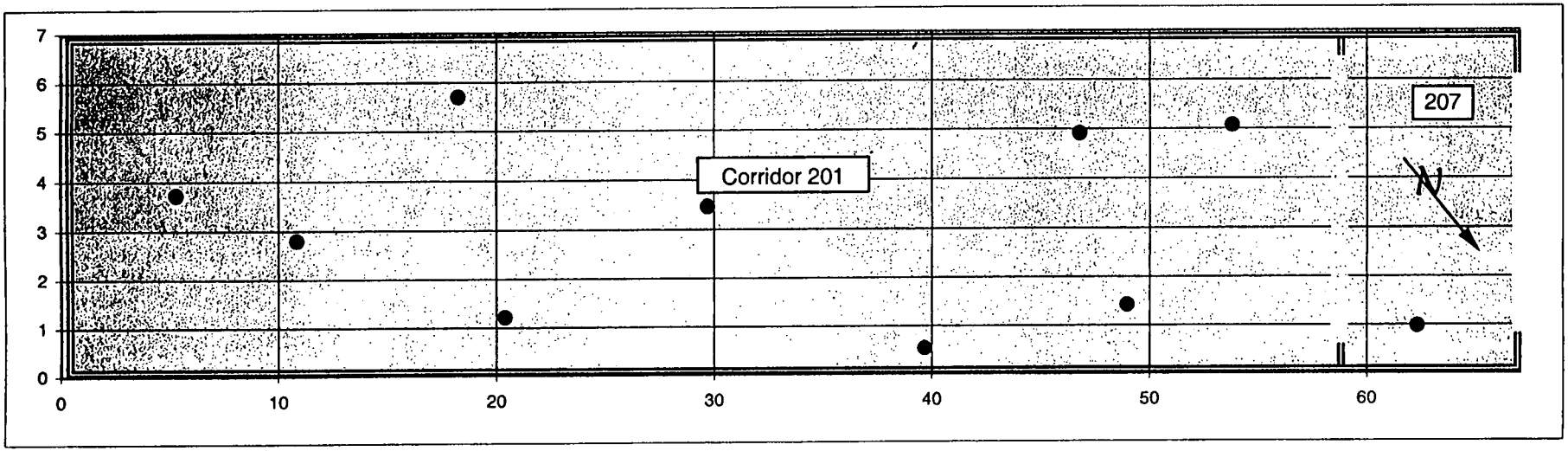
Area	L	L'
864	7.062898	6.11647

Start	X	Y
Rand X:Y	2	3

N

Not to scale

G-17d 25



	Corridor 201/207	
	Survey Unit 3	
	X	Y
	67.0	7.0
1	62.3	1.0
2	29.7	3.5
3	5.3	3.7
4	20.4	1.2
5	49.0	1.4
6	46.8	4.9
7	53.8	5.1
8	18.2	5.7
9	10.8	2.8
10	39.7	0.5

Area	L	L'
469	5.203703	4.506407

11-20 Place judgmentally on walls and ceiling in corridor

Not to scale

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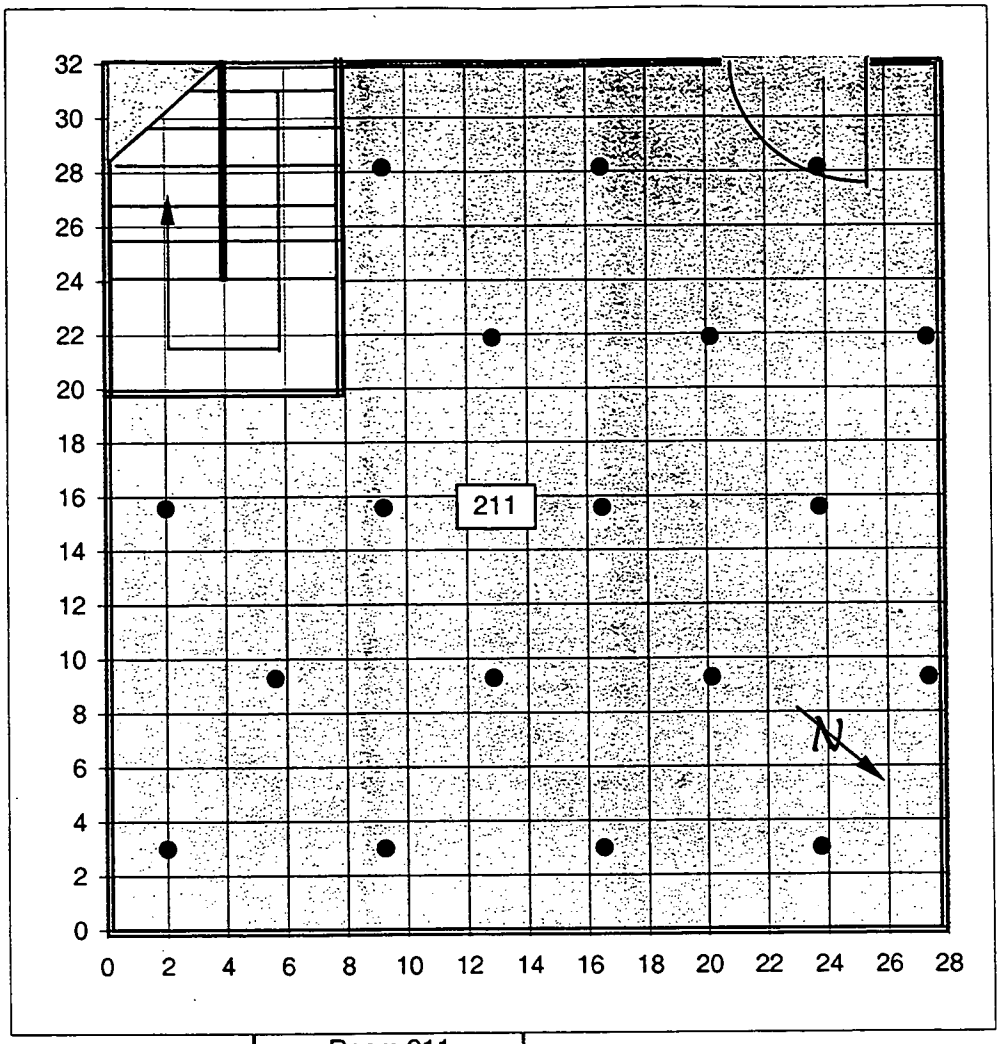
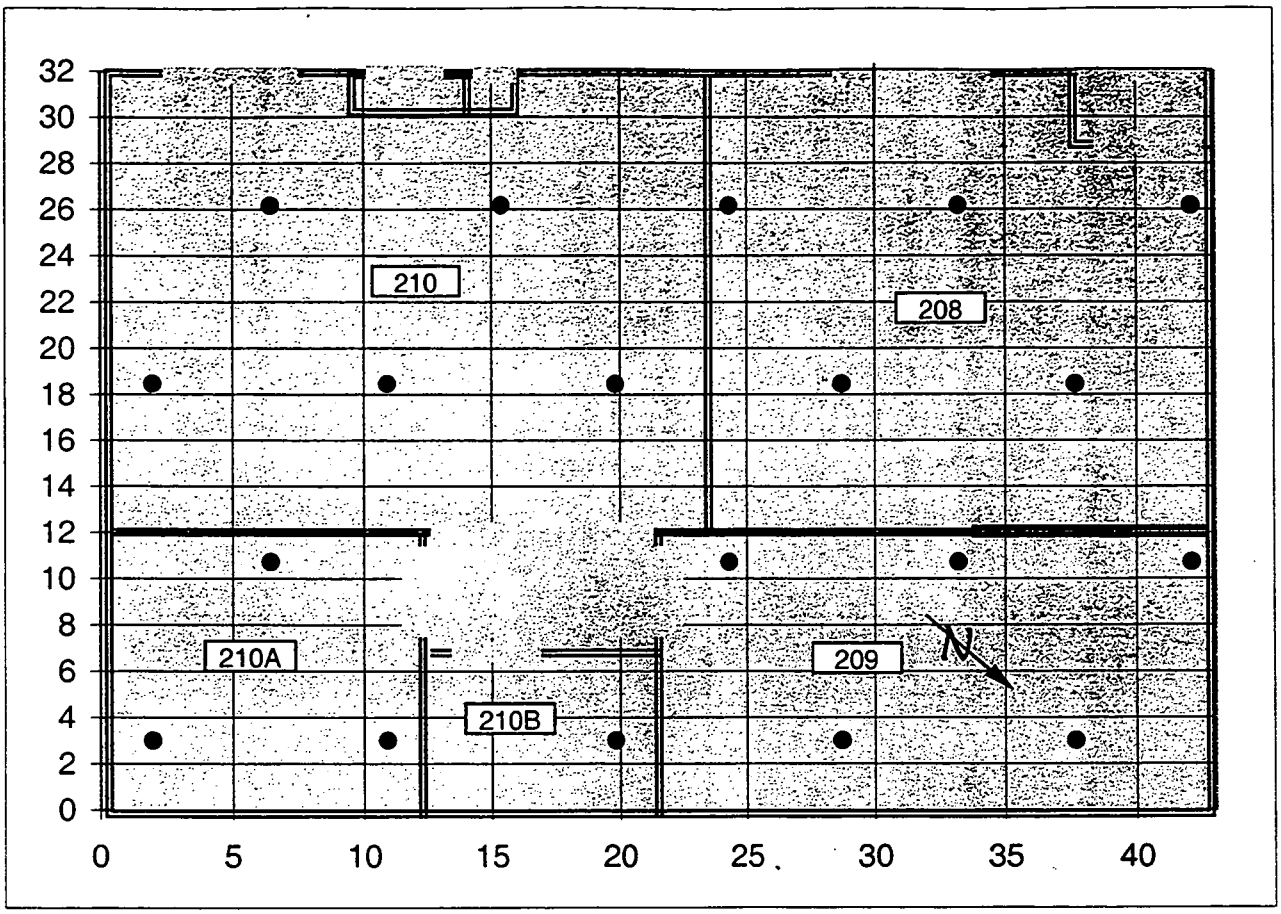


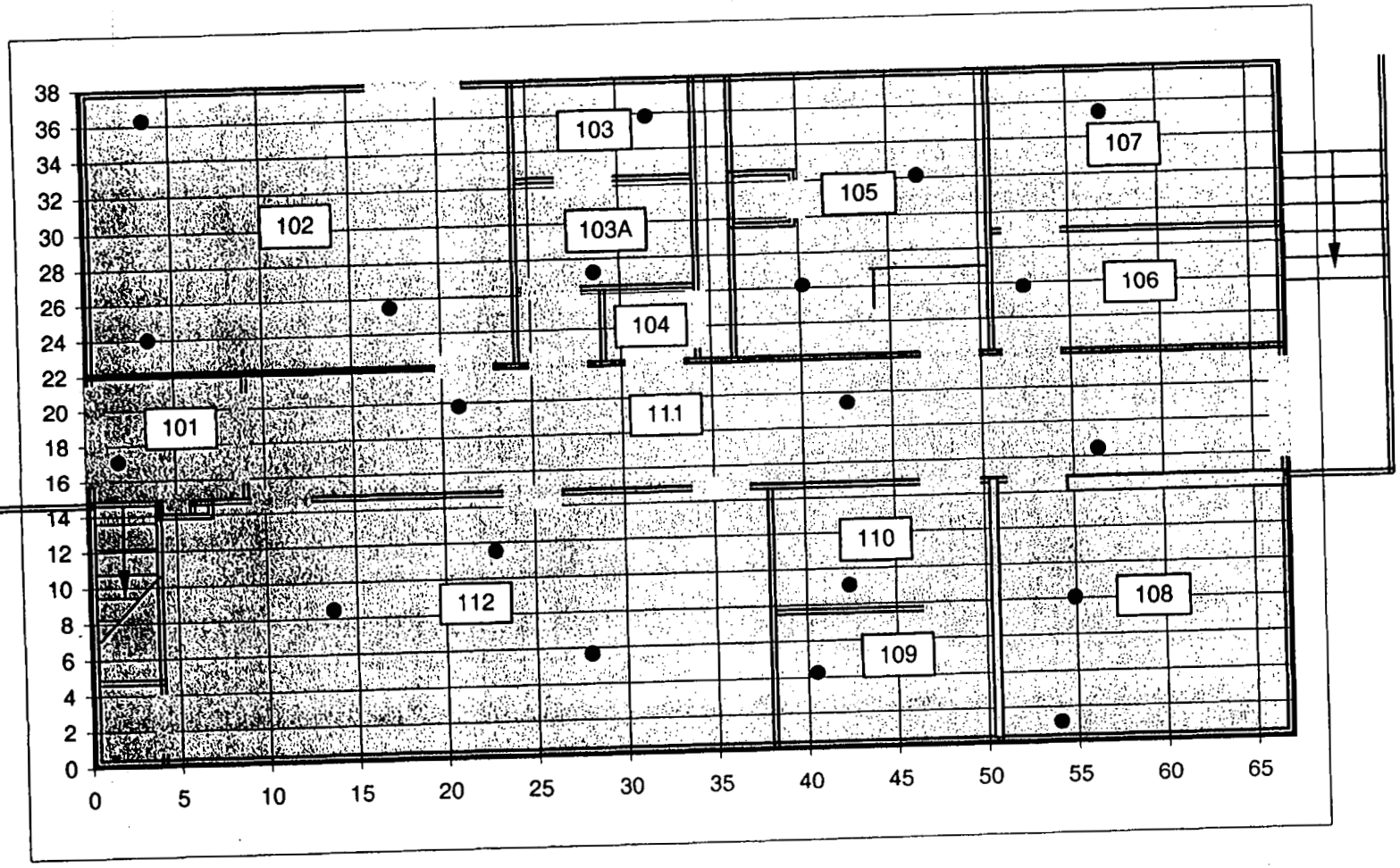
	Room 211	
	Survey Unit 4	
	X	Y
	28.5	32.0
1	2.0	3.0
2	9.3	3.0
3	16.5	3.0
4	23.8	3.0
5	5.6	9.3
6	12.9	9.3
7	20.1	9.3
8	27.4	9.3
9	2.0	15.6
10	9.3	15.6
11	16.5	15.6
12	23.8	15.6
13	12.9	21.9
14	20.1	21.9
15	27.4	21.9
16	9.3	28.1
17	16.5	28.1
18	23.8	28.1

Area	L	L'
912	7.256438	6.284075

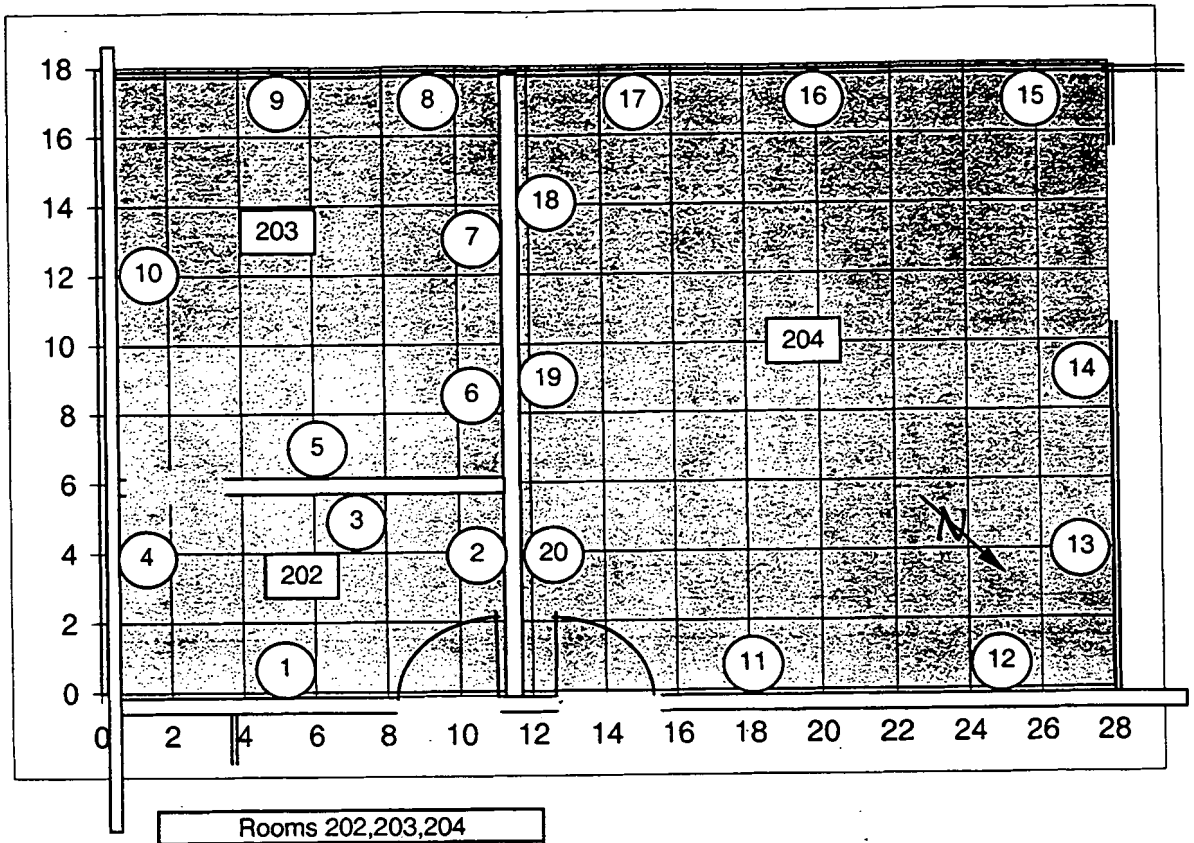
Start	X	Y
Rand X:Y	1	3



Rooms 208, 209, 210, 210A, 210B					
Survey Unit 5					
	X	Y	Area	L	L'
	43	32	1376	8.913233	7.71886
1	2.0	3.0			
2	10.9	3.0	Start	X	Y
3	19.8	3.0	Rand X:Y	2	3
4	28.7	3.0			
5	37.7	3.0			
6	6.5	10.7			
7	15.4	10.7			
8	24.3	10.7			
9	33.2	10.7			
10	42.1	10.7			
11	2.0	18.4			
12	10.9	18.4			
13	19.8	18.4			
14	28.7	18.4			
15	37.7	18.4			
16	6.5	26.2			
17	15.4	26.2			
18	24.3	26.2			
19	33.2	26.2			
20	42.1	26.2			



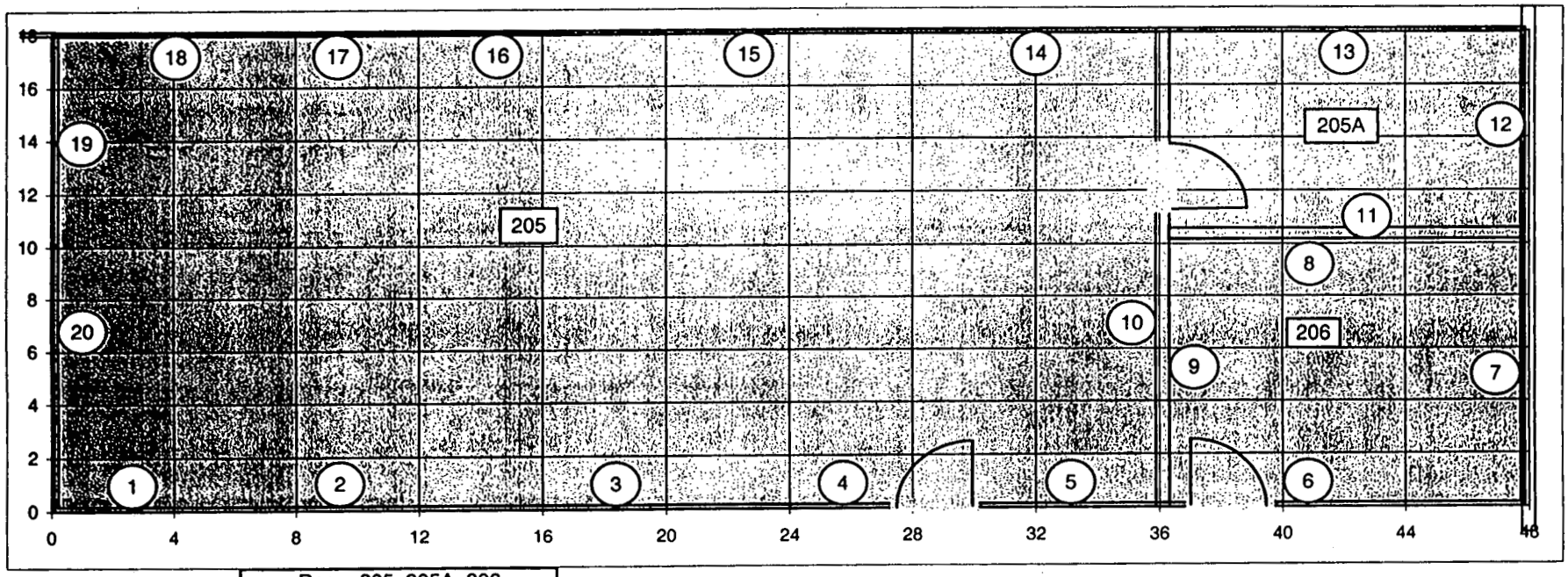
	First Floor	
	Survey Unit 6	
	X	Y
	67.5	38.3
1	56.9	35.4
2	42.5	19.4
3	40.2	26.2
4	56.4	16.4
5	1.8	17.1
6	31.6	35.8
7	28.0	5.7
8	42.4	9.1
9	17.2	25.5
10	54.9	8.1
11	40.5	4.3
12	46.7	32.1
13	20.9	19.8
14	13.7	8.5
15	3.6	36.3
16	54.0	1.2
17	22.8	11.5
18	52.5	25.8
19	28.6	27.2
20	3.6	24.0



	Rooms 202,203,204		
	SU 7		
	X	Y	Z
	28	18	8
1	5	0	7
2	11	4	3
3	7	6	1
4	0	4	5
5	6	6	2
6	11	9	7
7	11	13	3
8	9	18	4
9	5	18	5
10	0	12	3
11	18	0	4
12	25	0	6
13	28	4	3
14	28	9	7
15	26	18	5
16	20	18	2
17	15	18	1
18	12	14	4
19	12	9	2
20	12	4	2

21-30 Place judgmentally on ceiling

Not to scale



	Room 205, 205A, 206		
	Survey Unit 8		
	X	Y	Z
	48	18	8
1	3	0	6
2	9	0	4
3	17	0	1
4	26	0	6
5	33	0	1
6	41	0	4
7	48	5	1
8	41	10	8
9	36	5	1
10	36	7	4
11	43	11	4
12	48	14	2
13	42	18	4
14	32	18	2
15	23	18	7
16	15	18	3
17	9	18	8
18	4	18	2
19	0	14	2
20	0	7	2

N

Not to scale

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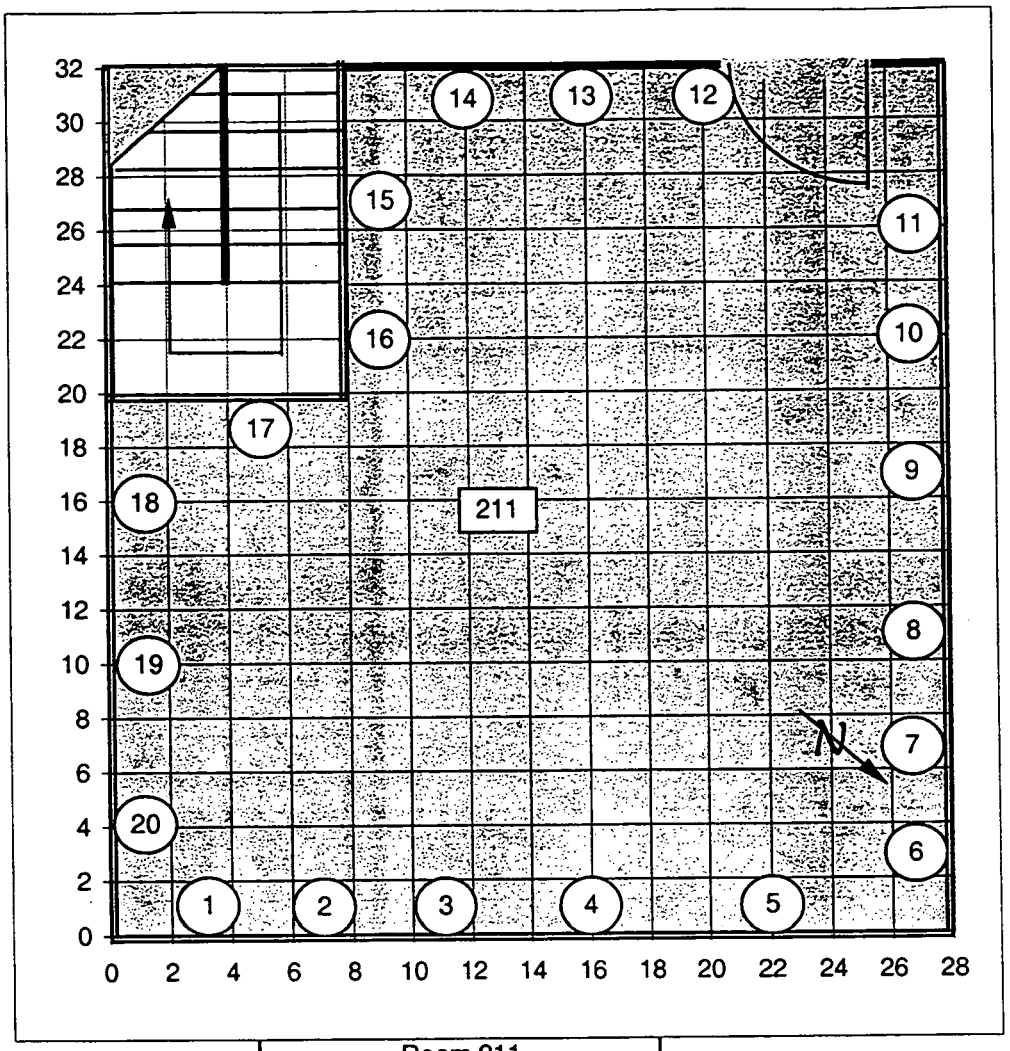
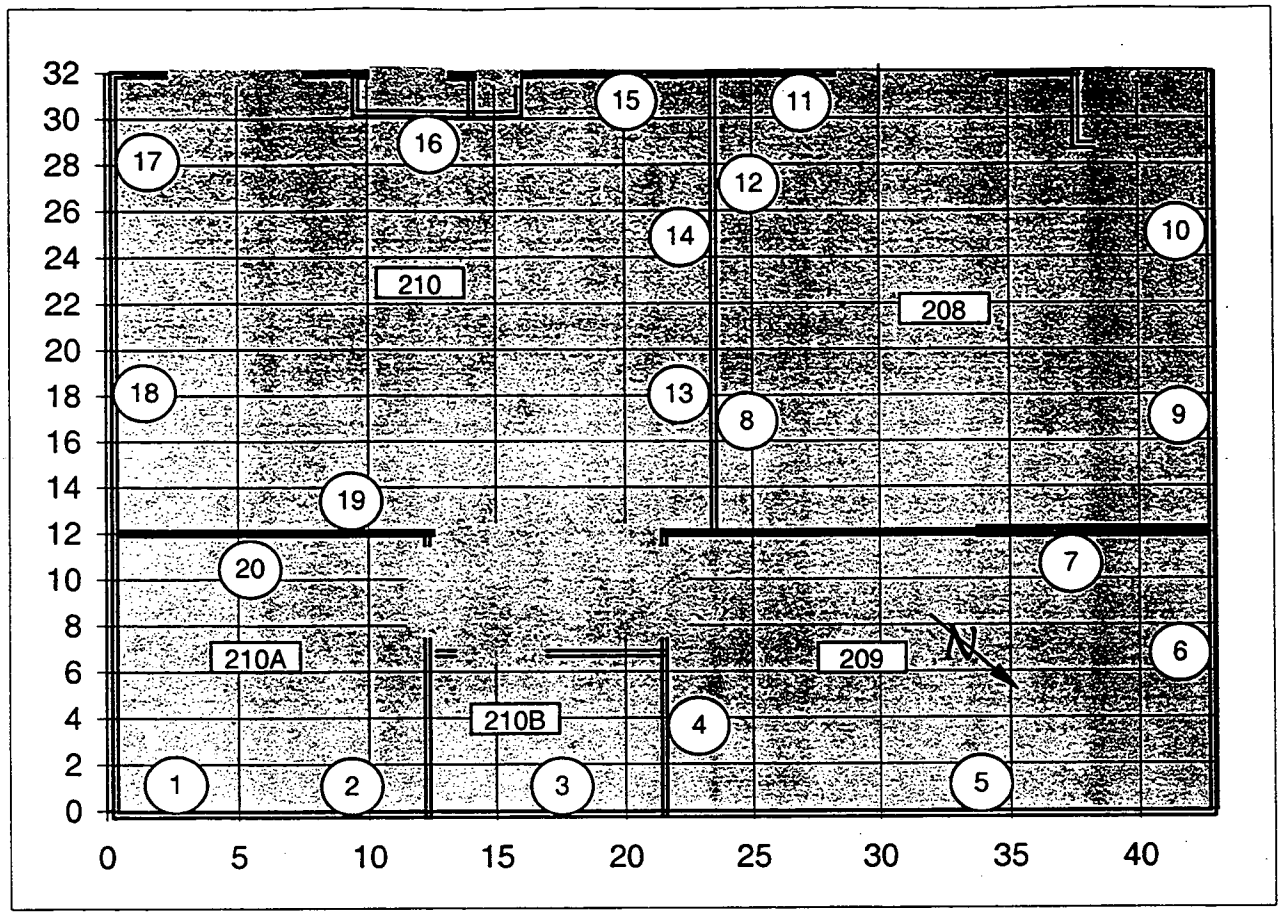


	Room 211		
	Survey Unit 9		
	X	Y	Z
	28.5	32.0	8
1	3.0	0.0	2
2	7.0	0.0	8
3	11.0	0.0	6
4	16.0	0.0	7
5	22.0	0.0	7
6	28.0	3.0	7
7	28.0	7.0	4
8	28.0	11.0	5
9	28.0	17.0	1
10	28.0	22.0	5
11	28.0	26.0	3
12	20.0	32.0	1
13	16.0	32.0	3
14	12.0	32.0	2
15	8.0	27.0	8
16	8.0	22.0	8
17	5.0	20.0	4
18	0.0	16.0	7
19	0	10	7
20	0	4	4

21-30 Place judgmentally on ceiling



	Rooms 208, 209, 210, 210A, 210B		
	Survey Unit 10		
	X	Y	Z
	43	32	8
1	3	0	1
2	9	0	1
3	17	0	4
4	21	4	1
5	34	0	5
6	43	7	1
7	37	11	1
8	24	17	7
9	43	17	4
10	43	25	6
11	26	32	6
12	24	27	3
13	24	18	4
14	24	25	7
15	20	32	4
16	12	30	1
17	0	28	4
18	0	18	8
19	9	12	4
20	5	12	4

21-30 Place judgmentally on ceiling

Appendix H

Radon Information

Radon level is not applicable for open air demolitions.

Appendix I

Asbestos Information

From: Christopher Ahlquist
To: Darnell, Val; Kramer, Donald
Date: 11/12/03 9:10AM
Subject: Building 48

Don/Val -

For Building 48 asbestos and lead paint concerns, the following is provided for your use:

Asbestos

Previous asbestos surveys for Building 48 were completed in 1989 and 1993. These surveys were intended to identify all reasonably accessible asbestos-containing materials within the building for the purposes of identifying damaged material and managing asbestos in place. Asbestos pipe insulation, transite panels, tank insulation, ceiling tiles, and floor tiles were previously identified.

During October of 2003, Mr. Christopher Ahlquist, an Industrial Hygienist with CH2M Hill Mound, Inc., performed a comprehensive walk-through survey of all areas of Building 48 in order to identify all asbestos-containing materials prior to demolition of the facility. Mr. Ahlquist is an Ohio Department of Health Certified Asbestos Hazard Evaluation Specialist as required by State regulations for individuals assessing asbestos-containing materials. Mr. Ahlquist was on site during a renovation of the building which occurred during the 1999-2000 time frame. At that time, al of the asbestos-containing ceiling tiles and tank insulation were removed and much of the pipe insulation was removed. 80 linear feet of pipe insulation, 60 square feet of transite cement panels in a fume hood, 9 fire rated doors, 1 application point of fire-stop putty, and 10 square feet of cement board laboratory drying racks were identified as requiring removal prior to demolition. These materials will be removed by a licensed asbestos hazard abatement contractor under contract to CH2M Hill Mound in accordance with NESHAP requirements prior to commencement of demolition activities.

The asphalt roofing is assumed to contain asbestos, but as a Nonfriable Category I material in accordance with NESHAP it will remain in place during demolition and be disposed of as construction waste. Two varieties of floor tile within the building were found to be asbestos-containing, but it is also classified as a Category I Nonfriable and need not be removed.

Lead

No previous lead surveys or sampling data for Buildings 48 were found.

Although untested paint coatings must be assumed to contain lead, the observed condition of the untested paint indicates that there are currently no lead paint hazards within the buildings. No further action would be necessary to protect worker health unless any coatings were to be disturbed by close worker contact (sanding, grinding, scraping, torch cutting, etc.). If these types of activities are planned, the affected paint coatings will be tested to verify the absence of lead. Since the building is scheduled for demolition, these restrictions will be incorporated into work plans for which disturbance of paint is a possibility.

In accordance with guidance from Mound Waste Management, paint coatings should not result in a hazardous waste issue during the course of normal demolition by heavy-duty means.

These determinations were made by Mr. Christopher Ahlquist who is an Ohio Department of Health Licensed Lead Risk Assessor.

Let me know if I can be of further assistance,

Chris Ahlquist

Appendix J

Lead Information

From: Christopher Ahlquist
To: Darnell, Val; Kramer, Donald
Date: 11/12/03 9:10AM
Subject: Building 48

Don/Val -

For Building 48 asbestos and lead paint concerns, the following is provided for your use:

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Let me know if I can be of further assistance,

Chris Ahlquist

Appendix K

Chemical Information

Ohio State Emergency Response Commission
c/o Ohio EPA, Lazarus Government Center
P. O. Box 1049, 122 South Front St.
Columbus, OH 43216-1049

STAPLE

Emergency and Hazardous Chemical Inventory Form

4.1 Facility Name: U. S. DOE - MOUND PLANT
City: MIAMISBURG
County: MONTGOMERY
Exact Street Location (no Box #'s): 1 MOUND ROAD
Zip Code: 45342

4.2 For Filing Date: 03/01/02
4.3 [ ] Check here if form and FACILITY MAP are Confidential and print "CONFIDENTIAL FORM" here: _____
4.4 [ ] Check if Revision
4.5 [x] I Have Attached a Facility Map

K 1 of 6

5.0	Chemical Description										Hazard Class					Location of Chemicals						Amount			
	CAS REGISTRY NO.	SPECIFIC CHEMICAL NAME	PURE	MIXTURE	COMPONENTS	EHS CHEMICAL	SOLID	LIQUID	GAS	TRADE SECRET	ACUTE	CHRONIC	FIRE	REACTIVE	RELEASE OF PRESSURE	B, T, OR A BUILDING, TANK OR AREA NO.	DIVISION OR ROOM LETTER	FLOOR	STORAGE TYPE CODE	PRESSURE & TEMPERATURE CONDITIONS	LOCATION-CONFIDENTIAL	MAXIMUM	AVERAGE	UNITS	NO. OF DAYS ON SITE
[redacted]																									
3	7440-37-1	argon		X					X		X				X	B-48	211	2	L	2,4		02	02	C	365
[redacted]																									

CERTIFICATION *(READ AND SIGN AFTER COMPLETING ALL SECTIONS)*

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED IN PAGES ONE THROUGH 27, AND THAT BASED ON MY INQUIRY OF THOSE RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THAT THE INFORMATION IS TRUE, ACCURATE, AND COMPLETE.

Richard Provencher, Director, USDOE, MEMP
NAME AND OFFICIAL TITLE OF OWNER OR OWNERS AUTHORIZED REPRESENTATIVE

SIGNATURE

2/27/02
DATE SIGNED

EPA 0317 Revised 5/3/89

Ohio State Emergency Response Commission
c/o Ohio EPA, Lazarus Government Center
P. O. Box 1049, 122 South Front St.
Columbus, OH 43216-1049

STAPLE

Emergency and Hazardous Chemical Inventory Form

4.1 Facility Name: U. S. DOE - MOUND PLANT
City: MIAMISBURG
County: MONTGOMERY
Exact Street Location (no Box #'s): 1 MOUND ROAD
Zip Code: 45342

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K2 of 6

5.0	Chemical Description										Hazard Class					Location of Chemicals						Amount			
	CAS REGISTRY NO.	SPECIFIC CHEMICAL NAME	PURE	MIXTURE	COMPONENTS	EHS CHEMICAL	SOLID	LIQUID	GAS	TRADE SECRET	ACUTE	CHRONIC	FIRE	REACTIVE	RELEASE OF PRESSURE	B, T, OR A BUILDING, TANK OR AREA NO.	DIVISION OR ROOM LETTER	FLOOR	STORAGE TYPE CODE	PRESSURE & TEMPERATURE CONDITIONS	LOCATION-CONFIDENTIAL	MAXIMUM	AVERAGE	UNITS	NO. OF DAYS ON SITE
1	107-21-1	ethylene glycol	X					X				X				B-48	211	2	N	1,4		02	02	C	365
~~2~~	~~107-21-1~~	~~ethylene glycol~~	~~X~~					~~X~~				~~X~~				~~B-48~~	~~211~~	~~2~~	~~N~~	~~1,4~~		~~02~~	~~02~~	~~C~~	~~365~~
~~3~~	~~107-21-1~~	~~ethylene glycol~~	~~X~~					~~X~~				~~X~~				~~B-48~~	~~211~~	~~2~~	~~N~~	~~1,4~~		~~02~~	~~02~~	~~C~~	~~365~~
~~4~~	~~107-21-1~~	~~ethylene glycol~~	~~X~~					~~X~~				~~X~~				~~B-48~~	~~211~~	~~2~~	~~N~~	~~1,4~~		~~02~~	~~02~~	~~C~~	~~365~~
~~5~~	~~107-21-1~~	~~ethylene glycol~~	~~X~~					~~X~~				~~X~~				~~B-48~~	~~211~~	~~2~~	~~N~~	~~1,4~~		~~02~~	~~02~~	~~C~~	~~365~~

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Emergency and Hazardous Chemical Inventory Form

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K3846

5.0	Chemical Description									Hazard Class					Location of Chemicals						Amount			
	CAS REGISTRY NO.	SPECIFIC CHEMICAL NAME	PURE	MIXTURE	COMPONENTS	EHS CHEMICAL	SOLID	LIQUID	GAS	TRADE SECRET	ACUTE	CHRONIC	FIRE	REACTIVE	RELEASE OF PRESSURE	B, T, OR A BUILDING, TANK OR AREA NO.	DIVISION OR ROOM LETTER	FLOOR	STORAGE TYPE CODE	PRESSURE & TEMPERATURE CONDITIONS	LOCATION-CONFIDENTIAL	MAXIMUM	AVERAGE	UNITS	NO. OF DAYS ON SITE
1	7697-37-2	nitric acid	X			X		X			X	X	X	X		B-48	211	2	M	1,4		02	02	C	365
[redacted]																									
[redacted]																									
[redacted]																									
8																									

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EPA 0317 Revised 5/3/89

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STAPLE

Emergency and Hazardous Chemical Inventory Form

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K4446

5.0	Chemical Description										Hazard Class					Location of Chemicals						Amount			
	CAS REGISTRY NO.	SPECIFIC CHEMICAL NAME	PURE	MIXTURE	COMPONENTS	EHS CHEMICAL	SOLID	LIQUID	GAS	TRADE SECRET	ACUTE	CHRONIC	FIRE	REACTIVE	RELEASE OF PRESSURE	B, T, OR A BUILDING, TANK, OR AREA NO.	DIVISION OR ROOM LETTER	FLOOR	STORAGE TYPE CODE	PRESSURE & TEMPERATURE CONDITIONS	LOCATION-CONFIDENTIAL	MAXIMUM	AVERAGE	UNITS	NO. OF DAYS ON SITE
1	7664-93-9	sulfuric acid	X			X		X			X	X	X	X	X	B-48	211	2	M	1,4		01	01	C	365
[redacted]																									
[redacted]																									
[redacted]																									
[redacted]																									
2																									

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Chemicals and Products Used or Stored in Building 48

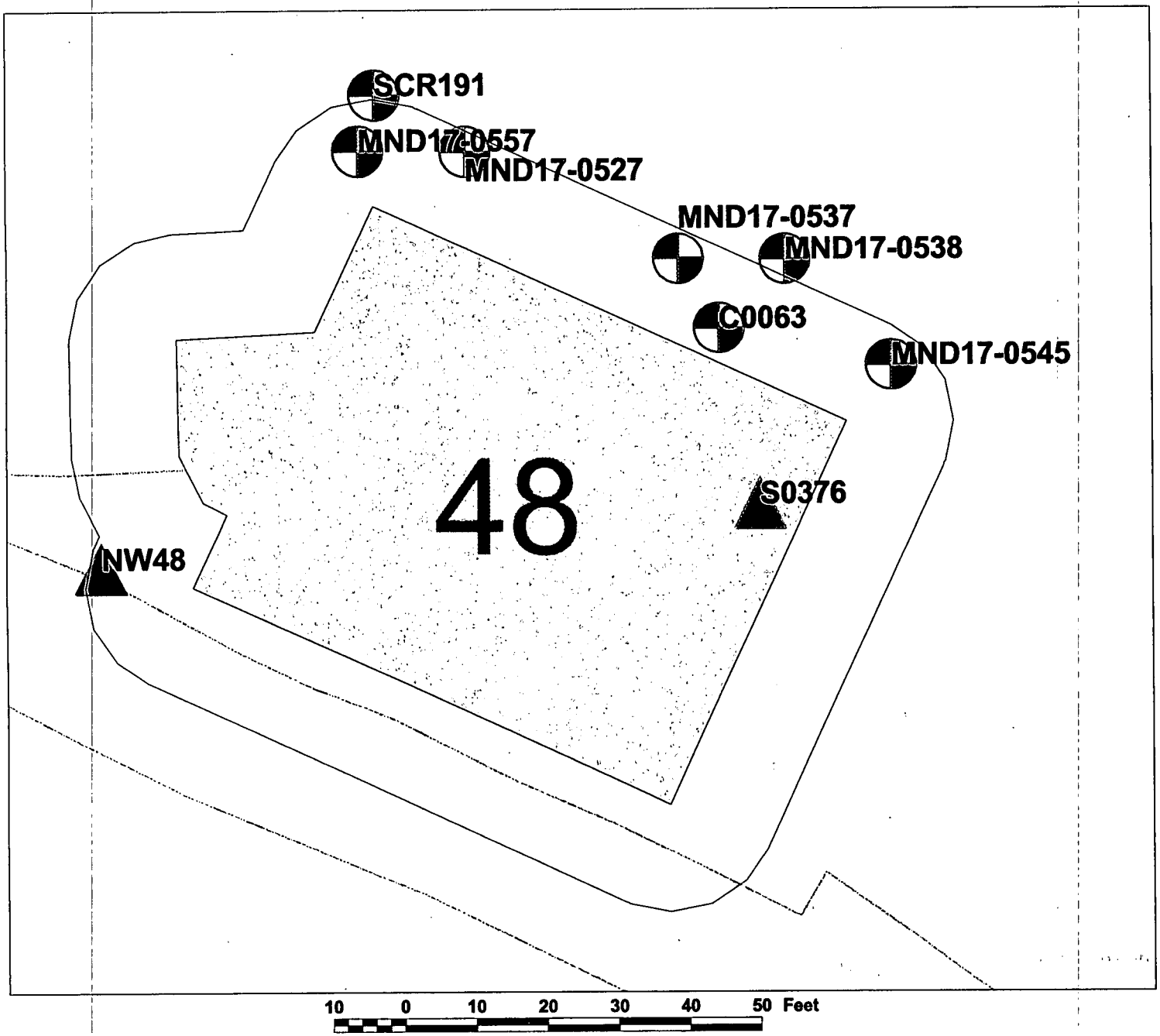
1-x4 Resin (100-200 Mesh)
1-x8 Resin (100-200 Mesh)
Acetate buffer sol
Acetic acid
Acetone
Acetylene
Activated carbon (50-200 Mesh)
All purpose (micro) cleaner
Aluminum nitrate
Ammonia pH adjusting ISA 5M (NaOH)
Ammonia Std Sol. 1g/L as NH3(N)
Ammonium hydroxide
Ammonium iodide 99+%
Ammonium oxalate
Ammonium thiocyanate
Argon
Ascorbic acid
Barium chloride dihydrate reagant
Cadmium 1000 pg sol
Calcium chloride sol
Calcium nitrate
Chemical oxygen demand 300ml/L
Chromium 1000 pg sol
COD
COD II
Collodion
Copper 1000 pg sol
CP
dichlorodifluoromethane
Disinfectant cleaner
DMQ Cleaner
DMSO (dimethyl sulfoxide)
Drirrite CaSO4 (8 Mesh)
Ducocopy chem-pac
EFFA duster
Epoxylite 8822 Part A
Epoxylite 8822 Part B
Ethanol
Ethyl acetate
Ethyl alcohol USP 200 proof
Ethylene glycol
Ferric chloride sol
Floor Finish
Foam Free Defoaming
Formic acid 90%
Freon TF
Furniture Polish
FWT Red Liquid 50
Gloss Extender
Glybet
Headstart Cleaner
Hexane
HMX (cyclotetramethylenetetranitramine)
HNAB
HNS
Hydriodic acid 47% sol
Hydrochloric acid
Hydrofluoric acid
Hydrogen peroxide
Iron powder
Iron stone
Isopropanol
Isopropyl alcohol
Lead 100pg sol
Lead azide
Lead debris
Lead styphnate
Liquid nitrogen
LX-10
LX-13
Magnesium sulfate sol
MDF
Mercuric sulfate
Mercury 1000 pg sol
Methyl Red
Micropac Gold Etchant
Nessler reagent
Nickel 1000 pg sol
Nitric acid
Nitrification inhibitor formula
Nitrogen standard
N-Lead styphnate
Odor Bane Carpet Cleaner
Oxalic acid
P 10 Gas Cylinder
PBX
PBX9407
PBX9487
Perchloric acid
PETN (pentaerythritol tetranitrate)
PETN Homolog
pH Electrolyte sol

Phenylarsene oxide sol
Phosphoric acid 85% sol
Potassium biiodate sol
Potassium iodide sol 5%
potassium sulfate reagent
RDX
Rinse Free Strip
RR5K
Silica Gel (6-12 Mesh)
Sodium 1000 pg sol
Sodium hydroxide
Sodium nitrite
Sodium sulfate
Sulfamic acid
Sulfuric acid
TATB
TIHX/KCLO4TI/B
TNT
Toner 409
Trichlorethane
Trichlorotrifluoroethane
Triclad Industrial Finish
Ultima Gold
Ultima Gold LLT
UltraKleen
Vesta-Powder
Wasp Killer
White petrolatum (purified grade)
XTEX
Zinc 1000 pg sol
Zip

Appendix L

Soil Sampling, Vicinity

Historic Sample Locations within 15 feet of Building 48



△ surface sample
⊕ Borehole

■ Sample Detect

N
W E
S

MOUND
Environmental Restoration Geographic Information System

101/10/03

L1 of 29

Building 48 Detects

Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0537	0537-5012	19950407	Antimony	30.6450	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Antimony	21.0710	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5001	19950407	Antimony	18.4150	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5004	19950406	Antimony	17.6840	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Antimony	16.1440	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Antimony	15.7530	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5001	19950822	Antimony	15.2460	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5004	19950407	Antimony	14.9060	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0545	0545-5008	19950406	Antimony	14.6070	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5004	19950412	Antimony	13.4660	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0545	0545-5001	19950406	Antimony	13.4240	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5012	19950406	Antimony	9.4727	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5004	19950407	Antimony	6.8170	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5012	19950412	Antimony	5.0153	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5008	19950823	Antimony	4.3576	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Antimony	4.2190	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Antimony	3.1624	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Antimony	3.0374	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5008	19950407	Antimony	-3.6135	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5008	19950407	Antimony	-7.6360	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Arsenic	45.4690	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	2
MND17-0538	0538-5012	19950407	Arsenic	41.5700	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0538	0538-5008	19950407	Arsenic	40.6610	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0527	0527-5004	19950412	Arsenic	33.7680	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	2
MND17-0527	0527-5012	19950412	Arsenic	32.5290	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0538	0538-5001	19950407	Arsenic	29.6710	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	2
MND17-0557	0557-5008	19950823	Arsenic	28.9570	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0537	0537-5012	19950407	Arsenic	28.6670	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0545	0545-5004	19950406	Arsenic	24.6730	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	2
MND17-0545	0545-5012	19950406	Arsenic	23.3270	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0545	0545-5008	19950406	Arsenic	22.0040	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	2

L 2 of 29

Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0527	0527-5008	19950412	Arsenic	20.6080	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0537	0537-5008	19950407	Arsenic	18.2660	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0545	0545-5001	19950406	Arsenic	18.0930	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	2
MND17-0557	0557-5012	19950823	Arsenic	10.8760	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0538	0538-5004	19950407	Arsenic	8.9954	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	2
MND17-0527	0527-5001	19950407	Arsenic	8.5345	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5001	19950407	Arsenic	3.9770	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5004	19950407	Arsenic	-3.6669	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5001	19950822	Arsenic	-20.2150	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5008	19950823	Barium	886.1500	MG/KG	2000.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0527	0527-5004	19950412	Barium	347.2900	MG/KG	2000.0000	INORG	0.5	4.0			MND17	Soil	2
MND17-0527	0527-5001	19950407	Barium	277.2200	MG/KG	2000.0000	INORG	0.0	0.5			MND17	Soil	2
MND17-0557	0557-5001	19950822	Barium	261.8900	MG/KG	2000.0000	INORG	0.0	0.5			MND17	Soil	2
MND17-0538	0538-5012	19950407	Barium	255.5500	MG/KG	2000.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0545	0545-5012	19950406	Barium	241.2700	MG/KG	2000.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0537	0537-5012	19950407	Barium	240.3600	MG/KG	2000.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0545	0545-5008	19950406	Barium	226.5800	MG/KG	2000.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0557	0557-5004	19950823	Barium	222.0600	MG/KG	2000.0000	INORG	0.5	4.0			MND17	Soil	2
MND17-0527	0527-5008	19950412	Barium	220.3100	MG/KG	2000.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0538	0538-5001	19950407	Barium	208.3100	MG/KG	2000.0000	INORG	0.0	0.5			MND17	Soil	2
MND17-0557	0557-5012	19950823	Barium	205.4600	MG/KG	2000.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0538	0538-5008	19950407	Barium	204.2200	MG/KG	2000.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0527	0527-5012	19950412	Barium	187.3700	MG/KG	2000.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0545	0545-5001	19950406	Barium	179.4000	MG/KG	2000.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5004	19950407	Barium	176.0900	MG/KG	2000.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5004	19950407	Barium	164.7100	MG/KG	2000.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5008	19950407	Barium	149.2600	MG/KG	2000.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Barium	125.7600	MG/KG	2000.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5004	19950406	Barium	115.9400	MG/KG	2000.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5008	19950407	Cadmium	104.8100	MG/KG	20.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0545	0545-5004	19950406	Cadmium	50.8390	MG/KG	20.0000	INORG	0.5	4.0			MND17	Soil	2
MND17-0537	0537-5012	19950407	Cadmium	43.7360	MG/KG	20.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0538	0538-5012	19950407	Cadmium	39.1210	MG/KG	20.0000	INORG	8.0	12.0			MND17	Soil	2

L 3 of 29

Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0538	0538-5004	19950407	Cadmium	30.7680	MG/KG	20.0000	INORG	0.5	4.0			MND17	Soil	2
MND17-0527	0527-5004	19950412	Cadmium	23.0750	MG/KG	20.0000	INORG	0.5	4.0			MND17	Soil	2
MND17-0545	0545-5008	19950406	Cadmium	22.7710	MG/KG	20.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0527	0527-5008	19950412	Cadmium	19.9420	MG/KG	20.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0545	0545-5012	19950406	Cadmium	16.2150	MG/KG	20.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0527	0527-5001	19950407	Cadmium	3.3464	MG/KG	20.0000	INORG	0.0	0.5			MND17	Soil	2
MND17-0538	0538-5008	19950407	Cadmium	-9.6715	MG/KG	20.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Cadmium	-16.9570	MG/KG	20.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5012	19950823	Cadmium	-21.5590	MG/KG	20.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Cadmium	-21.7830	MG/KG	20.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5008	19950823	Cadmium	-22.7620	MG/KG	20.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5012	19950412	Cadmium	-36.6400	MG/KG	20.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5001	19950822	Cadmium	-43.7810	MG/KG	20.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5004	19950823	Cadmium	-45.8710	MG/KG	20.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0545	0545-5001	19950406	Cadmium	-47.3040	MG/KG	20.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5004	19950407	Cadmium	-50.4790	MG/KG	20.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Calcium	153068.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5012	19950407	Calcium	137045.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5004	19950406	Calcium	123821.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5012	19950412	Calcium	118222.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5004	19950407	Calcium	116810.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5008	19950407	Calcium	113508.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5004	19950407	Calcium	105034.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Calcium	103594.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5012	19950406	Calcium	94220.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5008	19950406	Calcium	94087.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5012	19950407	Calcium	86670.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5008	19950823	Calcium	81056.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Calcium	80246.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5008	19950407	Calcium	71597.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5004	19950412	Calcium	64261.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Calcium	62400.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5001	19950406	Calcium	55385.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	

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Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0557	0557-5004	19950823	Calcium	48141.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5001	19950822	Calcium	31712.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5001	19950407	Calcium	20414.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5001	19950822	Cesium-137	0.0800	PCI/G		RAD	0.0	0.5			MND17	Soil	
MND17-0537	0537-5008	19950407	Chromium-HI	440.4500	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5004	19950412	Chromium-HI	100.7100	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Chromium-HI	64.1970	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Chromium-HI	-33.4060	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5008	19950406	Chromium-HI	-42.8320	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Chromium-HI	-63.7330	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5012	19950407	Chromium-HI	-73.8740	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5012	19950406	Chromium-HI	-139.5400	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5004	19950406	Chromium-HI	-167.3600	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Chromium-HI	-190.0400	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5001	19950407	Chromium-HI	-200.2500	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5004	19950407	Chromium-HI	-218.3500	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5012	19950412	Chromium-HI	-292.0500	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5001	19950406	Chromium-HI	-356.0300	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5008	19950407	Chromium-HI	-364.3600	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5001	19950822	Chromium-HI	-409.4300	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5004	19950407	Chromium-HI	-602.9200	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5008	19950823	Chromium-HI	-1053.1000	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Chromium-HI	-1189.1000	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Chromium-HI	-1224.3000	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5008	19950823	Chromium-LO	301.1700	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Chromium-LO	299.5200	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5012	19950412	Chromium-LO	154.3500	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Chromium-LO	153.6500	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5001	19950406	Chromium-LO	152.7800	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5001	19950822	Chromium-LO	135.3300	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5001	19950407	Chromium-LO	126.5100	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5001	19950407	Chromium-LO	111.9100	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5004	19950406	Chromium-LO	109.7900	MG/KG		INORG	0.5	4.0			MND17	Soil	

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Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0537	0537-5004	19950407	Chromium-LO	90.1810	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5008	19950407	Chromium-LO	80.5500	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5012	19950407	Chromium-LO	79.1540	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5008	19950407	Chromium-LO	73.6260	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Chromium-LO	68.1670	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5004	19950407	Chromium-LO	66.3480	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Chromium-LO	61.9360	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5001	19950407	Chromium-LO	61.4590	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5012	19950406	Chromium-LO	6.9660	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5008	19950406	Chromium-LO	-4.7786	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5004	19950412	Chromium-LO	-37.7810	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Cobalt	260.5500	MG/KG		INORG	8.0	12.0			MND17	Soil	2
MND17-0557	0557-5008	19950823	Cobalt	204.6900	MG/KG		INORG	4.0	8.0			MND17	Soil	2
MND17-0557	0557-5004	19950823	Cobalt	191.1800	MG/KG		INORG	0.5	4.0			MND17	Soil	2
MND17-0557	0557-5001	19950822	Cobalt	115.6700	MG/KG		INORG	0.0	0.5			MND17	Soil	2
MND17-0538	0538-5004	19950407	Cobalt	113.0200	MG/KG		INORG	0.5	4.0			MND17	Soil	2
MND17-0538	0538-5008	19950407	Cobalt	21.2690	MG/KG		INORG	4.0	8.0			MND17	Soil	2
MND17-0527	0527-5001	19950407	Cobalt	-39.1820	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5001	19950407	Cobalt	-84.6450	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5012	19950412	Cobalt	-98.6620	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5008	19950406	Cobalt	-117.3600	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5008	19950407	Cobalt	-133.8600	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5004	19950407	Cobalt	-141.7100	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0545	0545-5001	19950406	Cobalt	-147.0200	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5004	19950406	Cobalt	-164.0600	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Cobalt	-185.0500	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5012	19950407	Cobalt	-200.0100	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5012	19950406	Cobalt	-215.4900	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Cobalt	-228.2900	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Cobalt	-267.4900	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5004	19950412	Cobalt	-283.4600	MG/KG		INORG	0.5	4.0			MND17	Soil	
C0063	10379	19850901	Cobalt-60	1.1000	PCI/G	0.5000	RAD	10.5	10.5			RSS	Soil	13
MND17-0557	0557-5004	19950823	Copper	52.9390	MG/KG		INORG	0.5	4.0			MND17	Soil	2

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Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0557	0557-5008	19950823	Copper	44.2590	MG/KG		INORG	4.0	8.0			MND17	Soil	2
MND17-0545	0545-5001	19950406	Copper	43.8840	MG/KG		INORG	0.0	0.5			MND17	Soil	2
MND17-0557	0557-5012	19950823	Copper	31.9380	MG/KG		INORG	8.0	12.0			MND17	Soil	2
MND17-0527	0527-5001	19950407	Copper	27.2820	MG/KG		INORG	0.0	0.5			MND17	Soil	2
MND17-0545	0545-5008	19950406	Copper	26.4380	MG/KG		INORG	4.0	8.0			MND17	Soil	2
MND17-0537	0537-5008	19950407	Copper	17.3640	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5004	19950406	Copper	-2.4756	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5004	19950412	Copper	-7.9267	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Copper	-8.4898	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5012	19950407	Copper	-11.2460	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Copper	-11.5500	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5012	19950406	Copper	-18.0870	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5004	19950407	Copper	-22.3080	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5012	19950412	Copper	-26.2660	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0537	0537-5004	19950407	Copper	-40.5530	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5001	19950822	Copper	-42.6360	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5001	19950407	Copper	-46.5760	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5008	19950407	Copper	-48.1610	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Copper	-67.5880	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5004	19950412	Iron	35393.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	2
MND17-0537	0537-5012	19950407	Iron	28099.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Iron	26489.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Iron	26031.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5008	19950823	Iron	25709.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Iron	25063.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5001	19950407	Iron	24490.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5008	19950406	Iron	24250.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Iron	24041.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0537	0537-5008	19950407	Iron	23967.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Iron	22122.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5012	19950406	Iron	22056.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5001	19950822	Iron	21658.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5012	19950412	Iron	21259.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	

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Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0538	0538-5008	19950407	Iron	20769.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5001	19950406	Iron	19866.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5004	19950407	Iron	16715.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5004	19950407	Iron	14625.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0545	0545-5004	19950406	Iron	13028.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Iron	11586.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5001	19950407	Lead	20.5060	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5001	19950406	Lead	17.1950	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5004	19950407	Lead	15.9510	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5001	19950822	Lead	14.0110	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5004	19950407	Lead	8.1640	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Lead	7.2074	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5001	19950407	Lead	5.8671	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5008	19950407	Lead	5.1017	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5008	19950407	Lead	1.0258	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5004	19950406	Lead	-0.9254	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0545	0545-5008	19950406	Lead	-1.2004	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Lead	-3.6575	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5004	19950412	Lead	-4.8430	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Lead	-6.9593	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5008	19950823	Lead	-7.0363	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5012	19950406	Lead	-10.1640	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Lead	-10.4310	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Lead	-12.4580	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5012	19950412	Lead	-12.5960	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0537	0537-5012	19950407	Lead	-16.0660	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5001	19950822	Manganese	954.2800	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5001	19950407	Manganese	780.6800	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5008	19950823	Manganese	689.2600	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Manganese	655.1200	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Manganese	620.6900	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0537	0537-5012	19950407	Manganese	619.7700	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Manganese	601.2800	MG/KG		INORG	0.5	4.0			MND17	Soil	

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Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0545	0545-5012	19950406	Manganese	587.8200	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5004	19950406	Manganese	579.7600	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5004	19950407	Manganese	475.4700	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5004	19950412	Manganese	413.5700	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0545	0545-5008	19950406	Manganese	367.5500	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5008	19950407	Manganese	302.4000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Manganese	269.7400	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5001	19950406	Manganese	188.8900	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5008	19950412	Manganese	177.9800	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5004	19950407	Manganese	165.4900	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5012	19950412	Manganese	32.0340	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Manganese	28.0430	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5008	19950407	Manganese	25.4690	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5012	19950406	Mercury	32.7520	MG/KG	4.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0538	0538-5012	19950407	Mercury	21.2320	MG/KG	4.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0537	0537-5008	19950407	Mercury	7.1406	MG/KG	4.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0557	0557-5001	19950822	Mercury	1.2779	MG/KG	4.0000	INORG	0.0	0.5			MND17	Soil	2
MND17-0557	0557-5008	19950823	Mercury	-0.8913	MG/KG	4.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5001	19950407	Mercury	-1.2893	MG/KG	4.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5008	19950407	Mercury	-3.0820	MG/KG	4.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Mercury	-4.7923	MG/KG	4.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Mercury	-8.7092	MG/KG	4.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5008	19950406	Mercury	-10.8690	MG/KG	4.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Mercury	-11.1320	MG/KG	4.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5012	19950412	Mercury	-12.1160	MG/KG	4.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5004	19950406	Mercury	-12.8300	MG/KG	4.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5004	19950407	Mercury	-14.4640	MG/KG	4.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0545	0545-5001	19950406	Mercury	-16.1730	MG/KG	4.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5012	19950407	Mercury	-20.2730	MG/KG	4.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5004	19950412	Mercury	-22.6480	MG/KG	4.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5004	19950407	Mercury	-34.6100	MG/KG	4.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Mercury	-37.8240	MG/KG	4.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Mercury	-45.3660	MG/KG	4.0000	INORG	0.5	4.0			MND17	Soil	

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Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0537	0537-5004	19950407	Molybdenum	3.7669	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5001	19950407	Molybdenum	2.3976	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5008	19950406	Molybdenum	2.2793	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Molybdenum	2.1595	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5001	19950406	Molybdenum	2.1531	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5004	19950406	Molybdenum	2.1347	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5001	19950822	Molybdenum	1.0957	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5008	19950407	Molybdenum	1.0007	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Molybdenum	0.8690	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5008	19950407	Molybdenum	0.7633	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5012	19950412	Molybdenum	0.6541	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5004	19950407	Molybdenum	0.3180	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Molybdenum	0.0150	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Molybdenum	-0.0305	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5004	19950412	Molybdenum	-0.0558	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5012	19950407	Molybdenum	-1.1250	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5012	19950406	Molybdenum	-1.3746	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Molybdenum	-2.4811	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Molybdenum	-4.2078	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5008	19950823	Molybdenum	-6.7731	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5001	19950822	Nickel	22.1970	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5004	19950412	Nickel	16.0620	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Nickel	5.5414	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5008	19950407	Nickel	4.8049	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Nickel	-3.7934	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5012	19950407	Nickel	-7.3333	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5001	19950407	Nickel	-11.3730	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5004	19950407	Nickel	-22.0090	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0545	0545-5008	19950406	Nickel	-22.6210	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5012	19950412	Nickel	-23.2920	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0537	0537-5008	19950407	Nickel	-30.6260	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5001	19950406	Nickel	-38.3700	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5004	19950406	Nickel	-38.6100	MG/KG		INORG	0.5	4.0			MND17	Soil	

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Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0545	0545-5012	19950406	Nickel	-42.7610	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Nickel	-47.2110	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5004	19950407	Nickel	-62.3060	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Nickel	-62.5230	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Nickel	-81.7040	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5012	19950823	Nickel	-154.2800	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5008	19950823	Nickel	-177.1600	MG/KG		INORG	4.0	8.0			MND17	Soil	
SCR191	8802151	19880215	Plutonium-238	2902.0000	PCI/G		RAD	0.0	0.0			SCRDATA	Soil	123
SCR191	8802154	19880215	Plutonium-238	1279.0000	PCI/G		RAD	0.0	0.0			SCRDATA	Soil	123
SCR191	8802152	19880215	Plutonium-238	1118.0000	PCI/G		RAD	0.0	0.0			SCRDATA	Soil	123
SCR191	8802155	19880215	Plutonium-238	195.0000	PCI/G		RAD	0.0	0.0			SCRDATA	Soil	123
SCR191	8802153	19880215	Plutonium-238	39.0000	PCI/G		RAD	0.0	0.0			SCRDATA	Soil	12
S0376	3068	19831001	Plutonium-238	0.0500	PCI/G	0.0100	RAD	0.0	0.0			RSS	Soil	
MND17-0527	0527-5004	19950412	Potassium	43482.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	2
MND17-0537	0537-5012	19950407	Potassium	34485.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	2
MND17-0545	0545-5008	19950406	Potassium	28833.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	2
MND17-0527	0527-5008	19950412	Potassium	28019.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	2
MND17-0557	0557-5004	19950823	Potassium	27273.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	2
MND17-0538	0538-5012	19950407	Potassium	25432.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	2
MND17-0545	0545-5012	19950406	Potassium	24829.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	2
MND17-0557	0557-5008	19950823	Potassium	24799.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	2
MND17-0557	0557-5012	19950823	Potassium	24014.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	2
MND17-0527	0527-5001	19950407	Potassium	22282.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	2
MND17-0527	0527-5012	19950412	Potassium	21734.0000	MG/KG		INORG	8.0	12.0			MND17	Soil	2
MND17-0557	0557-5001	19950822	Potassium	21550.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	2
MND17-0538	0538-5008	19950407	Potassium	21324.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	2
MND17-0538	0538-5001	19950407	Potassium	21271.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	2
MND17-0545	0545-5001	19950406	Potassium	19683.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	2
MND17-0537	0537-5008	19950407	Potassium	15816.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	2
MND17-0538	0538-5004	19950407	Potassium	13792.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	2
MND17-0537	0537-5004	19950407	Potassium	11236.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	2
MND17-0545	0545-5004	19950406	Potassium	10145.0000	MG/KG		INORG	0.5	4.0			MND17	Soil	2
MND17-0537	0537-5001	19950407	Potassium	7224.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	2

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Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0557	0557-5004	19950823	Radium-226	1.5900	PCI/G		RAD	0.5	4.0			MND17	Soil	1
MND17-0557	0557-5012	19950823	Radium-226	0.8900	PCI/G		RAD	8.0	12.0			MND17	Soil	1
MND17-0557	0557-5008	19950823	Radium-226	0.8000	PCI/G		RAD	4.0	8.0			MND17	Soil	1
MND17-0557	0557-5001	19950822	Radium-226	0.7600	PCI/G		RAD	0.0	0.5			MND17	Soil	1
C0063	10375	19850901	Radium-226	0.6000	PCI/G		RAD	4.5	4.5			RSS	Soil	1
C0063	10373	19850901	Radium-226	0.6000	PCI/G		RAD	1.5	1.5			RSS	Soil	1
C0063	10377	19850901	Radium-226	0.5000	PCI/G		RAD	7.5	7.5			RSS	Soil	1
C0063	10379	19850901	Radium-226	0.5000	PCI/G		RAD	10.5	10.5			RSS	Soil	1
C0063	10381	19850901	Radium-226	0.5000	PCI/G		RAD	13.5	13.5			RSS	Soil	1
C0063	10374	19850901	Radium-226	0.4000	PCI/G		RAD	3.0	3.0			RSS	Soil	1
C0063	10378	19850901	Radium-226	0.4000	PCI/G		RAD	9.0	9.0			RSS	Soil	1
C0063	10380	19850901	Radium-226	0.4000	PCI/G		RAD	12.0	12.0			RSS	Soil	1
MND17-0527	0527-5004	19950412	Rubidium	163.3100	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5012	19950407	Rubidium	118.3900	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Rubidium	114.9100	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Rubidium	113.9200	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5008	19950823	Rubidium	110.5200	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Rubidium	104.7400	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5008	19950406	Rubidium	99.5100	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5001	19950822	Rubidium	98.6940	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5012	19950412	Rubidium	96.3110	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5001	19950407	Rubidium	92.8900	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5012	19950407	Rubidium	91.1190	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5012	19950406	Rubidium	85.8540	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5008	19950407	Rubidium	83.9830	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Rubidium	80.6030	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5001	19950406	Rubidium	72.6030	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5004	19950407	Rubidium	60.5930	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5004	19950407	Rubidium	41.9330	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5008	19950407	Rubidium	37.8620	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5004	19950406	Rubidium	36.5880	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Rubidium	30.7080	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5012	19950407	Selenium	-13.0030	MG/KG	20.0000	INORG	8.0	12.0			MND17	Soil	

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Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0537	0537-5008	19950407	Selenium	-17.2450	MG/KG	20.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5001	19950822	Selenium	-19.4520	MG/KG	20.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5004	19950407	Selenium	-25.4880	MG/KG	20.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0545	0545-5004	19950406	Selenium	-25.9560	MG/KG	20.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Selenium	-26.5390	MG/KG	20.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Selenium	-27.8690	MG/KG	20.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Selenium	-28.3200	MG/KG	20.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5008	19950823	Selenium	-28.8030	MG/KG	20.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5004	19950407	Selenium	-29.1560	MG/KG	20.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0545	0545-5008	19950406	Selenium	-30.4070	MG/KG	20.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5012	19950406	Selenium	-31.0880	MG/KG	20.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5001	19950406	Selenium	-31.8000	MG/KG	20.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5001	19950407	Selenium	-32.4820	MG/KG	20.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5004	19950412	Selenium	-33.6810	MG/KG	20.0000	INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5008	19950407	Selenium	-33.6840	MG/KG	20.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Selenium	-34.6010	MG/KG	20.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5012	19950412	Selenium	-35.3310	MG/KG	20.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Selenium	-36.9740	MG/KG	20.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Selenium	-40.7610	MG/KG	20.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Silver	86.6980	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	2
MND17-0557	0557-5012	19950823	Silver	80.3267	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0557	0557-5008	19950823	Silver	54.0220	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0538	0538-5012	19950407	Silver	52.0718	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0537	0537-5004	19950407	Silver	31.8506	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	2
MND17-0545	0545-5008	19950406	Silver	29.1533	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0545	0545-5004	19950406	Silver	29.0980	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	2
MND17-0527	0527-5004	19950412	Silver	28.8249	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	2
MND17-0527	0527-5012	19950412	Silver	23.2135	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0527	0527-5008	19950412	Silver	20.0656	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0537	0537-5008	19950407	Silver	9.1699	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	2
MND17-0545	0545-5012	19950406	Silver	6.0277	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	2
MND17-0538	0538-5008	19950407	Silver	0.6924	MG/KG	100.0000	INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5004	19950407	Silver	0.6487	MG/KG	100.0000	INORG	0.5	4.0			MND17	Soil	

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Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0538	0538-5001	19950407	Silver	-5.7592	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5001	19950822	Silver	-8.5904	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5001	19950407	Silver	-13.8800	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5012	19950407	Silver	-13.9509	MG/KG	100.0000	INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5001	19950407	Silver	-16.8192	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5001	19950406	Silver	-27.8855	MG/KG	100.0000	INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5012	19950407	Strontium	277.6700	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Strontium	218.1700	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5012	19950412	Strontium	194.2200	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5012	19950406	Strontium	190.4700	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5004	19950407	Strontium	185.0800	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5012	19950407	Strontium	179.9200	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5008	19950823	Strontium	175.2300	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5008	19950406	Strontium	167.6000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5004	19950407	Strontium	167.0800	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5008	19950407	Strontium	164.1000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Strontium	158.9200	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Strontium	157.7400	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5004	19950406	Strontium	155.9100	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5004	19950412	Strontium	154.3500	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Strontium	153.1900	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5004	19950823	Strontium	152.9000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5008	19950407	Strontium	147.5400	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5001	19950407	Strontium	138.3800	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5001	19950406	Strontium	138.3000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5001	19950822	Strontium	129.7900	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5001	19950822	Thorium-230	5.2300	PCI/G		RAD	0.0	0.5			MND17	Soil	123
SCR191	8802151	19880215	Thorium-232	182.2000	PCI/G		RAD	0.0	0.0			SCRDATA	Soil	123
SCR191	8802152	19880215	Thorium-232	106.9000	PCI/G		RAD	0.0	0.0			SCRDATA	Soil	123
SCR191	8802154	19880215	Thorium-232	59.9000	PCI/G		RAD	0.0	0.0			SCRDATA	Soil	123
SCR191	8802155	19880215	Thorium-232	8.2000	PCI/G		RAD	0.0	0.0			SCRDATA	Soil	123
SCR191	8802153	19880215	Thorium-232	2.8000	PCI/G		RAD	0.0	0.0			SCRDATA	Soil	123
MND17-0557	0557-5008	19950823	Thorium-232	0.7200	PCI/G		RAD	4.0	8.0			MND17	Soil	1

Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0557	0557-5004	19950823	Thorium-232	0.6900	PCI/G		RAD	0.5	4.0			MND17	Soil	1
MND17-0557	0557-5001	19950822	Thorium-232	0.2500	PCI/G		RAD	0.0	0.5			MND17	Soil	1
MND17-0537	0537-5012	19950407	Tin	35.1490	MG/KG		INORG	8.0	12.0			MND17	Soil	2
MND17-0527	0527-5004	19950412	Tin	8.0261	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5008	19950407	Tin	1.2226	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Tin	-12.6660	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5012	19950412	Tin	-13.7650	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5004	19950407	Tin	-15.2260	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Tin	-16.9860	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Tin	-21.2980	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5004	19950406	Tin	-22.4700	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5001	19950407	Tin	-27.9080	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5012	19950406	Tin	-31.0680	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Tin	-31.9370	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5001	19950406	Tin	-34.5950	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5008	19950406	Tin	-36.7470	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0557	0557-5001	19950822	Tin	-36.9000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5008	19950407	Tin	-42.7780	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5004	19950407	Tin	-44.2070	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Tin	-50.2330	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Tin	-50.9870	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5008	19950823	Tin	-66.5650	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5004	19950412	Titanium	3753.2000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5012	19950407	Titanium	3417.3000	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5008	19950406	Titanium	2905.0000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5001	19950407	Titanium	2529.3000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5004	19950823	Titanium	2502.4000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Titanium	2497.5000	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Titanium	2476.9000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5012	19950406	Titanium	2411.9000	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Titanium	2342.1000	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5001	19950822	Titanium	2263.4000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5008	19950823	Titanium	2258.9000	MG/KG		INORG	4.0	8.0			MND17	Soil	

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Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0527	0527-5012	19950412	Titanium	2111.4000	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Titanium	2078.0000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0538	0538-5008	19950407	Titanium	1990.4000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5001	19950406	Titanium	1914.8000	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5008	19950407	Titanium	1650.2000	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5004	19950407	Titanium	1452.7000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5004	19950407	Titanium	1400.9000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0545	0545-5004	19950406	Titanium	1075.3000	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Titanium	776.4600	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5012	19950823	Uranium-238	5.3700	PCI/G		RAD	8.0	12.0			MND17	Soil	123
MND17-0557	0557-5004	19950823	Zinc	142.5500	MG/KG		INORG	0.5	4.0			MND17	Soil	2
MND17-0557	0557-5001	19950822	Zinc	103.8500	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5008	19950823	Zinc	88.3460	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5004	19950412	Zinc	77.0320	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0527	0527-5001	19950407	Zinc	74.4830	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5004	19950406	Zinc	69.8820	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0545	0545-5001	19950406	Zinc	67.5210	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5012	19950823	Zinc	65.0660	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Zinc	58.7790	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5012	19950412	Zinc	57.5780	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5004	19950407	Zinc	48.3250	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5001	19950407	Zinc	44.5350	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5008	19950412	Zinc	42.7570	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Zinc	35.6500	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0537	0537-5012	19950407	Zinc	34.7220	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0545	0545-5012	19950406	Zinc	32.1650	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0537	0537-5008	19950407	Zinc	20.6680	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5004	19950407	Zinc	14.6890	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5008	19950407	Zinc	14.4850	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5008	19950406	Zinc	13.4340	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5001	19950407	Zirconium	246.6900	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0557	0557-5001	19950822	Zirconium	164.1500	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0545	0545-5001	19950406	Zirconium	154.5600	MG/KG		INORG	0.0	0.5			MND17	Soil	

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Location_nam	Sample_id	Collection _date	Value_name	Measured_val	Value_ units	Detection_l imit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_co	Media	Comments
MND17-0538	0538-5001	19950407	Zirconium	151.1500	MG/KG		INORG	0.0	0.5			MND17	Soil	
MND17-0527	0527-5004	19950412	Zirconium	141.5700	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5004	19950823	Zirconium	135.7300	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0557	0557-5012	19950823	Zirconium	129.5500	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0537	0537-5012	19950407	Zirconium	129.3300	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0538	0538-5004	19950407	Zirconium	124.6600	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0538	0538-5008	19950407	Zirconium	121.8100	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0537	0537-5008	19950407	Zirconium	120.2300	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5008	19950406	Zirconium	118.9300	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0527	0527-5008	19950412	Zirconium	116.8900	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0545	0545-5012	19950406	Zirconium	113.7400	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0557	0557-5008	19950823	Zirconium	112.8400	MG/KG		INORG	4.0	8.0			MND17	Soil	
MND17-0538	0538-5012	19950407	Zirconium	101.2200	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0527	0527-5012	19950412	Zirconium	80.0880	MG/KG		INORG	8.0	12.0			MND17	Soil	
MND17-0537	0537-5004	19950407	Zirconium	73.5180	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0545	0545-5004	19950406	Zirconium	67.8120	MG/KG		INORG	0.5	4.0			MND17	Soil	
MND17-0537	0537-5001	19950407	Zirconium	53.6080	MG/KG		INORG	0.0	0.5			MND17	Soil	

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*Comments

5	Exceeds MCL
3	Exceeds screening level
1	Exceeds the 10-6 Risk-Based Guide Value
6	Exceeds the Guide Value based on the hazard index
2	Exceeds the OU9 Soil Background Value

Lab and data qualifiers are defined on the pages immediately following the non-detects table in this appendix
Comparison values for results with comments are provided on the "Comparisons for Soil Analytical Results" table at the end of this appendix.
Common nutrients (such as calcium, iron, potassium, and sodium) are not considered in MCP risk assessement and therefore are not evaluated further herein.
There are no risk-based or hazard comparison values for rubidium, strontium, titanium, and zirconium.

Building 48 Non-Detects

Location_name	Sample_id	Collection _date	Value_name	Measured_value	Value_ units	Detection _limit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_cod	Media
MND17-0557	0557-5004	19950823	Actinium	0.3500	PCI/G		RAD	0.5	4.0	U		MND17	Soil
MND17-0557	0557-5008	19950823	Actinium	0.3200	PCI/G		RAD	4.0	8.0	U		MND17	Soil
MND17-0557	0557-5012	19950823	Actinium	0.2500	PCI/G		RAD	8.0	12.0	U		MND17	Soil
MND17-0557	0557-5001	19950822	Actinium	0.2300	PCI/G		RAD	0.0	0.5	U		MND17	Soil
C0063	10375	19850901	Americium-241	0.5000	PCI/G	0.5000	RAD	4.5	4.5	U		RSS	Soil
C0063	10377	19850901	Americium-241	0.5000	PCI/G	0.5000	RAD	7.5	7.5	U		RSS	Soil
C0063	10374	19850901	Americium-241	0.5000	PCI/G	0.5000	RAD	3.0	3.0	U		RSS	Soil
C0063	10373	19850901	Americium-241	0.5000	PCI/G	0.5000	RAD	1.5	1.5	U		RSS	Soil
C0063	10378	19850901	Americium-241	0.5000	PCI/G	0.5000	RAD	9.0	9.0	U		RSS	Soil
C0063	10379	19850901	Americium-241	0.5000	PCI/G	0.5000	RAD	10.5	10.5	U		RSS	Soil
C0063	10381	19850901	Americium-241	0.5000	PCI/G	0.5000	RAD	13.5	13.5	U		RSS	Soil
C0063	10380	19850901	Americium-241	0.5000	PCI/G	0.5000	RAD	12.0	12.0	U		RSS	Soil
MND17-0557	0557-5008	19950823	Americium-241	0.0900	PCI/G		RAD	4.0	8.0	U		MND17	Soil
MND17-0557	0557-5004	19950823	Americium-241	0.0700	PCI/G		RAD	0.5	4.0	U		MND17	Soil
MND17-0557	0557-5012	19950823	Americium-241	0.0700	PCI/G		RAD	8.0	12.0	U		MND17	Soil
MND17-0557	0557-5001	19950822	Americium-241	0.0500	PCI/G		RAD	0.0	0.5	U		MND17	Soil
C0063	10375	19850901	Cesium-137	0.5000	PCI/G	0.5000	RAD	4.5	4.5	U		RSS	Soil
C0063	10377	19850901	Cesium-137	0.5000	PCI/G	0.5000	RAD	7.5	7.5	U		RSS	Soil
C0063	10374	19850901	Cesium-137	0.5000	PCI/G	0.5000	RAD	3.0	3.0	U		RSS	Soil
C0063	10373	19850901	Cesium-137	0.5000	PCI/G	0.5000	RAD	1.5	1.5	U		RSS	Soil
C0063	10378	19850901	Cesium-137	0.5000	PCI/G	0.5000	RAD	9.0	9.0	U		RSS	Soil
C0063	10379	19850901	Cesium-137	0.5000	PCI/G	0.5000	RAD	10.5	10.5	U		RSS	Soil
C0063	10381	19850901	Cesium-137	0.5000	PCI/G	0.5000	RAD	13.5	13.5	U		RSS	Soil
C0063	10380	19850901	Cesium-137	0.5000	PCI/G	0.5000	RAD	12.0	12.0	U		RSS	Soil
MND17-0557	0557-5004	19950823	Cesium-137	0.0500	PCI/G		RAD	0.5	4.0	U		MND17	Soil
MND17-0557	0557-5012	19950823	Cesium-137	0.0400	PCI/G		RAD	8.0	12.0	U		MND17	Soil
MND17-0557	0557-5008	19950823	Cesium-137	0.0400	PCI/G		RAD	4.0	8.0	U		MND17	Soil
C0063	10375	19850901	Cobalt-60	0.5000	PCI/G	0.5000	RAD	4.5	4.5	U		RSS	Soil
C0063	10377	19850901	Cobalt-60	0.5000	PCI/G	0.5000	RAD	7.5	7.5	U		RSS	Soil
C0063	10374	19850901	Cobalt-60	0.5000	PCI/G	0.5000	RAD	3.0	3.0	U		RSS	Soil
C0063	10373	19850901	Cobalt-60	0.5000	PCI/G	0.5000	RAD	1.5	1.5	U		RSS	Soil

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Location_name	Sample_id	Collection _date	Value_name	Measured_value	Value_ units	Detection _limit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_cod	Media
C0063	10378	19850901	Cobalt-60	0.5000	PCI/G	0.5000	RAD	9.0	9.0	U		RSS	Soil
C0063	10381	19850901	Cobalt-60	0.5000	PCI/G	0.5000	RAD	13.5	13.5	U		RSS	Soil
C0063	10380	19850901	Cobalt-60	0.5000	PCI/G	0.5000	RAD	12.0	12.0	U		RSS	Soil
MND17-0557	0557-5004	19950823	Cobalt-60	0.0500	PCI/G		RAD	0.5	4.0	U		MND17	Soil
MND17-0557	0557-5008	19950823	Cobalt-60	0.0500	PCI/G		RAD	4.0	8.0	U		MND17	Soil
MND17-0557	0557-5001	19950822	Cobalt-60	0.0400	PCI/G		RAD	0.0	0.5	U		MND17	Soil
MND17-0557	0557-5012	19950823	Cobalt-60	0.0300	PCI/G		RAD	8.0	12.0	U		MND17	Soil
MND17-0557	0557-5008	19950823	Plutonium-238	75.1300	PCI/G		RAD	4.0	8.0	U		MND17	Soil
MND17-0557	0557-5004	19950823	Plutonium-238	69.4100	PCI/G		RAD	0.5	4.0	U		MND17	Soil
MND17-0557	0557-5012	19950823	Plutonium-238	57.5100	PCI/G		RAD	8.0	12.0	U		MND17	Soil
MND17-0557	0557-5001	19950822	Plutonium-238	39.5300	PCI/G		RAD	0.0	0.5	U		MND17	Soil
MND17-0527	0527-5004	19950412	Plutonium-238	25.0000	PCI/G	25.0000	RAD	0.5	4.0	U		MND17	Soil
MND17-0527	0527-5001	19950407	Plutonium-238	25.0000	PCI/G	25.0000	RAD	0.0	0.5	U		MND17	Soil
MND17-0527	0527-5008	19950412	Plutonium-238	25.0000	PCI/G	25.0000	RAD	4.0	8.0	U		MND17	Soil
MND17-0527	0527-5012	19950412	Plutonium-238	25.0000	PCI/G	25.0000	RAD	8.0	12.0	U		MND17	Soil
MND17-0538	0538-5012	19950407	Plutonium-238	25.0000	PCI/G	25.0000	RAD	8.0	12.0	U		MND17	Soil
MND17-0538	0538-5008	19950407	Plutonium-238	25.0000	PCI/G	25.0000	RAD	4.0	8.0	U		MND17	Soil
MND17-0538	0538-5004	19950407	Plutonium-238	25.0000	PCI/G	25.0000	RAD	0.5	4.0	U		MND17	Soil
MND17-0538	0538-5001	19950407	Plutonium-238	25.0000	PCI/G	25.0000	RAD	0.0	0.5	U		MND17	Soil
MND17-0537	0537-5004	19950407	Plutonium-238	25.0000	PCI/G	25.0000	RAD	0.5	4.0	U		MND17	Soil
MND17-0537	0537-5001	19950407	Plutonium-238	25.0000	PCI/G	25.0000	RAD	0.0	0.5	U		MND17	Soil
MND17-0537	0537-5008	19950407	Plutonium-238	25.0000	PCI/G	25.0000	RAD	4.0	8.0	U		MND17	Soil
MND17-0537	0537-5012	19950407	Plutonium-238	25.0000	PCI/G	25.0000	RAD	8.0	12.0	U		MND17	Soil
MND17-0545	0545-5012	19950406	Plutonium-238	25.0000	PCI/G	25.0000	RAD	8.0	12.0	U		MND17	Soil
MND17-0545	0545-5001	19950406	Plutonium-238	25.0000	PCI/G	25.0000	RAD	0.0	0.5	U		MND17	Soil
MND17-0545	0545-5004	19950406	Plutonium-238	25.0000	PCI/G	25.0000	RAD	0.5	4.0	U		MND17	Soil
MND17-0545	0545-5008	19950406	Plutonium-238	25.0000	PCI/G	25.0000	RAD	4.0	8.0	U		MND17	Soil
MND17-0557	0557-5008	19950823	Protactinium-231	1.7100	PCI/G		RAD	4.0	8.0	U		MND17	Soil
MND17-0557	0557-5001	19950822	Protactinium-231	1.4900	PCI/G		RAD	0.0	0.5	U		MND17	Soil
MND17-0557	0557-5004	19950823	Protactinium-231	1.3600	PCI/G		RAD	0.5	4.0	U		MND17	Soil
MND17-0557	0557-5012	19950823	Protactinium-231	1.2700	PCI/G		RAD	8.0	12.0	U		MND17	Soil
MND17-0557	0557-5008	19950823	Thorium-230	9.3000	PCI/G		RAD	4.0	8.0	U		MND17	Soil
MND17-0557	0557-5004	19950823	Thorium-230	7.9500	PCI/G		RAD	0.5	4.0	U		MND17	Soil

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Location_name	Sample_id	Collection _date	Value_name	Measured_value	Value_ units	Detection _limit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_cod	Media
MND17-0557	0557-5012	19950823	Thorium-230	5.2900	PCI/G		RAD	8.0	12.0	U		MND17	Soil
MND17-0527	0527-5004	19950412	Thorium-232	5.0000	PCI/G	5.0000	RAD	0.5	4.0	U		MND17	Soil
MND17-0527	0527-5001	19950407	Thorium-232	5.0000	PCI/G	5.0000	RAD	0.0	0.5	U		MND17	Soil
MND17-0527	0527-5008	19950412	Thorium-232	5.0000	PCI/G	5.0000	RAD	4.0	8.0	U		MND17	Soil
MND17-0527	0527-5012	19950412	Thorium-232	5.0000	PCI/G	5.0000	RAD	8.0	12.0	U		MND17	Soil
MND17-0538	0538-5012	19950407	Thorium-232	5.0000	PCI/G	5.0000	RAD	8.0	12.0	U		MND17	Soil
MND17-0538	0538-5008	19950407	Thorium-232	5.0000	PCI/G	5.0000	RAD	4.0	8.0	U		MND17	Soil
MND17-0538	0538-5004	19950407	Thorium-232	5.0000	PCI/G	5.0000	RAD	0.5	4.0	U		MND17	Soil
MND17-0538	0538-5001	19950407	Thorium-232	5.0000	PCI/G	5.0000	RAD	0.0	0.5	U		MND17	Soil
MND17-0537	0537-5004	19950407	Thorium-232	5.0000	PCI/G	5.0000	RAD	0.5	4.0	U		MND17	Soil
MND17-0537	0537-5001	19950407	Thorium-232	5.0000	PCI/G	5.0000	RAD	0.0	0.5	U		MND17	Soil
MND17-0537	0537-5008	19950407	Thorium-232	5.0000	PCI/G	5.0000	RAD	4.0	8.0	U		MND17	Soil
MND17-0537	0537-5012	19950407	Thorium-232	5.0000	PCI/G	5.0000	RAD	8.0	12.0	U		MND17	Soil
MND17-0545	0545-5012	19950406	Thorium-232	5.0000	PCI/G	5.0000	RAD	8.0	12.0	U		MND17	Soil
MND17-0545	0545-5001	19950406	Thorium-232	5.0000	PCI/G	5.0000	RAD	0.0	0.5	U		MND17	Soil
MND17-0545	0545-5004	19950406	Thorium-232	5.0000	PCI/G	5.0000	RAD	0.5	4.0	U		MND17	Soil
MND17-0545	0545-5008	19950406	Thorium-232	5.0000	PCI/G	5.0000	RAD	4.0	8.0	U		MND17	Soil
S0376	3068	19831001	Thorium-232	2.0000	PCI/G	2.0000	RAD	0.0	0.0	U		RSS	Soil
MND17-0557	0557-5012	19950823	Thorium-232	0.2900	PCI/G		RAD	8.0	12.0	U		MND17	Soil
MND17-0557	0557-5008	19950823	Uranium-238	7.3900	PCI/G		RAD	4.0	8.0	U		MND17	Soil
MND17-0557	0557-5004	19950823	Uranium-238	6.9600	PCI/G		RAD	0.5	4.0	U		MND17	Soil
MND17-0557	0557-5001	19950822	Uranium-238	4.8300	PCI/G		RAD	0.0	0.5	U		MND17	Soil

Lab and data qualifiers are defined on the pages immediately following this non-detects table.

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LABORATORY DATA QUALIFIERS (LABQUAL)

The following qualifiers will be applied to the organic analysis results by the laboratory in accordance with CLP SOW direction:

ORGANICS

U	Indicates compound was analyzed for but not detected. The associated sample quantitation limit will be the CRQL, corrected for dilution and for percent moisture.
J	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) assuming a 1:1 response, 2) when the qualitative data indicated the presence of a compound that meets the volatile, semivolatile, and pesticide/Aroclor identification criteria, and the result is less than the CRQL but greater than zero.
N	Indicates presumptive evidence of a compound. This flag is used only for tentatively identified compounds, where identification is based on a mass spectral library search.
P	Used for pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns.
C	Applies to pesticide results where the identification has been confirmed by GC/MS.
B	Used when the analyte is found in the associated blank as well as in the sample. This flag must be used for a TIC as well as for a positively identified target compound.
E	Identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
D	Identifies all compounds identified in an analysis at a secondary dilution factor.
A	Indicates that a TIC is a suspected aldol-condensation product.

INORGANICS

B	Indicates that the reported value was obtained from a reading that was less than the CRDL but greater than or equal to the Instrument Detection Limit (IDL).
U	Indicates that the analyte was analyzed for but not detected.
E	Indicates the reported value is estimated because of the presence of interferences.
M	Duplicate injection precision was not met.
N	Spiked sample recovery not within control limits.
S	Reported value was determined by the Method of Standard Additions (MSA).
W	Post-digestion spike for Furnace AA analysis is out of control limits, while sample absorbency is less than 50% of spike absorbency.
*	Duplicate analysis not within control limits.
+	Correlation coefficient for the MSA is less than 0.995.

DATA QUALIFIER CODES (DATAQUAL)

ORGANICS AND INORGANICS

U	The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.
J	The associated numerical value is an estimated quantity.
R	The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.
N	Presumptive evidence of the presence of the material.
NJ	Presumptive evidence of the presence of the material at an estimated quantity.
UJ	The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

SUB-QUALIFIER CODES

ORGANICS

D	Duplicates
B	Qualified due to blank
C	Qualified due to calibration
H	Holding time exceeded
K	Qualified due to surrogate recovery
L	Qualified due to Laboratory Control Sample
S	Qualified due to matrix spike recovery
I	Qualified due to internal standard
N	Tentative identification (only for TICs)
P	Pesticide/PCB results have >25 percent difference on two different columns
+	Positive bias (added after subqualifier)
-	Negative bias (added after subqualifier)

INORGANICS

D	Duplicates
B	Qualified due to blank
C	Qualified due to calibration
H	Holding time exceeded
L	Qualified due to Laboratory Control Sample
S	Qualified due to matrix spike recovery
I	Qualified due to interference
+	Positive bias (added after subqualifier)
-	Negative bias (added after subqualifier)
Examples of final qualification might be J-C, UJ-S(+), UJ-BC(-), etc.	

The subqualifiers have been included to clarify any reports you may use. The subqualifiers have been captured when it was included in the electronic data submitted by the contractor. Most of the data in MEIMS does not include them.

The above data was extracted from the OU9 Site Wide Quality Assurance Project Plan, pages 9-16 and Appendix H page 3-1. It was updated from the Methods Compendium.

Comparisons for Soil Analytical Results

10^{-6} Risk-Based Guideline Values			
79-00-5	1,1,2-Trichloroethane	1.90E+00	MG/KG
79-34-5	1,1,2,2-Tetrachloroethane	8.90E-01	MG/KG
75-35-4	1,1-Dichloroethene	1.20E-01	MG/KG
107-06-2	1,2-Dichloroethane	7.60E-01	MG/KG
78-87-5	1,2-Dichloropropane	4.38E+01	MG/KG
118-96-7	2,4,6-Trinitrotoluene	1.91E+02	MG/KG
72-55-9	4,4'-DDE	9.00E+00	MG/KG
50-29-3	4,4'-DDT	9.00E+00	MG/KG
309-00-2	Aldrin	1.80E-01	MG/KG
5103-71-9	Alpha Chlordane	8.50E+00	MG/KG
12672-29-6	Aroclor-1248	3.85E-01	MG/KG
11096-82-5	Aroclor-1260	3.85E-01	MG/KG
7440-38-2	Arsenic	1.20E+03	MG/KG
71-43-2	Benzene	1.45E+00	MG/KG
56-55-3	Benzo(a)anthracene	4.10E+00	MG/KG
50-32-8	Benzo(a)pyrene	4.10E-01	MG/KG
205-99-2	Benzo(b)fluoranthene	4.10E+00	MG/KG
207-08-9	Benzo(k)fluoranthene	4.10E+01	MG/KG
7440-41-7	Beryllium	7.00E-01	MG/KG
319-85-7	Beta-BHC	1.65E+00	MG/KG
117-81-7	Bis(2-ethylhexyl)phthalate	2.15E+02	MG/KG
75-27-4	Bromodichloromethane	4.80E+01	MG/KG
75-25-2	Bromoform	3.75E+02	MG/KG
7440-43-9	Cadmium	1.00E+04	MG/KG
56-23-5	Carbon Tetrachloride	5.38E-01	MG/KG
67-66-3	Chloroform	5.20E-01	MG/KG
74-87-3	Chloromethane	2.71E+00	MG/KG
7440-47-3	Chromium	1.50E+03	MG/KG
218-01-9	Chrysene	4.10E+02	MG/KG
53-70-3	Dibenz(a,h)anthracene	4.10E-01	MG/KG
124-48-1	Dibromochloromethane	3.55E+01	MG/KG
75-09-2	Dichloromethane	2.03E+01	MG/KG
60-57-1	Dieldrin	1.85E-01	MG/KG
5103-74-2	Gamma Chlordane	8.50E+00	MG/KG
58-89-9	Gamma-BHC (Lindane)	2.30E+00	MG/KG
76-44-8	Heptachlor	0.66	MG/KG
1024-57-3	Heptachlor Epoxide	0.33	MG/KG
193-39-5	Indeno(1,2,3-cd)pyrene	4.10E+00	MG/KG
78-59-1	Isophorone	3.15E+03	MG/KG
86-30-6	N-Nitrosodiphenylamine	6.00E+02	MG/KG
87-86-5	Pentachlorophenol	2.50E+01	MG/KG
121-82-4	RDX	2.70E+01	MG/KG
127-18-4	Tetrachloroethene	1.87E+01	MG/KG
79-01-6	Trichloroethene	5.09E+00	MG/KG
75-01-4	Vinyl Chloride	4.10E-01	MG/KG
7440-41-7	1,1,1,2-Tetrachloroethane	1.10E-02	MG/L
7440-38-2	1,1,2,2-Tetrachloroethane	1.40E-03	MG/L

14952-40-0	Actinium-227	4.50E-01	PCI/G
14596-10-2	Americium-241	6.30E+00	PCI/G
13982-38-2	Bismuth-207	1.60E-01	PCI/G
10045-97-3	Cesium-137	3.40E-01	PCI/G
10198-40-0	Cobalt-60	7.00E-02	PCI/G
14255-04-0	Lead-210	6.20E-01	PCI/G
13981-16-3	Plutonium-238	6.10E+00	PCI/G
15117-48-3	Plutonium-239	6.00E+00	PCI/G
PU239/240	Plutonium-240	6.00E+00	PCI/G
13982-10-0	Plutonium-242	6.33E+00	PCI/G
13966-00-2	Potassium-40	1.42E+00	PCI/G
14331-85-2	Protactinium-231	3.90E-01	PCI/G
13982-63-3	Radium-226	9.00E-02	PCI/G
10098-97-2	Strontium-90	9.40E+00	PCI/G
14274-82-9	Thorium-228	1.10E-01	PCI/G
14269-63-7	Thorium-230	9.00E-02	PCI/G
7440-29-1	Thorium-232	7.00E-02	PCI/G
10028-17-8	Tritium	2.35E+04	PCI/G
13968-55-3	Uranium-233	9.68E-01	PCI/G
13966-29-5	Uranium-234	1.05E+01	PCI/G
15117-96-1	Uranium-235	1.60E+00	PCI/G
7440-61-1	Uranium-238+D	1.00E-01	PCI/G
14596-10-2	Americium-241	4.90E-01	PCI/L
14331-79-4	Bismuth-210	2.20E+01	PCI/L
15262-20-1	Radium-228	3.30E-01	PCI/L
13967-73-2	Strontium-85	1.10E+02	PCI/L
10098-97-2	Strontium-90	3.90E+00	PCI/L
15623-47-9	Thorium-227	4.00E+00	PCI/L
14274-82-9	Thorium-228	6.90E-01	PCI/L
14269-63-7	Thorium-230	1.20E-01	PCI/L
7440-29-1	Thorium-232	3.10E-01	PCI/L
7440-61-1	Uranium-238	1.10E-01	PCI/L
OU9 Soil Background Value			
72-54-8	4,4'-DDD	4.2	MG/KG
72-55-9	4,4'-DDE	4.3	MG/KG
50-29-3	4,4'-DDT	13	MG/KG
309-00-2	Aldrin	ND	MG/KG
5103-71-9	Alpha Chlordane	ND	MG/KG
319-84-6	Alpha-BHC	ND	MG/KG
7429-90-5	Aluminum	19000	MG/KG
14596-10-2	Americium-241	ND	MG/KG
12672-29-6	Aroclor-1248	ND	MG/KG
11097-69-1	Aroclor-1254	58	MG/KG
11096-82-5	Aroclor-1260	ND	MG/KG
7440-38-2	Arsenic	8.6	MG/KG
7440-39-3	Barium	180	MG/KG
7440-41-7	Beryllium	1.3	MG/KG
319-85-7	Beta-BHC	ND	MG/KG
7440-69-9	Bismuth	ND	MG/KG

13982-38-2	Bismuth-207	ND	MG/KG
14331-79-4	Bismuth-210m	ND	MG/KG
7440-43-9	Cadmium	2.1	MG/KG
7440-70-2	Calcium	310000	MG/KG
7440-47-3	Chromium	20	MG/KG
7440-48-4	Cobalt	19	MG/KG
7440-50-8	Copper	26	MG/KG
57-12-5	Cyanide	ND	MG/KG
60-57-1	Dieldrin	ND	MG/KG
959-98-8	Endosulfan I	ND	MG/KG
1031-07-8	Endosulfan Sulfate	ND	MG/KG
72-20-8	Endrin	ND	MG/KG
7421-93-4	Endrin Aldehyde	ND	MG/KG
53494-70-5	Endrin Ketone	ND	MG/KG
5103-74-2	Gamma Chlordane	ND	MG/KG
58-89-9	Gamma-BHC (Lindane)	ND	MG/KG
76-44-8	Heptachlor	ND	MG/KG
1024-57-3	Heptachlor Epoxide	ND	MG/KG
77-47-4	Hexachlorocyclopentadiene	ND	MG/KG
7439-89-6	Iron	35000	MG/KG
7439-92-1	Lead	48	MG/KG
7439-93-2	Lithium	26	MG/KG
7439-95-4	Magnesium	40000	MG/KG
7439-96-5	Manganese	1400	MG/KG
7439-97-6	Mercury	ND	MG/KG
72-43-5	Methoxychlor	30	MG/KG
7439-98-7	Molybdenum	27	MG/KG
7440-02-0	Nickel	32	MG/KG
7440-09-7	Potassium	1900	MG/KG
7782-49-2	Selenium	ND	MG/KG
7440-22-4	Silver	1.7	MG/KG
7440-23-5	Sodium	240	MG/KG
7440-28-0	Thallium	0.46	MG/KG
7440-31-5	Tin	20	MG/KG
7440-62-2	Vanadium	25	MG/KG
7440-66-6	Zinc	140	MG/KG
14952-40-0	Actinium-227	1.10E-01	PCI/G
10045-97-3	Cesium-137	0.42	PCI/G
14255-04-0	Lead-210	1.20E+00	PCI/G
13981-16-3	Plutonium-238	0.13	PCI/G
15117-48-3	Plutonium-239	1.80E-01	PCI/G
PU239/240	Plutonium-240	1.80E-01	PCI/G
13966-00-2	Potassium-40	37	PCI/G
14331-85-2	Protactinium-231	1.10E-01	PCI/G
13982-63-3	Radium-226	2	PCI/G
10098-97-2	Strontium-90	0.72	PCI/G
14274-82-9	Thorium-228	1.5	PCI/G
14269-63-7	Thorium-230	1.9	PCI/G
7440-29-1	Thorium-232	1.4	PCI/G
10028-17-8	Tritium	1.6	PCI/G

13966-29-5	Uranium-234	1.1	PCI/G
15117-96-1	Uranium-235	0.11	PCI/G
7440-61-1	Uranium-238	1.2	PCI/G
Core Team Determined Screening Level			
7439-92-1	Lead	4.00E+02	MG/KG
14952-40-0	Actinium-227	5.60E-01	PCI/G
14596-10-2	Americium-241	6.30E+00	PCI/G
13982-38-2	Bismuth-207	1.75E-01	PCI/G
10045-97-3	Cesium-137	7.60E-01	PCI/G
10198-40-0	Cobalt-60	7.00E-02	PCI/G
14255-04-0	Lead-210	1.80E+00	PCI/G
13981-16-3	Plutonium-238	5.50E+01	PCI/G
14331-85-2	Protactinium-231	4.00E+00	PCI/G
13982-63-3	Radium-226	2.10E+00	PCI/G
14274-82-9	Thorium-228	1.61E+00	PCI/G
14269-63-7	Thorium-230	2.00E+00	PCI/G
7440-29-1	Thorium-232	1.47E+00	PCI/G
15117-96-1	Uranium-235	1.70E+00	PCI/G
7440-61-1	Uranium-238+D	1.30E+00	PCI/G
Maximum Contaminant Level for Drinking Water			
71-55-6	1,1,1-Trichloroethane	0.2	MG/L
79-00-5	1,1,2-Trichloroethane	0.005	MG/L
75-35-4	1,1-Dichloroethene	0.007	MG/L
120-82-1	1,2,4-Trichlorobenzene	0.07	MG/L
156-59-2	1,2-cis-Dichloroethene	0.07	MG/L
106-93-4	1,2-Dibromoethane	0.00005	MG/L
95-50-1	1,2-Dichlorobenzene	0.6	MG/L
107-06-2	1,2-Dichloroethane	0.005	MG/L
78-87-5	1,2-Dichloropropane	0.005	MG/L
156-60-5	1,2-trans-Dichloroethene	0.01	MG/L
106-46-7	1,4-Dichlorobenzene	0.075	MG/L
95-95-4	2,4,5-Trichlorophenol	0.05	MG/L
94-75-7	2,4-D	0.07	MG/L
7440-36-0	Antimony	0.0006	MG/L
7440-38-2	Arsenic	0.05	MG/L
7440-39-3	Barium	2	MG/L
71-43-2	Benzene	0.005	MG/L
50-32-8	Benzo(a)pyrene	0.002	MG/L
7440-41-7	Beryllium	0.004	MG/L
117-81-7	bis(2-ethylhexyl)phthalate	0.006	MG/L
75-27-4	Bromodichloromethane	0.008	MG/L
75-25-2	Bromoform	0.008	MG/L
7440-43-9	Cadmium	0.005	MG/L
56-23-5	Carbon Tetrachloride	0.005	MG/L
57-74-9	Chlordane	0.002	MG/L
108-90-7	Chlorobenzene	0.1	MG/L
67-66-3	Chloroform	0.008	MG/L
7440-47-3	Chromium	0.1	MG/L

7440-50-8	Copper	1.3	MG/L
57-12-5	Cyanide	0.2	MG/L
96-12-8	Dibromochloropropane	0.0002	MG/L
75-09-2	Dichloromethane (Methylene Chloride)	0.005	MG/L
88-85-7	Dinoseb	0.007	MG/L
1746-01-6	Dioxin	0.00000003	MG/L
72-20-8	Endrin	0.002	MG/L
100-41-4	Ethylbenzene	0.07	MG/L
16984-48-8	Flouride	4	MG/L
58-89-9	Gamma-BHC (Lindane)	0.0002	MG/L
76-44-8	Heptachlor	0.0004	MG/L
1024-57-3	Heptachlor Epoxide	0.0002	MG/L
118-74-1	Hexachlorobenzene	0.001	MG/L
77-47-4	Hexachlorocyclopentadiene	0.05	MG/L
7439-92-1	Lead	0.015	MG/L
7439-97-6	Mercury	0.002	MG/L
72-43-5	Methoxychlor	0.04	MG/L
7440-02-0	Nickel	0.1	MG/L
NO3	Nitrate	10	MG/L
14797-65-0	Nitrite	1	MG/L
87-86-5	Pentachlorophenol	0.001	MG/L
7782-49-2	Selenium	0.05	MG/L
100-42-5	Styrene	0.1	MG/L
127-18-4	Tetrachloroethene	0.005	MG/L
7440-28-0	Thallium	0.002	MG/L
108-88-3	Toluene	1	MG/L
8001-35-2	Toxaphene	0.003	MG/L
79-01-6	Trichloroethene	0.005	MG/L
75-01-4	Vinyl Chloride	0.002	MG/L
1330-20-7	Xylenes, Total	10	MG/L
14952-40-0	Actinium-227	0.4	PCI/L
14596-10-2	Americium-241	1.2	PCI/L
13982-38-2	Bismuth-207	1200	PCI/L
10045-97-3	Cesium-137	120	PCI/L
10198-40-0	Cobalt-60	400	PCI/L
13981-16-3	Plutonium-238	1.6	PCI/L
13982-63-3	Radium-226	4	PCI/L
10098-97-2	Strontium-90	40	PCI/L
14274-82-9	Thorium-228	16	PCI/L
14269-63-7	Thorium-230	12	PCI/L
7440-29-1	Thorium-232	2	PCI/L
10028-17-8	Tritium	20000	PCI/L
13968-55-3	Uranium-233	20	PCI/L
13966-29-5	Uranium-234	20	PCI/L
15117-96-1	Uranium-235	24	PCI/L
7440-61-1	Uranium-238	24	PCI/L
Guideline Values Based on the Hazard Index			
71-55-6	1,1,1-Trichloroethane	3.31E+03	MG/KG
79-00-5	1,1,2-Tricloroethane	8.52E+02	MG/KG

76-13-1	1,1,2-Trichloro-1,2,2triflouroethane	7.00E+04	MG/KG
75-34-3	1,1-Dichloroethane	2.13E+04	MG/KG
75-35-4	1,1-Dichloroethene	1.92E+03	MG/KG
120-82-1	1,2,4-Trichlorobenzene	2.04E+04	MG/KG
156-59-2	1,2-cis-Dichloroethene	2.13E+03	MG/KG
78-87-5	1,2-Dichloropropane	2.16E+01	MG/KG
156-60-5	1,2-trans-Dichloroethene	4.30E+03	MG/KG
99-65-0	1,3-Dinitrobenzene	2.00E+02	MG/KG
118-96-7	2,4,6-Trinitrotoluene	1.00E+03	MG/KG
78-93-3	2-Butanone	9.30E+03	MG/KG
95-57-8	2-Chlorophenol	1.06E+03	MG/KG
108-10-1	2-Methyl-4-pentanone	7.00E+02	MG/KG
50-29-3	4,4'-DDT	1.10E+02	MG/KG
106-44-5	4-Methylphenol	1.10E+03	MG/KG
67-64-1	Acetone	2.10E+04	MG/KG
309-00-2	Aldrin	6.4	MG/KG
5103-71-9	Alpha Chlordane	110	MG/KG
7429-90-5	Aluminum	210000	MG/KG
120-12-7	Anthracene	6.40E+04	MG/KG
7440-36-0	Antimony	8.50E+01	MG/KG
11097-69-1	Aroclor-1254	4.30E+00	MG/KG
7440-38-2	Arsenic	6.40E+01	MG/KG
7440-39-3	Barium	1.50E+04	MG/KG
71-43-2	Benzene	2.36E+01	MG/KG
65-85-0	Benzoic Acid	8.50E+05	MG/KG
7440-41-7	Beryllium	1.10E+03	MG/KG
117-81-7	Bis(2-ethylhexyl)phthalate	4.30E+03	MG/KG
75-27-4	Bromodichloromethane	4.26E+03	MG/KG
75-25-2	Bromoform	4.30E+03	MG/KG
74-83-9	Bromomethane	1.26E+01	MG/KG
85-68-7	Butyl Benzyl Phthalate	4.30E+04	MG/KG
7440-43-9	Cadmium	2.10E+02	MG/KG
75-15-0	Carbon Disulfide	1.16E+03	MG/KG
56-23-5	Carbon Tetrachloride	5.62E+00	MG/KG
108-90-7	Chlorobenzene	4.89E+02	MG/KG
75-00-3	Chloroethane	1.60E+02	MG/KG
67-66-3	Chloroform	1.50E+03	MG/KG
74-87-3	Chloromethane	1.58E+02	MG/KG
7440-47-3	Chromium	1.10E+03	MG/KG
18540-29-9	Chromium-VI	6.39E+02	MG/KG
7440-48-4	Cobalt	1.28E+04	MG/KG
7440-50-8	Copper	7.90E+03	MG/KG
57-12-5	Cyanide	4.30E+03	MG/KG
124-48-1	Dibromochloromethane	4.26E+03	MG/KG
75-09-2	Dichloromethane	1.00E+03	MG/KG
60-57-1	Dieldrin	1.10E+01	MG/KG
84-74-2	Di-n-butyl Phthalate	2.10E+04	MG/KG
117-84-0	Di-n-octyl Phthalate	4.30E+03	MG/KG
959-98-8	Endosulfan I	1300	MG/KG
33213-65-9	Endosulfan II	1300	MG/KG

100-41-4	Ethylbenzene	4.80E-01	MG/KG
86-73-7	Flourene	8.50E+03	MG/KG
206-44-0	Fluoranthene	8.50E+03	MG/KG
5103-74-2	Gamma Chlordane	110	MG/KG
58-89-9	Gamma-BHC (Lindane)	64	MG/KG
76-44-8	Heptachlor	110	MG/KG
1024-57-3	Heptachlor Epoxide	2.8	MG/KG
110-54-3	Hexane	9.10E+01	MG/KG
78-59-1	Isophorone	4.30E+04	MG/KG
7439-96-5	Manganese	2.70E+04	MG/KG
7439-97-6	Mercury	6.40E+01	MG/KG
72-43-5	Methoxychlor	1100	MG/KG
7440-02-0	Nickel	4.30E+03	MG/KG
87-86-5	Pentachlorophenol	6.40E+03	MG/KG
108-95-2	Phenol	1.30E+05	MG/KG
129-00-0	Pyrene	6.40E+03	MG/KG
7782-49-2	Selenium	1100	MG/KG
7440-22-4	Silver	1.10E+03	MG/KG
100-42-5	Styrene	1.45E+04	MG/KG
127-18-4	Tetrachloroethene	2.13E+03	MG/KG
79-01-6	Trichloroethene	6.39E+01	MG/KG
7440-28-0	Thallium	17	MG/KG
7440-31-5	Tin	130000	MG/KG
108-88-3	Toluene	2.50E+02	MG/KG
75-69-4	Trichlorofluoromethane	7.30E+02	MG/KG
7440-62-2	Vanadium	1.50E+03	MG/KG
75-01-4	Vinyl Chloride	1.19E+02	MG/KG
1330-20-7	Xylenes, Total	4.26E+05	MG/KG
7440-66-6	Zinc	6.40E+04	MG/KG
7440-41-7	1,1,1,2-Tetrachloroethane	2.90E-01	MG/L
7440-38-2	1,1,2,2-Tetrachloroethane	2.50E-01	MG/L
71-55-6	1,1,1-Trichloroethane	1.80E+00	MG/L
76-13-1	1,1,2-Trichloro-1,2,2triflouroethane	2.50E+03	MG/L
7429-90-5	Aluminum	100	MG/L
7440-42-8	Boron	9.00E+00	MG/L
18540-29-9	Chromium-VI	3.00E-01	MG/L
7440-48-4	Cobalt	6	MG/L
7440-50-8	Copper	4.00E+00	MG/L
7439-98-7	Molybdenum	0.5	MG/L
7782-49-2	Selenium	0.5	MG/L
7440-28-0	Thallium	0.008	MG/L
7440-31-5	Tin	60	MG/L
2691-41-0	HMX	1.10E+04	UG/KG
121-82-4	RDX	6.40E+04	UG/KG

Appendix M

Occurrence Reports

A search of the occurrence reporting system revealed nine reports, all of which were minor and without environmental impact.

The following occurrence reports are provided in this appendix:

- tritium contamination found in Building 48 fumehood,
- discovery of tritium contamination outside radiological area,
- storage of explosive materials in unapproved area,
- curtailment of tritium operations due to disablement of the Emergency Containment System, and
- alpha contamination discovered in abandoned waste transfer manhole.

The following occurrence reports are not provided in this appendix because they are not related to environmental issues.

- activation of Emergency Containment System (ECS),
- precautionary evacuation of an explosive facility,
- alarm system failure – Building 48, and
- near miss accident during core drilling operations in Building 48.

OH-MB-BWO-BWO01-2001-0005 FINAL

Occurrence Report
Before 2003 Redesign

Tritium Facilities

(Name of Facility)

Balance-of-Plant

(Facility Function)

Mound Plant Babcock and Wilcox of Ohio, Inc.

(Laboratory, Site, or Organization)

Name: ALLISON, JERRY L
Title: TRITIUM FACILITY MANAGER **Telephone No.:** (937) 865-4533

(Facility Manager/Designee)

Name: ALLISON, JERRY L
Title: **Telephone No.:** (937) 865-4533

(Originator/Transmitter)

Name: ALLISON, JERRY L **Date:** 08/23/2001

(Authorized Classifier (AC))

1. Occurrence Report Number: OH-MB-BWO-BWO01-2001-0005

Tritium Contamination Found in Building 48 Fumehood

2. Report Type and Date: FINAL

	Date	Time
Notification:	07/17/2001	13:34 (MTZ)
Initial Update:	08/20/2001	13:24 (MTZ)
Latest Update:	08/23/2001	08:57 (MTZ)
Final:	02/20/2002	13:27 (MTZ)

3. Occurrence Category: Off-Normal

4. Number of Occurrences: 1 **Original OR:**

5. Division or Project: BWXT of Ohio Inc.

6. Secretarial Office: EM - Environmental Management

7. System, Bldg., or Equipment: Building 48, Room 208

8. UCNI?: No

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9. Plant Area: Main Hill Area

10. Date and Time Discovered: 07/16/2001 16:30 (ETZ)

11. Date and Time Categorized: 07/17/2001 10:00 (ETZ)

12. DOE HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

13. Other Notifications:

Date	Time	Person Notified	Organization
07/17/2001	10:15 (ETZ)	Chris White	DOE-MEMP

14. Subject or Title of Occurrence:

Tritium Contamination Found in Building 48 Fumehood

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15. Nature of Occurrence:

01) Facility Condition
D. Loss of Control of Radioactive Material/Spread of Radioactive Contamination

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16. Description of Occurrence:

At 1000 Hours (ETZ)on July 17, 2001 results of swipe surveys completed in Building 48 were presented to Main Hill Facility Management indicating that a fumehood within Room 208 was contaminated with tritium beyond the permissible levels for a control area not posted as a radiological area. One of the dry tritium swipes taken from inside the fumehood showed levels of 268,760 DPM per 100 square centimeters. This was greater than the 100,000 DPM per 100 square centimeters threshold of 10 times 10 CFR 835 Appendix D levels.

Tritium contamination in the fumehood was the result of contaminated samples being processed there. The samples were obtained from inside a glovebox in Room 48 of Technical (T) Building. The swipe samples were taken the week of July 9, 2001. Previous swipe surveys on record indicated the glovebox interior was contaminted at approximately 10 million DPM tritium per 100 square centimeters. The samples were escorted to Building 48 by an attending Radiological Control Technician (RCT) and turned over to the Environmental Analyst in Building 48 on Monday July 16, 2001 at approximately 0800 hours (ETZ). A request for an alpha isotopic analysis of these samples was made previously by the T Building Radiological Point of Contact (RPOC) through the Analytical Services Supervisor. The Analyst, expecting the samples to be accompanied by a Radiological Work Permit (RWP), questioned the attending RCT about the samples potentially being contaminated. The RCT, unaware of what agreements had been made between the RPOC and the Analytical Services Supervisor, called for guidance and was told that the samples were to be analyzed for alpha and that tritium was not a concern. The RCT interpreted this to mean that a RWP for tritium work was not required and upon showing the analyst that an alpha field scan indicated that there was little alpha activity it would be okay to do the analysis without a RWP.

Upon being shown that the samples were not alpha contaminated, the Analyst proceeded to take the samples from inside the Room 208 fumehood (which was not posted as a Contamination Area) and prepare them for analysis. At approximately 1015 hours (ETZ) the Analytical Services Supervisor discovered that the analysis had proceeded without a RWP and inside an area without the proper postings. Based on his knowledge of the sample's origin he initiated an inquiry that prompted surveys of the area. At about 1045 hours (ETZ) analytical operations were ceased and screen surveys were begun on areas most likely to have been contaminated. The screen surveys were conclusive for tritium contamination and decontamination was begun in the affected areas. Additional surveys were made in surrounding areas and also on personnel. There was no contamination above the 10 CFR 835 thresholds for facilities or personnel found by the expanded surveys. By 1600 hours (ETZ) the areas within Building 48 had been returned to normal operations.

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17. Operating Conditions of Facility at Time of Occurrence:

Not Applicable

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18. Activity Category:

03 - Normal Operations (other than Activities specifically listed in this Category)

19. Immediate Actions Taken and Results:

Affected personnel were swiped surveyed to make sure they were not contaminated. Affected equipment and areas were decontaminated and resurveyed to assure they were below free release levels.

20. Direct Cause:

3) Personnel Error
C. Communication Problem

21. Contributing Cause(s):

6) Management Problem
C. Inadequate Supervision

22. Root Cause:

5) Training Deficiency
B. Insufficient Practice or Hands-On Experience

23. Description of Cause:

The direct cause of the event was personnel error, communication problem where the information concerning swipe surveys being tritium contaminated was not communicated to the RCT who escorted the swipe surveys to Building 48. It was assumed that the RCT knew the swipe surveys were tritium contaminated and needed an analysis to tell what alpha isotopes were present.

There were two contributing causes to the event. The first was a procedure problem, inadequate procedure because all that was required was that the RPOC and Analytical Service Supervisor agree on what was required to handle the surveys, if they were over 1 million DPM for tritium. The second cause was a management problem for inadequate supervision because the RCT was not given sufficient information to perform his job properly.

The root cause of the event was a training deficiency for insufficient practice or hands-on experience because the RCT had been told at one time how to handle the swipe surveys to be taken to Building 48 but had never performed the task himself or with someone.

24. Evaluation (by Facility Manager/Designee):

There was poor communications between the RCT and the his supervisor the RPOC. The RCT was apparently not given much information on the swipe surveys by the RPOC and the RCT did not ask any questions about the swipe surveys to get the information he needed to know. The RCT had been told how to handle swipe surveys from T Building taken to Building 48 for analysis, but had never done the task. Since he had not actually performed the work before or with someone else, he was unfamiliar with what to do. The RPOC assumed the RCT knew how to handle the swipe surveys.

The procedure on how to handle swipe surveys over 1 million DPM tritium directs the RPOC and Environmental Services Supervisor to agree on what procedures to use without giving any details. The procedure would be better if some of the basics were in it, e.g. RWP required, posting of area, etc.

Before a RCT is assigned a task the RPOC should be sure that the RCT has had enough surpervised practice and hands-oh experience to be able to perform the task without creating contamination or other problems.

25. Is Further Evaluation Required?: No

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26. Corrective Actions
(* = Date added/revised since final report was approved.)

1. RPOC will walk through handling of swipe surveys over 1 million DPM with RCTs until he is assured that they know how to handle the process.

Target Completion Date: 07/26/2001	**Completion Date:** 07/26/2001

2. Issue lessons learned to RCTs and laboratory personnel on swipe samples being taken to be analyzed.

Target Completion Date: 07/26/2001	**Completion Date:** 07/26/2001

3. Review and revise procedures as necessary to properly cover how to handle swipe surveys over 1 million DPM being sent to Environmental Services Laboratory.

Target Completion Date: 01/15/2002	**Completion Date:** 12/06/2001

27. Impact on Environment, Safety and Health:

None

28. Programmatic Impact:

None

29. Impact on Codes and Standards:

None

30. Lessons Learned:

Personnel must be given sufficient detail about the tasks they are performing in order to accomplish those tasks in a successful manner. All the requirements and details of the task should be gone over and if the person has not performed the task before, someone should walk the person through the steps until they are capable of performing the task successfully on their own. The procedures for performing the task should at least give the basic steps for the personnel to follow.

31. Similar Occurrence Report Numbers:

None

32. User-defined Field #1:

33. User-defined Field #2:

34. HQ Keyword(s):

06B--Radiological Issues - Facility/Equipment/Site Contamination

35. DOE Facility Representative Input:

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36. DOE Program Manager Input:

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37. Approvals:

Approved by: ALLISON, JERRY L, Facility Manager/Designee
Date: 08/23/2001
Telephone No.: (937) 865-4533

Approved by: BERRY, RONALD E, Facility Representative/Designee
Date: 02/20/2002
Telephone No.: (513) 865-4836

Approved by: Approval delegated to FR, Program Manager/Designee
Date: 02/20/2002
Telephone No.:

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OH-MB-BWO-BWO01-2002-0004 FINAL

Occurrence Report
Before 2003 Redesign

Tritium Facilities

(Name of Facility)

Tritium Activities

(Facility Function)

Mound Plant Babcock and Wilcox of Ohio, Inc.

(Laboratory, Site, or Organization)

Name: ALLISON, JERRY L
Title: Operations and Facility Manager **Telephone No.:** (937) 865-4533

(Facility Manager/Designee)

Name: ALLISON, JERRY L
Title: **Telephone No.:** (937) 865-4533

(Originator/Transmitter)

Name: ALLISON, jERRY L **Date:** 06/27/2002

(Authorized Classifier (AC))

1. Occurrence Report Number: OH-MB-BWO-BWO01-2002-0004

No spills / RELEASE

Discovery of Tritium Contamination Outside Radiological Area

2. Report Type and Date: FINAL

	Date	Time
Notification:	05/15/2002	06:05 (MTZ)
Initial Update:	06/27/2002	12:04 (MTZ)
Latest Update:	06/27/2002	12:04 (MTZ)
Final:	01/28/2003	08:36 (MTZ)

3. Occurrence Category: Off-Normal

4. Number of Occurrences: 1 **Original OR:**

5. Division or Project: BWXT of Ohio, Inc.

6. Secretarial Office: EM - Environmental Management

7. System, Bldg., or Equipment: Building 48, Room 208

8. UCNI?: No

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9. Plant Area: Main Hill Area

10. Date and Time Discovered: 05/14/2002 12:30 (ETZ)

11. Date and Time Categorized: 05/14/2002 12:35 (ETZ)

12. DOE HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

13. Other Notifications:

Date	Time	Person Notified	Organization
05/14/2002	13:30 (ETZ)	Ron Berry	DOE/MEMP

14. Subject or Title of Occurrence:

Discovery of Tritium Contamination Outside Radiological Area

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15. Nature of Occurrence:

01) Facility Condition
D. Loss of Control of Radioactive Material/Spread of Radioactive Contamination

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16. Description of Occurrence:

On Tuesday, May 14, 2002 at approximately 1230 hours (ETZ) results from routine swipe surveys of fumehoods in Building 48, Room 208 indicated tritium contamination of approximately 488,000 dpm per 100 square centimeters in fumehood number 9. The fumehood was not posted as a radiological area (Contamination or High Contamination Area or Radiological Buffer Area). The building is posted as a controlled area. Bagged tritium sample vials from the Contaminated Waste Processing Facility (CWPF) were put inside the fumehood approximately three months ago and removed about two weeks ago. When the vials were removed, the swipe results of the outside of the plastic bag were neagative for contamination. Prior routine surveys of the fumehood were also negative for contamination.

Prior to obtaining the swipe survey of 488,000 dpm per 100 square centimeters tritium, an original routine survey of 98,000 dpm per 100 square centimeters tritium was obtained that was believed to have come from fumehood #10. After rechecking records and talking to the RCT, it was determined that the surveys were probably mixed up and actually came from fumehood #9. Subsequent surveys of fumehood #10 were zero or nearly zero.

The access to Room 228 was not controlled, therefore people from other areas or projects could have set something down in the fumehood. The sample vials from CWPF were not stored in the area where the contamination was found, which was near the fumehood sink.

There was also a small bag of contaminated trash that contained surgeons gloves and other PPE and items used in the processing of the CWPF vials. This bag was removed at the same time the vials were removed. Swipe surveys of the outside of the trash bag showed no contamination.

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17. Operating Conditions of Facility at Time of Occurrence:

Not Applicable

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18. Activity Category:

03 - Normal Operations (other than Activities specifically listed in this Category)

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19. Immediate Actions Taken and Results:

The Radiological Control Technician posted the fumehood as a Contamination Area.

20. Direct Cause:

8) Radiological/Hazardous Material Problem
B. Source Unknown

21. Contributing Cause(s):

22. Root Cause:

8) Radiological/Hazardous Material Problem
B. Source Unknown

23. Description of Cause:

The direct and root cause of this event is 'Radiological Material Problem, Source Unknown'. The only sources for contamination that were known to be in the fumehood were the CWPF sample vials and the process trash from the vials. The outside of the plastic bags which contained these items were surveyed and show no signs of contamination. Therefore, it can not be assumed that the contamination came from these items.

24. Evaluation (by Facility Manager/Designee):

Since the only known source of contamination in the fumehood were the sample vials from the CWPF and the bag of trash containing used PPE and materials used to analyze the vials, one could assume that the contamination came from one of those sources. However, someone may have set a contaminated sample in the fumehood and then removed it without letting the laboratory personnel know about it. The top of the fumehood and the exhaust system were swipe surveyed and no contamination was found.

Better methods of sample receipt and improved "Good Laboratory Practices" may help control the spread of contamination in the future.

25. Is Further Evaluation Required?: No

26. Corrective Actions
(* = Date added/revised since final report was approved.)

1.

Proceduralize changes to handling of radiological samples for sample receipt and good laboratory paractice for the control of the spread of contamination.	
Target Completion Date: 06/17/2002	**Completion Date:** 06/17/2002

27. Impact on Environment, Safety and Health:

None

28. Programmatic Impact:

None

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29. Impact on Codes and Standards:

None

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30. Lessons Learned:

To prevent the spread of contamination inside the fumehoods and other laboratory work surfaces, adequate sample receipt and handling practices need to be in place.

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31. Similar Occurrence Report Numbers:

OH-BWO-BWO01-2001-0005

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32. User-defined Field #1:

33. User-defined Field #2:

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34. HQ Keyword(s):

06B--Radiological Issues - Facility/Equipment/Site Contamination

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35. DOE Facility Representative Input:

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36. DOE Program Manager Input:

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37. Approvals:

Approved by: ALLISON, JERRY L, Facility Manager/Designee
Date: 06/27/2002
Telephone No.: (937) 865-4533

Approved by: BERRY, RONALD E, Facility Representative/Designee
Date: 01/28/2003
Telephone No.: (513) 865-4836

Approved by: Approval delegated to FR, Program Manager/Designee
Date: 01/28/2003
Telephone No.:

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OH-MB-EGGM-EGGMAT03-1997-0003 FINAL

Occurrence Report
Before 2003 Redesign

Main Hill Facilities

(Name of Facility)

Balance-of-Plant

(Facility Function)

Mound Plant EG&G Mound Applied Technologies

(Laboratory, Site, or Organization)

Name: Jeffrey L. Boston
Title: Facility Manager **Telephone No.:** (937) 865-3262

(Facility Manager/Designee)

Name: BOSTON, JEFFREY L
Title: BLDG MGR EXPLOSIVE FACILITIES **Telephone No.:** (513) 865-3262

(Originator/Transmitter)

Name: Robert A. Ward **Date:** 08/07/1997

(Authorized Classifier (AC))

No Spill / Release

1. Occurrence Report Number: OH-MB-EGGM-EGGMAT03-1997-0003

Storage of Explosive Materials in Unapproved Area

2. Report Type and Date: FINAL

	Date	Time
Notification:	06/04/1997	12:57 (MTZ)
Initial Update:	07/17/1997	11:42 (MTZ)
Latest Update:	08/07/1997	13:37 (MTZ)
Final:	12/11/1997	07:57 (MTZ)

3. Occurrence Category: Off-Normal

4. Number of Occurrences: 1 **Original OR:**

5. Division or Project: E G & G Mound Applied Technologies

6. Secretarial Office: EM - Environmental Management

7. System, Bldg., or Equipment: Building #48

8. UCNI?: No

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9. Plant Area: Main Hill Area

10. Date and Time Discovered: 06/04/1997 11:45 (ETZ)

11. Date and Time Categorized: 06/04/1997 11:45 (ETZ)

12. DOE HQ OC Notification:

Date	Time	Person Notified	Organization
06/04/1997	11:45 (ETZ)	Ron Berry	DOE/MEMP

13. Other Notifications:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

14. Subject or Title of Occurrence:

Storage of Explosive Materials in Unapproved Area

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15. Nature of Occurrence:

01) Facility Condition
F. Violation/Inadequate Procedures

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16. Description of Occurrence:

On June 4, 1997 at 1145 (ETZ) during a critique meeting it was determined that explosive components were stored in an area that was not approved for explosive storage.

The Materials were reported to originate from three areas of the plant; 1. debris (some classified CRD) from the former burn area that contained explosive material not completely expended, 2. containers from T- Building ready for shipment with explosive labeling, and 3. miscellaneous explosive devices from DS-Building.

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17. Operating Conditions of Facility at Time of Occurrence:

Normal Plant Operations

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18. Activity Category:

05 - Shutdown

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19. Immediate Actions Taken and Results:

The explosive and classified components were secured in the Building #48 area, and a security guard posted.

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20. Direct Cause:

3) Personnel Error
B. Procedure Not Used or Used Incorrectly

21. Contributing Cause(s):

22. Root Cause:

3) Personnel Error
A. Inattention to Detail

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23. Description of Cause:

The direct cause of the occurrence was the failure of a Mound employee to follow the proper procedure for the storage of explosive materials. The materials were stored in an area no longer approved for explosives storage.

The root cause of the occurrence was the employee's inattention to detail that would have ensured the proper storage of explosive materials.

A root cause analysis of the event was conducted utilizing REASON Software. Two causes of the event were determined; 1. The fact that no approved explosive storage areas were available and 2. The employee did not follow the proper procedure by establishing an approved location for storage of the materials.

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24. Evaluation (by Facility Manager/Designee):

During the safe shutdown and cleanup of several explosive production facilities, explosive debris and small components were discovered. Since there are no longer any approved explosive storage areas, the employee, rather than follow the procedure to establish a new storage area, temporarily stored the explosive materials in what was previously an explosive storage area.

No impact on the plant, systems, or programs is expected.

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25. Is Further Evaluation Required?: No

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26. Corrective Actions
(* = Date added/revised since final report was approved.)

1. A Safeshutdown Department staff meeting will be held to instruct the staff on the proper action that should be taken when suspect energetic materials or parts are discovered. The staff was directed to immediately notify their supervisor when the materials or parts are discovered who will direct them in the disposition of the parts or materials.

Target Completion Date: 06/18/1997	**Completion Date:** 06/18/1997

2. An approved explosive storage area will be established and

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maintained for the storage of explosive materials and components while awaiting final disposition.	
Target Completion Date: 07/15/1997	**Completion Date:** 07/15/1997

27. Impact on Environment, Safety and Health:

No there was no impact on the environment, safety, health, or the public offsite, however, safety and health of on-site personnel was potentially at risk with the storage of explosive materials in an unauthorized area with out the knowledge of the fire department or other personnel.

28. Programmatic Impact:

No programmatic impact is expected.

29. Impact on Codes and Standards:

None

30. Lessons Learned:

The unavailability of proper storage or retention facilities can lead to the exposure of unsafe conditions to unsuspecting workers.

31. Similar Occurrence Report Numbers:

None

32. User-defined Field #1:

33. User-defined Field #2:

34. HQ Keyword(s):

01J--Conduct of Operations - Operations Procedure

35. DOE Facility Representative Input:

36. DOE Program Manager Input:

37. Approvals:

Approved by: Jeffrey L. Boston, Facility Manager/Designee
Date: 08/07/1997

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Telephone No.: (937) 865-3262

Approved by: HOLBROOK, FRED B, Facility Representative/Designee
Date: 12/11/1997
Telephone No.: (513) 865-4677

Approved by: TRACY, TERRANCE, Program Manager/Designee
Date: 12/11/1997
Telephone No.: (301) 903-2173

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ALO-DA-EGGM-EGGMAT01-1990-0003 FINAL

Occurrence Report
Before 2003 Redesign

Tritium Facilities

(Name of Facility)

(Facility Function)

Mound Plant EG&G Mound Applied Technologies

(Laboratory, Site, or Organization)

Name: Woltermann, H. Anthony
Title: Drector, Technology Department **Telephone No.:** (513) 865-3415

(Facility Manager/Designee)

Name: Woltermann, H. Anthony
Title: Director, Technology Department **Telephone No.:** (774) 774-3415

(Originator/Transmitter)

Name: **Date:**

(Authorized Classifier (AC))

1. Occurrence Report Number: ALO-DA-EGGM-EGGMAT01-1990-0003

Curtailment of Tritium Operations due to disablement of the Emerg. Containment System (ECS). Group 8A, Subgp, b, pg.G8-1

2. Report Type and Date: FINAL

	Date	Time
Notification:	11/16/1990	12:00 (MTZ)
Initial Update:	12/03/1990	12:00 (MTZ)
Latest Update:	12/03/1990	12:00 (MTZ)
Final:	04/26/1991	12:00 (MTZ)

3. Occurrence Category: Unusual

4. Number of Occurrences: 1 **Original OR:**

5. Division or Project: EG&G MOUND

6. Secretarial Office: DP - Defense Programs

7. System, Bldg., or Equipment: Emerg. Contain. Sys

8. UCNI?: No

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9. Plant Area: Main Plant

10. Date and Time Discovered: 11/16/1990 14:30 (ETZ)

11. Date and Time Categorized: 11/16/1990 15:30 (ETZ)

12. DOE HQ OC Notification:

Date	Time	Person Notified	Organization
11/16/1990	17:15 (ETZ)		

13. Other Notifications:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

14. Subject or Title of Occurrence:

Curtailment of Tritium Operations due to disablement of the Emerg. Containment System (ECS). Group 8A, Subgp, b, pg.G8-1

15. Nature of Occurrence:

16. Description of Occurrence:

T-Building Tritium Process were curtailed by Contractor initiative after it was discovered that the emergency containment exhaust duct was blocked by the presence of water in the duct tunnel. Estimated 12,000 gallons of water was involved. The water was slightly contaminated at the level of 6 micro curies per liter of tritium. Less than 2 micro curies per liter of water is the DOE discharge guideline. no environmental release, personnel exposure of injury occurred.

17. Operating Conditions of Facility at Time of Occurrence:

Tritium processes curtailed to investigate the reason the duct blocked.

18. Activity Category:

19. Immediate Actions Taken and Results:

Curtailment of tritium processes in T Building based on Contractor initiative. Water was held in duct tunnel pending decision on disposition of the water. an investigation team was formed.

20. Direct Cause:

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9) Other
~. Other Problems Reported Prior to 04/01/91

21. Contributing Cause(s):

9) Other
~. Other Problems Reported Prior to 04/01/91

22. Root Cause:

4) Design Problem
~. Design Problems Reported Prior to 04/01/91

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23. Description of Cause:

Subsidence of the sewer piping resulting from a fracture of the piping allowed water to accumulate underground in the area around the air shaft vertical section or "head house." The water leaked into the air shaft through an abandoned vent line and accumulated until it impacted air flow from the ventilation ducting.

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24. Evaluation (by Facility Manager/Designee):

Other systems of like design were checked for similar problems. None have been found.

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25. Is Further Evaluation Required?: No

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26. Corrective Actions
(* = Date added/revised since final report was approved.)

1. The fractured sewer line was replaced and the underground vent hole in the head house was plugged with concrete.Installation of a water level alarm and sump pump is planned for the utility tunnel area; the level alarm will be on the preventive maintenance schedule. Until this installation is complete, the utility tunnel will be checked monthly for water. The water in the tunnel was pump out and is being converted into concrete for LSA burial. The unplugged abandoned vent line situation, which occurred in 1970 when Building 48 was built, is unlikely to happen in future construction projects due to the maintainability review process, which was installed five years ago. In addition, all "like" vent system on site were reviewed for similar problems, and none were found.
Taken: X

Target Completion Date: 04/23/1991	Completion Date: 04/23/1991

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27. Impact on Environment, Safety and Health:

None. All water has been removed for approved LSA burial. No releases occurred during removal. Air flows from building were monitored throughout. No personnel exposures or projected health impacts resulted.

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28. Programmatic Impact:

Since the air duct was rerouted within a day, no programmatic impact was incurred.

29. Impact on Codes and Standards:

30. Lessons Learned:

The importance of proper job design for long-term problem avoidance was highlighted.

31. Similar Occurrence Report Numbers:

32. User-defined Field #1:

33. User-defined Field #2:

34. HQ Keyword(s):

35. DOE Facility Representative Input:

36. DOE Program Manager Input:

37. Approvals:

Approved by: Woltermann, H. Anthony, Facility Manager/Designee
Date: 04/23/1991
Telephone No.: (513) 865-3415

Approved by: Gertrell, George R., Facility Representative/Designee
Date: 04/26/1991
Telephone No.:

Approved by: Hagen, R. A., Program Manager/Designee
Date: 04/26/1991
Telephone No.:

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OH-MB-EGGM-EGGMAT05-1996-0001 FINAL

Occurrence Report
Before 2003 Redesign

Utilities Facilities

(Name of Facility)

Environmental Restoration Operations

(Facility Function)

Mound Plant EG&G Mound Applied Technologies

(Laboratory, Site, or Organization)

Name: Jon D. Yonko
Title: Maintenance Manager **Telephone No.:** (513) 865-3151

(Facility Manager/Designee)

Name: KOEHLER, KATHY G
Title: SITE GROUNDS MANAGER **Telephone No.:** (513) 865-4886

(Originator/Transmitter)

Name: Ronald A. Mahan **Date:** 12/18/1996

(Authorized Classifier (AC))

1. Occurrence Report Number: OH-MB-EGGM-EGGMAT05-1996-0001

Alpha Contamination Discovered in Abandoned Waste Transfer Manhole

2. Report Type and Date: FINAL

	Date	Time
Notification:	11/20/1996	15:19 (MTZ)
Initial Update:	12/19/1996	14:05 (MTZ)
Latest Update:	12/19/1996	14:05 (MTZ)
Final:	02/13/1997	07:00 (MTZ)

3. Occurrence Category: Off-Normal

4. Number of Occurrences: 1 **Original OR:**

5. Division or Project: EG&G Mound Applied Technologies

6. Secretarial Office: EM - Environmental Management

7. System, Bldg., or Equipment: Abandoned Waste Transfer lines between DS & Bldg. 48

8. UCNI?: No

Location only

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9. Plant Area: Main Hill

10. Date and Time Discovered: 11/18/1996 13:45 (ETZ)

11. Date and Time Categorized: 11/19/1996 09:00 (ETZ)

12. DOE HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

13. Other Notifications:

Date	Time	Person Notified	Organization
11/20/1996	13:00 (ETZ)	Raymond J. Powell	DOE/MEMP

14. Subject or Title of Occurrence:

Alpha Contamination Discovered in Abandoned Waste Transfer Manhole

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15. Nature of Occurrence:

01) Facility Condition
D. Loss of Control of Radioactive Material/Spread of Radioactive Contamination

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16. Description of Occurrence:

In preparation for the Underground Lines Project (an Environmental Restoration Project), a Radiological Control Technician (RCT) was surveying an abandoned radionuclide waste transfer line manhole located between DS building and building 48. On November 18, 1996, analytical results from wipes taken inside the manhole were available and revealed a maximum count of 102 dpm/100cm2 loose alpha. Radon was not a contributing factor to the alpha levels detected. Gamma spectroscopy results indicated that the transuranic isotope associated with the contamination was Plutonium 238 within an eighty percent confidence level. The area where the manhole resides was not previously posted as a Controlled area and levels detected exceeded twice the DOE Radiological Control Manual values.

Earlier Environmental Restoration reports (generated by Roy F. Weston, Inc.) had shown the underground lines were likely contaminated with radionuclide material. Prior to initiation of the work, a RCT had identified slightly elevated fixed Beta activity on the top of the manhole cover during the pre-work survey. The RCT did not post the area as a result of the discovery because posting of Soil Contamination Areas and Underground Radiological Areas has not been communicated nor implemented.

This occurrence report was reviewed by an Authorized Derivative Classifier (Ronald A. Mahan) on 12/16/96 at 14:00 hour (ETZ) and contains no Classified or UCNI Information.

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17. Operating Conditions of Facility at Time of Occurrence:

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Normal Plant Operations

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18. Activity Category:

11 - Facility Decontamination/Decommissioning

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19. Immediate Actions Taken and Results:

The Manhole was posted as a Controlled Area.

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20. Direct Cause:

8) Radiological/Hazardous Material Problem
A. Legacy Contamination

21. Contributing Cause(s):

3) Personnel Error
A. Inattention to Detail

22. Root Cause:

6) Management Problem
E. Policy Not Adequately Defined, Disseminated, or Enforced

---

23. Description of Cause:

The direct cause of this occurrence is due legacy radioactive waste in waste transfer lines from historic operations.

The contributing problem associated with this occurrence was due to a personnel error, inattention to detail. When the elevated beta count was detected on the manhole cover, radiological operations personnel could have taken further action to label the manhole cover and surrounding area since the survey was being conducted in preparation of future surveying and analysis work inside the manhole.

The root cause of the occurrence is the failure to mark the manhole as either a Soil Contamination Area or Underground Radiological Materials Area prior to surveying the work area. The procedure for posting SCA's and URMA's has yet to be defined and disseminated. The administrative controls associated with working in SCA's and URMA's also needs to be defined and disseminated. The target completion date for work associated with the posting of exterior areas as either SCA's or URMA's is scheduled for February 1997.

---

24. Evaluation (by Facility Manager/Designee):

Posting of URMA's and SCA's is normally not done until a complete site characterization has been performed. Since the Environmental Restoration Program has been expedited to complete cleanup in a more timely and more economic manner, complete assessments with Feasibility Studies and Records of decision (ROD's) have been replaced by doing sufficient

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characterization to enable planning of a Removal Action.

To implement DOE guidance without complete site characterization data, SCA's and URMA's will be posted on the basis of available environmental sampling data. Areas of known or suspected radionuclide contamination will be posted as an URMA. The URMA posting will be removed prior to initiation of soil intrusion and posted as a SCA. Areas will not be de-posted until they meet on of the following criteria: 1.) the Environmental Restoration Removal Action cleanup goals have been achieved. 2.) When the Potential Release Site (PRS) is classified as "No Further Assessment"; or 3.) For D&D projects when the cleanup value is achieved.

---

25. Is Further Evaluation Required?: No

---

26. Corrective Actions
(* = Date added/revised since final report was approved.)

1.	RCT Team Leader to instruct RCT's to be alert for indicators of radioactivity in unexpected areas and the resulting need to ensure proper radiological controls are in place.	
	Target Completion Date: 11/28/1996	**Completion Date:** 11/28/1996
2.	The remaining manholes associated with Environmental Restorations Underground Lines Project will be posted as Controlled Areas.	
	Target Completion Date: 11/27/1996	**Completion Date:** 11/27/1996
3.	Radiological Operations will post soils areas which exceed the posting criteria as either "Soil Contamination Area" or "Underground Radiological Materials Area".	
	Target Completion Date: *04/30/1997	**Completion Date:** 06/26/1997

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27. Impact on Environment, Safety and Health:

The RCT was not exposed to contamination since he did not enter the manhole. An extension rod was used to obtain the wipes inside the manhole.

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28. Programmatic Impact:

None

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29. Impact on Codes and Standards:

None

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30. Lessons Learned:

Post known contamination areas appropriately.

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31. Similar Occurrence Report Numbers:

M22 of 23

OH-MB_EGGM-EGGMAT04-1996-0008
OH-MB-EGGM-EGGMAT04-1996-0011

32. User-defined Field #1:

33. User-defined Field #2:

34. HQ Keyword(s):

06B--Radiological Issues - Facility/Equipment/Site Contamination
06F--Radiological Issues - Radcon Procedures (Start Feb 99)

35. DOE Facility Representative Input:

DOE/MB is tracking the posting of underground/soil contamination areas. All known areas and areas where contamination could reasonably be expected to be present will be appropriately posted by 2/28/97.

Entered by: POWELL, RAYMOND J Date: 06/26/1997

36. DOE Program Manager Input:

37. Approvals:

Approved by: Jon D. Yonko, Facility Manager/Designee
Date: 12/19/1996
Telephone No.: (513) 865-3151

Approved by: POWELL, RAYMOND J, Facility Representative/Designee
Date: 02/13/1997
Telephone No.: (513) 865-3041

Approved by: TRACY, TERRANCE, Program Manager/Designee
Date: 02/13/1997
Telephone No.: (301) 903-2173

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Appendix N

PRS Information

MOUND PLANT
PRS #123

RECOMMENDATION:

PRS 123 was identified as a result of a December 1970 waste line break. Several radionuclides (including Cobalt-60) are present in the soils at PRS 123 at a greater than 1 in 10,000 (10^{-4}) risk level.

Therefore, a RESPONSE ACTION is recommended for PRS 123.

CONCURRENCE:

DOE/MEMP: _____ 9/18/00
Robert S. Rothman, Remedial Project Manager (date)

USEPA: _____ 9/18/00
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: _____ 9/18/00
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from _____ to _____

☐ No comments were received during the comment period.

☐ Comment responses can be found on page _____ of this package.

R

MOUND PLANT
PRS 124

BUILDING 48 HILLSIDE

RECOMMENDATION:

Potential Release Site (PRS) 124 was identified due to a release on Nov. 9, 1967. 1,500 to 2,000 gallons of low-level radioactive wastewater were accidentally released during waste line repair. Several Main Hill radiological process waste lines join near this location and continue to the Waste Disposal (WD) Building. Soil Sampling accomplished in support of a construction project (Circa 1986) indicated Plutonium-238 concentrations as high as 32,000 pCi/g.

Therefore, a RESPONSE ACTION is recommended for PRS 124.

CONCURRENCE:

DOE/MEMP: _____ 6/19/01
Robert S. Rothman, Remedial Project Manager (date)

USEPA: _____ 6/19/01
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: _____ 6/19/01
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from Aug 14-02 to Sept 14-02

☐ No comments were received during the comment period.

☑ Comment responses can be found on first page _____ of this package.

RECOMMENDATION

PRS 31-36, 125, & 270 Package

Potential Release Sites (PRSs) 31-36, 125, and 270 were identified as PRSs as a result of breaks and/or separations in Mound's sanitary sewer lines, identified during a 1982 video survey of the lines. Radionuclides were not considered contaminants of concern. The concern was the potential release of non-radioactive contaminants into the environment from the identified breaks in the lines. A subsequent project repaired these lines by replacing them or by extruding a liner at the point of the breaks. Soil sampling was performed and results for all non-radioactive analytes were below 10^{-5} Risk-Based Guideline Values.

Therefore, the Core Team recommends **No Further Assessment** for PRSs 31-36, 125, and 270.

11-27-02

Rob Rothman, OSC
U.S. Department of Energy
Miamisburg, Ohio

11/26/02

Tim Fischer, RPM
USEPA
Chicago, Illinois

11/27/02

Brian Nickel
OEPA
Dayton, Ohio

MOUND PLANT
PRS 236
SOIL CONTAMINATION
SW BUILDING DOCK AREA

RECOMMENDATION:

Potential Release Site (PRS) 236 was identified after 34.5 pCi/g of plutonium-238 was detected in a surface sample, location S0166, collected from the dock area on the southwest corner of SW Building in 1983-84. Four (4) adjacent samples ranged from 0.22 pCi/g - 1.76 pCi/g. All are below the 10^{-5} Guideline Value of 55 pCi/g. Toluene was the only volatile organic compound (VOC) detected. The toluene concentration ranged from 0-106 parts per billion (ppb), which is below the calculated guideline value of 414,600 ppb.

In 1995, five surface samples were collected from the S0166 location.. These samples were field screened for radioactivity and VOCs to supplement the previous investigations. No radioactivity above background levels or soil gas VOCs were detected.

Since the detection of a slightly elevated level of plutonium-238 was limited to the one of five samples and additional sampling indicated no detections above background, NO FURTHER ASSESSMENT is recommended for PRS 236.

CONCURRENCE:

DOE/MB: Arthur W. Kleinrath 5/8/96
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fischer 5/8/96
Timothy J. Fischer, Remedial Project Manager (date)

OHIO EPA: Brian K. Nickel 5/8/96
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 6/15/96 6/19/96 to 7/15/96 7/17/96.

☒ No comments were received during the comment period.

☐ Comment responses can be found on page_____ of this package.

MOUND PLANT
PRS #423, 424, 425, 426, 427, 428
MAIN HILL UNDERGROUND LINES
H Building to WD Building

RECOMMENDATION:

PRS 423, 424, 425, 426, 427, and 428 were identified because the underground line segments carried radioactively contaminated effluent from H Building operations to the Waste Disposal building (WD).

Therefore, a RESPONSE ACTION is recommended for PRS 423, 424, 425, 426, 427, and 428.

CONCURRENCE:

DOE/MEMP: _____ 7/18/01
Robert S. Rothman, Remedial Project Manager (date)

USEPA: _____ 7/18/01
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: _____ 7/18/01
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from _____ to _____

☐ No comments were received during the comment period.

☐ Comment responses can be found on page _____ of this package.

R

MOUND PLANT
PRS #429, 430, 431, 432, 433

RECOMMENDATION:

PRSs 429, 430, 431, 432, & 433 were identified because the underground line segments carried radioactively contaminated effluent from T Building operations to the Waste Disposal building (WD). Several radionuclides (including Cobalt-60) are present in the waste lines at a greater than 1 in 10,000 (10^{-4}) risk level.

Therefore, a RESPONSE ACTION is recommended for PRSs 429, 430, 431, 432, & 433.

CONCURRENCE:

DOE/MEMP: _____ 9/18/00
Robert S. Rothman, Remedial Project Manager (date)

USEPA: _____ 9/18/00
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: _____ 9/18/00
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from _____ to _____

☐ No comments were received during the comment period.

☐ Comment responses can be found on page _____ of this package.

R

MOUND PLANT
PRS #434, 435, 436

RECOMMENDATION:

PRSs 434, 435 and 436 were identified because the underground line segments carried radioactively contaminated effluent from T Building operations to the Waste Disposal building (WD). Several radionuclides (including Cobalt-60) are present in the waste lines at a greater than 1 in 10,000 (10^{-4}) risk level.

Therefore, a RESPONSE ACTION is recommended for PRSs 434, 435, & 436.

CONCURRENCE:

DOE/MEMP: _____ 9/18/00
Robert S. Rothman, Remedial Project Manager (date)

USEPA: _____ 9/18/00
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: _____ 9/18/00
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from _____ to _____

☐ No comments were received during the comment period.

☐ Comment responses can be found on page _____ of this package.

R

MOUND PLANT
PRS #437, 438, 439
MAIN HILL UNDERGROUND LINES
Man Hole 20 to WD Building

RECOMMENDATION:

PRS 437, 438, and 439 were identified because the underground line segments carried radioactively contaminated effluent from R and SW Building operations to the Waste Disposal building (WD).

Therefore, a RESPONSE ACTION is recommended for PRS 437, 438, and 439.

CONCURRENCE:

DOE/MEMP: _____ 7/18/01
Robert S. Rothman, Remedial Project Manager (date)

USEPA: _____ 7/18/01
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: _____ 7/18/01
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from _____ to _____

☐ No comments were received during the comment period.

☐ Comment responses can be found on page _____ of this package.

R

MOUND PLANT
PRS #440
MAIN HILL UNDERGROUND LINES
Building SW to Building WD

RECOMMENDATION:

PRS 440 was identified because the underground line segment carried radioactively contaminated effluent from SW Building operations to the Waste Disposal building (WD).

Therefore, a RESPONSE ACTION is recommended for PRS 440.

CONCURRENCE:

DOE/MEMP: _____ 7/18/01
Robert S. Rothman, Remedial Project Manager (date)

USEPA: _____ 7/18/01
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: _____ 7/18/01
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from _____ to _____

☐ No comments were received during the comment period.

☐ Comment responses can be found on page _____ of this package.

R

Appendix O

Work Plan (Draft)

WORK PACKAGE / PRELIMINARY HAZARD ANALYSIS

☐~ Office Master Copy (Original Approval Signatures) ☐ ~ Field Working Copy (Original Field Sign -Offs) ☐ ~ Review Copy [Note: Mark this section in color] ☐ ~ Other Copy

Note: The Project Engineer is responsible for completing Sections 1 through 10.

1. WORK PACKAGE TITLE: **Building 48 Demolition**

2. WORK PACKAGE NUMBER: BOSS- 36791 | **Requestor: Lee Koehmstedt x 3659**

3. WORK PACKAGE SCOPE:

The purpose of this effort is to demolish Building 48. Using heavy equipment to demolish the facility (including pipe stanchions, superstructure, slab and foundation), remove and dispose of the debris, provide site restoration, grading, and erosion protection with seeding and mulch. This is a non-radiological demolition project and no RWP is required. Asbestos abatement, safe shutdown, and utilities isolation activities will have already been completed prior to demolition.

4. WORK LOCATION: **Building 48**

5. WORK PACKAGE PHASES:

1. Site information.
2. Site preparation & mobilization.
3. Building, pipe stanchions, slab and footings demolition.
4. Site restoration & demobilization.

List of Appendixes

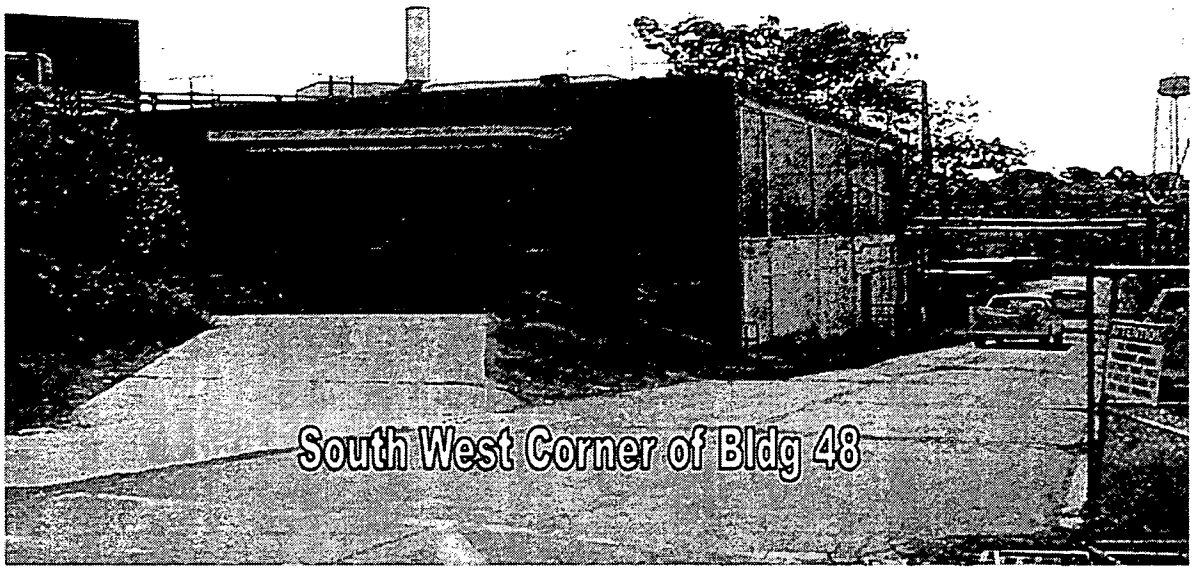
A – PHA/JSHA
B – Pre-Job Briefings/Job Status Log
C – Drawings/Sketches
D – Miscellaneous (RWP, USQ, etc.)
E – Post-Job Conference/Lessons Learned

Note: Insert the Work Package phases for the job. A phase is a separately definable portion or evolution of the project.

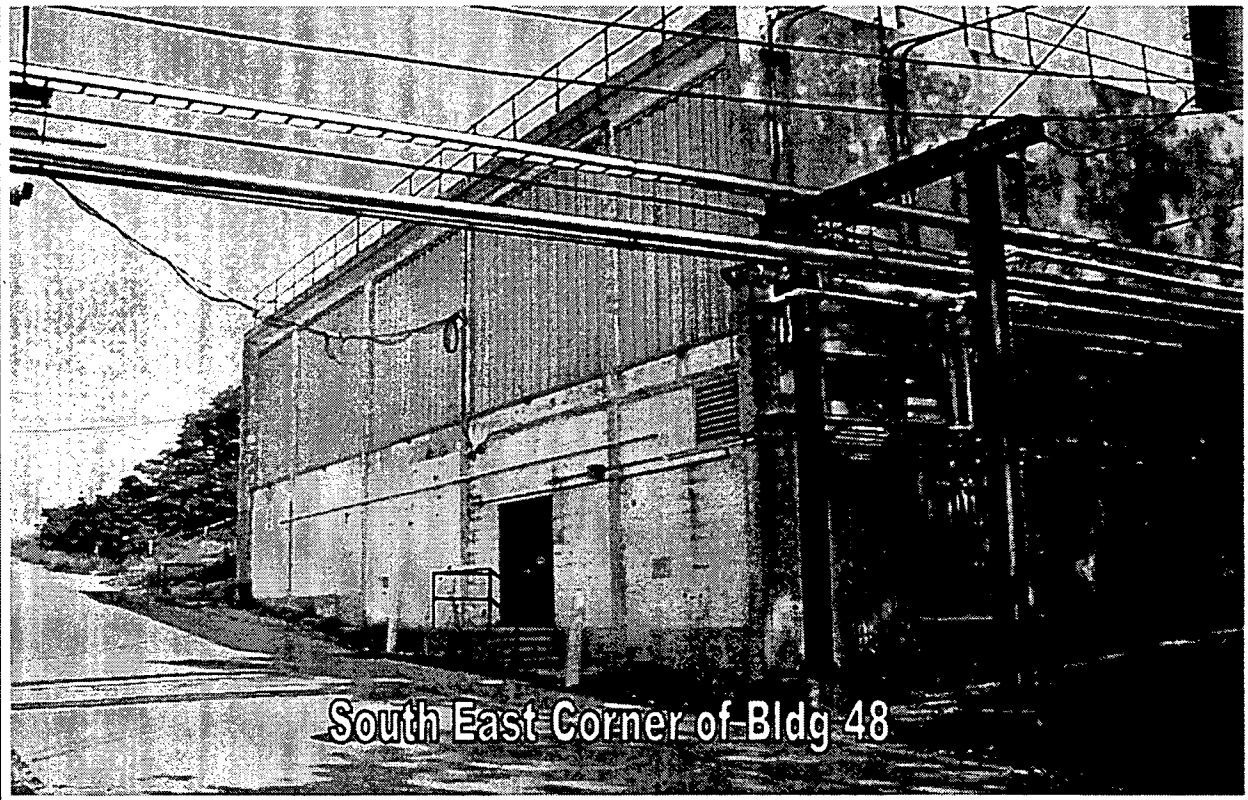
6. SPECIAL MATERIALS AND EQUIPMENT:

1. Tracked excavator with shear, grapple, hoe ram, concrete cracker/pulverizer, or bucket attachment.
2. Rock crusher.
3. Aerial man lifts.
4. Rubber tired and tracked front-end loaders.
5. Transport equipment for debris.
6. Fog Cannon

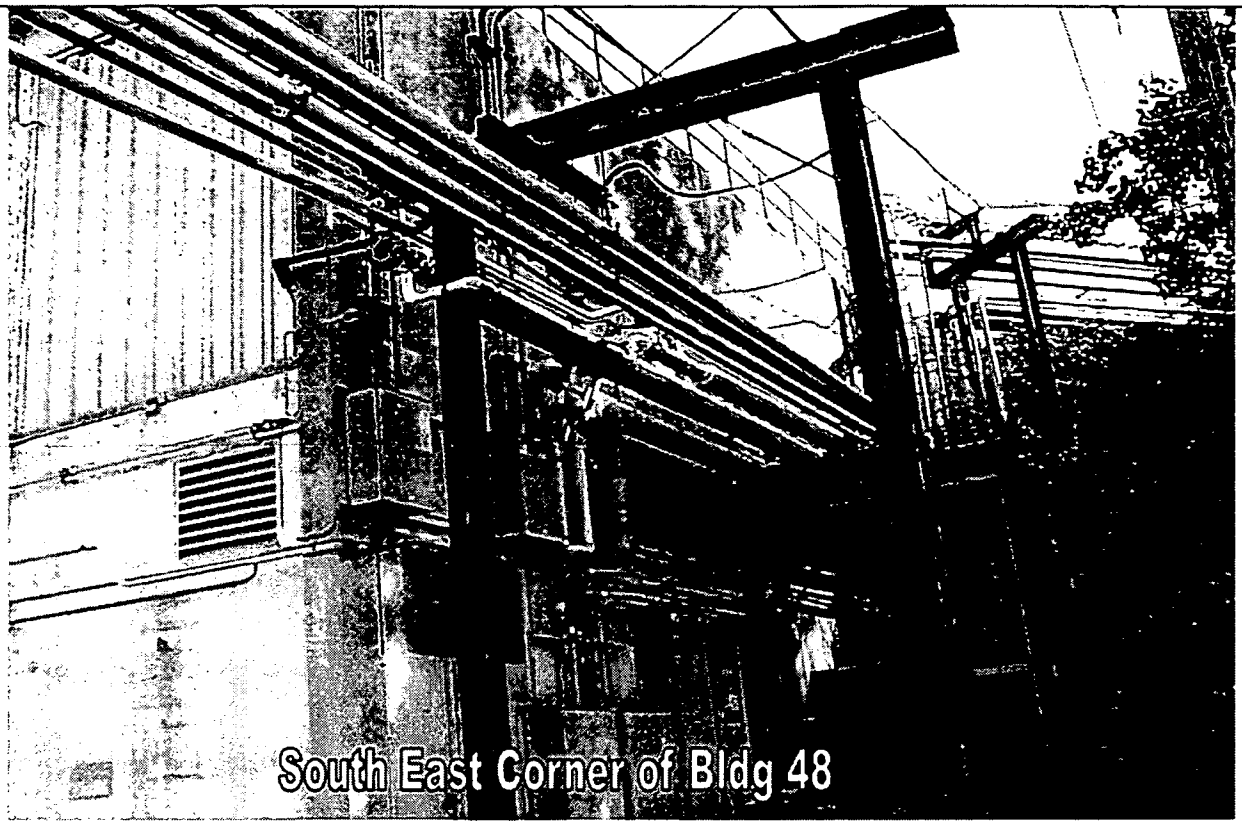
Note: Insert any materials that require long lead procurement or special order. Don't list common items such as PPE.



South West Corner of Bldg 48



South East Corner of Bldg 48



7. DETAILED WORK STEPS:

7.1 SITE INFORMATION:

Building 48 is a two story building constructed in 1970, as the "Energetic Material Surveillance Facility." At the time of construction, the building contained 7,950-ft^2.

This building is atypical of Mound buildings as it has not had any additions constructed on it, and today remains at the "as constructed" square footage. PRS 125 has been binned NFA, and is a sanitary sewer manhole is located near bldg. 48. Other PRS in the vicinity of the building include PRS 429 located behind the building to the north and PRS 123 to the east of the building both of these PRS 's are removal actions.

The foundation consists of standard reinforced concrete "footers" and "stem foundation walls."

Exposed exterior wall construction generally consists of reinforced concrete block. Reinforcing rebar consists of #5 @ 48" for vertical wall reinforcement and continuous bond beam with a two reinforcing rebar (#4). Masonry block has a vermiculite fill. The South wall is a blow-out wall by design.

The floor slab is 6" thick reinforced concrete, with a vapor barrier at its base, underlain by 6" of compacted gravel.

7.2 NATIONAL HISTORIC PRESERVATION ACT (NHPA)

Building 48 is not listed as a historic structure with the Ohio Historic Preservation Office (OHPO). No mitigative documentation package is required.

IMPORTANT: However, if any items or artifacts are discovered as this project progresses, the Cultural Resource Representative will be notified at extension 3691. Work will be temporarily suspended until which time the items or artifacts have been recovered.

7.3 SITE PREPARATION & MOBILIZATION

7.3.1 Site Access Control

Work zone boundary will be established during Safe Shutdown, using fencing and/or with barricade tape as directed by the Project Foreman. Proper signage will be placed at all access points to the site.

This zone is not to be entered by anyone not directly involved with the demolition unless they have obtained permission from the Project Construction Manager/Foreman first.

Emergency egress for Bldgs. DS and T occupants shall be maintained.

7.3.2 Site Erosion Control

Install sediment/storm water control fence, straw bales and sandbags around designated construction area. See Underground utilities and Erosion Control Sketch in Appendix C. Coordinate with Environmental Compliance PoC. The effectiveness of storm water controls will be evaluated as the project progresses. Erosion control to remain in place until a good stand of grass is present.

7.3.3 Clear Area and Mark/Protect Utility Equipment and Monitoring wells

The area around the building will be mowed or otherwise cleared of obstacles as appropriate.

Mark and/or protect fire prevention post indicator valves(PIV's), monitoring wells and other utility equipment with visible stakes. Cover field grates for protection.

7.3.4 Temporary Utilities

The only temporary utilities that will be required is water and electricity. Ensure backflow prevention is present, if applicable. Water will be used to control dust emissions.

7.3.5 Temporary Facilities

This project will use the existing BOSS project trailer complex located in the existing Mound "C" parking lot.

7.3.6 Temporary Communications

Temporary communications are required (cell phone, radios) due to the equipment for hearing plant announcements and emergency notifications will have been removed prior to demolition.

7.3.7 Staging Areas

The project site is of sufficient size to also be used as a staging area. Roadway to be closed during work activities.

7.4 PRELIMINARY ACTIVITIES AND VERIFICATIONS

7.4.1 Verify all Building Safe Shutdown Activities have been completed per BOSS-36789

verified by _____ date: _____
Bill Wahler or designee

7.4.2 Verify all Building Mechanical Utility Isolation Activities have been completed per FTS –36792.

verified by _____ date: _____
Allen Upshaw or designee

7.4.3 Verify all Building Electrical Utility Isolation Activities have been completed per FTS-37483.

verified by _____ date: _____
Allen Upshaw or designee

7.4.4 Verify the Radiological Final Status Report complete, by contacting Steve Collas @ 4522.

Control number _____ verified by _____ date: _____
Bill Wahler or designee

7.4.5 The *Pre-Job Briefing Record* must be completed and signed.

7.4.6 The *Job Specific Hazards Analysis (JSHA) must be reviewed.*

7.4.7 Notify engineering to communicate with site security and site "GroupWise" e-mails news of the pending road closure.

Notify Doug Levan X-3571 Building Manager of T, occupants of demolition schedule, potential traffic pattern delays, and building access/egress coordination.

Verified by _____ date: _____
Mike Stromberg or designee

7.4.8 Notification of Demolition and Renovation form must be filed with the Regional Air Pollution Control Agency (RAPCA) at least **10 business days before planned building demolition.**

HOLD POINT: RAPCA Notification verification

Environmental Compliance PoC_____ Date to Proceed with Demo_____

IMPORTANT NOTE: All workers have Stop Work Authority. Situations where stop work authority is to be exercised are:

- To stop unsafe work.
- To stop unauthorized work, for example, work outside the scope of this work package.

7.5 BUILDING DEMOLITION SEQUENCE OF WORK

HOLD POINT: 'COLD & DARK' Review Team Walk-down Completed & Project Manager Authorizes Work to Start:

Project Manager:_____ Date and Time:_____

7.5.1 Structural Demolition

Starting on the western or southern side of the structure demolish the structure's concrete walls, floors and ceilings using heavy equipment. Reach through building openings with heavy equipment to extract building mechanical and electrical equipment components for demolition. Use the existing slab for load out surface for loading debris and placing into appropriate hauling containers or trucks.

Note: The progression of the building demolition will ultimately be determined in the field.

IMPORTANT: Ensure structure collapse is directed away from Building T and roadway to the west of Bldg.T tunnel.

CAUTION HAZARD: Vehicle traffic hazard. Stop and barricade traffic flow during stanchion removal and building demolition with construction fencing.

WARNING HAZARD: Dust Control – Utilize misting and fogging during demolition & road wetting during waste hauling. The Goal is no visible dust emissions. The effectiveness of dust controls will be evaluated as the project progresses.

CAUTION HAZARD: Contact overhead power lines with heavy-duty equipment. If any part of heavy-duty equipment

has the potential to come within 10' of street lighting circuit, perform LOTO to de-energize electrical power source. This circuit must be re-energized each evening when demolition is complete for that day.

CAUTION HAZARD: Struck by flying debris. Establish construction boundary. Wear hardhat, safety glasses, safety shoes, and reflective vest inside construction area. Steep and uneven terrain hazard use caution when walking around structure.

CAUTION HAZARD: Struck by moving equipment.

- Maintain the following distances from operating equipment:
  - Shear – 75 feet
  - Hoe Ram – 50 feet
  - Other heavy duty equipment – 30 feet
  - Bobcat – 15 feet

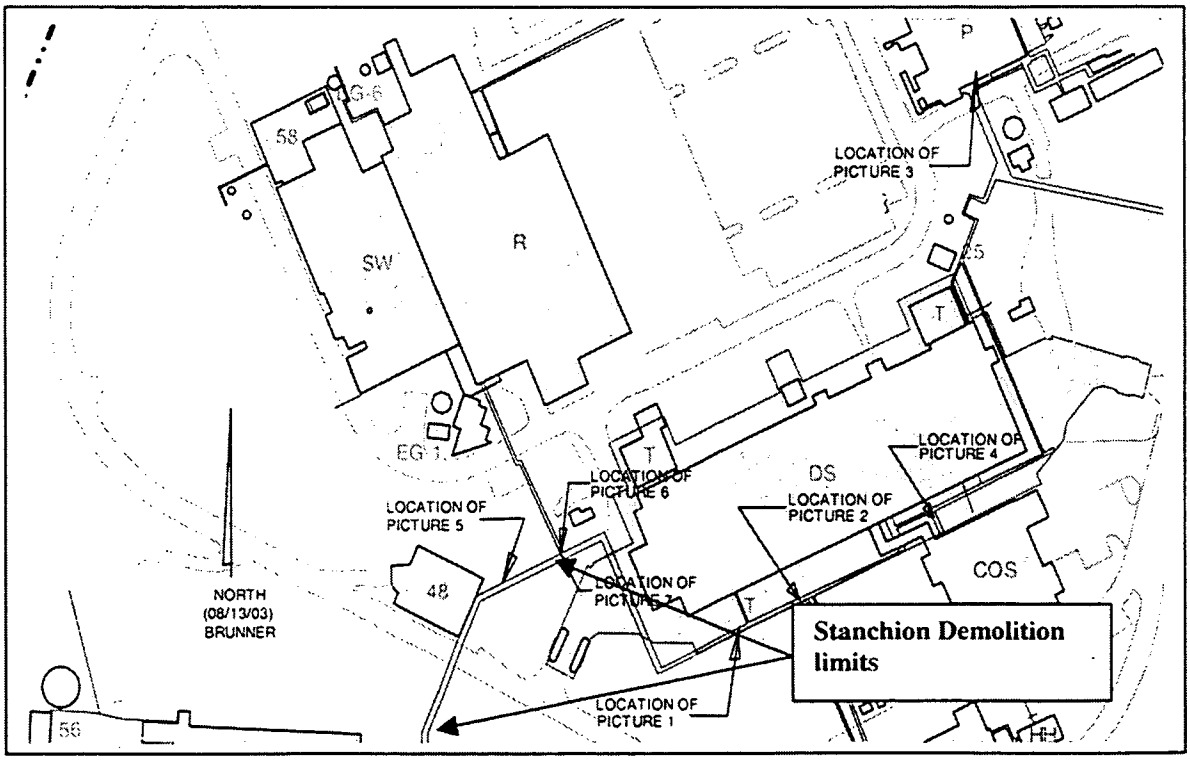
WARNING NOISE HAZARD: Wear hearing protection while running heavy-duty equipment. Follow the requirements of MD-10286 D9.

CAUTION HAZARD: Burns from torch cutting. Obtain and follow Hot Work permit per MD-10286 O2

CAUTION HAZARD: Heat/Cold Stress. Follow the requirements of MD-10286 D13/D16

7.5.2 Pipe Stanchion Line Demolition

Sketch below is from the utility disconnect package with the demolition limits



Refer to the Utility Isolation Activity plans Mechanical FTS-36792 and Electrical FTS-37483 for detail of isolations.

CAUTION HAZARD: Terrain is very steep and covered with vegetation that can be a slipping hazard.

06 of 48

Demolish utility stanchions to limits shown on sketch above, remove concrete support piers (down to a min. 3' beneath grade), grade and compact pier holes with backfill to prevent ponding; and remove the generated demolition debris.

CAUTION HAZARD: There is known soil contamination in and on the hillside north of Building 48. Analytical results above site Cleanup Objectives have been found at the surface and to a depth of 10.5 feet (see Table 1, and Figure A in appendix C). In the hillside, there is a hot waste line (PRS 429), which has been designated as a Removal Action (RA). The ER project will perform the RA after the demolition of Building 48 is complete; the RA will include the removal of the hot waste line and the contaminated soil in the vicinity.
In addition to the contaminated soil within PRS 429, there is one additional boring location (C0063) that has elevated analytical results. However, the exact location of C0063 is +/- 25 feet from the location shown on the attached graphic.

Table 1 - Maximum Results Exceeding Screening Levels (pCi/g)

Analyte	Maximum Result*	Background	RBGV (10^{-6})	Screening Level	Location	Depth (bgs)
Cobalt-60	**1.10**	**NC**	**0.07**	**0.07**	**C0063**	**10.5 feet**
Plutonium-238	**2,902**	**0.13**	**6.10**	**55**	**SCR191**	**Surface**
Thorium-230	**5.23**	**1.9**	**0.09**	**2.00**	**MND17-0557**	**0 to 0.5 feet**
Thorium-232	**182.2**	**1.4**	**0.07**	**1.47**	**SCR191**	**Surface**
Uranium-238	**5.37**	**1.2**	**0.1**	**1.3**	**MND17-0557**	**8 to 12 feet**

RBGV: most stringent of construction and office worker scenarios per Risk-Based Guideline Values, March 1997, Final, as performed using April 2001 HEAST slope factors.

NC: Not calculated for as part of background soils investigation.

*** Results also exceed site Cleanup Objectives, which are based on 10^{-5} RBGV plus background.**

All craft working on this project are advised of the soil contamination in the hillside north of Building 48 and are advised to perform the demolition activities in a manner that minimizes disturbance of the hillside soil. If hillside soil disturbance is necessary, Radiological Control and Engineering are to be consulted prior to the soil disturbance for further direction.

CAUTION HAZARD: Strike underground utilities. Obtain Excavation permit and follow its requirements per MD-10286 O5

Note: The progressions of the stanchion line demolition will ultimately be determined in the field.

7.5.3 Slab and Foundation Demolition

CAUTION HAZARD: Terrain is very steep and covered with vegetation that can be a slipping hazard.

Using heavy equipment, break apart the concrete slab, foundation, and footers to 3 feet below grade, torch cut the rebar if required (Hot Work Permit is required) to support demolition and downsizing.
A portion of the foundation wall and slab below the 3 foot demolition limit will be left in place to stabilize the hillside to the northeast of Building 48. Maintain current hillside slope from the upper hill/building soil interface point down to the road side prior building southern wall location.

During concrete demolition, use heavy equipment to assist radiological control personnel to perform radiological screening of ground contact concrete surfaces. Based on radiological screening results, transport to Mound's spoils area (contact project engineering to prepare clean waste form), offsite disposal, or rail spur as directed by Waste Management PoC.

Note: The progressions of the slab & foundation demolition will ultimately be determined in the field.

CAUTION HAZARD: Strike underground utilities. Obtain Excavation permit and follow its requirements per MD-10286 O5

CAUTION HAZARD: Burns/fire. Utilize Burn Permit, fire protection, and wear appropriate PPE.

7.6 SITE REMEDIATION & DEMOBILIZATION

7.6.1 Grading, Seeding, & Mulching
Restore the area by grading and filling with appropriate amount of gravel/soil to grade to drain.

Apply appropriate amounts of grass seed and mulch to maintain erosion control/protection in accordance with Environmental Compliance PoC instructions. Erosion control to remain in place until a good stand of grass is present. Remove any unnecessary remaining sediment/storm water control fences, straw bales and sand bags.

CAUTION SLIP TRIPS FALL HAZARD: Steep terrain utilize fall protection, be sure of footing, be aware of slippery slope and vegetation, use barricades.

7.6.2 Remove Temporary Protection Structures
Remove wooden boxes from fire hydrants, fire prevention water lines, steel sheeting from field grates.

7.6.3 Demobilize Construction Equipment
Remove dust control water distribution system, temporary power, fencing and any traffic control. Scan equipment for radiological contamination prior to leaving area as required dependent upon in-process Rad surveys.

Note: Insert the activities to be performed during the job. Describe the specific methods of accomplishing these activities and appropriate level of detail based on the complexity, hazard, and skill of the craft. Activities listed must be grouped under the Work Package phases listed in item 5.

8. *Note: Comments, to identify activities/hazards that are common to multiple phases of the project. Identification of these items will facilitate the option of addressing the items once in the pre-job briefing, as opposed to redundantly listing them in the JSHAs for different phases.*

COMMENTS:

Enter any review comment or issues in this section and/or information generated as a result of completing detailed work steps.

9. REVIEW SIGNATURES:

Written by: _____ Date: ___/___/___ Phone: _____

Job Foreman: _____ Date: ___/___/___ Phone: _____

Superintendent/Constr. Mgr: _____ Date: ___/___/___ Phone: _____

Project Eng. Mgr: _____ Date: ___/___/___ Phone: _____

Industrial Safety & Hygiene: _____ Date: ___/___/___ Phone:

Rad. Controls: _____ Date: ___/___/___ Phone:

Environmental Compliance_____ Date: ___/___/___ Phone:

Waste Mgmt: _____ Date: ___/___/___ Phone:

Bldg. Mgr:_____ Date: ___/___/___ Phone:

Craft Review:_____ Trade_____ Date: ___/___/___ Phone:

Craft Review:_____ Trade_____ Date: ___/___/___ Phone:

Craft Review:_____ Trade_____ Date: ___/___/___ Phone:

Craft Review:_____ Trade_____ Date: ___/___/___ Phone:

10. USQ SCREEN / DETERMINATION REQUIRED? ☐ **YES** ☐ **NO**

Brief Explanation: This work will have no effect upon a nuclear or radiological bldg.

USQ Trained Person: _____ Date: ___/___/___ Phone:

10. AUTHORIZATION SIGNATURE:

Project Manager: _____ Date: ___/___/___ Phone:

11. WORK PACKAGE CLOSURE:

Job Supervisor: _____ Date: ___/___/___ Phone:

Project Manager: _____ Date: ___/___/___ Phone:

RETURN PHA TO IS&H AT JOB COMPLETION.

Work Package Revision Form

Work Package Revision Form			
Work Package No. BOSS- 36791		Revision No.	
Revision Description: (attach page revisions to form)			
	Name	Signature	Date
PREPARED BY:			
Revision Preparer:			
REVIEWED BY:			
Project Engr. Manager:			
Project Foreman:			
Project Superintendent/ Constr. Mgr.:			
Industrial Safety & Hygiene P o C:			
Radiological Point of Contact:			
Environmental Safeguards & Compliance P o C:			
Waste Management PoC:			
Building Manager:			
Other:			
Other:			
USQ Trained Person			
USQ SCREEN / DETERMINATION REQUIRED? ☐YES ☐NO Brief Explaination_____			
APPROVED BY:			
Project Manager:			

Work Package Revision History Form

WORK PACKAGE REVISION HISTORY FORM			
REV. NO.	REASON	SIGNATURE	DATE

Appendix A

PHA/JSHA

PRELIMINARY HAZARD ANALYSIS (PHA)
FOR WORK PACKAGE ACTIVITIES

SECTION A. INDUSTRIAL SAFETY - TO BE COMPLETED BY THE INDUSTRIAL SAFETY AND HEALTH REPRESENTATIVE
Identify engineering/administrative controls or PPE as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard (i.e. lead compliance plans, confined space plans, hearing conservation programs, etc.). Including any notations for future Hazard Analyses. Additionally, identify any activities which DOE prescribed Occupational Safety and Health standards, that require protective measures be designed, inspected, or approved by a professional engineer or other competent person. (Use Section D if additional space is needed.)

Item	Exist	Work Package Phase	Comments, Controls, Methods of Compliance
Blockage of exits or means of egress	Yes	2	[EGRESS] Building T & DS -West Tunnel needs to be protected, and access provided.
Blockages/obstructions (Identify)	No	N/A	
Burning, welding, hot-work (Fire Watch)	Yes	3	[BURN] Verify paint does not contain lead or other coatings that become toxic when heated prior the use of cutting torch during demolition. Obtain and follow Hot Work Permit. All compressed gas cylinders will be stored, transported, and used in accordance with MD-10286 ops. no. H-1.
Chemical compatibility of corrosives/flammables	No	N/A	
Chemical process safety	No	N/A	
Compressed gas cylinders	YES	All	All compressed gas cylinders will be stored, transported, and used in accordance with MD-10286 ops. no. H-1.
Confined space entry	No	N/A	[CONFINE]
Crane operations, overhead or mobile	No	N/A	
Critical lifts (heavy or high value loads)	No	N/A	[CLIFT]
Electrical hazards	YES	ALL	[LIVEL] Electrical Isolation of facility is accomplished during Utilities Isolation activities. Street light circuit will be LOTO when within 10'.
Elevated work/fall protection	YES	All	[ELEV]
Emergency eyewash/shower available	No	N/A	[EWASH]
Emergency alarms or evacuation plans required	Yes	All	[EMERG] Plant Public Address system will be used to announce any plant emergency over the plant radio channel, cell phones will be used also, no specific added hazards exist in the demolition of this building.
Explosive/flammable atmosphere	No	N/A	
Explosives	No	N/A	
Fire protection system/equipment outage	Yes	All	[FIRE/EFIRE] FAS & fire protection system isolated during Utilities Isolation activities.
Fire Hazards Analysis Required of Demolition	Yes	N/A	[FHA/ADJA] FHA walkthrough of facility is accomplished during Utilities Isolation activities.
Flammable liquids/gases	Yes	ALL	Verify paint does not contain lead or other coatings that become toxic when heated prior the use of cutting torch during demolition. Obtain and follow Hot Work Permit. All compressed gas cylinders will be stored, transported, and used in accordance with MD-10286 ops. no. H-1.
Forklifts, aerial lifts or material handling equipment	Yes	All	
Grounding of electrical equipment	No	N/A	
Hazards due to condition of facility or terrain (Identify)	Yes	3 & 4	Proximity to T-West Tunnel and west roadway of Southside ofBldg.48 heavy traffic patterns. Increase awareness of adjacent structures & roadway and utilize traffic control. Also the Bldg. 48 structure sets on a steep slope.
Hoisting and rigging	No	N/A	[HOIST]
Lighting/illumination/adequacy	Yes	3	[MLITE] Provide temporary lighting.
Excavation and Soil disturbance	Yes	3 & 4	Excavation Permit is required for stanchion, slab and foundation removal.

SECTION A. INDUSTRIAL SAFETY - TO BE COMPLETED BY THE SAFETY AND HEALTH REPRESENTATIVE

Identify engineering/administrative controls or PPE as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard (i.e. lead compliance plans, confined space plans, hearing conservation programs, etc.). Including any notations for future Job Safety and Health Analysis(JSHA). Additionally, identify any activities which DOE prescribed Occupational Safety and Health standards that require protective measures be designed, inspected, or approved by a professional engineer or other competent person. (Use Section D if additional space is needed.)

Item	Exist	Work Package Phase	Comments, Controls, Methods of Compliance
Lockout/tagout of hazardous sources:	No	N/A	[LOTO/ISO]
• Electrical	Yes	2, 3, & 4	Electrical Isolation of facility is accomplished during Utilities Isolation activities. Street light circuit to be LOTO as needed, follow MD-10286 ops. No. M3
• Mechanical (steam, hydraulic, pneumatic)	Yes	2, 3, & 4	Mechanical Isolation of facility is accomplished during Utilities Isolation activities.
• Interlocks	No	N/A	[ILOCK]
• Chemical	No	N/A	
• Radiological	Yes	3	The roof access ladder has fixed contamination, remove and transport to the rail spur. Building 48 is not a radiological area, no RWP is required.
Machine guards	N/A	N/A	
Modification to Fire Wall/Door	No	N/A	[FIREWAL]
Obstruction of fire protection equipment (pull boxes, hydrants, fire department connections, control panels, fire extinguishers, etc.)	Yes	All	Fire hydrant available for emergency use.
Off-shift work	Yes	All	Potential for 2nd Shift due to traffic/Building T – West Tunnel access coordination–road closure will be required
Outages of the plant public announcement (PA) system or the emergency notification system	No	N/A	[OUTAGE]
Overhead or underground utilities (Identify)	Yes	2, 3, & 4	[UTTL] See attached drawings Appendix C.
Penetrations into walls, floors, etc.	No	N/A	[PENETR]
Plastic sheeting or wood framing/enclosures	No	N/A	
Powder-actuated tools	No	N/A	
Plant utilities (Identify)	No	N/A	[WATER]
Repetitive work	No	N/A	[ERGO]
Structural Modification	Yes	2 & 3	[STRUCT] Building & slab are being demolished.
Special Fire Protection Equipment Required	No	N/A	[FIREQU]
Trenching/Shoring	No	N/A	[DIG]
Temporary heating facilities	No	N/A	
Temporary/portable buildings or structures	N/A	N/A	[FACIL]
Temporary service hook-ups (Identify)	Yes	All	Temp. electrical and water service (for dust control).
Traffic control/flagman	Yes	All	[TRAFIC] as needed basis, during equipment movement & demolition activities – road closure will be required
Work in attics, ceilings, chases, or crawlspaces	No	N/A	
Work impacting adjacent normally occupied areas	Yes	2 & 3	[ADJAC/BMAPP/SIGNS/NOTIF] Coordination with Building T and DS tenants during demolition activities –road closure will be required.
Work Requiring Scaffolding, construction and inspection	No	N/A	[SCAFF]
Other (Specify) Building Structural Engineering Survey per OSHA 29 CFR 1926.850	Yes	2	Survey Completed by W. Johanan letter in Appendix D.

SECTION B. INDUSTRIAL HYGIENE - TO BE COMPLETED BY INDUSTRIAL HYGIENE REPRESENTATIVE

Identify engineering/administrative controls or PPE as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard (i.e. lead compliance plans, confined space plans, hearing conservation programs, etc.). Including any notations for future Job Safety and Health Analysis (JSHA). Additionally, identify any activities which DOE prescribed Occupational Safety and Health standards that require protective measures be designed, inspected, or approved by a professional engineer or other competent person. (Use Section D if additional space is needed.)

Item	Exist	Work Package Phase	Comments, Controls, Methods of Compliance
Abrasive blast (☐ MSDS available)*	No	N/A	
Asbestos	Yes	3	[ASBEST] Asphalt roof may contain asbestos, don't conduct activities which may cause ACM materials to become friable and involving close worker contact. Asbestos abatement activities of regulated materials will be completed prior to demolition.
Beryllium	No	N/A	
Blood-borne pathogens*	No	N/A	
Cadmium	No	N/A	
Carcinogens (☐ MSDS available)*	No	N/A	[CARC]
Chemicals/solvents (☐ MSDS available)*	No	N/A	[CHEM/MSDS]
Chlorofluorocarbon (CFC)	No	N/A	[CFC]
Coal, tar or asphalt products	Yes	2	Roofing material contains tar and asphalt products; to be disposed of as construction debris.
Coating/painting (☐ MSDS available)*	No	N/A	
Corrosives/acids/caustics (☐ MSDS available)*	No	N/A	
Dusty operations	Yes	2 & 3	[POWDER] Potential dust generation controlled via water misting during demolition and road wetting during waste hauling.
Hazardous Waste Operations (HAZWOPER)*	No	N/A	
High Pressure systems	No	N/A	[HIPRES]
Insulation/man-made mineral fibers (☐ MSDS available)*	No	N/A	
Lasers	No	N/A	
Lead	Yes	2 & 3	Paint may contain lead, do not torch cut painted surfaces without verification by IH.
Foam in Place Operations	No	N/A	
Mercury	No	N/A	
Noise in excess of 85 dBA	Yes	2 & 3	[NOISE] Hearing protection required
Polychlorinated biphenyls (PCBs)	No	N/A	
Removal of ceiling tiles*	No	N/A	
Spraying/generation of mists*	Yes	2 & 3	Demolition dust control via water mist and road wetting during waste hauling.
Temperature extremes (heat or cold stress)	Yes	All	[CRYRO/COLD/HEAT] discuss in Pre-job/daily briefings & monitor work.
Ventilation or Air Monitoring requirements	Yes	2 & 3	[VENTIL/IH] Air monitoring for potential silica during demolition activities will be performed as needed for annual site assessment.
Welding, brazing, or thermal cutting operations	Yes	2 & 3	[BURN Verify paint does not contain lead or other coatings that become toxic when heated prior the use of cutting torch during demolition. Obtain and follow Hot Work Permit. All compressed gas cylinders will be stored, transported, and used in accordance with MD-10286 ops. no. H-1.
Other (specify)	No	N/A	

***NOTE:** Requires a description of the materials involved which present a hazard. Identify the physical location of the MSDS.

SECTION C. RADIOLOGICAL PROTECTION - TO BE COMPLETED BY RADIOLOGICAL CONTROLS REPRESENTATIVE

Identify engineering/administrative controls or PPE as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard (i.e. RWP, ALARA Plan, etc.). Additionally, identify any activities which DOE prescribed Occupational Safety and Health standards that require protective measures be designed, inspected, or approved by a professional engineer or other competent person. (Use Section D if additional space is needed.)

Item		Exist	Work Package Phase	Comments, Controls, Methods of Compliance
Location:	Controlled Area	No	N/A	
	Contamination Area	No	N/A	[STP]
	High Contamination Area	No	N/A	[STP]
	Radioactive Materials Storage Area	No	N/A	
	Airborne Radioactivity Area (STP or OBT)	No	N/A	
	Radiation Area	No	N/A	
	High Radiation Area	No	N/A	
	Very High Radiation Area	No	N/A	
	Other (Specify)	No	N/A	
Activities:	Criticality Safety Concerns	No	N/A	
	Digging/Soil Removal	Yes	3 & 4	[DIG] Excavation Permit required. Flip slab sections to survey before release.
	Surface destruction of radioactively contaminated materials or equipment?	No	N/A	[SURFAC]
	Welding, burning, or grinding?	No	N/A	[SURFAC]
	Hammering, chipping or scraping?	No	N/A	[SURFAC]
	Abrasive blasting?	No	N/A	[SURFAC]
	Dust-collecting equipment or systems?	No	N/A	
	Decontamination and clean-up?	No	N/A	
	Rad Waste Storage and Disposal Required	No	N/A	[RWSTOR/WASTE/CHAR]
	Other (Specify)	No	N/A	
Sources:	X-Ray machine/generator	No	N/A	[XRAY]
	Sealed radioactive sources	No	N/A	
	Unsealed radioactive sources	No	N/A	
Controls:	Radiological Work Permit	No	N/A	[RWP/RWP=JS/RWP=N/R/RPGEN]
	ALARA Plan	No	N/A	[ALARA]
	Air Flow Studies	No	N/A	[AIRFLOW/CAM]
	Urinalysis program	No	N/A	
	Preliminary or in-process characterization	No	N/A	[SURVPS/SURVIP]
	Anti-contamination clothing	No	N/A	
	Respiratory protection	No	N/A	[RESP]
	Needs Analysis Evaluation	No	N/A	
	Hazards Analysis	No	N/A	
	Engineering Controls	No	N/A	
	Administrative Controls	No	N/A	
	Supplemental dosimetry	No	N/A	
	Shielding	No	N/A	
	Personnel monitoring (frisking)	No	N/A	

SECTION D. ENVIRONMENTAL COMPLIANCE - TO BE COMPLETED BY ENVIRONMENTAL COMPLIANCE REPRESENTATIVE
Identify engineering/administrative controls as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard Additionally, identify any activities which are DOE or EPA prescribed protective requirements (Use Section F if additional space is needed.)

Item	Exist	Work Package Phase	Comments, Controls, Methods of Compliance
Conditions			
Fugitive Dust OPA980014	Yes	3	Use water misting during demolition & road wetting during waste hauling.
Storm Water Runoff	Yes	3	Install silt fence, straw bales and sandbags per attached sketch Appendix C.
Erosion Control	Yes	4	Grading, seeding, & mulching.
NESHAPS Calculation	Yes	N/A	Emission Levels determined to be below requirement. No US EPA approval required for this building.
Safe Drinking Water Act	Yes	2 & 3	Ensure backflow prevention for water misting source.
Emergency Spill Response	Yes	3	Ensure glycol spill kit is available.
Notifications			
RAPCA Notification for Asbestos	No	N/A	Asbestos abatement completed prior to demolition.
RAPCA Notification for Demolition	Yes	3	Required 10 business before beginning demolition activity
Emergency Spill Response	Yes	3	Call 911 or 865-4040, have spill kit at job site.
other			

SECTION E, WASTE MANAGEMENT- TO BE COMPLETED BY WASTE MANAGEMENT REPRESENTATIVE *Include any required and/or other special actions to be taken because of the particular hazard. Additionally, identify any activities which are required by DOE, Nevada Test Site, Envirocare or other waste site.* (Use Section F If additional space is needed.)

	Quantity Expected	Work Package Phase	Radiological Characterization	Packaging Requirements	Mode of Disposal
Types: Solid Waste (list types):	Total 200 cyds	3	No elevated radioactivity levels	30 Cu. Yd. Roll-Off/End Dumps	Offsite disposal via Waste Management Operations/Journey LTD
Concrete					
Steel & Copper Piping					
Metal Roofing					
PVC					
Electrical Wiring					
Fiberglass Insulation					
Wood					
RCRA Hazardous Waste (list types)	Non-hazardous				
Asbestos Waste	None				All non-regulated asbestos disposed with construction debris
Low Level Waste	N/A				
TRU Waste	No				
NOTE: 1. Sealed pressure vessels will need to be at <1.5 atmosphere if present. 2. Any items not previously evaluated are to be set aside for evaluation by Waste Management prior to disposal.					
Other:					

SECTION F - OTHER CONDITIONS, CONCERNS, OR SUPPLEMENTAL INFORMATION FROM SECTIONS A THROUGH C INCLUDING APPLICABLE LESSONS LEARNED

EMERGENCY PREPAREDNESS

- Site Notification Procedures

Use **911** for all emergency services onsite. This is the first response for any emergency, spill, or release. If using a cell phone, dial **865-4040**. This number will ring into the plant 911 system. Any injury, no matter how minor, shall be reported immediately to the Medical Department for evaluation and treatment. The injured employee shall report any injury to the supervisor in charge or designee.

Employees will be notified of emergency or abnormal conditions by the project two-way radios. Additionally, unique sheltering and evacuation signals are available should site-wide protective actions be necessary.

- Evacuation Route/Assembly Areas

Assembly area is east of Building 89 drive . See sketch in Appendix C.

- Take Shelter Area

Be aware of threatening weather and take shelter when life-threatening storms are imminent.

The take shelter area is in T Building port. See map per Appendix C.

APPLICABLE LESSONS LEARNED – See Appendix E

Attachment 1 – Request To Stage Clean Hard Fill Debris at Construction Spoils Area

Work Location/ Building 48 Approximate Volume 200cyds
Source of material
Requestor Project Group Boss Project Point of Contact Lee Koehmstedt

Name/Phone Ext. 3659

MSR # 36791 Charge # EE048J

Process Knowledge (attach documentation, if more space needed):

PRS #125 PRS Binning Status: NFA
Binning remarks
Clean up criteria for soils

Identify how point of origination /area is posted: (e.g. non-RMMA, URMA, SCA, CA, HCA, RMA, RMMA, FCA, etc.) Note:

Radionuclides of Concern for verification sampling:

Radiological Surface Contamination Not Applicable – never exposed to radionuclides circle if applicable

Survey Results: <PP-1059F, Table 2-2 criteria > PP-1059F, Table 2-2 criteria

In Process monitoring
of excavating equipment: <PP-1059F, Table 2-2 criteria > PP-1059F, Table 2-2 criteria

Activation Concerns: No Yes If yes, explain

Material is released for recycle /reuse Yes No

Sending Rad POC Signature	**Date**
Sending Project Manager Signature	**Date**

Work Location/ Source of material

Final material use:
On-site Unrestricted Removed as LLW to disposal

Waste Management Rad POC Signature	**Date**
Spoils Area Foreman Signature	**Date**

The _____BOSS_____ Project has determined that all solid waste streams resulting from safe shutdown, decontamination, and/or demolition of Building(s) ___48_____ have been free released in accordance with DOE Order 5400.5, MCP procedural manual MD-80043, and direction from the DOE Miamisburg Environmental Management Project (MEMP) office (letter from Provencher to Baker, MB 423-99, dated

April 27, 1999). Data supporting this free release determination may be found by contacting _Kurt Kehler_____, Project Manager, at _____. This data may include radiological surveys and data sheets and/or process knowledge utilized according to the above procedures.

_____ _____

Waste Coordinator Date

Project/Activity: **Building 48 Demolition**
Name: Lee Koehmstedt

JSHA CRITERIA CHECKLIST	YES	NO	N/A
1. Work performed with a 6 ft. or greater fall hazard, excluding portable ladders. See Item 14 for further requirements.		X	
2. Roof work requiring the use of fall protection (within 6 ft of an unprotected edge) or special fall protection procedures.		X	
3. Potential hazardous chemical exposure above action levels or permissible exposure limits (PELs), or ACGIH Threshold Limit Values (TLVs).		X	
4. Work activity in an immediately dangerous to life or health (IDLH) breathing hazard environment.		X	
5. Fire or explosion hazards. Are fire hazards beyond a Hot Work Permit? (Reference O2, MD-10286)		X	
6. Work within close proximity of live electrical greater than 50 volts, conductors, and/or work that requires multiple locks, multiple hazard sources, or complicated lockout/tagout circumstances. (Reference MD-10444, *Lockout/Tagout Procedure Manual*, for multiple energy lockout/tagout.)		X	
7. Any maintenance or repair of equipment under pressure where the pressure cannot be shut off and de-energized.		X	
8. Work with high or extreme exposure to ionizing or nonionizing radiation (reference MD-80036, Op 10002), noise, or heat or cold stress (reference D9, D13 & D16, MD-10286).		X	
9. Determined by an appropriate core team, building manager, member of general or executive management, or the IS&H manager to require a JSHA.	X		
10. Any onsite construction or service project directed to have JSHAs based on this procedure and/or instruction from project personnel or IS&H staff.	X		
11. Near-miss event with the potential for loss of life or limb or disabling injury/illness if repeated.		X	
12. Excessive trauma/motion/vibration work situations or manual lifting involving heavy, large, and/or awkward-to-handle objects (reference MD-10407, *Ergonomics Program.*		X	
13. Unguarded, unmarked close clearance, pinch point, exposed moving machinery parts.		X	
14. Known potential falling object hazards (e.g., employees working above other employees, potential for dropping tools, falling equipment or material) or working in areas with the potential for flying objects (flying chips, sandblasting, etc.), exposure to sharp or protruding objects (e.g., working inside plenums, air mover ducts, etc.).	X		

MANDATORY JSHA REQUIRED TO ADDRESS ANY/ALL (YES) RESPONSES

JOB SAFETY & HEALTH ANALYSIS

JSHA MASTER DOCUMENT CONTROL NO:
BOSS -36791

DATE: 11/25/2003	_X_ NEW ___ REV	BUILDING: 48	JOB: Demolish Building 48
DEPARTMENT/COMPANY: BOSS Project/CH2M Hill Mound, Inc.			SECTION: N/A

OCCUPATIONS: : Heavy Duty Operators, Demolition Tech's, Demolition Crafts, & Electricians.
Supported by Project Personnel e.g.. Supervision, Engineering, RAD Control, Ind. Hygiene, and Safety

SIGNATURES

ORIGINATOR: Lee Koehnstedt
REVIEW/REV:
REVIEW/REV:
REVIEW/REV:
APPROVED:

REQUIRED PERSONAL PROTECTIVE EQUIPMENT:
Hard Hat, Safety Glasses with side shields, safety shoes, safety vest

MSDS(s)/CHEMICALS ASSOCIATED WITH THE JOB:
None

BASIC JOB STEPS	POTENTIAL ACCIDENT/ILLNESSES OR KNOWN HAZARDS	SAFE JOB PROCEDURES
Break the job down into basic steps that tell what is done first, what is done next, and so on. Record the job steps in their normal order of occurrence. Describe what is done, not the details of how it is done. Usually, three or four words are sufficient to describe each job step. For example, the job of "replacing a light bulb" may break down into basic steps as follows: 1. Bring and set up ladder 2. Ascend ladder 3. Remove light globe & bulb 4. Replace light bulb 5. Replace light globe 6. Descend ladder 7. Remove and store ladder	Ask yourself for each job what accidents/illnesses could occur to the employee doing the job. Record potential accidents/illnesses by combining one of the abbreviations below with the agent of contact. For example, "struck by a crane hook" is recorded "SB-crane hook." Number each potential accident. SB - Struck by CB - Contacted by SA - Struck against CW - Contact with CI - Caught in CO - Caught on IB - Caught between F - Fall SO - Strain-overexertion* E - Exposure (occ. illness) *Show ergonomic stresses as SO (repetitive trauma, single event strain, or awkward position)	For each potential accident/illness, ask yourself exactly what the employee should do or not do to avoid the accident/illness. Describe specific precautions in detail. Give each precaution the same number given in the potential accident (center column) to which it applies. Avoid generalities such as "Be alert," "Be careful," and "Take caution." Use simple do or don't statements; e.g., "Lock out main power switch," "Stand clear of lift before signaling," or "Check wrench grip before exerting full force." If necessary, explain how, as well as what, to do. Amount of detail is a matter of judgment. Describe ergonomic solutions (job redesign, new tools, worker lift assistance, etc.)
General Safety Note	A wide variety of incidents occur on a regular basis that potentially could result in injury or illness	-Be cognizant of your own safe work practices as well as those of your co-workers -Review any related safety procedures of which you are unsure -Utilize STOP WORK Authority as necessary
Pre-job meeting with involved personnel to discuss the work plan and safety requirements. This meeting is conducted daily.	N/A	-This project engages in Enhanced Work Planning(EWP), a ISM process that evaluates and improves the approach by which work is identified, planned, approved, controlled, and executed.
Site Preparation & Mobilization	Standard construction hazards.	-Demolition preparation is defined by 29CFR1926.850; workers, unfamiliar with construction standards must notify the project supervision and/or project health and safety personnel.
Site Access Control Emergency egress/access	Struck by equipment, debris Blocked access	-Once the work area is defined, only authorized personnel are permitted in the construction perimeter. -Unescorted, Non-project and Non-emergency personnel, must have acceptance of the BOSS Project Manager for entry -Emergency access to the work zone will be maintained to the extent possible. Bldg DS emergency egress will be maintained for occupants.
Work zone access	Slip – Trip – Falls Lifting /twisting strain .	-Uneven walking and/or working surfaces –use extra caution. Terrain is very steep and covered with vegetation that can be a slipping hazard. -Follow accepted practices.

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JOB SAFETY AND HEALTH ANALYSIS FORM
(CONTINUATION SHEET)

BASIC JOB STEPS	POTENTIAL ACCIDENT/ILLNESSES OR KNOWN HAZARDS	SAFE JOB PROCEDURES
1c. Clear Area and Mark/Protect Utility Equipment	Running into fire PIV's, manhole covers, or grates over field drains.	-Mark/protect fire prevention water line in BD –DS & T and other utility equipment with wooden boxes, visible stakes, and/or colored flags. -Cover field grates to protect
2 Building , stanchions & slab demolition	Vehicle Traffic Hazard	–road closure will be required -Excavation permit -Terrain is very steep and covered with vegetation that can be a slipping hazard.
2a. Operation of heavy equipment near electric overhead lines	Shock Hazard	-All utilities to the building including electrical have been disconnected by project electricians at a point away from the building. -Identify sources outside the building that may require LOTO to prevent incidental contact by Heavy Duty Equipment, such as street lighting circuit.
2c. Demolish building, pipe stanchions, and slab using excavator mounted shear, hoe ram, grapple, loader, and bobcat	Struck by flying debris Struck by moving equipment Noise Hazard Steep terrain	-Establish construction boundary. -Wear hard hat safety glasses, safety shoes, and reflective vest inside construction area. Make eye contact with operator when working around equipment. Use hand signals to communicate intent. -Maintain the following distances from operating equipment: Shear – 75 feet Hoe Ram – 50 feet Other heavy duty equipment – 30 feet Bobcat – 15 feet -Make sure equipment is in safe working order. Use spotter if vision is obstructed. –road closure will be required -Wear hearing protection while running heavy duty equipment Follow the requirements of MD-10286 D9 -Terrain is very steep and covered with vegetation that can be a slipping hazard.
2d. Torch cut rebar or to weaken structural members	Burns, fire Potential lead paint	-Obtain and follow Hot Work permit per MD-10286 O2. Wear proper PPE, have fire extinguishers in the construction zone. All compressed gas cylinders will be stored, transported and used in accordance with MD-10286 ops. no. H-1. -Test for lead paint; do not torch cut lead paint.
2e. Working in excessive heat/cold	Heat Stress/Cold Stress	-Follow the requirements of MD-10286 D13/D16 and discuss in daily pre-job briefings

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2f. Slab removal	Strike underground utilities Radiological Contamination	-Obtain Excavation permit and follow its requirements per MD-10286 O5 -Coordinate in-process Rad Surveys with Rad Techs
3 Site Remediation & Demobilization	**General Safety Note** A wide variety of incidents occur on a regular basis that potentially could result in injury or illness	-Be cognizant of your own safe work practices as well as those of your co-workers -Review any related safety procedures of which you are unsure -Utilize STOP WORK Authority as necessary
3a Rough grading	Equipment/ personnel mixture	-Stay clear of operating heavy equipment -Excavation permit
3b. Seeding & Mulching	Slip – Trip – Fall Lifting /twisting strain	-Uneven walking and/or working surfaces –use extra caution. -Follow accepted practices
3e Remove Temporary Protection Structures Remove wooden boxes from fire hydrants & fire prevention water lines Remove steel sheeting from field grates	Lifting /twisting strain Cuts and abrasions Slip trips and falls	-2 man rule follow standard practice lifting -Wear appropriate PPE -Be cognizant of your own safe work practices as well as those of your co-workers
3d. Demobilize Construction Equipment Remove dust control water distribution system Remove temporary power Remove fencing	Equipment/ personnel mixture Cuts and abrasions Lifting /twisting strain	-Be cognizant of your own safe work practices as well as those of your co-workers -Review any related safety procedures of which you are unsure -Utilize STOP WORK Authority as necessary

SIGN-OFF SHEET

I have read and understand the attached Job Specific Work Plan and JSHA:

SIGNATURE	Date	Department

Appendix B

PRE-JOB BRIEFING/JOB STATUS LOG

PRE-JOB UPDATE

MSR/PROCEDURE (if applicable):	JOB SUPERVISOR

A.	Time, Date and Location of PJB:
B.	Applicable Procedure Number:
C.	Job Description:
D.	Personnel Attending:

HP#	SIGNATURE	HP#	SIGNATURE

JOB SUPERVISOR – This is a reminder checklist for the update. The supervisor need only discuss and note changes from the previous day's briefing or update. (Use NC for No Change).

1.	Any changes/revisions to safety envelope for work: a. New/added assignments and responsibilities of any individual b. Changes in facility conditions, tagouts, valve lineups c. New or changed precautions/hazards d. Valid RWP or other required work permits still in effect
2.	Adequate supply of PPE
3.	New training, any training coming up on expiration
4.	New changes to relevant Category "A" or Category "B" procedures.
5.	Equipment and tools calibrations in effect
6.	Relevant lessons learned, critique reports
7.	RWP revisions: a. Changes to radiological conditions of the workplace, particularly with respect to postings. b. Change in scope, especially if it is a reduction in scope or Stop Work Levels.
8.	Changes to radiological and/or health monitoring.
9.	Open the floor to questions.

The above minimum requirements have been met; this PJB has been conducted in sufficient detail to maximize continued safe conduct of the job, and all personnel have been through a previous Pre-Job Brief.

Job Supervisor/Foreman _____ Date _____

NOTE: Completed pre-job update sheet must be retained with the work package or maintained in your record file.

Daily Toolbox Safety Meeting

Project:	**Date:**
Safety Topic of Meeting:	
Work Description of Meeting:	

Review the following to determine if conditions have changed since the last Pre-Job Meeting
If this is the 1st meeting with a subcontractor, has Safe Work Authorization been done?
Check off each item that applies or mark N/A if it doesn't apply.

Hot Work Permit (torch cutting, spark producing grinding, open flame heaters, welding)		Signage and Barricades (construction area, hazard notification, rad postings, etc).	
Penetration Permit (penetrating walls, ceilings, or floors in a building)		Air Monitoring (as required by Environmental Compliance and/or Industrial Hygiene)	
Excavation Permit (digging in soil)		Dust Suppression (misting, etc.)	
Trench Plan (shoring, soil layback, etc. if over 4 feet below grade)		Water Runoff Prevention (silt fence, straw bales, collection pond, etc.)	
Confined Space Entry Permit (manhole, tank, or other confined space entry)		Radiation Work Permit (as required by Rad Controls)	
Fall Protection (person's feet over 6 feet above ground)		TLDs (as required by RWP and rad postings)	
Lockout/Tagout (all energy sources to equipment being worked on)		Waste Containers (rolloffs, sealands, dumpsters, LSA boxes, drums, etc.)	
PPE (respirators, Tyveks, safety shoes, safety glasses, hard hats, gloves, reflective vests, etc.)		Utility review especially for asbestos abatement contractor (label live utilities e.g. FAS, phone, electric)	
Personnel Training up-to-date for assigned work (Radworker II, Asbestos, Lead, etc.)		Hoisting and Rigging Review	

PRE-JOB UPDATE

Continuation Sheet for _____/_____/_____

HP#	SIGNATURE	HP#	SIGNATURE

PRE-JOB UPDATE

MSR/PROCEDURE (if applicable):	JOB SUPERVISOR

A.	Time, Date and Location of PJB:
B.	Applicable Procedure Number:
C.	Job Description:
D.	Personnel Attending:

HP#	SIGNATURE	HP#	SIGNATURE

JOB SUPERVISOR – This is a reminder checklist for the update. The supervisor need only discuss and note changes from the previous day's briefing or update. (Use NC for No Change).

2. Any changes/revisions to safety envelop for work: e. New/added assignments and responsibilities of any individual f. Changes in facility conditions, tagouts, valve lineups g. New or changed precautions/hazards h. Valid RWP or other required work permits still in effect
2. Adequate supply of PPE
3. New training, any training coming up on expiration
4. New changes to relevant Category "A" or Category "B" procedures.
5. Equipment and tools calibrations in effect
6. Relevant lessons learned, critique reports
8. RWP revisions: c. Changes to radiological conditions of the workplace, particularly with respect to postings. d. Change in scope, especially if it is a reduction in scope or Stop Work Levels.
8. Changes to radiological and/or health monitoring.
9. Open the floor to questions.

The above minimum requirements have been met; this PJB has been conducted in sufficient detail to maximize continued safe conduct of the job, and all personnel have been through a previous Pre-Job Brief.

_____

Job Supervisor/Foreman Date

JOB STATUS LOG

Work Package Title: Building 48 Demolition

Work Package No: BOSS - 36791

DATE	TIME	WORK PKG. SECTION	% Complete	BY	STATUS

Appendix C

DRAWINGS/SKETCHES

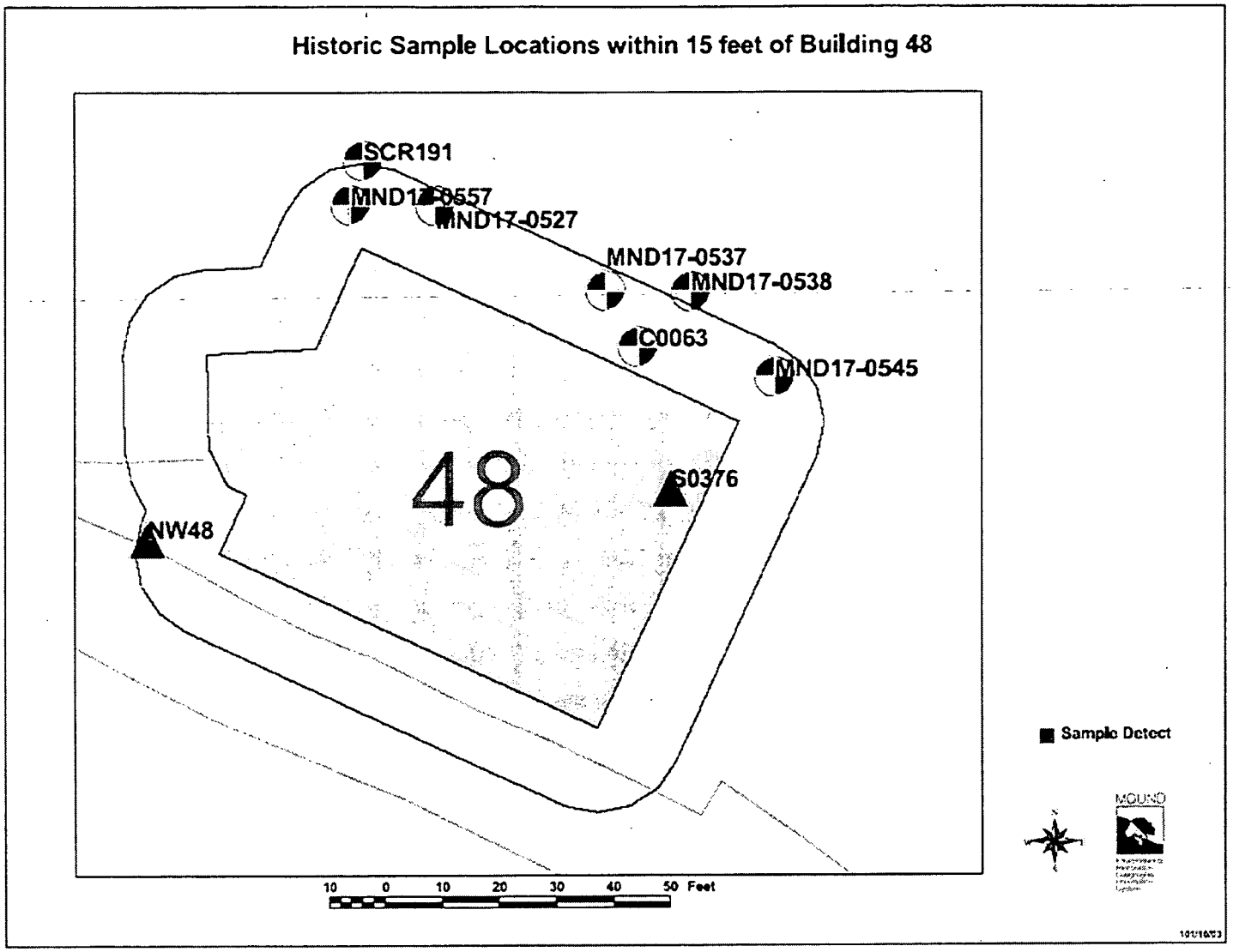
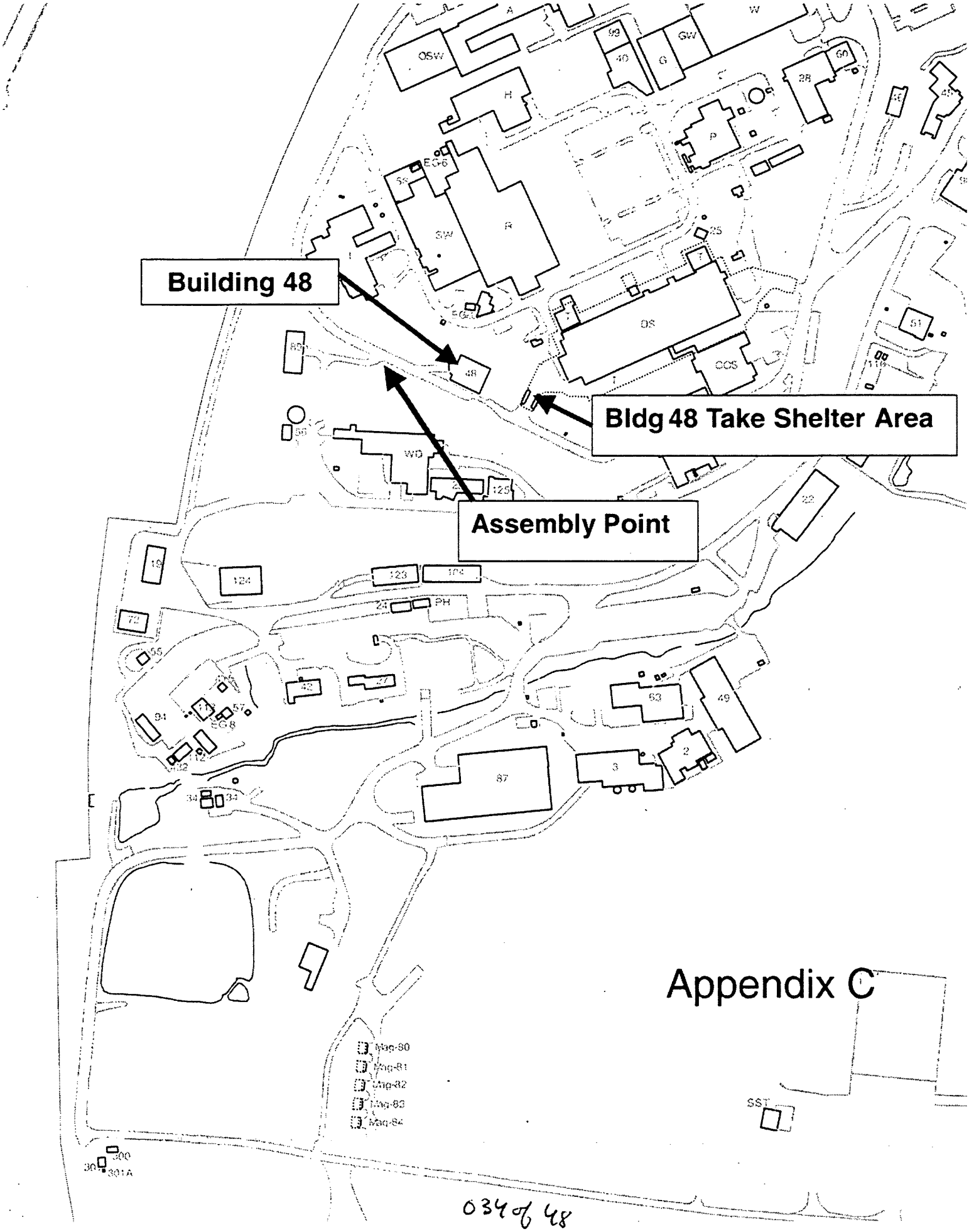
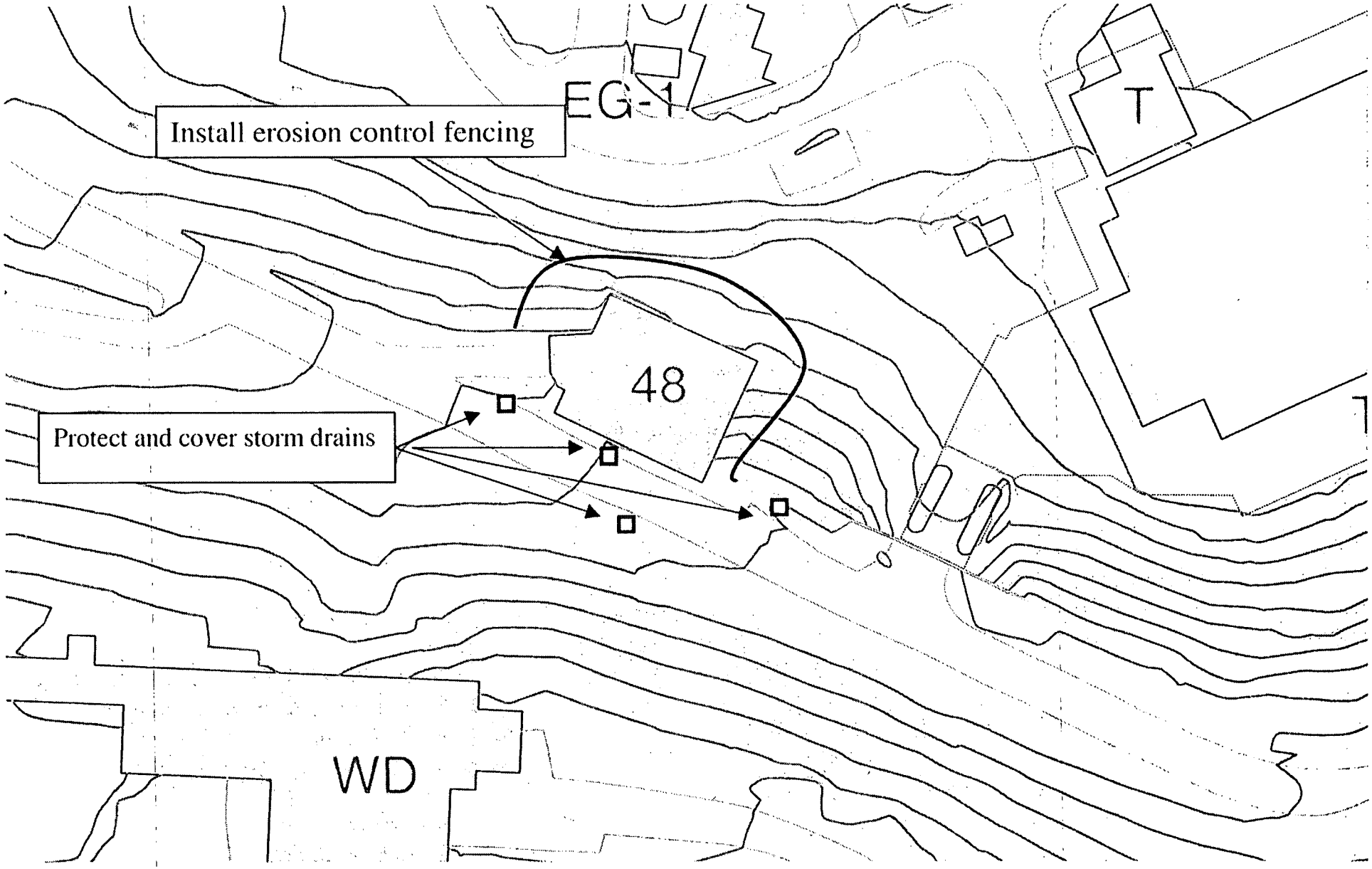
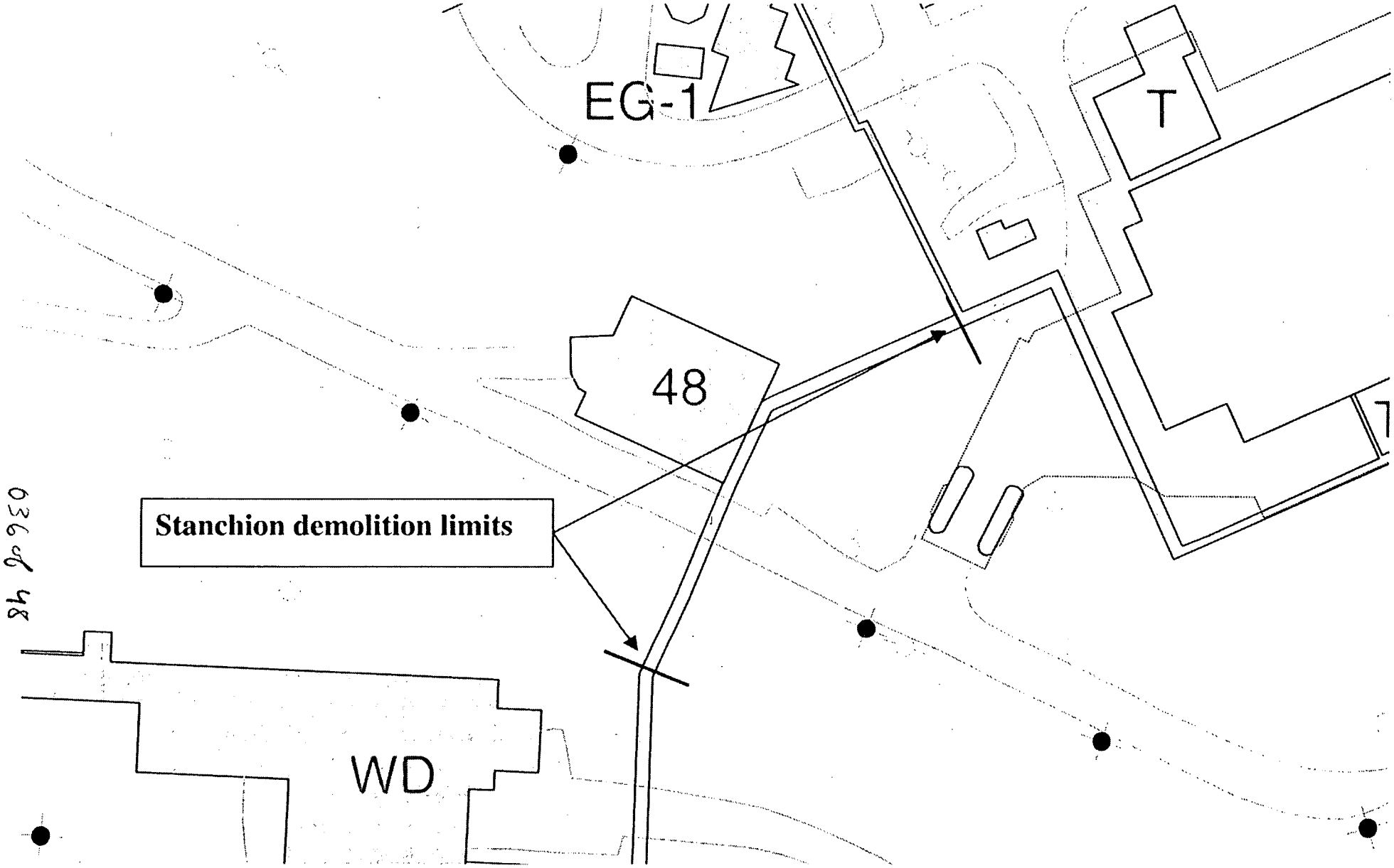

Historic Sample Locations within 15 feet of Building 48
SCR191
MND17-0557
MND17-0527
MND17-0537
MND17-0538
C0063
MND17-0545
48
S0376
NW48
Sample Detect
10 0 10 20 30 40 50 Feet
MOUND

Figure A

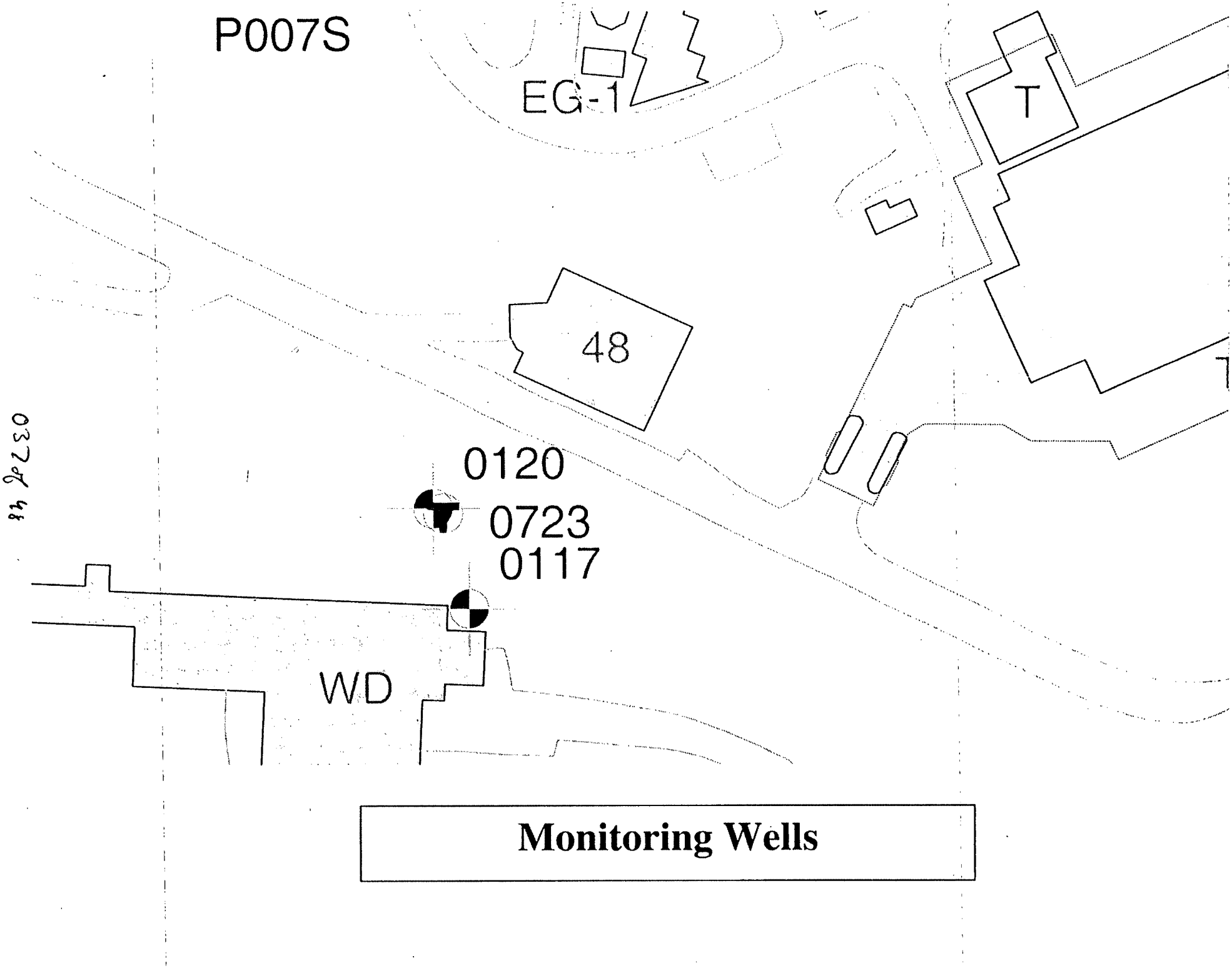

Building 48
Bldg 48 Take Shelter Area
Assembly Point
Appendix C

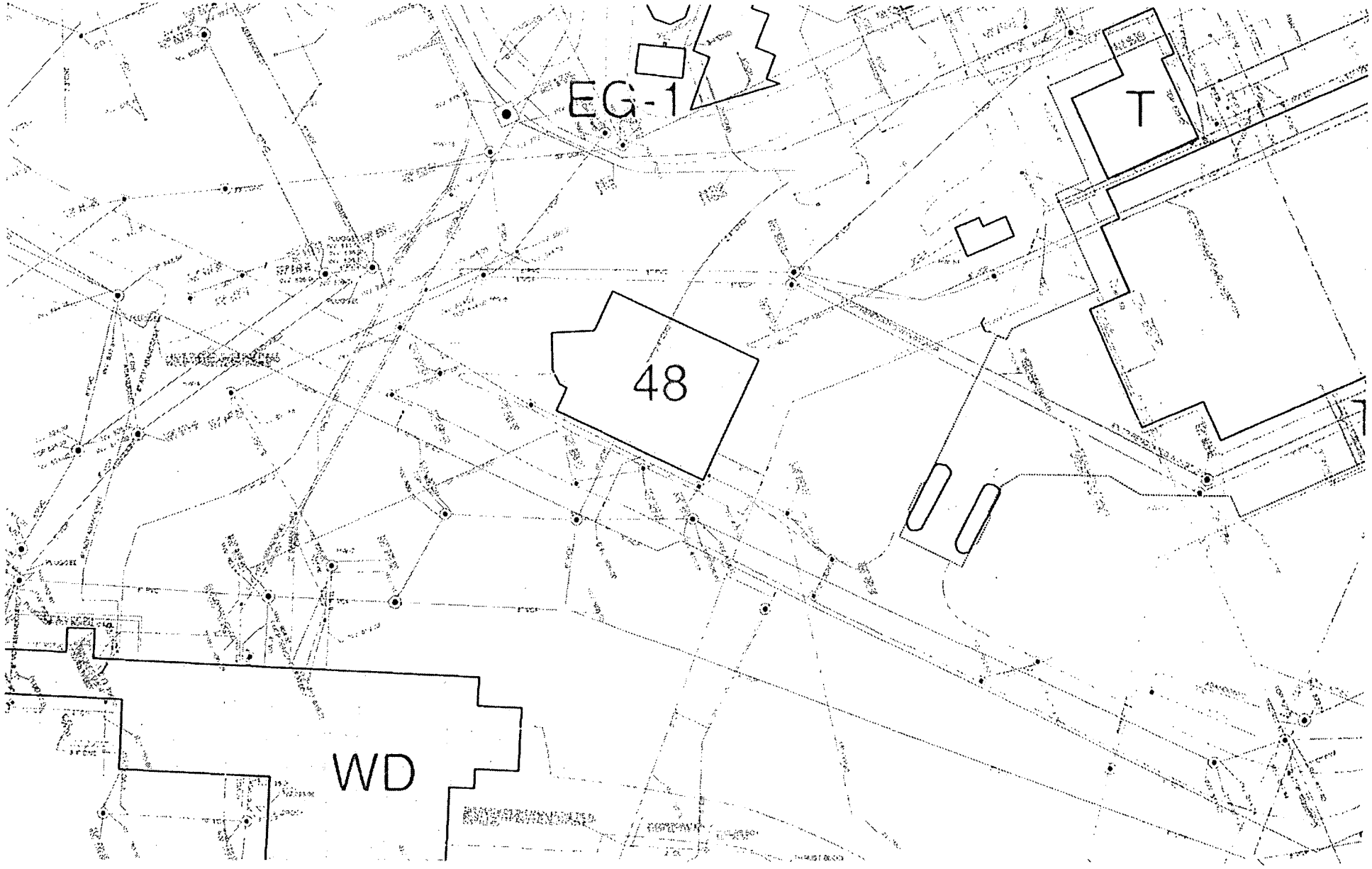


Erosion control



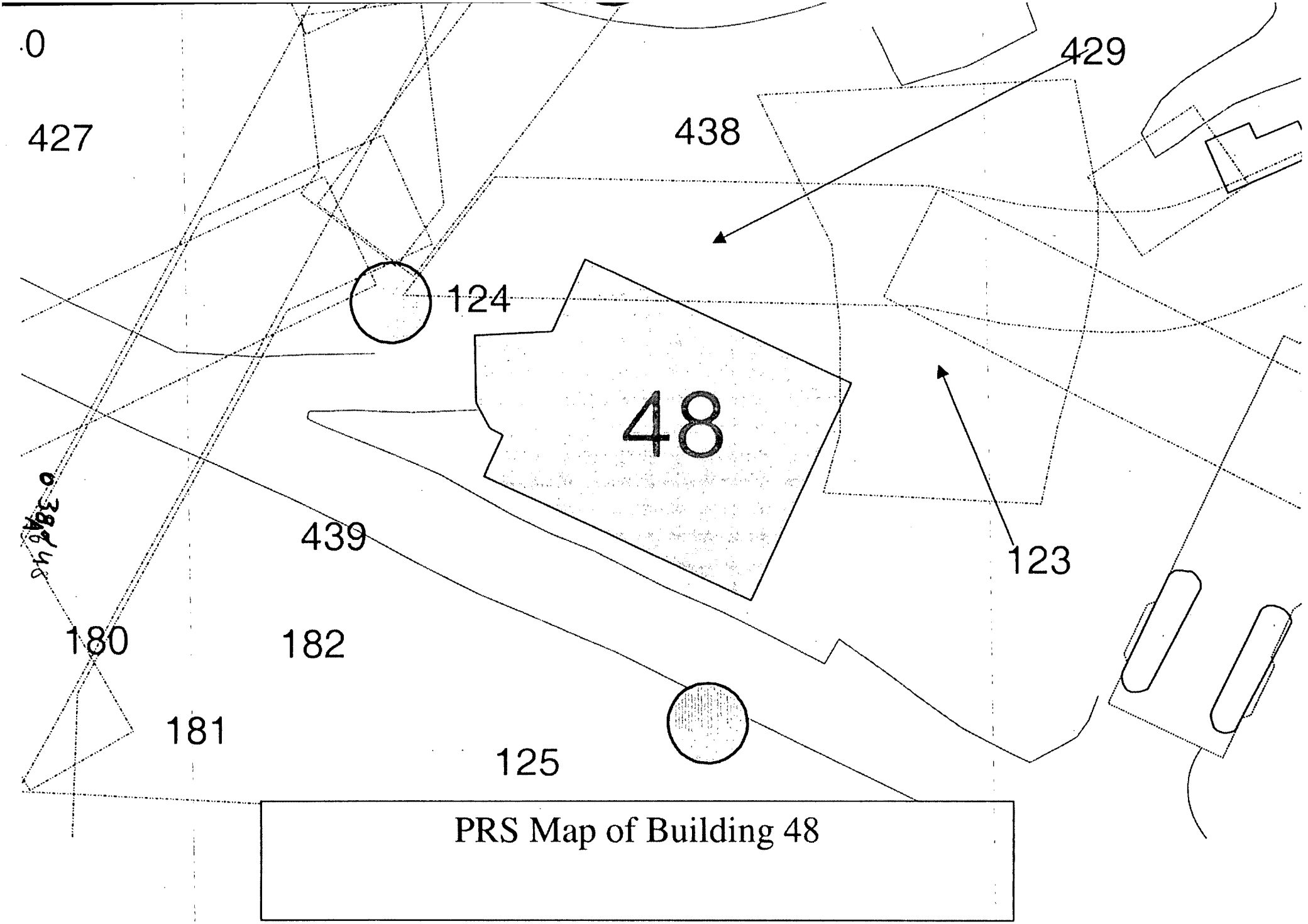
Aboveground Stanchions Lines and Power Poles


P007S
EG-1
T
48
0120
0723
0117
WD
Monitoring Wells

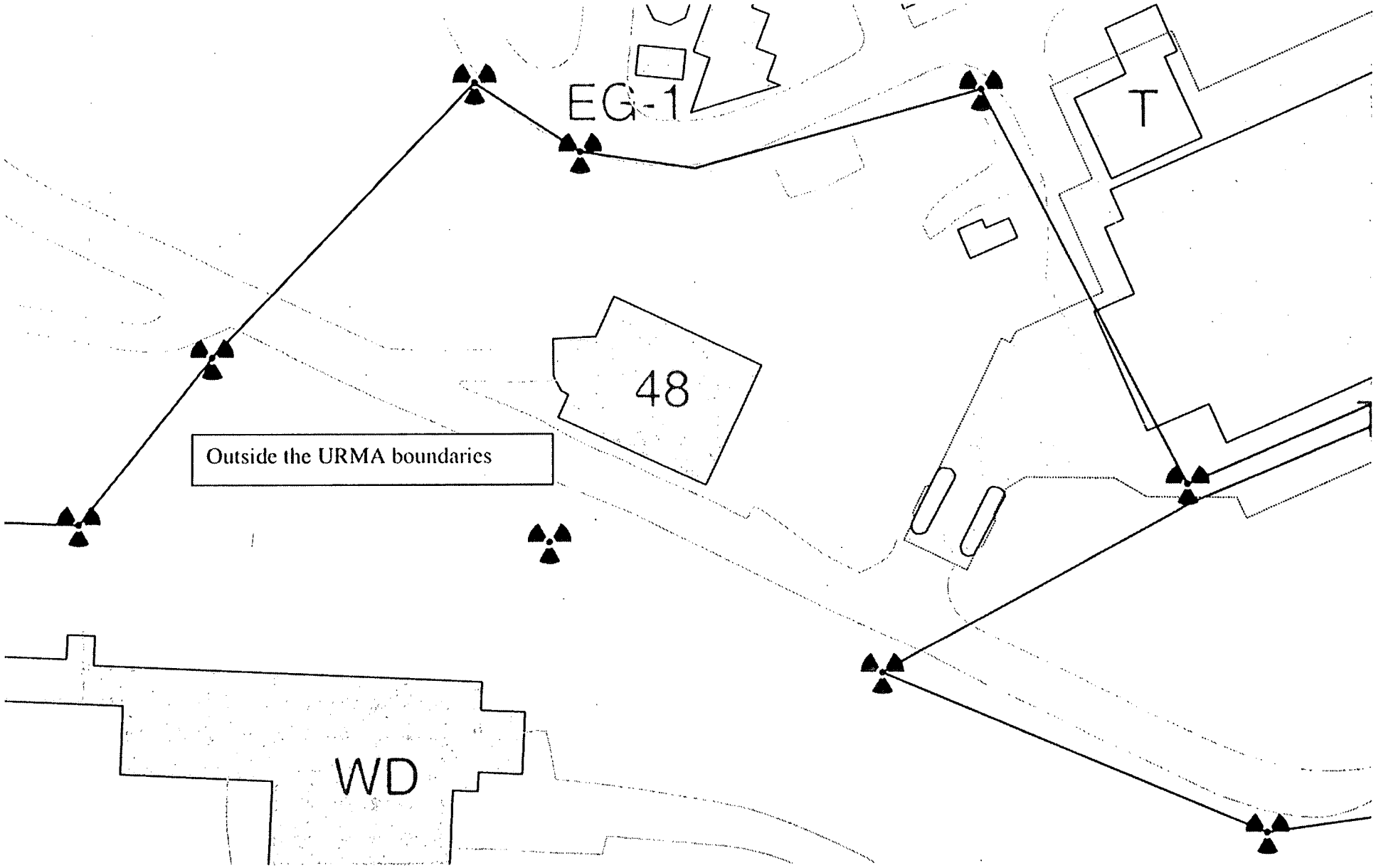


Underground Utilities

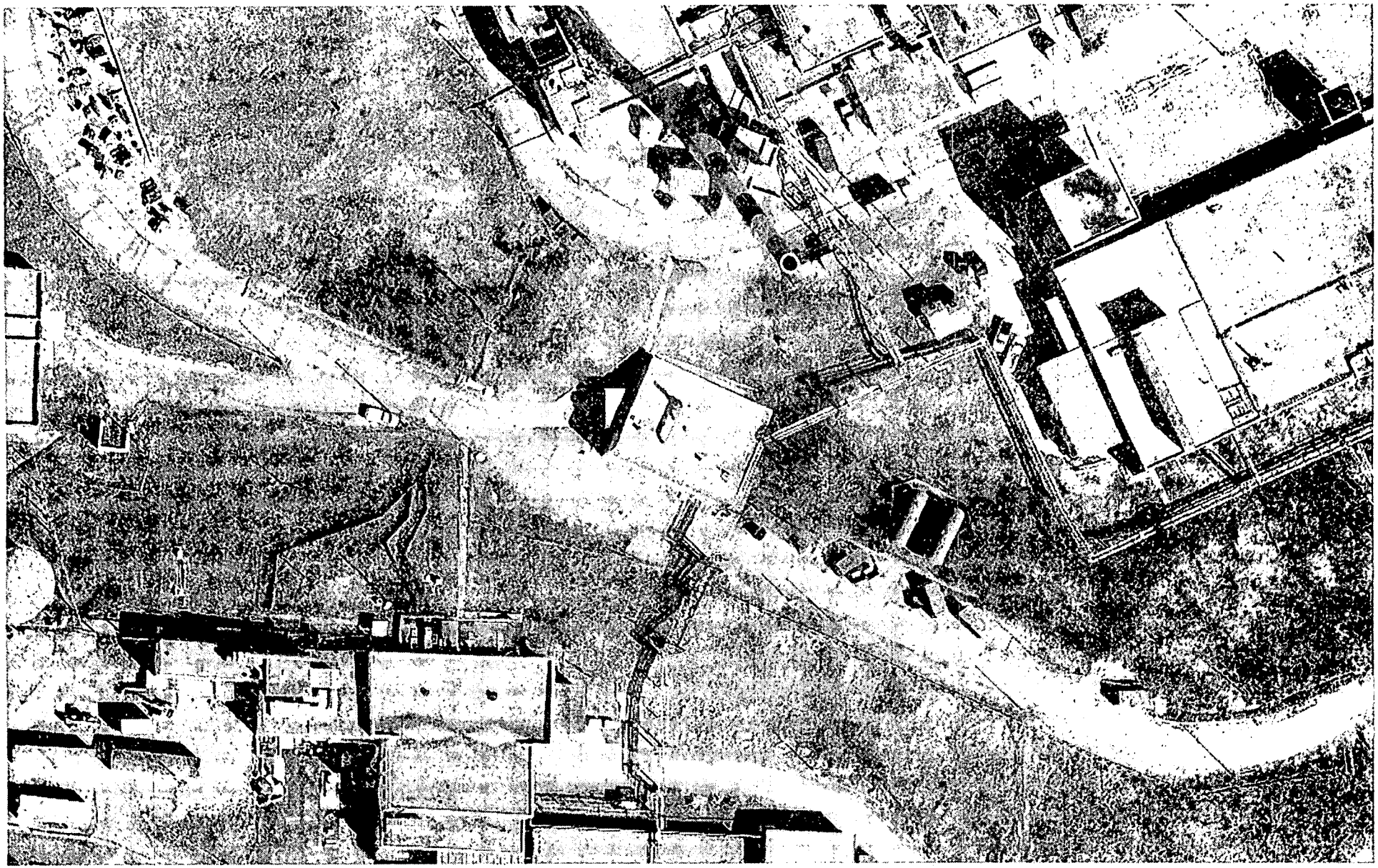
8420850



PRS Map of Building 48

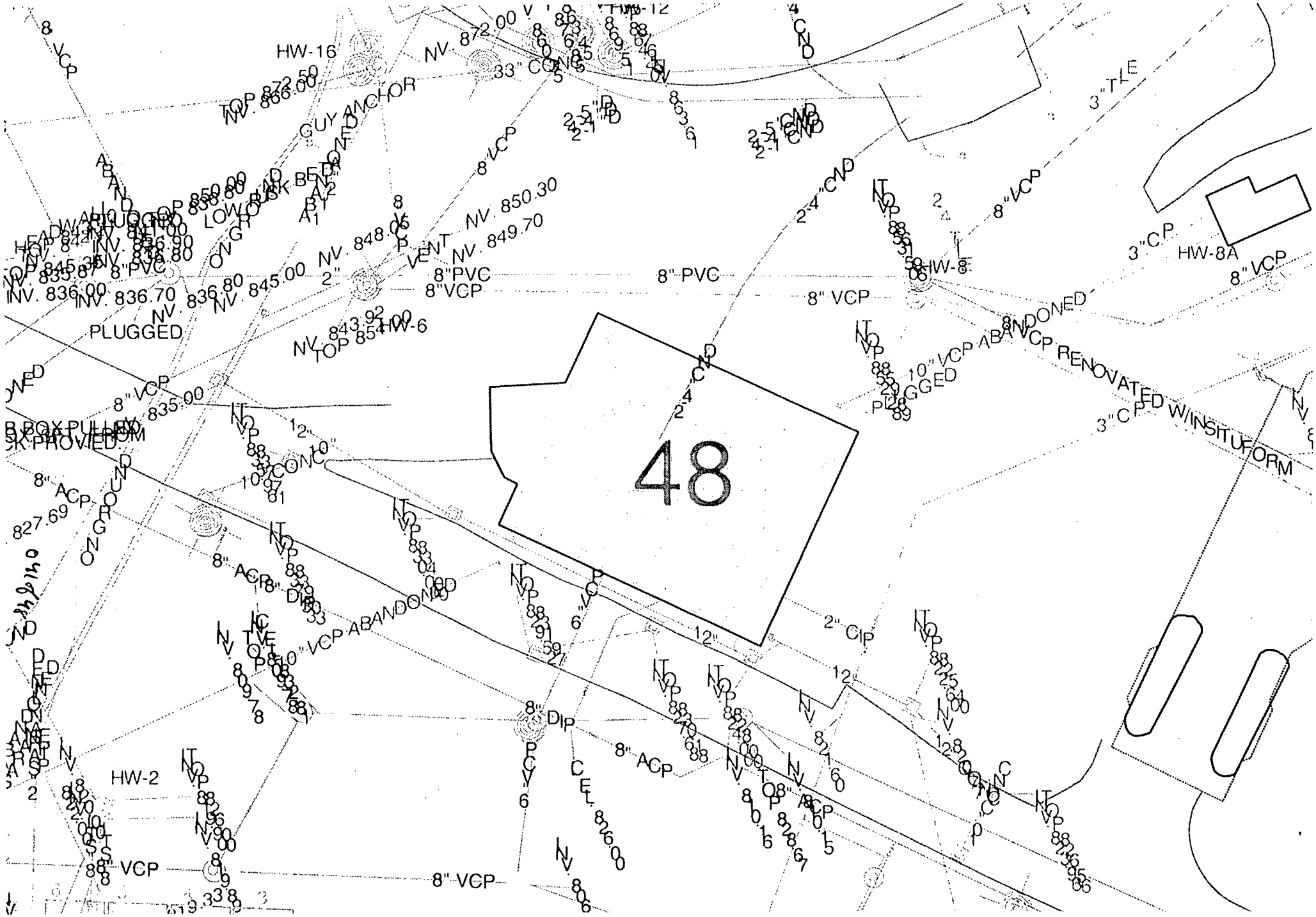


URMAs



Aerial Photo

Ocod 48



BUILDING 48 UNDERGROUND UTILITIES

Appendix D
MISCELLANEOUS
(USQ, RWP, etc.)

- No RWP required for this Work Package
- Structural Engineering Survey letter, per OSHA CFR1926.

INTER OFFICE MEMO CH2MHILL MOUND, INC.

Date: Sept. 18, 2003 cc. L. Koehmstedt

From: W. L. Johanan – Blg. 61-220B

Subject: Structural Survey of Building 48, RE: 29 CFR 1926.850 (a)

To: Kurt Kehler-Project Manager

Please be advised that we have performed a structural review and walk down of the subject building and found them to be satisfactory based on the demolition process and work plan.

Please call me if you have any further questions.

W. L. Johanan P.E.
Site Structural Engineer

STATE OF OHIO
WILLIAM L. JOHANAN
E-44883
REGISTERED
PROFESSIONAL ENGINEER

0438 48

Appendix E

POST-JOB CONFERENCE/LESSONS LEARNED

Work Package Revisions Must Be Carefully Controlled (Lessons Learned L01-080)

Lessons Learned Statement:

Work packages tend to be living documents requiring change as errors are discovered, conditions change, methods improve, and other reasons. It's important that these changes receive proper reviews, including a peer review, which look at not only technical issues, but also work sequencing and format.

Discussion:

Recently a Mound Contractor Readiness Assessment (CRA) team completed a review of the SW19 Vertical Lathe work package. The CRA Team noted a significant amount of inconsistencies, do-loops and other errors associated with the SW19 Vertical Lathe work package. These inconsistencies, do-loops, and other errors were present even after peer reviews and a Line Management Self-Assessment (LMSA). The result was a work package that seemed confusing in some areas and in others could not be implemented as written. The purpose of this lessons learned is to discuss the causes and educate other personnel.

Analysis:

As a result of the reviews by peers, the LMSA, the CRA and DOE surveillance's, the SW19 work package underwent multiple revisions even after the first revision was published. As comments were resolved and additions and deletions were completed, numbering and work steps were not reviewed to assure that the sequencing could be followed.

Changes were made to the work package without a formal revision. Although the changes were not considered significant, they should have triggered a revision to the work package and further review in accordance with PP1059A. Subsequent reviews should have caught the errors.

The LMSA discovered many of the errors, but they were not corrected prior to the CRA. The LMSA team used an informal process to communicate needed changes to the work package. As a result, some changes were missed or not communicated and an opportunity to correct the errors was missed.

Recommended Actions:

1) Following changes to the work package, numbering and sequencing should be reviewed and verified by a peer reviewer.

2) A formal revision to the work package is triggered by changes other than minor editorial revisions. Based on the type of change, further reviews must be performed.

3) Editorial changes, comments, and other suggested changes should be documented during the LMSA and discussed at closing to assure that they have been incorporated.

Excavator Damaged During Demolition Work

Lesson Learned Statement:

Heavy powered equipment involved demolition activities should be inspected daily for damage that may result to that equipment during demolition activities.

Discussion of Activities:

On 9 February 2000, during the demolition of a concrete tank, an excavator shear was damaged. The initial estimated cost to repair is $20,000, and in addition to the damaged equipment, approximately 62 gallons of hydraulic fluid were spilled on the ground.

A trackhoe with a 360-degree rotating excavator shear attachment was being used to demolish a tank dome and sides at the 20H Site Water Tank, part of the Fernald Water Treatment Plant. When the crew returned from break, the operator started up the trackhoe and proceeded to raise the boom. The jaw section of the shear broke off from the head, where the slew ring was attached to the back plate. When the jaw section fell to the ground it pulled out a hydraulic fluid line and the fluid poured out.

Analysis

The shear was found to have approximately 500 hours of use on it at the time of the incident. A full preventative maintenance check of the trackhoe and the shear had been performed two days prior to the incident that conformed with the manufacturer's recommended maintenance schedule. Photographs of the damaged shear and video of the previous day's operations were reviewed and indicated that the shear was probably damaged at some time prior to the day of the incident.

POST JOB CONFERENCE

5. WHAT WENT WELL?

What could be improved?

Other Comments:

Items Requiring Further Action:

POST-JOB CONFERENCE ATTENDEES

NAME	HP	NAME	HP

LESSONS LEARNED INPUT FORM

What Happened? (Describe in as little or as much detail as necessary the situation and what occurred. Do not mention any names, only job functions and activities)

What did you learn? (Describe how the job could have been done better, how a hazard could have been eliminated, etc.)

Submitted by: _____ **Date:** _____

OPTIONAL

Mail to: Lessons Learned Program Manager, DS-133 or appropriate Project or Functional Manager