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Interoffice Communication

Date: September 29, 2008

To: Tom Wessels, Manager
ESH&A

From: Paul E. Richmond, CIH, CSP
Associate Director, EH&S

Jim Withers, CIH, CSP
Manager, Industrial Hygiene

Subject: Beryllium Survey

Please find attached a beryllium survey report completed on Ames Laboratory facilities. The report includes an executive summary, sampling plan, analytical results, and recommendations. The facilities, which were not part of the original beryllium survey completed in 2001, included Metals Development, Spedding Hall, TASF, and Wilhelm. Survey samples were collected over two days; on August 19 and August 20, 2008.

Please contact one of us if you have questions regarding the attached report.

cc: A. David Inyang

Executive Summary

Beryllium is a hard, lightweight metal that is very strong and easy to shape. It has many industrial uses. Beryllium-copper alloys and beryllium-oxide ceramics are used in the electronic, nuclear and aerospace programs. Beryllium parts for nuclear weapons were manufactured and used at a number of Department of Energy (DOE) laboratories. This manufacturing process continues at some laboratories today. Additional information on beryllium is included in the Ames Laboratory Beryllium Fact sheet (Appendix 1).

On December 8, 1999, the Department of Energy published 10 CFR Part 850—Chronic Beryllium Disease Prevention Program; Final Rule in the Federal Register. The rule required the establishment of a chronic beryllium disease prevention program (CBDPP) to reduce the number of workers currently exposed to beryllium in the course of their work at DOE facilities, and established medical surveillance requirements to ensure early detection of the disease. Because Ames Laboratory is a DOE facility with a past history of beryllium usage, a beryllium surveillance program was begun in the spring of 2001 to comply with the CBDPP requirements.

In 2001, a survey was completed to address concerns over potential beryllium contamination in existing campus buildings that were used for Ames Laboratory research as part of the Manhattan Project. One hundred fifteen surface wipe samples were analyzed for beryllium content. Results indicated that beryllium concentrations were below the analytical method's detection limit in all accessible public areas; six samples in non-routine, restricted areas had beryllium contamination above detection limits.

Purpose and Scope

The purpose of this beryllium survey was to determine surface concentrations of beryllium in Ames Laboratory buildings with no historical evidence of beryllium usage. For the scope of this survey, representative areas of hallways, shops, and office spaces were sampled in Metals Development, Spedding Hall, TASF and Wilhelm. Samples were collected from floor, wall, ceiling, and horizontal work surfaces. (NOTE: See Appendix 2 for the overall sampling plan and Appendix 3 for specific sampling locations).

Project Personnel

The beryllium sampling project was led by Certified Industrial Hygienists (CIH's) from Iowa State University and Ames Laboratory. All wipe samples were collected by the same individual to ensure consistent sampling techniques. Two other individuals assisted by logging each sample location and ensuring that cross-contamination between samples was prevented by use of clean sampling templates, gloves and containers for each sample.

Sampling Protocol

Representative surface samples were collected utilizing a 100 square centimeter template and wiping a pre-moistened Ghost Wipe™ over the entire area using a standard wipe technique. Gloves were worn and changed after each sample to avoid cross-contamination. Samples were analyzed by a laboratory accredited by the American Industrial Hygiene Association (AIHA) using National Institute of Occupational Safety and Health (NIOSH) Method 7300.

Wipe Sample Results

A total of 63 wipe samples were analyzed for beryllium contamination (see Appendix 4 for sample locations and results). All samples had concentrations less than the analytical detection limit of 0.5µg/100 cm^2.

Beryllium Exposure Limits

The Occupational Safety & Health Administration (OSHA), American Conference of Governmental Industrial Hygienists (ACGIH) and National Institute of Occupational Safety and Health (NIOSH) have established workplace airborne beryllium exposure limits. DOE has established more restrictive airborne and surface contamination limits for DOE facilities. These limits are summarized in Table 1.

Table 1 - Beryllium Exposure Limit Table

Standard	8-hour TWA[b] (µg/m^3)	Surface Contamination (µg/100 cm^2)
OSHA PEL[a]	2	NA[c]
ACGIH TLV[d]	2	NA
NIOSH REL[e]	0.5	NA
DOE [f]	0.2	3.0; 0.2

[a]Occupational Safety and Health Administration Permissible Exposure Limit
[b]Time Weighted Average
[c]Not Applicable
[d]American Conference of Governmental Industrial Hygienists Threshold Limit Value
[e]National Institute for Occupational Safety and Health Recommended Exposure Limit-Ceiling
[f]As set by 10 CFR Part 850, Department of Energy action level for airborne beryllium exposure is 0.2µg /m^3. Surface contamination is separated in building surface levels in areas where beryllium was used versus "release" levels for release of equipment, etc. to the general public. The building surface contamination limit during non-operational periods is 3µg /100 cm^2. Equipment below this limit may also be released to other facilities for beryllium work. The general release level for items released to the public must not exceed 0.2 µg /100 cm^2.

Recommendations

The sampling survey was designed to assess beryllium contamination that might be encountered by building occupants during routine activities. Samples were collected from Metals Development, Spedding Hall, TASF and Wilhelm Hall. All samples collected indicated beryllium concentrations below the analytical limit of detection, thus beryllium contamination should not be a concern in any of the areas tested.

APPENDIX 1

Ames Laboratory Beryllium Fact Sheet

Ames Laboratory Beryllium Factsheet

What is beryllium?
Beryllium is a hard, lightweight metal that is very strong and easy to shape. It has many industrial uses. Beryllium-copper alloys and beryllium-oxide ceramics are used in the electronic, nuclear and aerospace programs. Beryllium parts for nuclear weapons were manufactured and used at a number of Department of Energy (DOE) laboratories. This manufacturing process continues at some laboratories today.

What is the Former Beryllium Workers Medical Surveillance Program?
The Medical Surveillance Program is designed to gather information regarding exposure to beryllium and to screen all DOE and DOE-contractor personnel who worked in plants where beryllium was processed. The Program was created at DOE because in 1993 Congress passed Public Law 102-484. Section 3162 of this law required DOE to evaluate the long-range health conditions of current and former employees who may be at risk for health problems as a result of their employment at DOE sites. Workers who were exposed to beryllium dust or fumes during machining and manufacturing operations may develop sensitivity to beryllium or, ultimately, chronic beryllium disease, or CBD. Beryllium screening formally began in Oak Ridge, Tennessee, in 1993. The national program was kicked off in early 1999. By mid-1999, Oak Ridge Institute for Science and Education (ORISE) in Tennessee, the agency managing the program, began testing at locations across the country. Beryllium screening consists of a blood test and a brief health questionnaire. The process takes only a few minutes and is paid for by the DOE.

How many DOE laboratories/facilities are involved in the program?
The medical surveillance program is operating at more than 20 DOE sites, including Rocky Flats in Colorado, Oak Ridge National Laboratory in Tennessee, Hanford in Washington, Los Alamos National Laboratory in New Mexico and Lawrence Livermore National Laboratory in California. The Burlington Assembly Plant in Burlington, Iowa, was also known to have handled beryllium.

Is the Ames Laboratory included in the list of sites where beryllium was handled?
Yes. Beryllium was used at the Ames Laboratory in the 1940s and early 1950s. In the 1940s, it was used in the processes developed at the Laboratory for the production of highly pure uranium and thorium for the historic Manhattan Project. Ames Lab metallurgists also worked on a process to produce pure beryllium metal from beryllium fluoride. In the early 1950s, beryllium-oxide powder was used to produce beryllium shapes and crucibles. The toxicity of beryllium was not well known until after WWII when greater efforts were made to minimize exposure. Present-day buildings in which purification work would have occurred include Wilhelm Hall and Gilman Hall on the Iowa State University (ISU) campus.

How do you become exposed to beryllium?
Usually exposure is through breathing beryllium mists, dusts or fumes. Machinists, welders and operators may have been exposed to beryllium through direct handling of beryllium and beryllium compounds. Other workers may have been exposed by performing laboratory analyses

on beryllium compounds, coming into contact with contaminated equipment or by working near a beryllium operation.

How many Ames Lab workers may have been exposed to beryllium dust or fumes?
Part of the purpose of the Medical Surveillance Program is to gather information regarding exposure to beryllium. Because the exact number of workers potentially exposed at Ames Laboratory is not known, the Laboratory has submitted a list of all workers at the Laboratory before the mid-1950s, well past the time period after which beryllium work with significant exposure potential had ceased. This list included 1106 workers. A search of those names by the Center for Epidemiologic Research at ORISE produced a final list of 776 names. In addition to the Ames Laboratory employees, ISU identified 222 non-Ames Laboratory faculty, staff, fellows and graduate students who worked in Gilman Hall during the late 1940s and early 1950s. These individuals may have been exposed to beryllium dusts through collaborations with Ames Lab projects or because of the proximity of their workspace to facilities where beryllium work was performed.

Is beryllium still used at the Ames Laboratory?
Beryllium is used on a very limited basis at the Ames Laboratory today. The quantities are small and used in such a way as to not generate ambient concentrations. No machining or grinding of beryllium is performed at the Ames Lab. Beryllium is also a constituent of some materials used at the Laboratory. For example, beryllium is a constituent of the windows used for cryostats and X-ray beam paths. There is virtually no potential for exposure to employees in these forms.

How will I be notified if I am identified as potentially having been exposed to beryllium?
Individuals should have received a letter from the Department of Energy inviting them to have a blood test (called a beryllium lymphocyte proliferation test, or Be-LPT) to determine whether they are sensitized to beryllium. If you want the test, simply return the reply form enclosed with the letter in the postage-paid envelope. Upon receipt, ORISE will contact you and schedule an appointment to have the blood test taken at a location convenient for you. If, after the blood test, additional medical examinations are recommended, a doctor will explain these tests. There is no cost to former workers for these tests.

How many people exposed to beryllium contract beryllium disease?
Based on a 1993 screening of 11,000 beryllium workers at sites like DOE's Rocky Flats Environmental Technology Site in Colorado and its Y-12 plant in Tennessee, approximately 4 to 5 percent showed an increased sensitivity to beryllium, and 1 to 2 percent have contracted CBD.

Can anyone get the test?
Only former Ames Laboratory workers, contractors and specified ISU personnel are being offered the screening. Other individuals must have the test performed by their own physician under their own health insurance plan. ORISE will work with personal physicians to help obtain proper testing. If the test comes back positive for beryllium sensitization, these individuals should contact ORISE at 1-866-812-6703.

What are the symptoms, and is beryllium disease treatable?
The symptoms include shortness of breath, especially with activity; cough; chest pain; fatigue; weight loss or loss of appetite. Today, chronic beryllium disease is not considered a fatal condition. For a few people, however, it can be serious enough to cause disability. Basically, beryllium disease causes inflammation and scarring of the lungs. Treatment includes prescription drugs and regular medical treatment. Some people can be diagnosed with the disease but have no symptoms.

Has the Ames Laboratory tested buildings to ensure they are beryllium free?
Yes. Ames Laboratory has completed two beryllium surveys. In 2001, in cooperation with ISU, wipe samples were collected in areas within two buildings (Gilman Hall and Wilhelm Hall) where beryllium work was known to have occurred. Representative surfaces, such as walls and floors, and utility chases were wiped for beryllium. This study showed that there was no beryllium contamination in occupied spaces. Several areas were identified in interstitial spaces that had beryllium levels above analytical detection limits. Workers enter these areas on a limited basis and wear appropriate personal protective equipment.

In 2008, a similar study was done in the remaining Ames Laboratory buildings. The majority of the sampling locations were in occupied areas and the results showed no beryllium levels above analytical detection limits.

Related Web Pages/Contacts:

Former Beryllium Workers Medical Surveillance Program
Toll-free hotline: 1-866-812-6703
E-mail: NeillB@orau.com
Web sites: http://www.hss.energy.gov/HealthSafety/IIPP/hservices/fb_msurv.html

Beryllium facts and factsheets
http://tis.eh.doe.gov/be/
http://www.orau.gov/cer/BMSP_pro/be-facts.htm

Energy Employees Occupational Illness Compensation Program (EEOICP)
http://www.dol.gov/esa/owcp/energy/regs/compliance/main.htm

Ames Laboratory Public Affairs Office: 1-515-294-5643 (Steve Karsjen)

DOE Public Affairs Office: 1-865-576-3147 (Pam Bonee)

Updated: September, 2008

APPENDIX 2

2008 Sampling Plan for Beryllium Survey of Ames Laboratory Buildings

2008 Sampling Plan for Beryllium Survey of Ames Laboratory Buildings

The purpose of the sampling will be to survey representative surfaces in two Ames Laboratory buildings (Spedding Hall and Metals Development) for beryllium metal. The results of the survey will supplement a 2001 Ames Laboratory Beryllium Survey which primarily focused on existing campus buildings utilized as part of the Manhattan Project and subsequent Ames Laboratory activities potentially involving beryllium (Wilhelm Hall, Physics Hall, and Gilman Hall). Representative areas of hallways, shops, and office spaces will be sampled in Metals Development and Spedding Hall (see Table). Sampling locations will typically include samples from the floor, wall, ceiling and horizontal work surfaces such as desks or laboratory benches.

Representative surface samples will be collected by utilizing a 100 square centimeter template and wiping a pre-moistened Ghost Wipe™ over the entire area using a standard wipe technique. Gloves will be worn and changed after each sample to avoid potential sample cross-contamination. Samples will be analyzed in accordance with National Institute of Occupational Safety and Health Method 7300. Samples will be collected under the supervision of a Certified Industrial Hygienist (CIH). Samples will be analyzed for beryllium by an independent laboratory accredited by the American Industrial Hygiene Association (AIHA). Initial sample results will be assessed by Ames Laboratory ESH&A staff and ISU EH&S personnel and the need for further sampling will be reviewed with the Ames Laboratory Director. A report will be prepared by staff from the ESH&A and the EH&S offices and delivered to the Ames Laboratory Director.

Table of Sampling Locations for Beryllium Survey of Spedding Hall and Metals Development Building

#	Building	Location	Space Usage	Comments
1	Spedding Hall	Basement, Hallway, near entrance to HWH tunnel	Hallway	
2	Spedding Hall	Basement, Hallway, near B35	Hallway	Historical radioactive materials work in area.
3	Spedding Hall	Ground Floor, 18-23	Laboratory	Former shop, Historical radioactive materials work.
4	Spedding Hall	Ground Floor, Hallway, near Room 32	Hallway	
5	Spedding Hall	1st Floor, Hallway, near 108	Hallway	
6	Spedding Hall	1st Floor, Hallway, near 138	Hallway	
7	Spedding Hall	2nd Floor, Hallway, near 222	Hallway	
8	Spedding Hall	2nd Floor, Hallway, above ceiling near 230	Hallway	
9	Spedding Hall	238	Shop	Local group machine shop.
10	Spedding Hall	3rd Floor, Hallway, near 322	Hallway	
11	Spedding Hall	3rd Floor, Hallway, near 337	Hallway	
12	Metals Development	1st Floor, Hallway, Front East, near 121	Hallway	
13	Metals Development	135	Laboratory	Materials preparation laboratory.
14	Metals Development	160	Shop	Former and current Ames Lab Machine shop.
15	Metals Development	1st Floor, Hallway, near 161	Hallway	Former machine shop in 161.
16	Metals Development	2nd Floor, Hallway, Front West, near 296	Hallway	
17	Metals Development	2nd Floor, Hallway, Front East, near 222	Hallway	
18	Wilhelm Hall	Basement Hallway, near 26	Hallway	
19	TASF	G51	Vending area	

APPENDIX 3

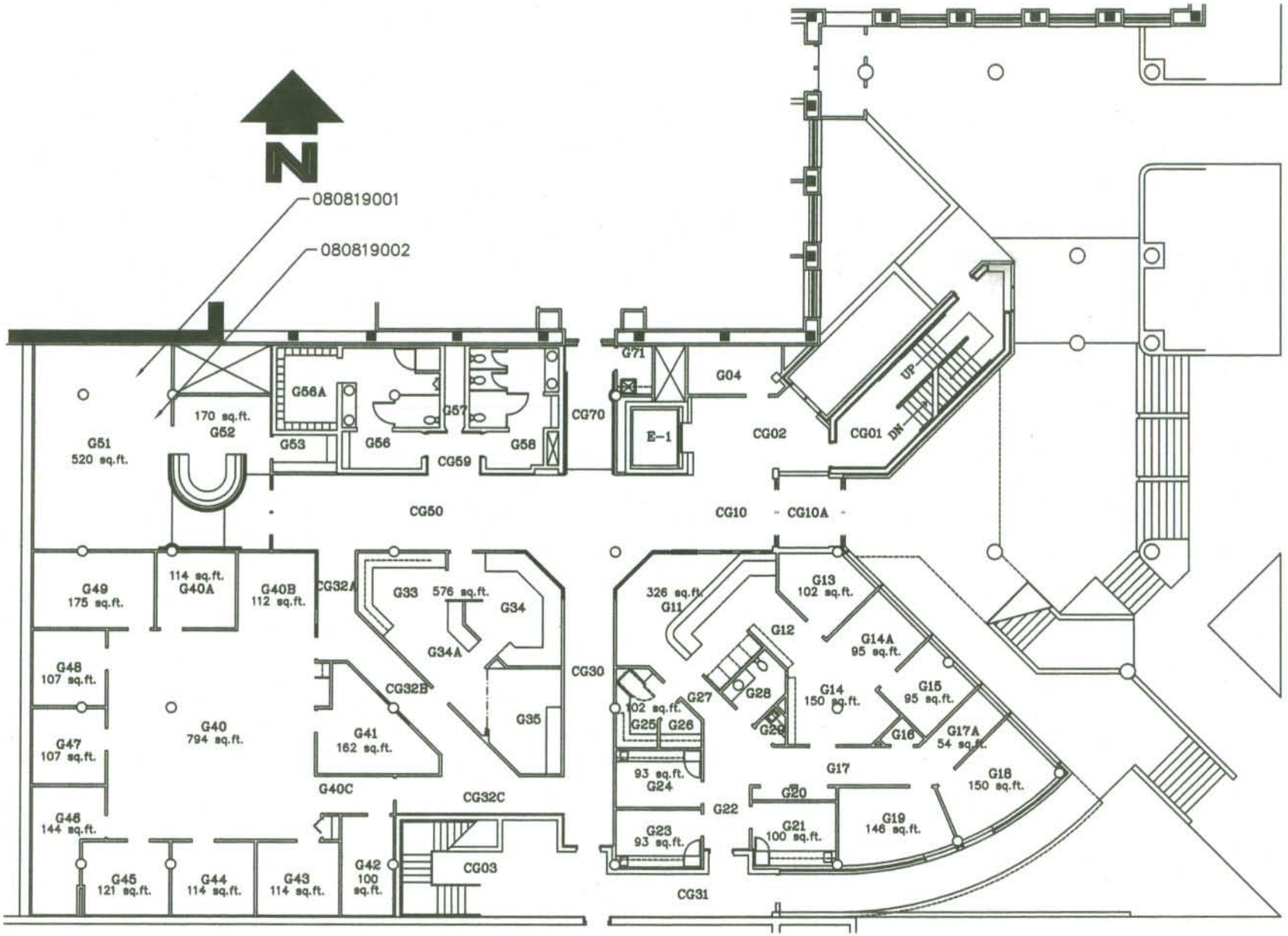
Beryllium Sampling Locations

Beryllium Sample Surveys
August 19th & 20th, 2008

Sample #	Location	Description
080819001	G51 TASF	Floor, northeast corner of room
080819002	G51 TASF	Wall, north side of wall, height of 10 feet, near vending machines
080819003	26 HWH	Floor, hallway outside room
080819004	26 HWH	Wall, outside room, height of 5 feet
080819005	26 HWH	Above false ceiling, on cement column, height of 12 feet
080819006	Basement SPH	Floor, near HWH tunnel door
080819007	Basement SPH	Wall, near HWH tunnel door, height of 5 feet
080819008	Basement SPH	Ceiling, near HWH tunnel door, height of 7.5 feet
080819009	B35 SPH	Floor, outside lab door
080819010	B35 SPH	Wall, outside lab door, height of 5 feet
080819011	B35 SPH	Above false ceiling, outside of ductwork, height of 10 feet
080819012	32 SPH	Floor, hallway outside room
080819013	32 SPH	Wall, outside room, height of 5 feet
080819014	32 SPH	Above false ceiling, on red clay block, height of 9 feet
080819015	22 SPH	Floor, hallway outside room
080819016	22 SPH	Wall, height of 5 feet
080819017	22 SPH	Ceiling, height of 10 feet
080819018	22 SPH	Horizontal surface on top of supply air duct
080819019	108 SPH	Floor, hallway outside room
080819020	108 SPH	Wall, height of 5 feet
080819021	108 SPH	Above false ceiling, on wall, height of 11 feet
080819022	138 SPH	Floor, hallway outside room
080819023	138 SPH	Wall, height of 5 feet
080819024	138 SPH	Above false ceiling, on wall, height of 11 feet
080819025	222 SPH	Floor, hallway outside room
080819026	222 SPH	Wall, height of 5 feet
080819027	222 SPH	Above false ceiling, height of 11 feet
080819028	230 SPH	Floor, hallway outside room
080819029	230 SPH	Wall, height of 5 feet
080819030	230 SPH	Above false ceiling, side of return duct
080819031	238 SPH	Floor, southeast corner of shop
080819032	238 SPH	Wall, southeast corner, height of 5 feet
080819033	238 SPH	Top of cabinet, northeast side of room
080819034	244 SPH	Floor, southwest corner of room
080819035	244 SPH	Window ledge, SW corner of room, height of 4 feet

Sample #	Bldg/Room	Description
080819036	244 SPH	Top of cabinet, southwest corner of room, height of 15 feet
080819037	322 SPH	Floor, hallway outside of room
080819038	322 SPH	Wall, height of 5 feet
080819039	322 SPH	Above false ceiling, wall, height of 11 feet
080819040	337 SPH	Floor, hallway outside door
080819041	337 SPH	Wall, height of 5 feet
080819042	337 SPH	Above false ceiling, wall, height of 11 feet
080820001	161 MD	Floor, hallway outside door
080820002	161 MD	Wall, height of 5 feet
080820003	161 MD	Above false ceiling, wall, height of 11 feet
080820004	296 MD	Floor, hallway outside door
080820005	296 MD	Wall, height of 5 feet
080820006	296 MD	Above false ceiling, wall, height of 11 feet
080820007	160 MD	Floor, by large mill, high bay area, inside safety rail
080820008	160 MD	Wall, high bay area, height of 14 feet
080820009	160 MD	Ceiling, high bay area, center of room
080820010	160 MD	On top of pipe, high bay area
080820011	160 MD	On top of vertical mill, height of 8 feet
080820012	135 MD	Floor, northwest corner of room, near HPGA ventilation table
080820013	135 MD	Wall, inside south door, near safety glasses receptacle, 5 feet
080820014	135 MD	Ceiling, southwest corner, near 208 V bus bar
080820015	135 MD	Horizontal surface, on top of 208 V bus bar
080820016	121 MD	Floor, hallway outside room
080820017	121 MD	Wall, height of 4 feet
080820018	121 MD	Above false ceiling, wall, height of 11 feet
080820019	222 MD	Floor, hallway outside door
080820020	222 MD	Wall, height of 5 feet
080820021	222 MD	Above false ceiling, wall, height of 11 feet

G: ih/Beryllium/Beryllium Sample Description table

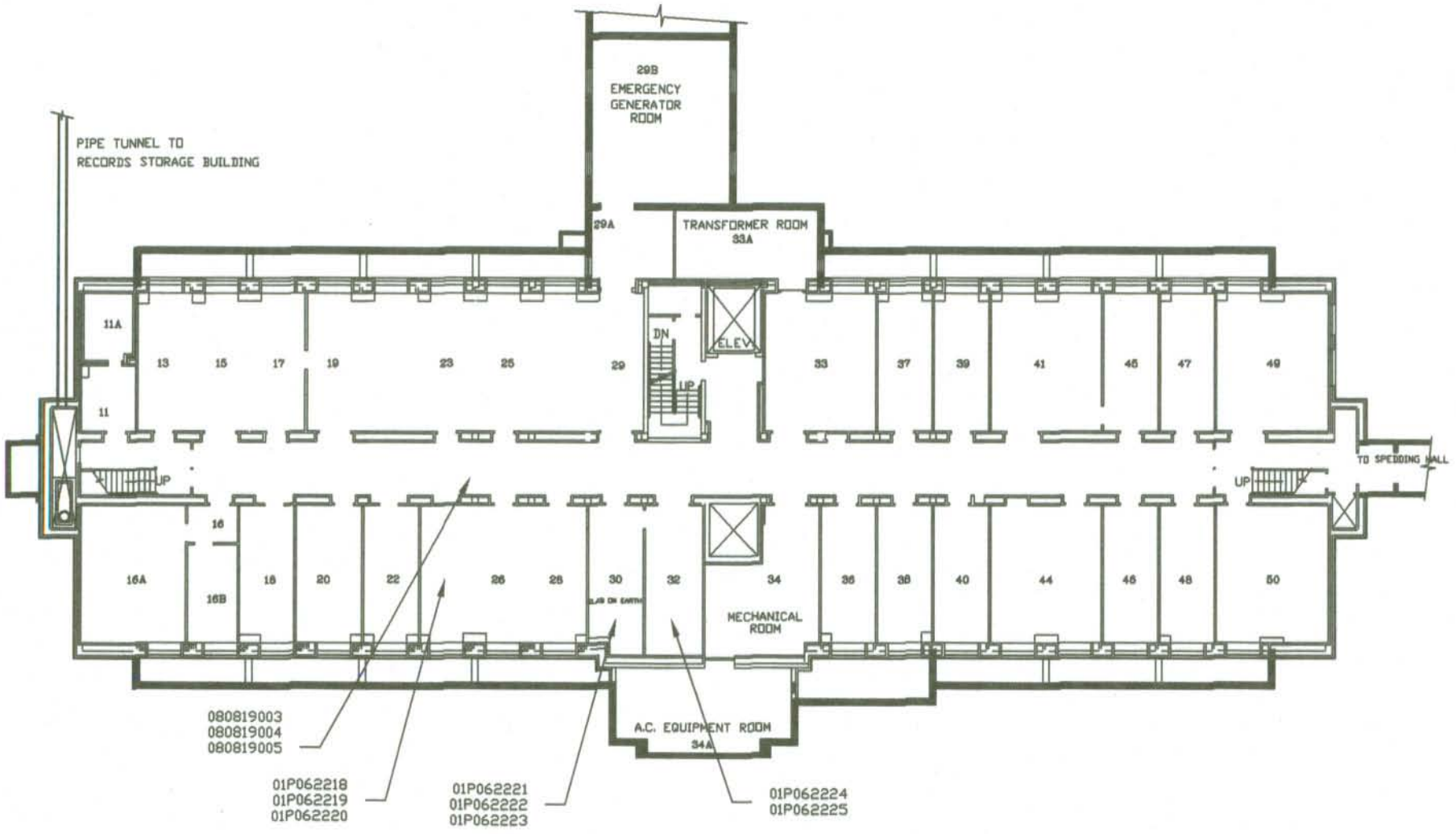


AMES LABORATORY

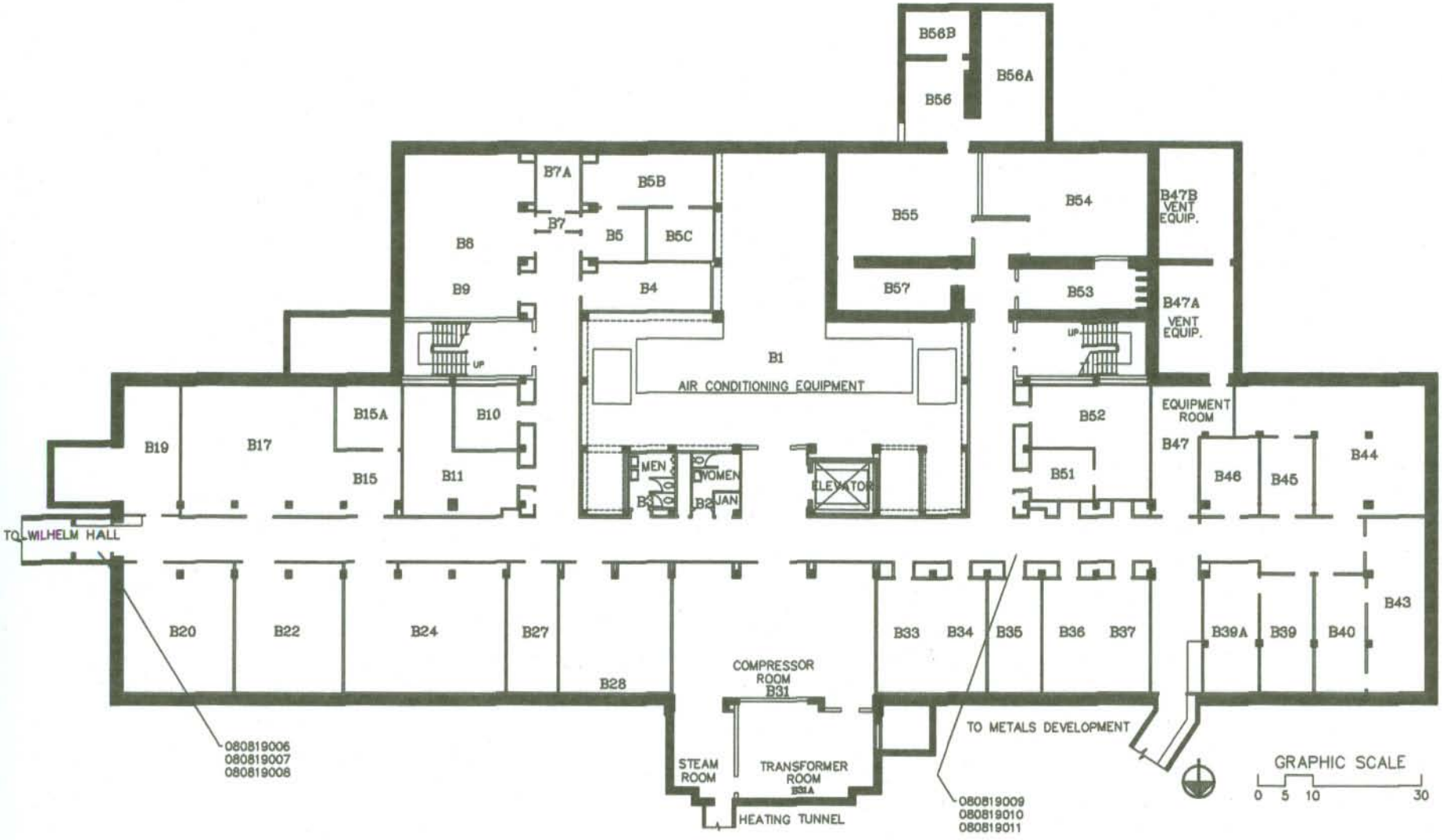
FACILITIES SERVICES GROUP
158 METALS DEVELOPMENT

TECHNICAL/ADMINISTRATIVE SERVICES FACILITY

GROUND FLOOR – BERYLLIUM SAMPLE LOCATIONS



AMES LABORATORY FACILITIES SERVICES GROUP 158 METALS DEVELOPMENT	WILHELM HALL – BASEMENT BERYLLIUM TESTING LOCATIONS	DWG: Ber_hwh_b DATE: 7/25/01 DRAWN BY: DEM

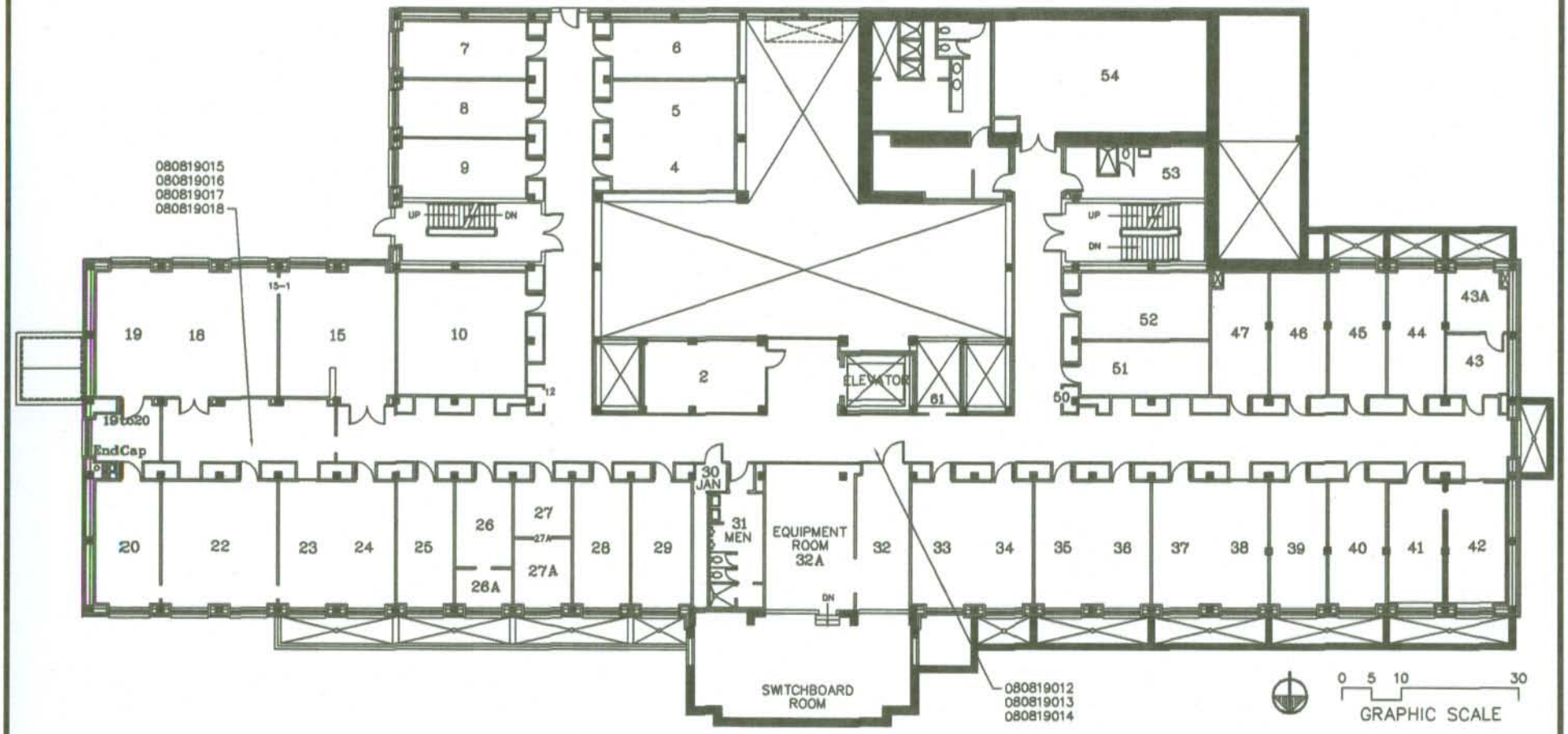


AMES LABORATORY

FACILITIES SERVICES GROUP
158 METALS DEVELOPMENT

SPEDDING HALL

BASEMENT – BERYLLIUM SAMPLE LOCATIONS

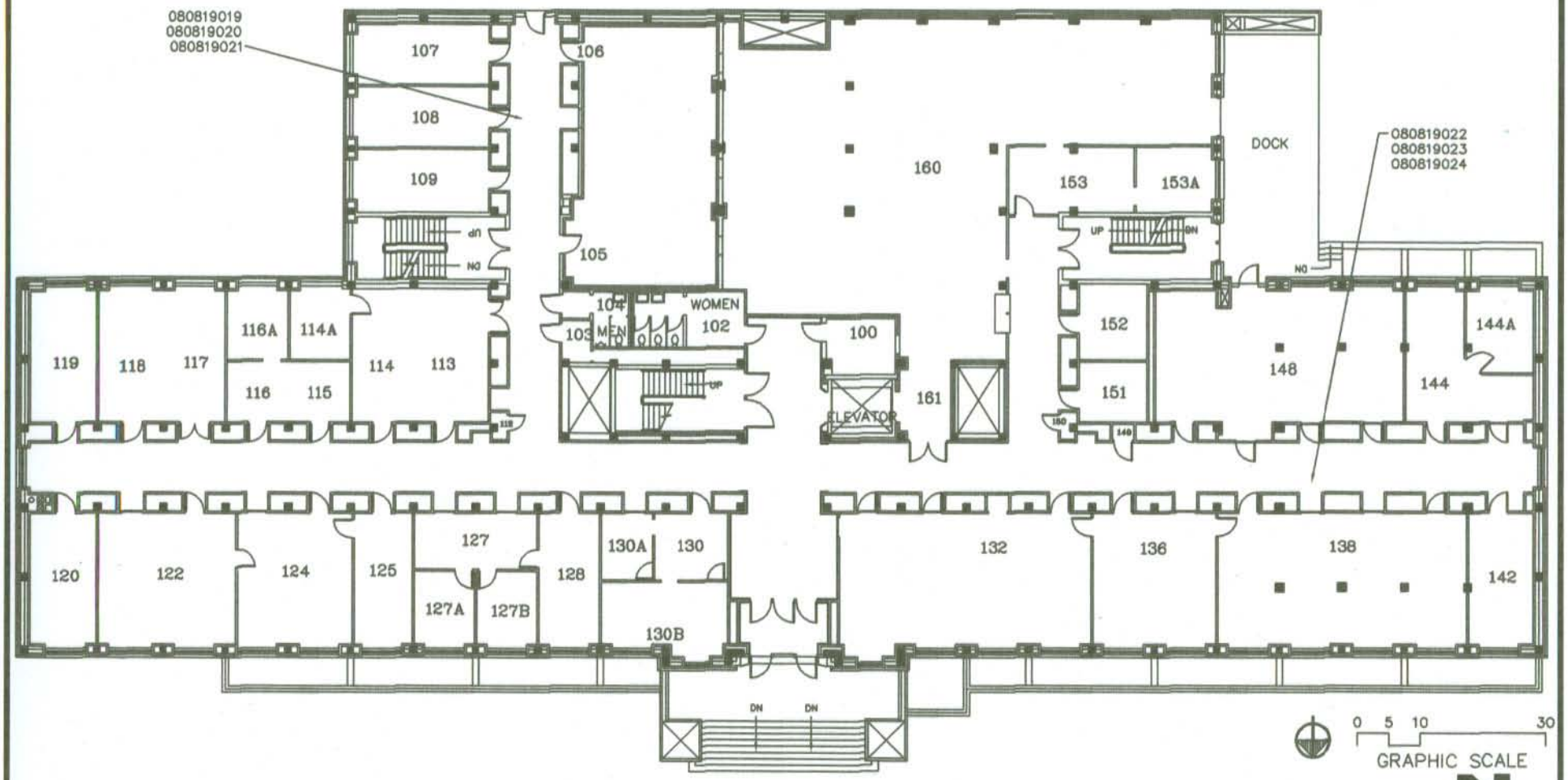


AMES LABORATORY

FACILITIES SERVICES GROUP
158 METALS DEVELOPMENT

SPEDDING HALL

GROUND – BERYLLIUM SAMPLE LOCATIONS

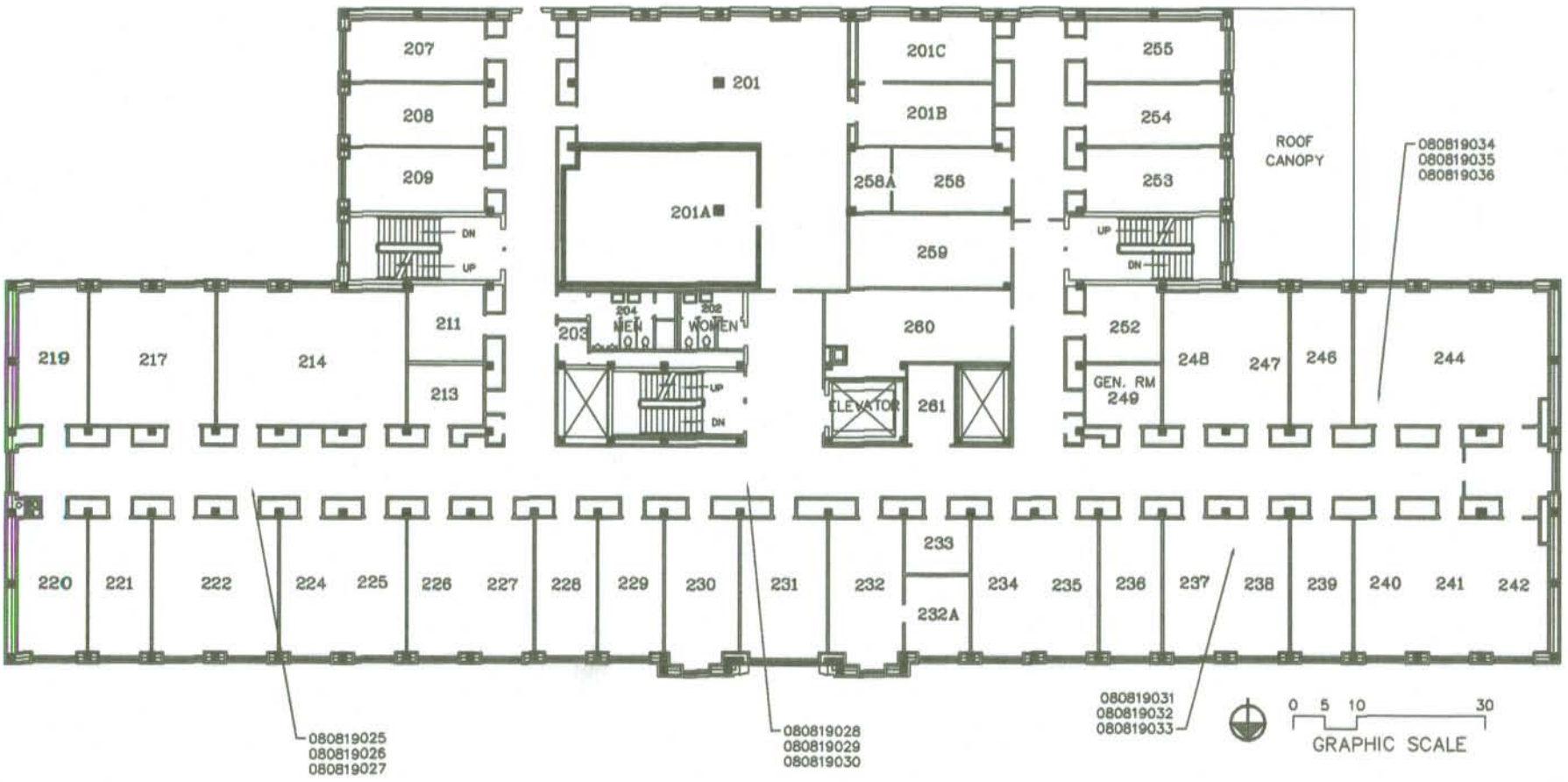


AMES LABORATORY

FACILITIES SERVICES GROUP
158 METALS DEVELOPMENT

SPEDDING HALL

FIRST FLOOR – BERYLLIUM SAMPLE LOCATIONS

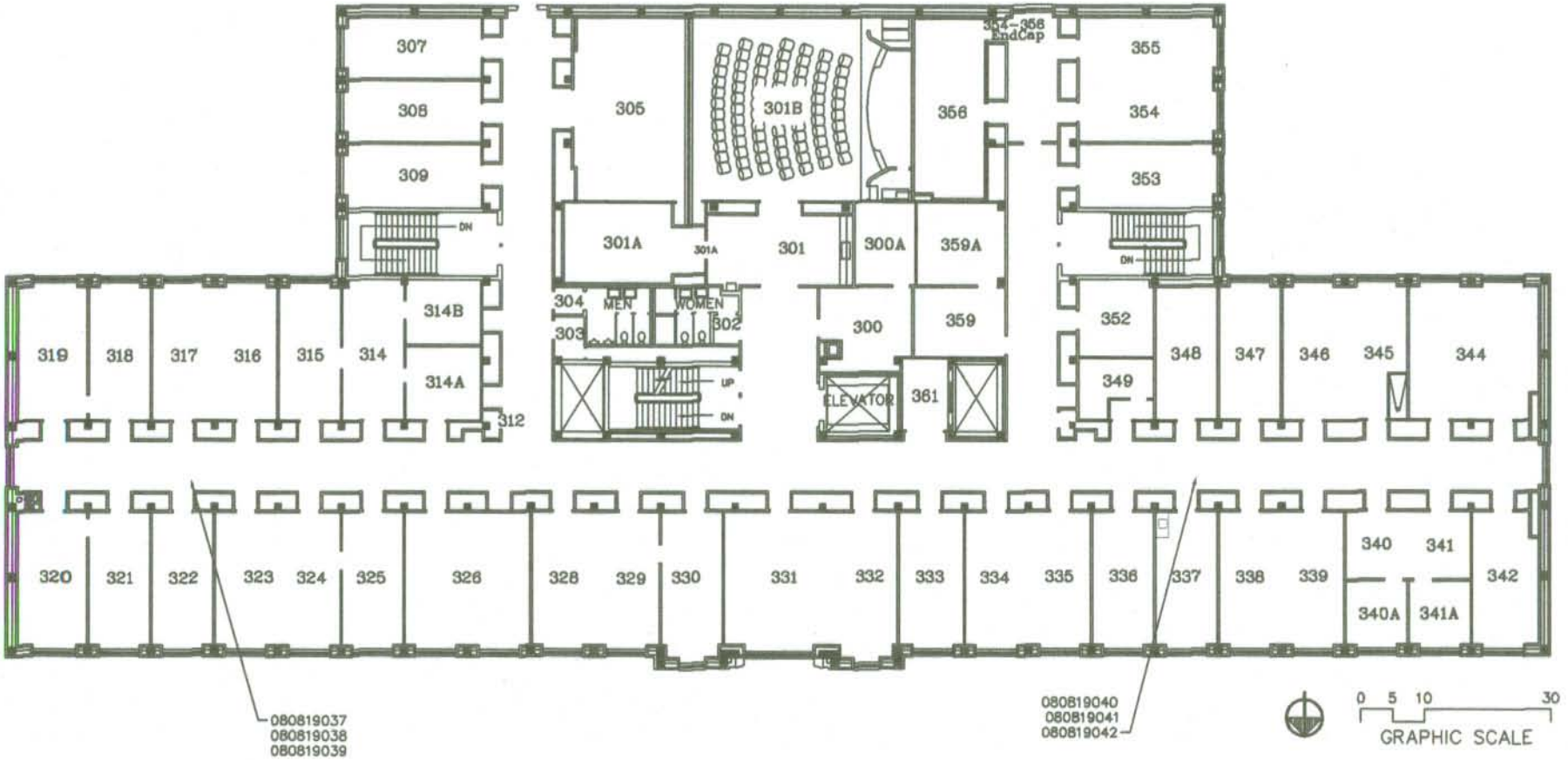


AMES LABORATORY

FACILITIES SERVICES GROUP
158 METALS DEVELOPMENT

SPEDDING HALL

SECOND FLOOR – BERYLLIUM SAMPLE LOCATIONS

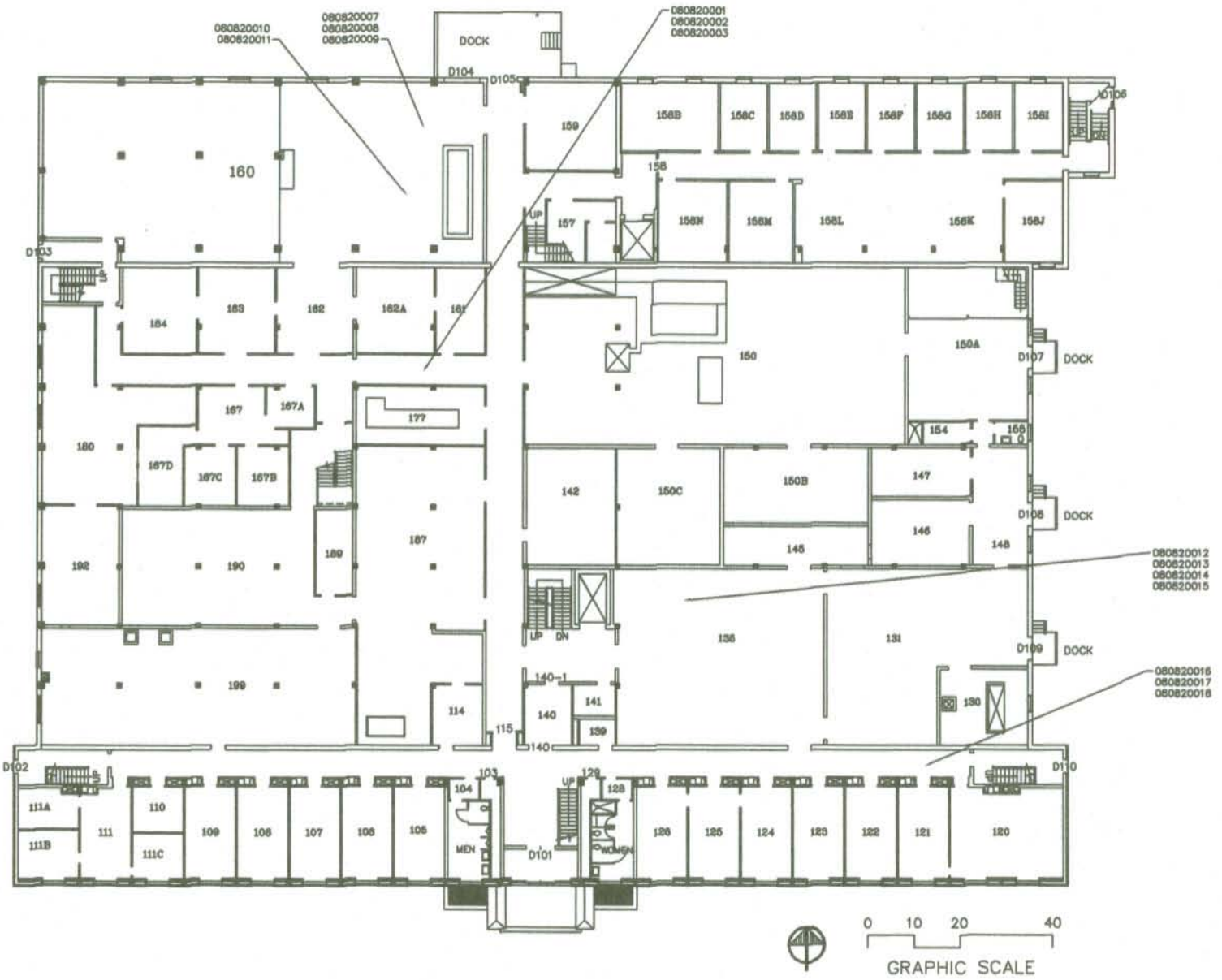


AMES LABORATORY

FACILITIES SERVICES GROUP
158 METALS DEVELOPMENT

SPEDDING HALL

THIRD FLOOR – BERYLLIUM SAMPLE LOCATIONS



AMES LABORATORY

FACILITIES SERVICES GROUP
158 METALS DEVELOPMENT

METALS DEVELOPMENT BUILDING

FIRST FLOOR – BERYLLIUM SAMPLE LOCATIONS

AMES LABORATORY

FACILITIES SERVICES GROUP
158 METALS DEVELOPMENT

METALS DEVELOPMENT BUILDING

SECOND FLOOR – BERYLLIUM SAMPLE LOCATIONS

APPENDIX 4

Sample Results

Beryllium Sample Survey Results
August 19th & 20th, 2008

Sample #	Location	Description	Result (micrograms/100 square centimeters)
080819001	G51 TASF	Floor, northeast corner of room	< **0.50**
080819002	G51 TASF	Wall, north side of wall, height of 10 feet, near vending machines	< **0.50**
080819003	26 HWH	Floor, hallway outside room	< **0.50**
080819004	26 HWH	Wall, outside room, height of 5 feet	< **0.50**
080819005	26 HWH	Above false ceiling, on cement column, height of 12 feet	< **0.50**
080819006	Basement SPH	Floor, near HWH tunnel door	< **0.50**
080819007	Basement SPH	Wall, near HWH tunnel door, height of 5 feet	< **0.50**
080819008	Basement SPH	Ceiling, near HWH tunnel door, height of 7.5 feet	< **0.50**
080819009	B35 SPH	Floor, outside lab door	< **0.50**
080819010	B35 SPH	Wall, outside lab door, height of 5 feet	< **0.50**
080819011	B35 SPH	Above false ceiling, outside of ductwork, height of 10 feet	< **0.50**
080819012	32 SPH	Floor, hallway outside room	< **0.50**
080819013	32 SPH	Wall, outside room, height of 5 feet	< **0.50**
080819014	32 SPH	Above false ceiling, on red clay block, height of 9 feet	< **0.50**
080819015	22 SPH	Floor, hallway outside room	< **0.50**
080819016	22 SPH	Wall, height of 5 feet	< **0.50**
080819017	22 SPH	Ceiling, height of 10 feet	< **0.50**
080819018	22 SPH	Horizontal surface on top of supply air duct	< **0.50**
080819019	108 SPH	Floor, hallway outside room	< **0.50**
080819020	108 SPH	Wall, height of 5 feet	< **0.50**
080819021	108 SPH	Above false ceiling, on wall, height of 11 feet	< **0.50**
080819022	138 SPH	Floor, hallway outside room	< **0.50**
080819023	138 SPH	Wall, height of 5 feet	< **0.50**
080819024	138 SPH	Above false ceiling, on wall, height of 11 feet	< **0.50**
080819025	222 SPH	Floor, hallway outside room	< **0.50**
080819026	222 SPH	Wall, height of 5 feet	< **0.50**
080819027	222 SPH	Above false ceiling, height of	< **0.50**

		11 feet	
080819028	230 SPH	Floor, hallway outside room	< **0.50**
080819029	230 SPH	Wall, height of 5 feet	< **0.50**
080819030	230 SPH	Above false ceiling, side of return duct	< **0.50**
080819031	238 SPH	Floor, southeast corner of shop	< **0.50**
080819032	238 SPH	Wall, southeast corner, height of 5 feet	< **0.50**
080819033	238 SPH	Top of cabinet, northeast side of room	< **0.50**
080819034	244 SPH	Floor, southwest corner of room	< **0.50**
080819035	244 SPH	Window ledge, SW corner of room, height of 4 feet	< **0.50**
080819036	244 SPH	Top of cabinet, southwest corner of room, height of 15 feet	< **0.50**
080819037	322 SPH	Floor, hallway outside of room	< **0.50**
080819038	322 SPH	Wall, height of 5 feet	< **0.50**
080819039	322 SPH	Above false ceiling, wall, height of 11 feet	< **0.50**
080819040	337 SPH	Floor, hallway outside door	< **0.50**
080819041	337 SPH	Wall, height of 5 feet	< **0.50**
080819042	337 SPH	Above false ceiling, wall, height of 11 feet	< **0.50**
080820001	161 MD	Floor, hallway outside door	< **0.50**
080820002	161 MD	Wall, height of 5 feet	< **0.50**
080820003	161 MD	Above false ceiling, wall, height of 11 feet	< **0.50**
080820004	296 MD	Floor, hallway outside door	< **0.50**
080820005	296 MD	Wall, height of 5 feet	< **0.50**
080820006	296 MD	Above false ceiling, wall, height of 11 feet	< **0.50**
080820007	160 MD	Floor, by large mill, high bay area, inside safety rail	< **0.50**
080820008	160 MD	Wall, high bay area, height of 14 feet	< **0.50**
080820009	160 MD	Ceiling, high bay area, center of room	< **0.50**
080820010	160 MD	On top of pipe, high bay area	< **0.50**
080820011	160 MD	On top of vertical mill, height of 8 feet	< **0.50**

080820012	135 MD	Floor, northwest corner of room, near HPGA ventilation table	< **0.50**
080820013	135 MD	Wall, inside south door, near safety glasses receptacle, 5 feet	< **0.50**
080820014	135 MD	Ceiling, southwest corner, near 208 V bus bar	< **0.50**
080820015	135 MD	Horizontal surface, on top of 208 V bus bar	< **0.50**
080820016	121 MD	Floor, hallway outside room	< **0.50**
080820017	121 MD	Wall, height of 4 feet	< **0.50**
080820018	121 MD	Above false ceiling, wall, height of 11 feet	< **0.50**
080820019	222 MD	Floor, hallway outside door	< **0.50**
080820020	222 MD	Wall, height of 5 feet	< **0.50**
080820021	222 MD	Above false ceiling, wall, height of 11 feet	< **0.50**

G: ih/Beryllium/Beryllium Sample Description table