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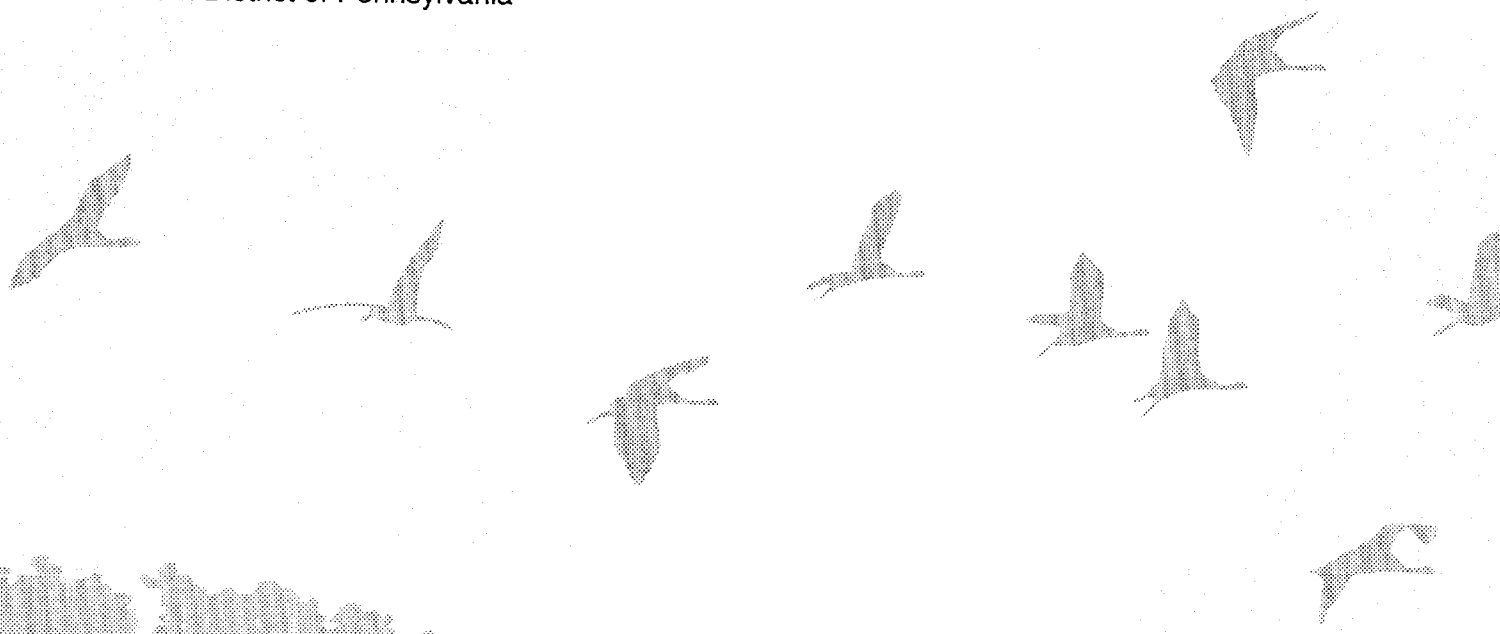
RADIOLOGICAL SURVEY OF THE GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

T. J. VITKUS

Prepared for the
United States Bankruptcy Court
for the Western District of Pennsylvania



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RADIOLOGICAL SURVEY OF THE GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

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RADIOLOGICAL SURVEY
OF THE
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

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ABBREVIATIONS AND ACRONYMS

µR/h	microroentgens per hour
µrem/h	microrem per hour
AEC	Atomic Energy Commission
ASME	American Society of Mechanical Engineers
cm	centimeter
cpm	counts per minute
DOE	U.S. Department of Energy
dpm/100cm^2	disintegrations per minute per one hundred square centimeters
EML	Environmental Measurements Laboratory
EPA	U.S. Environmental Protection Agency
ESSAP	Environmental Survey and Site Assessment Program
GM	Geiger Mueller
GSSC	Guterl Speciality Steel Corporation
ha	hectare
kg	kilograms
m	meters
m^2	square meters
mm	millimeter
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDC	minimum detectable concentration
MeV	million electron volts
NaI	sodium iodide
NIST	National Institute of Standards and Technology
NLO	National Lead of Ohio
NRC	U.S. Nuclear Regulatory Commission
ORISE	Oak Ridge Institute for Science and Education
ORNL	Oak Ridge National Laboratory
pCi/g	picocuries per gram
Pa-234m	protactinium-234 metastable
Ra-226	radium-226
Th-232	thorium-232
Th-234	thorium-234
U_3O_8	uranium octaoxide ("yellowcake")
U-235	uranium-235
U-238	uranium-238

RADIOLOGICAL SURVEY
OF THE
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

INTRODUCTION AND SITE HISTORY

The Guterl Specialty Steel Corporation (GSSC) site, formerly known as the Simonds Saw and Steel Company, performed rolling mill operations on uranium metal, and to a much smaller extent, thorium metal, during the period from 1948 to 1956. Uranium and thorium operations were performed under two separate contracts. The first contract, AT-30-1-Gen-339, initiated in May of 1948 and in effect until 1952, was negotiated with the New York Operations Office of the Atomic Energy Commission (AEC), predecessor to the U.S. Department of Energy (DOE). The second contract, number S-4, was a subcontract from the AEC with National Lead of Ohio (NLO), which extended the plant activities until 1956. In total, between 25 and 35 million pounds of uranium and approximately 30 to 40 thousand pounds of thorium were rolled from 1948 until operations discontinued in 1956. More than 99 percent of the work done under these contracts involved uranium, which was rolled on the 16-inch rolling mill located in Building 8. Several small lots of uranium bars were run through the 10-inch rolling mill, and approximately 15 to 20 ingots were processed in the hammer forge shop, which was located in Building 3 (NYDEC 1994a and b).

During all operations from 1948 through 1956, the AEC was responsible for providing radiological monitoring and safety guidance and assistance. Residue from the operation was returned to the AEC or NLO. The DOE's Niagara Falls Storage Site (formerly Lake Ontario Ordnance Works) was used for interim storage of the materials between processing operations and use. Protective measures employed at the site included the use of hoods and dust collection equipment over the 16-inch rolling mill stands, and catch pans in the mill pits to collect material from each rolling operation. The mill area was vacuumed after every batch of 16 ingots, and the shipping area was vacuumed daily (ORNL 1979).

A radiological survey by Nuclear Science and Engineering Corporation/Carborundum Metals was performed in 1958 which identified elevated radiation levels, and indicated that radiation levels were highest in the quench tank area located in Building 8. Area decontamination was performed, clean steel plates placed over the area, and a second radiological survey was performed in December 1958

to verify decontamination was effective. In October 1976, at the request of DOE Headquarters, Oak Ridge National Laboratory (ORNL) performed another radiological survey to determine the status of the property relative to current radiological release guidelines. The ORNL survey revealed that most of the residual contamination remaining from the uranium and thorium rolling operations was confined to the areas inside and immediately outside of Buildings 6 and 8 (ORNL 1979).

On February 7, 1980, DOE determined that the site required consideration for remedial action. New York State was notified of these findings and took steps to ensure that the site would be adequately controlled. In August of 1984, after reviewing historical and contractual information, DOE determined that they did not have the authority under the Atomic Energy Act of 1954 to conduct remedial action at the site. This was primarily due to a "hold harmless" provision in the subcontract between Simonds and NLO, which released the government from liability in regard to these operations. In accordance with DOE policy, the State of New York and the U.S. Environmental Protection Agency (EPA) were notified of the results of the investigation in order that appropriate actions would take place (ORNL 1979).

In August 1982, GSSC filed for Chapter 11 (bankruptcy) protection and in March 1984 Allegheny International (now known as Allegheny Ludlum Corporation) bought out the assets of the GSSC. The purchase by Allegheny Ludlum Corporation included the entire site with the exception of two regions, classified as the excised property and the landfill. The excised property is approximately 3.6 hectares (ha [9 acres]), consists of a chain-link fenced area which surrounds all of the buildings that existed during the rolling operations from 1948 through 1956, and includes the adjacent exterior land areas. The landfill region was originally owned and used by Simonds Saw and Steel Company from 1962 to 1978, and was subsequently owned and used by GSSC from 1978 to 1980. The landfill area was used for the disposal of slag, baghouse flue dust, foundry sand, waste oils and greases, and miscellaneous plant rubbish. The landfill is not lined or covered, and although its surface has been regraded, ponding occurs and surface runoff is uncontrolled. The landfill region is currently a New York State superfund site (NYDEC 1994a and b).

SITE DESCRIPTION

The 28 ha GSSC site is located in Lockport, New York (Figure 1). The site is bordered by Ohio Street to the east, residential and commercial properties to the north, Route 95 to the west, and the New York State Barge Canal to the south (Figure 2). The property is grouped into three areas, the 21 ha Allegheny Ludlum Corporation property, which includes four buildings that were constructed after the termination of AEC activities; the 3.5 ha landfill area, located in the northwest corner of the site; and the 3.6 ha excised property, which includes nine buildings that existed during the AEC activities, located in the southeast corner of the site (Figure 2).

The nine buildings located within the excised property include Buildings 1 and 2; the co-joined Buildings 3, 4, 5, 6, 8, 9; and Building 35 (Figure 3). Buildings 1 and 2, built in 1913 and 1914, were primarily used as manufacturing buildings, having total areas of approximately 815 and 6,400 m^2, respectively (Figures 4 and 5). Buildings 3 and 35, built in 1920 and 1950, were used for grinding and roll staging and have total areas of approximately 6,300 and 410 m^2, respectively (Figures 6 and 7). Buildings 4 and 9, built in 1920 and 1918, were both used as manufacturing buildings and have total areas of approximately 2,600 and 1,800 m^2, respectively (Figure 8). Building 5, built in 1918, contained a 25-cycle heat exchanger and has a total area of approximately 350 m^2 and is located between Buildings 4 and 9, and 6 (Figure 3). Buildings 6 and 8, both built in 1918, were used for uranium and thorium metal roll processing and contain the 16-inch and 10-inch rolling mills. The total area of these buildings is approximately 970 and 2,300 m^2, respectively (Figure 9). Attached to the west end of Buildings 6 and 8 is a railcar loading dock, which was used to transport residues from the rolling operations. Building 24 is located outside of the excised property boundary and contains approximately 6900 m^2 of floor space (Figure 10). Only the southwest area of the structure existed at the time of the AEC activities. The southeast and north areas were constructed at later periods. Currently the structure is used for general warehousing- type operations. The majority of the buildings are approximately 10 meters (m [30 feet]) in height to the steel I-beam supports. The walls are constructed of brick and sheet metal paneling and the floors consist primarily of compacted dirt with some areas of concrete or bricks. Most horizontal surfaces contain an excessive amount of dust and debris. Buildings 6 and 8 have steel plates on the floor surface with dirt and cinders beneath and the majority of all the equipment used during the AEC

activities is still present. The buildings have been isolated since closing and exhibit leaking roofs, broken windows, excessive debris on the floor, etc. Numerous other safety hazards and concerns currently exist within all the buildings.

The exterior grounds of the excised area include a crane yard to the east of Buildings 1 and 2, an alleyway between Buildings 2 and 3, an alleyway encircling Building 5, a courtyard area between Buildings 2 and 35, and the exterior loading dock area to the west of Buildings 6 and 8. The 3.5 ha landfill region, which is located in the northwest corner of the site, consists of level grade compacted dirt (Figure 3).

The Allegheny Ludlum Corporation property, measuring approximately 21 ha, consists of open land covered with minimal vegetation and numerous piles of used fire brick, stockpiled equipment, and other miscellaneous material. Railroad spurs that presently exist appear to have been moved approximately 10 meters south upon the completion of Building 24 in 1966. The previous location of rail spurs extended north from the excised property (from the west end of Building 8 and from Building 2), merged and led to the east side of the landfill region (Figure 3). North of the landfill is a 0.4 ha strip of land that leads to another 0.13 ha parcel that may also have belonged to Simonds Saw and Steel Company. At the request of the United States Bankruptcy Court for the Western District of Pennsylvania and with the approval of DOE, the Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE) performed a radiological survey of the GSSC site. This report documents the survey procedures and results.

OBJECTIVE

The objective of the survey was to obtain sufficient data to 1) adequately characterize the radiological status of the land and building areas located at the GSSC and Allegheny Ludlum property site and 2) be comprehensive enough to provide both a volume and cost estimate for remediation design.

DOCUMENT REVIEW

ESSAP reviewed previously issued reports and field data for the development of the overall survey approach.

PROCEDURES

A survey team from ESSAP visited the GSSC during the periods April 26 through May 7 and November 1 through 3, 1999 and performed visual inspections, and measurement and sampling activities. Survey activities were conducted in accordance with a site-specific survey plan and the ORISE/ESSAP Survey Procedures and Quality Assurance Manuals (ORISE 1997, 1998 a and b). Appendices A and B provide additional information on survey equipment and procedures that were used during the survey activities.

ESSAP designed the survey and investigated the GSSC site based on the contamination potential definitions provided in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (NRC 1997). ESSAP designated each area of the site as either Class 1, 2, or 3 and developed general residual activity range guidance for each classification based on the results of the previous ORNL and NYDEC investigations. A description of each classification is as follows:

> Class 1: Areas that have a significant potential for radioactive contamination (based on site operating history), known contamination (based on previous radiological surveys), or any interior areas identified to be greater than 75% of the surface activity guideline based on scans and direct surface activity measurements, or exterior areas identified to be twice background based on direct gamma scans.
>
> Class 2: Areas contiguous to Class 1 areas or areas that have a potential for radioactive contamination or known contamination that is between 25% and 75% of the surface activity guideline based on scans and direct surface activity measurements for interior areas and for exterior areas that are not directly associated with firebrick, identified to be between 1.3 and 2 times background based on direct gamma scans.

Class 3: Areas that are not expected to contain any residual contamination based on site operating history or previous radiological surveys. Exterior areas identified to be at or near background based on direct gamma scans or any interior areas identified to be less than 25% of the surface activity guideline based on scans and direct surface activity measurements.

Areas were reclassified, either up or down, based on information obtained during the performance of the survey. In many cases, the general procedural approach discussed in the survey plan was modified to best utilize time and resources as the survey progressed.

INTERIOR SURVEY PROCEDURES

The following survey procedures were applicable to the interior portions of site buildings within the excised area or immediately contiguous to those buildings.

Reference System

ESSAP used a 5 m × 5 m reference system on the floors and a 1 m × 1 m reference system on the lower walls (up to 2 m) in Buildings 6 and 8. The ceiling, walls (above 2 m), and equipment in these areas were not gridded. The remaining buildings were not gridded. Measurements and samples collected on ungridded surfaces were referenced to site features and documented on to-scale facility drawings.

Surface Scans

Floors and lower walls were scanned for beta and gamma radiation, with total scan coverage based on the area classification. Particular attention was given to cracks and joints in the floors and walls, ledges, ducts, drains, and horizontal surfaces where material had accumulated. Scans were performed using NaI scintillation detectors for gamma radiation and gas proportional or GM detectors for beta radiation. All detectors were coupled to ratemeters or ratemeter-scalers with audible indicators. Locations of elevated direct radiation were marked for further investigation.

Where residual contamination was detected, additional areas were scanned to delineate contamination boundaries.

In Class 1 areas, approximately 100% of the accessible surfaces were scanned for gamma and beta radiation on non-dirt surfaces (i.e., brick, concrete, etc.). On dirt surfaces, 100% scans were performed for gamma and 10% or greater for beta radiation. Accessible upper walls, ceilings, overhead pipe runs, beams, and equipment were also scanned, although only minimal coverage could be achieved due to logistical and safety considerations. To compensate, random and judgmental locations were selected based on findings as the surveys progressed. Initially, only Buildings 6 and 8 were identified and surveyed as Class 1 areas. However, the results of the investigations as the survey progressed required reclassification of some areas of Buildings 1, 2, 3, 4 and 9, and 24 as Class 1.

For Class 2 areas (originally all of Buildings 2, 3, 4 and 9, 5, the southern section of 24 and 35), scans for beta radiation were performed on non-dirt surfaces at a minimum frequency of 50%, with some areas scanned 100% if suspect areas were identified. On dirt surfaces, 100% gamma scans were performed. Approximately 1% of upper walls, ceilings, and overhead structures were also scanned for beta activity with emphasis on horizontal surfaces where residual contamination may have settled and accumulated. Only minimum surveys could be performed in Building 5 due to structural integrity concerns and the extensive accumulation of debris.

Surface scan coverage in Class 3 areas (originally all of Building 1 and the north section of Building 24) consisted of approximately 50% of the accessible surfaces scanned for gamma radiation and up to 10% of accessible surfaces scanned for beta radiation.

Surface Activity Measurements

Construction material-specific background measurements used for calculating action levels and for data conversion were made in the old Guard House (Building 48, Figure 2), an area of similar construction but without a history of radioactive material use. Direct measurements for total beta activity were performed in each building at systematic, and judgmental locations using gas

proportional or GM detectors coupled to ratemeter-scalers. Measurements were made on floors, lower walls, equipment, and upper surfaces at what was determined to be a sufficient frequency representative of the overall surface activity distribution. Additional measurements were performed at locations of elevated gamma and/or beta radiation identified by surface scans. The total number of direct measurements made in each building are as follows: Building 1, 14 locations; Building 2, 76 locations; Building 3, 58 locations; Buildings 4 and 9, 43 locations; Building 6, 30 locations; Building 8, 135 locations; Building 24 north area, 17 locations; Building 24 south areas, 93 locations; and Building 35, 25 locations. Figures 11 through 26 show measurement locations. A smear sample, to determine removable gross alpha and gross beta activity levels, was collected from most direct measurement locations.

Exposure Rate Measurements

Exposure rates measurements at one meter above the surface were made at a minimum of five locations within each building using a microrem meter. A total of 72 measurements were made.

Soil Samples

Surface (0 to 15 cm) soil samples were collected systematically and/or randomly and from locations of elevated direct gamma and beta radiation. Figures 27 through 32 show sampling locations. A total of 102 surface soil samples were collected from soil areas within the buildings. Samples of residue from equipment pits and similar areas that were inherently soil-like are included in these totals. The samples collected represented 13 locations from Building 2, 24 locations from Building 3, 21 locations from Building 6, and 47 locations from Building 8. This represents a minimum frequency of at least one sample per 100 m^2 in Class 1 areas and 10 locations in each Class 2 building.

Additionally, subfloor—that is beneath the concrete floor or other type of overlayments—soil samples, were collected from two locations in Building 2, one location in Building 3, two locations in Building 4 and 9, and four locations in Building 24. Subsurface samples were collected from six locations in Building 8. A total of 25 samples were collected from these 15 locations.

Miscellaneous Samples

One composite sample of dust and loose residue was collected from random horizontal surfaces within the Building 8 area. Sediment samples were collected from the oil/water separator—located in a small building next to the east side of Building 3—and from five water-filled equipment or utility trenches that are in Buildings 3 and 8 (Figures 28 and 31).

EXTERIOR SURVEY PROCEDURES

The following survey procedures were applicable to the exterior areas of the site. As discussed under the Procedures Section, land area surveys were performed based on the expected potential for residual contamination. The area within the excised property fence line was generally considered to be Class 1. Additional Class 1 areas included other previously identified small areas located across the northern portion of the Allegheny Ludlum Corporation property. The remainder of the north portion of the property was classified as Class 2 and the southwest portion classified as Class 3.

Reference Grid

ESSAP established a site grid system consisting of 20 m × 20 m grid blocks. This grid was further subdivided into 10 m × 10 m grids within the excised property area. The southwest Class 3 portion of the property was not gridded. Measurements and samples from the Class 3 area were referenced to the southwest corner of the site's perimeter fence and documented on a site map.

Surface Scans

Surface scans for gamma radiation were performed over 100 % of both Class 1 and 2 land areas and 10 % of the Class 3 area. Scans were performed using NaI scintillation detectors coupled to ratemeters with audible indicators. Locations of elevated gamma radiation were marked for further investigation and documented on field data sheets and site drawings.

Exposure Rate Measurements

ESSAP has previously collected background exposure rate measurement data from sites within the Lockport vicinity (ORAU 1989 and 1990). Site exposure rate measurements were performed at one meter above the surface using a microrem meter at 285 locations within the Class 1 and 2 areas. Exposure rate measurements were not made within the Class 3 area.

Soil Samples

For the Class 2 portions of the site, surface soil samples were systematically collected at a frequency of one every 20 meters, alternating in a triangular sampling pattern (Figures 33 and 34). Within the excised Class 1 area, samples were initially collected every 10 meters. However, most of the area was reclassified as Class 2 and the frequency reduced to one every 20 meters based on the minimal findings in this area as the survey progressed. Additional surface soil samples were collected from locations of elevated direct gamma radiation detected by surface scans. Subsurface samples were collected from 50 locations. Borehole locations were selected based on surface scan results and were placed within, and at the perimeters of areas of elevated direct gamma radiation detected while performing surface scans. Subsurface sample collection was achieved at 34 of the locations using a subcontracted, truck-mounted drill rig equipped with a split-spoon sampler. Sample depth was generally 120 to 180 cm at which point bedrock and shallow groundwater were encountered. The remaining subsurface locations were sampled manually to a depth of 30 cm. Figures 33 and 34 show surface and borehole soil sampling locations. For the Class 1 and Class 2 areas, a total of 232 surface and 147 subsurface soil samples were collected.

Soil sampling within the Class 3 area involved the collection of 15 samples from randomly selected locations—using the MARSSIM methods for determining number and location of samples—and three samples from locations of elevated direct radiation detected by surface scans (Figure 35).

SAMPLE ANALYSIS AND DATA INTERPRETATION

Samples and data were returned to the ORISE/ESSAP laboratory in Oak Ridge, Tennessee for analysis and interpretation. Sample analysis was in accordance with the ORISE/ESSAP Laboratory Procedures Manual (ORISE 1999). Soil and miscellaneous samples were analyzed by gamma spectroscopy and results reported in picocuries per gram (pCi/g). The radionuclides of interest were processed uranium and thorium-232; however, spectra were also reviewed for other identifiable photopeaks. Photopeaks associated with americium-241 and thorium-230 were identified by the gamma spectroscopy system, but these were thought to be the result of low-energy x-ray interferences. To confirm this, selected samples were analyzed by alpha spectroscopy for americium, plutonium, and thorium to verify that these radionuclides were not present in samples. Smears were analyzed for gross alpha and gross beta activity using a low-background gas proportional counter. Smear results and direct measurements for surface activity were converted to units of disintegrations per minute per 100 square centimeters (dpm/100 cm^2). Exposure rates were reported in units of microroentgens per hour (μR/h). Appendices A and B contain additional information on analytical equipment and methods.

FINDINGS AND RESULTS

SURVEY RESULTS: INTERIOR

The results of the survey for the building interiors are provided below.

Surface Scans

Building 1—Elevated gamma and beta radiation was detected in a work room located on the southern end of the building. The contaminated area identified was associated with a work bench, the surrounding floor, a floor drain (which had been grouted closed), and a contaminated rag. A thorough survey of the room was not completed due to health and safety concerns associated with degraded boxes of suspected asbestos insulation that had been stored in the room. Surface scans of

the remaining accessible portions of Building 1 did not identify any residual contamination. The basement area could not be surveyed as the area was flooded.

Building 2—Surface scans of Building 2 identified both elevated surface and soil activity. These locations were not widely distributed and by their nature indicated that some of the contamination was most likely the result of personnel tracking the material into these areas. In the north section of the building, two areas of elevated radiation were noted in the Northwest Metals Lab, one on a work bench and another on a door facing. A suspected area of contamination, previously documented (FBD 1981), that was associated with the Forge Shop in the north-end of the Building could not be verified. The center section contained a contaminated locker in one of the side rooms and multiple areas of elevated gamma and/or beta activity on the floor surfaces. Investigations beneath a concrete overlayment at the location noted on the west side of the building identified a slag-like material which exhibited the elevated gamma activity. This material was sampled and analyzed. There were no areas of elevated radiation found in the southern section of the building other than those associated with numerous old samples that had been stored there and had presumably been collected during previous site investigations. Limited overhead and upper wall surface investigations did not identify surface activity in excess of action levels.

Building 3—Numerous areas of elevated direct gamma and/or beta activity levels were identified within Building 3 soils, on equipment, and on surfaces. These areas of elevated activity were found primarily in the southern two-thirds of the structure, with the northern boundary being the point at which Building 8 ended. In general, contaminated structures identified were in and around the equipment trench (a thorough survey could not be performed within this trench due to the accumulated water) located in the south section, a roller cap located in the south section, the walkway/hopper track leading into the east side of the building (this area was selected for subfloor investigation and sampling), and on interspersed concrete areas next to the cafeteria and in the vicinity of Building 8. Most all overhead surfaces were also found to have elevated surface activity in the southern two-thirds of the building. Elevated soil activity detected was generally within the same regions as those described for surface activity, with the highest levels in the area immediately adjacent to Building 8.

Buildings 4 and 9—One area of elevated direct beta radiation was detected in the central portion of the area and another area in the east central portion in the vicinity of a roller furnace. Overhead surfaces above these areas were also found to have elevated activity levels. The floor was primarily comprised of brick and the potential that the contamination identified may have migrated to the soils beneath the brick was investigated by collecting a soil sample under this area and a sample of residue contained on and between the bricks.

Building 5—There were no areas of elevated beta or gamma radiation detected by surface scans in this facility.

Building 6—Areas of elevated direct gamma and beta radiation in Building 6 were identified primarily along the north portion which adjoins Building 8. Interspersed locations of gamma activity were also identified beneath many of the steel floor plates and near two furnaces located on the east side. Overhead surfaces could not be accessed for surveys.

Building 8—Extensive areas of elevated direct beta and gamma activity in soils and on surfaces were identified throughout the Building 8 area, including all overhead surfaces investigated. Essentially, all surfaces within Building 8 had some residual activity with the highest levels noted in the central and eastern portions. On upper surfaces, all horizontal surface locations investigated were found to have elevated beta activity levels. Much of the elevated activity on surfaces, other than the rolling mills, was associated with residue and dust that had collected. Equipment and structural surfaces that were scanned within Building 8, and found to be free of dust or other residues, generally did not have associated residual contamination.

Building 24—Elevated beta surface activity was noted on both upper and lower surfaces throughout the southwest portion of Building 24, which is that part of the building that existed at the time of the AEC activities. Of particular note were the levels associated with expansion joints indicating the potential for subfloor soil contamination. Several of the expansion joint areas were therefore selected for subfloor soil investigation and sampling. No elevated activity levels were identified in the north portion. One small area of elevated activity was identified in the southeast section and

additional elevated activity identified in a small southeast storage room and the adjoining transformer room.

Building 35—There were no locations of elevated beta or gamma radiation detected by surface scans in this facility.

Appendix C provides photographs of the various buildings and shows representative contaminated areas.

Surface Activity Levels

Surface activity levels at each measurement location for each building are provided in Tables 1 through 9. In addition to the total and removable surface activity levels, specific information as to the surface the measurement was made on is provided. The general range of each measurement is further illustrated on Figures 11 through 27. The total surface activity ranges shown on the figures are for less than 5,000 dpm/100 cm^2; 5,000 to 15,000 dpm/100 cm^2; and greater than 15,000 dpm/100 cm^2.

A general summary of surface activity levels within each of the surveyed buildings is as follows:

Location	Total Beta Activity Range (dpm/100 cm^2)	Alpha Removable Range (dpm/100 cm^2)	Beta Removable Range (dpm/100 cm^2)
Building 1 (11 samples from 14 locations)	-540 to 340,000	0 to 5	-6 to 7
Building 2 (74 samples from 76 locations)	-560 to 24,000	0 to 5	-5 to 18
Building 3 (55 samples from 58 locations)	-1300 to 250,000	0 to 185	-4 to 248

Location	Total Beta Activity Range (dpm/100 cm^2)	Alpha Removable Range (dpm/100 cm^2)	Beta Removable Range (dpm/100 cm^2)
Building 6 (30 sample locations)	-480 to 30,000	0 to 7	-3 to 15
Building 8 (119 samples from 135 locations)	17 to 64,000	0 to 74	-4 to 120
Building 24, North (17 sample locations)	-390 to 120	0 to 3	-3 to 6
Building 24, South (93 sample locations)	-650 to 99,000	0 to 65	-5 to 80
Building 35 (25 locations)	-760 to 650	0 to 3	-5 to 4

Exposure Rates

Interior exposure rates ranged from 5 to 50 μR/h and are summarized for each building in Table 10.

Radionuclide Concentrations in Miscellaneous Samples

Wet weight radionuclide concentrations in the sediments are summarized in Table 11 and ranged from less than 0.1 to 0.2 pCi/g for Ra-226, less than 0.1 to 1.2 pCi/g for Th-232, 0.2 to 3.9 pCi/g for U-235, and 3.8 to 96.8 pCi/g for U-238.

The radionuclide concentrations in the sample of dust and residue collected from Building 8 were as follows: less than 0.4 pCi/g for Ra-226, 2.8 ± 0.8 pCi/g for Th-232, 27.5 ± 2.4 pCi/g for U-235, and 684 ± 54 pCi/g for U-238. Similar results, shown in Table 12, were noted in the residues collected from Building 4 and 9.

Radionuclide Concentrations in Soil

Soil sample results are presented in Table 12. This data table includes soil concentrations for the contaminants of concern, uranium and Th-232, as well as Ra-226. The Ra-226 concentration is provided to determine whether any residual uranium present is the result of the processed uranium, where the long-lived daughter radionuclides have been separated, or from the presence of firebrick and similar materials that may contain elevated levels of uranium together with the associated long-lived daughter products. In other words, samples containing residual processed uranium are not expected to contain Ra-226 concentrations in excess of naturally occuring background levels. Samples with elevated uranium levels that are only the result of firebrick should have essentially equivalent levels of U-238 and Ra-226. Samples with a mixture of the two materials would be characterized by a proportionately higher U-238 concentration. Additionally, the presence of high-Z materials within the sample matrix resulted in significant attenuation of the low-energy gamma emissions of the U-238 daughter, Th-234, that is typically used to quantify uranium by gamma spectroscopy. Therefore, another of the U-238 daughters, Pa-234m which has a higher energy gamma emission that is less susceptible to attenuation, was primarily used to quantify the U-238 level. The low abundance of the Pa-234m gamma emission results in a higher minimum detectable concentration (MDC). Therefore, the table includes the gamma spectroscopy results for both the 63 keV Th-234 gamma emission and the 1001 keV Pa-234m gamma emission for those sample results where the Pa-234m concentration was less than the MDC. The reader is cautioned to be aware that the U-238 concentration reported when using the 63 keV Th-234 gamma may be underestimated by a factor of 1.5 to 3. The sample weight is therefore included to assist in evaluating the accuracy of the data. ESSAP's analysis of the data determined that those samples weighing in excess of 800 grams exhibited significant attenuation of the 63 keV gamma.

The sample results have been illustrated on Figures 27 through 32 according to concentration ranges. The ranges shown are for U-238 concentrations less than 35 pCi/g, between 35 and 100 pCi/g, and greater than 100 pCi/g. These figures provide the relative distribution of the contamination. Some locations were discrete sources while others were characterized by lower activity yet a greater areal extent of contamination. It should be noted that a number of samples collected from Buildings 2, 6, and 8, in addition to the uranium contamination, also had elevated concentrations of Th-232. Therefore, the figures also indicate locations where the Th-232 concentration is in excess of 5 pCi/g.

A summary of the results for each building where soil samples were collected is as follows:

Area	Ra-226 (pCi/g)	Th-232 (pCi/g)	U-235 (pCi/g)	U-238 (pCi/g)
Building 2 (Results shown exclude subfloor slag samples-see Table 12)	0.4 to 8.4	< 0.6 to 2.3	< 0.4 to 4.4	< 16 to 113
Building 3	< 3.0	< 3.4 to 78.5	< 0.4 to 796	< 5.9 to 41,600
Building 4 (Results shown exclude residue samples-see Table 12)	0.4 to 0.6	0.4 to 0.6	< 0.1	< 4.1
Building 6	< 0.5 to 0.7	< 0.6 to 68.7	< 1.6 to 10.9	< 12 to 297
Building 8	< 2.2	< 2.8 to 442	< 0.5 to 348	< 15 to 25,200
Building 24	0.7 to 1.7	0.9 to 1.7	< 0.4 to 1.5	< 7.3 to 37.4

Many of the surface soil samples exhibiting the highest uranium concentrations had a yellow substance associated with the sample. The material closely resembled the appearance of U_3O_8 commonly referred to as "yellowcake". A photo of such material is provided as Plate 10 in Appendix C. Unusual subfloor sample results included: the slag-like material in Building 2 that was previously discussed had elevated Th-232 activity; and the contamination at the subfloor sampling location in Building 3 appeared to primarily be sandwiched between a layer of concrete and then asphalt that overlayed the soil, rather than in the soil itself. Activity in excess of that represented in the sample is expected at this location based on the extremely elevated gamma count rates observed. Because of the expected significant contamination levels, the sample was collected from the periphery of the anamoly to avoid potentially cross-contaminating the sampling equipment. In Building 24, low-levels of uranium were identified in the subfloor soil. Scans of the floor core and expansion joint material determined that most of the elevated activity was within the expansion joint.

Previous investigations at the site clearly document that the contamination in Building 8 extends as deep as one meter and possibly deeper, within the cinder material beneath the floor plates. Contamination up to 45 cm in depth was clearly evident during this investigation. Deeper samples

could not be collected due to auger refusal. Field investigations during this survey determined that contamination in other interior areas was usually in the first 15 cm with some locations in Buildings 3 and 6 showing increased activity below the first 15 cm.

Alpha spectroscopy results confirmed that americium and plutonium were not present and were inconclusive for thorium-230 due to interferences. X-ray fluorescence analysis identified high levels of tungsten in samples. The low-energy x-rays that caused false positives for americium-241 and thorium-230 were the result of high uranium activity causing the tungsten to fluoresce and emit these x-rays.

SURVEY RESULTS: EXTERIOR

The results of the survey for the exterior portions of the property are provided below.

Surface Scans

Surface scans of the exterior of the facility identified and/or verified the presence of multiple locations of elevated direct gamma radiation, some of which were the result of visible firebrick. Those locations that were determined not to be the result of visible firebrick were investigated further. Locations identified within the excised property included three general areas within the crane yard on the east side of the excised property, three locations within the alley that separates Buildings 2 and 3, an area in the alley encircling Building 5, and four areas on the west side of Buildings 6 and 8.

The Class 1 and 2 portions of the Allegheny Ludlum Corporation property also had multiple locations of elevated direct gamma radiation that were not associated with firebrick. These areas were: one area within the courtyard separating Buildings 3 and 24, one area directly west of Building 24, and numerous areas across the northern property. Investigation of one location of elevated gamma activity within the landfill identified a brick-sized piece of radioactive metal, as determined by direct monitoring. This material was double-bagged, labeled as radioactive and placed in Building 2. In addition, it should be noted that numerous pieces of thoriated metal were present outside the northern fence—and due east of the landfill—of the Allegheny Ludlum Corporation property. Because of the high radiation levels from these pieces of metals and existing data previously obtained by the State of New York, specific samples of this material were not collected. Furthermore, the State of New York personnel identified the presence of this material on other

property located directly north of Allegheny Ludlum Corporation-owned property. ORISE personnel could not further investigate this finding as there was not an access agreement in place with the property owner.

Appendix C shows representative exterior areas of the site.

Surface scans of the Class 3 area identified three locations of elevated gamma radiation, two of which were the result of visible buried firebrick.

Exposure Rates

Exposure rates for the exterior areas ranged from 3 to 50 μR/h and are summarized in Table 10. Exterior background levels in this geographic region generally average 8 μR/h (ORAU 1989 and 1990).

Radionuclide Concentrations in Soil

Radionuclide concentrations in systematic surface soil samples are summarized in Table 13. Table 14 provides the concentrations of surface soils collected from locations of elevated radiation detected by surface scans (i.e. biased samples), and Table 15 summarizes the results of borehole samples. Table 16 provides results for those samples collected from the Class 3 area. Figures 33, 34, and 35 show the soil sample results according to the uranium concentration ranges previously discussed, as well as Th-232 concentrations in excess of 5 pCi/g, when not in the presence of elevated uranium concentrations. A summary of the results follows:

Area	Ra-226 (pCi/g)	Th-232 (pCi/g)	U-235 (pCi/g)	U-238 (pCi/g)
Systematic (213 sample locations)	< 0.3 to 3.0	< 0.8 to 1.5	< 0.6 to 2.6	< 18 to 51
Judgmental (48 samples at 33 locations)	< 6.9 to 21	< 8.7 to 307	< 0.9 to 1,079	< 10 to 54,800
Boreholes (118 samples at 35 locations)	< 2.0 to 2.1	< 1.3 to 371	< 5.4 to 525	< 35 to 17,780

Area	Ra-226 (pCi/g)	Th-232 (pCi/g)	U-235 (pCi/g)	U-238 (pCi/g)
Class 3 (17 samples)	< 0.1 to 9.7	< 0.2 to 2.2	< 0.8	< 0.6 to 8.8

The soil sample results show that there is residual uranium and thorium contamination at various locations around the site. A review of the subsurface sample results show that the contamination generally extends to a depth from 30 cm to 60 cm with several areas having contamination to a depth of 120 cm. A number of the samples also had the characteristic "yellowcake" material previously described. A gray colored material was also noted in one of the sample locations in the alley between Buildings 2 and 3. One location in the Class 3 area exhibited elevated uranium levels. However, a comparison of the Ra-226 results to the U-238 concentrations demonstrate that the activity in this sample is the result of naturally occurring material, rather than the AEC processed uranium.

COMPARISON OF RESULTS WITH GUIDELINES

The primary radionuclide of concern at the GSSC site is processed natural uranium. There are also lesser amounts of Th-232. Until recently, most regulatory guidance for the generic acceptable residual surface activity levels evolved from those values published for nuclear reactor decommissioning in the U.S. Nuclear Regulatory Commission's (NRC) Regulatory Guide 1.86 (NRC 1974). As an example for data comparison, the following uranium surface contamination guidelines from this publication are:

Total Activity

5,000 α dpm/100 cm^2, averaged over 1 m^2

15,000 α dpm/100 cm^2, maximum in 100 cm^2

Removable Activity

1,000 α dpm/100 cm^2

Processed natural uranium emits both alpha and beta particles in approximately equal proportions. Because alpha particles are attenuated by rough, damp, or dirty surfaces, beta measurements were performed for comparison to the guideline.

The various exposure rate guidelines that have been implemented in the past have ranged from 5 to 20 μR/h above background for indoor and outdoor soil areas.

The most recent NRC generic guidelines for residual concentrations of radionuclides in soil assuming secular equilibrium are as follows: (NRC 1981)

Natural Uranium (U-238 + U-235 + U-234): 10 pCi/g*
Natural Thorium (Th-228 + Th-232)**: 10 pCi/g* (5 pCi/g each)
*Secular equilibrium assumed

Other state and federal agencies have developed soil concentration guidelines for uranium on a site-specific basis. Additionally, the NRC has recently adapted, (effective August 1999), dose-based unrestricted release criteria that are dependent upon developing cleanup criteria on a site-specific basis. Previously determined site-specific uranium soil guidelines have ranged from 35 to 120 pCi/g of U-238 (70 to 240 pCi/g total uranium). For general comparison of the soil concentrations presented in this report, the background concentrations for the Lockport area are 1.5 to 2.0 pCi/g for U-238 and 1.0 to 1.1 pCi/g for Th-232 (FBD 1981).

INTERPRETATION OF RESULTS

The results of the survey clearly show that there are areas of the site with residual uranium and thorium contamination. However, because remedial action authority has not been clearly established and because of the recent changes to the regulatory requirements, there may be a requirement for the development of site-specific cleanup criteria for not only soils, but also potentially for surface activity. As introduced in the previous section, the unrestricted release regulatory criteria are transitioning to either a dose- or risk-based criteria such as the NRC's 25 mrem/y dose-based criteria and the EPA's risk-based criteria for excess cancer fatalities of 10^{-6} to 10^{-4}. ESSAP can therefore only draw general conclusions using existing guidelines as to which portions of the site would

require remediation and what other activities may be necessary. Provided below is general information that may be used to develop an initial approach and remedial action scope for the site as well as identify those areas that require further investigation. Figure 36 shows the overall site and each interior and exterior impacted area. Appendix C contains a photographic record of many of the areas discussed below.

INTERIOR AREAS

Building 1: Remove or decontaminate the work bench and adjacent floor area. Remove the contaminated rag. Remove or trace and investigate drain line (the drain throat had been grouted closed and could not be investigated further). Total contaminated area is estimated as less than 100 m^2. Remove stored asbestos and complete survey of the work room area. Consider investigating the flooded basement at some future point in time. There were no additional areas of residual contamination identified in Building 1.

Building 2: Remove contaminated samples stored in the southern section. Decontaminate locker, remediate concrete floor and underlying soils (where indicated in Figure 2), and remediate contaminated exposed soils in the center section. Remediate door facing and work bench in the lab. Total impacted surface area is 275 m^2 and total contaminated soil volume (assuming a minimum depth of 15 cm) is estimated as 40 m^3.

Building 3: Remove or remediate the contaminated roller endcap in the south end of the building (NYDEC personnel on-site during the November 1 through 3, 1999 activities indicated their investigations of this area may have removed some or all of the contamination). Remove and survey for release the stockpiled roller equipment stored with this endcap and survey the surfaces under this equipment that are currently inaccessible. Remediate contaminated trench and other proximal surfaces. Dewater and survey trench bottom and remove sediments as necessary. Remediate identified soil areas in the southern and central portions of the building. Remediate concrete areas in the central area and underlying soils as needed. Remove and survey stored rollers in central portion. Survey area beneath rollers that is currently inaccessible. Remediate by vacuuming or other appropriate methods the accumulated dust and other residue on overhead and other horizontal

surfaces in central and south sections. Total impacted surface area is approximately 800 m^2 plus overheads and total contaminated soil volume (assuming a minimum depth of 15 cm) is estimated as 120 m^3.

Building 4 and 9: Remediate contaminated floor area in the central and east-central portions of the building. The contamination in this area is contained within a residue on top of and within the interstitial spaces of the brick floor. Remediate by vacuuming or other methods accumulated residues on overhead horizontal surfaces within this same area. The impacted surfaces are encompassed within a 630 m^2 area.

Building 5: No residual contamination identified.

Building 6: Remediate isolated residual surface activity located near the north end of the building. Remove steel plates and remove contaminated soils from identified locations. Recommend removing remaining plates and performing addditional soil investigations. Estimated impacted area is 16 m^2 of surfaces and 2.4 m^3 of soil (the reader is cautioned that a larger volume of soil may be identified as impacted when steel floor plates are removed and full access to the underlying soil is achieved).

Building 8: Essentially all surfaces within this area have some residual activity. Recommend vacuuming accumulated loose residues from all floor, equipment, and overhead horizontal surfaces. Remove and survey for release steel floor plates after initial residue removal. Decontaminate equipment surfaces, equipment trenches, and other surfaces with accumulated, adhered residues. Decontaminate west lower wall. Remove contaminated soils. Dewater trenches and remove contaminated sediments. Estimated impacted area is 2000 m^2 of surfaces plus overhead/equipment surfaces, and 1000 to 2000 m^3 of soil.

Building 24: Decontaminate floor and overhead horizontal surfaces in the southwest area of the building. Determine whether the uranium concentrations within subfloor soils at expansion joints are a concern and address accordingly. Decontaminate the floor and trench surfaces in the southeast

area and the southeast storage and transformer rooms. Estimated impacted area is 850 m^2 plus overhead surfaces.

Building 35: No residual contamination identified.

EXTERIOR AREAS

Each exterior area, as described below, is designated with the corresponding number shown in Figure 36. Distinct areas of residual contamination in excess of the screening values of 35 pCi/g for U-238 and 5 pCi/g for Th-232 that are used in this report are designated by line hatching on Figure 35. Additionally, interstitial soils containing residual radioactive material between 10 and 35 pCi/g is also illustrated to show the general overall impacted area boundaries. The areas and volumes provided are estimated based on available data and are provided for general planning purposes. Additional sampling may be required to further refine contamination boundaries and volume estimates.

Area 1: This area is located in the extreme northwest portion of the site. Both uranium soil contamination and discrete pieces of thorium metal were identified. The total impacted area is estimated as 2300 m^2 of surface area and 1200 m^3 of soil. The contaminated soil in this area reaches depths up to 1.80 m.

Area 2: This area is located in the northwest section of the site and may be an isolated location although some contamination was identified in an adjacent area across the fenceline in a northwesterly direction. Total contaminated area is estimated as 100 m^2. The contaminated soil in this area reaches depths of 0.15 m which equates to approximately 15 m^3 of soil.

Area 3: This area is located in the northwest quadrant of the site adjacent to Building 35. Total contaminated area is estimated as 3200 m^2. The contaminated soil in this area reaches depths of up to 1.80 m. The total impacted soil volume is estimated at 5400 m^3.

Area 4: This area is located in the northwest quadrant of the site directly east of Building 35. Total contaminated area is estimated as 400 m^2. The contaminated soil in this area reaches depths of 1.20 m. There is an estimated 480 m^3 of impacted soil at this location.

Area 5: This area is located in the northwest quadrant of the site. The impacted area at this location is estimated as 200 m^2, and extends to a depth of 0.15 m. The impacted soil volume is estimated as 30 m^3.

Area 6: This area is located in the northwest quadrant of the site. Total contaminated area is estimated as 200 m^2 and reaches a depth of 2.1 m. The impacted soil volume is estimated as 420 m^3.

Area 7: This area is located in a drainage ditch along the northern site fenceline. Total contaminated area is estimated as 200 m^2 of soil, and reaches a depth of up to1.2 m. The estimated impacted soil volume is 240 m^3.

Area 8: This area is located in the northeast quadrant of the site and measures approximately 300 m^2 of soil. The impacted soil in this area reaches a depth of 0.15 m with an estimated soil volume of 45 m^3.

Area 9: This area is located in the northeast quadrant of the site. Total impacted area is estimated as 2300 m^2 and extends to depths of up to 1.8 m. The estimated impacted soil volume is 1200 m^3.

Area 10: This area is located immediately adjacent to the west wall of Building 24. Total impacted area is 4 m^2 and extends to a depth of approximately 0.3 m. The estimated impacted soil volume is 1.2 m^3.

Area 11: This area is located within the fenced-in yard on the west side of Buildings 6 and 8. Total impacted area is estimated as 100 m^2 and extends to a depth of 0.15 m which equates to an estimated soil volume of 15 m^3.

Area 12: This area is also located within the fenced-in yard on the west side of Buildings 6 and 8. Total contaminated area includes locations beneath the loading dock and is estimated in area as 800 m^2 and extends to a depth of 0.30 m, but may be deeper beneath the loading dock. The estimated soil volume is 170 m^3.

Area 13: This area is in located in the alley surrounding Building 5. Total impacted area is estimated as 10 to 20 m^2, to a depth of 0.15 m. The estimated soil volume is 1.5 to 3 m^3.

Area 14: This area is located at the south-end of the courtyard between Buildings 3 and 24. Total impacted area is estimated as 500 m^2 to a depth of 0.15 m. The estimated soil volume is 140 m^3.

Area 15: This area is located at the exterior of the northwest corner of Building 2. The potentially impacted area measures less than 100 m^2 to a depth of 0.15 m. The soil volume is estimated as 15 m^3.

Area 16: This area is located in the alley between Buildings 2 and 3. The impacted soil is below asphalt and is estimated to encompass 200 m^2 to a depth of 0.15 m. The estimated soil volume is 30 m^3.

Area 17: This area is also located in the alley between Buildings 2 and 3 and is characterized by impacted soils beneath ashphalt. The total impacted area is estimated as 500 m^2 to a depth of 0.30 m. The estimated soil volume is 150 m^3.

Area 18: This area is located at the north end of the crane yard. The impacted area is estimated as 700 m^2 to a depth of up to 0.60 m. The estimated soil volume is 150 m^3.

Area 19: This area is located in the central crane yard and measures approximately 600 m^2. The impacted soil extends to an estimated depth of 0.60 m which equates to a soil volume of 180 m^3.

Area 20: This area is located at the eastern property boundary inside the crane yard. The total estimated impacted area is 200 m^2 to a depth of 0.15 m.

Area 21: This area was identified in the alley between Buildings 1 and 2. It is a small area measuring less than 100 m^2 to a depth of 0.15 m for an estimated soil volume of less than 15 m^3.

SUMMARY

The Environmental Survey and Site Assessment Program (ESSAP) performed a radiological survey of the Guterl Specialty Steel Corporation during the periods April 26 through May 7 and November 1 through 3, 1999. The survey procedures included surface scans, surface activity measurements, exposure rate measurements, and soil and miscellaneous material sampling.

The survey identified residual uranium and thorium contamination in numerous areas of the site. As previously documented by various parties, the surfaces and soils within Building 8 contain the most significant residual uranium surface activity and soil concentration levels. Additionally, less extensive areas of residual concentrations of uranium were identified on surfaces and/or in soils within Buildings 1, 2, 3, 4, 6, 4 and 9, and 24. For the site exterior, residual uranium and/or thorium was detected at multiple surface and subsurface locations, both within the excised property and in the northern half of the Allegheny Ludlum Corporation property. The survey of the Class 3 area of the site—the southwest portion of the Allegheny Ludlum Corporation property—did not identify any locations of residual uranium concentrations, other than those associated with firebrick.

Overall, most objectives of the characterization survey were achieved. General contamination boundaries were identified. Most residual uranium levels found outside of the Buildings 6 and 8 area are believed to be the result of personnel tracking material and moving contaminated items during site operations—as evidenced by contaminated hand prints on a locker in Building 2 and the contaminated rag and work bench in Building 1—or airborne deposition. Airborne deposition was substantiated by taking measurements on surfaces that were dust free (after removing a physical covering) and from the miscellaneous dust sample collected from the Building 8 area. The collection of subfloor soils beneath the concrete in suspect areas of Buildings 2, 3, 4 and 9, and 24 determined that varying degrees of contamination exists within the soils of Buildings 3 and 24; thoriated slag was identified beneath the concrete of Building 2. Total depth of contamination for all interior soils was not determined. Previous investigations in Building 8 have confirmed contamination throughout

the cinder layer, which varies in depth, up to at least one meter (FBD 1981 and ORNL 1979). This investigation substantiated that finding. Numerous traps, sumps, and equipment trenches throughout

Buildings 3, 6, and 8 contain residues or sediments beneath accumulated water, some of which are contaminated. Roofs and roof structures were not surveyed due to safety considerations.

Exterior areas exhibit pockets of contamination, some of which extend to the bedrock layer, scattered within the excised area and across the northern portion of the Allegheny Ludlum Corporation property. In addition, it should be noted that numerous pieces of thoriated metal are present outside the northern fence—and due east of the landfill—of the Allegheny Ludlum Corporation property. Because of the high radiation levels from these pieces of metals and existing data collected by the State of New York, specific samples of this material were not collected. Furthermore, the State of New York personnel identified the presence of this material on other property located due north of the northwest boundary of the Allegheny Ludlum Corporation-owned property (Figure 36) (NYDEC 1999). ESSAP personnel could not investigate this finding further as no access agreement was in place with the property owner. One additional previously documented suspect area could not be located. This area was identified by ORNL and was located in an exterior area at the south end of Buildings 4 and 9. At the time of the ORNL survey, this area was exposed soil but has since been covered with asphalt. It is possible that this area was essentially remediated when it was originally sampled by ORNL.

FIGURES

401-007 (x)

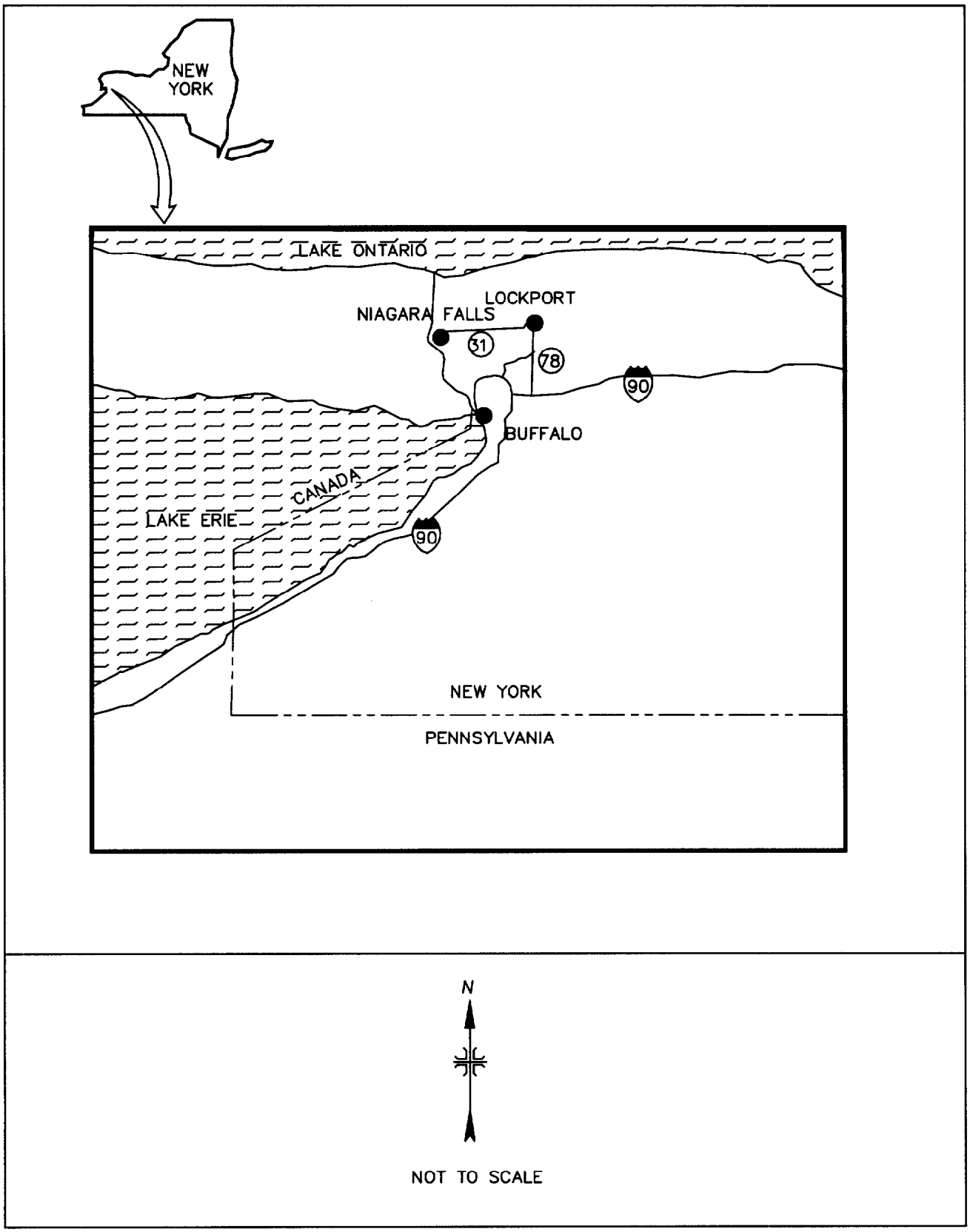

FIGURE 1: Location of Lockport, New York

401-001 (1)

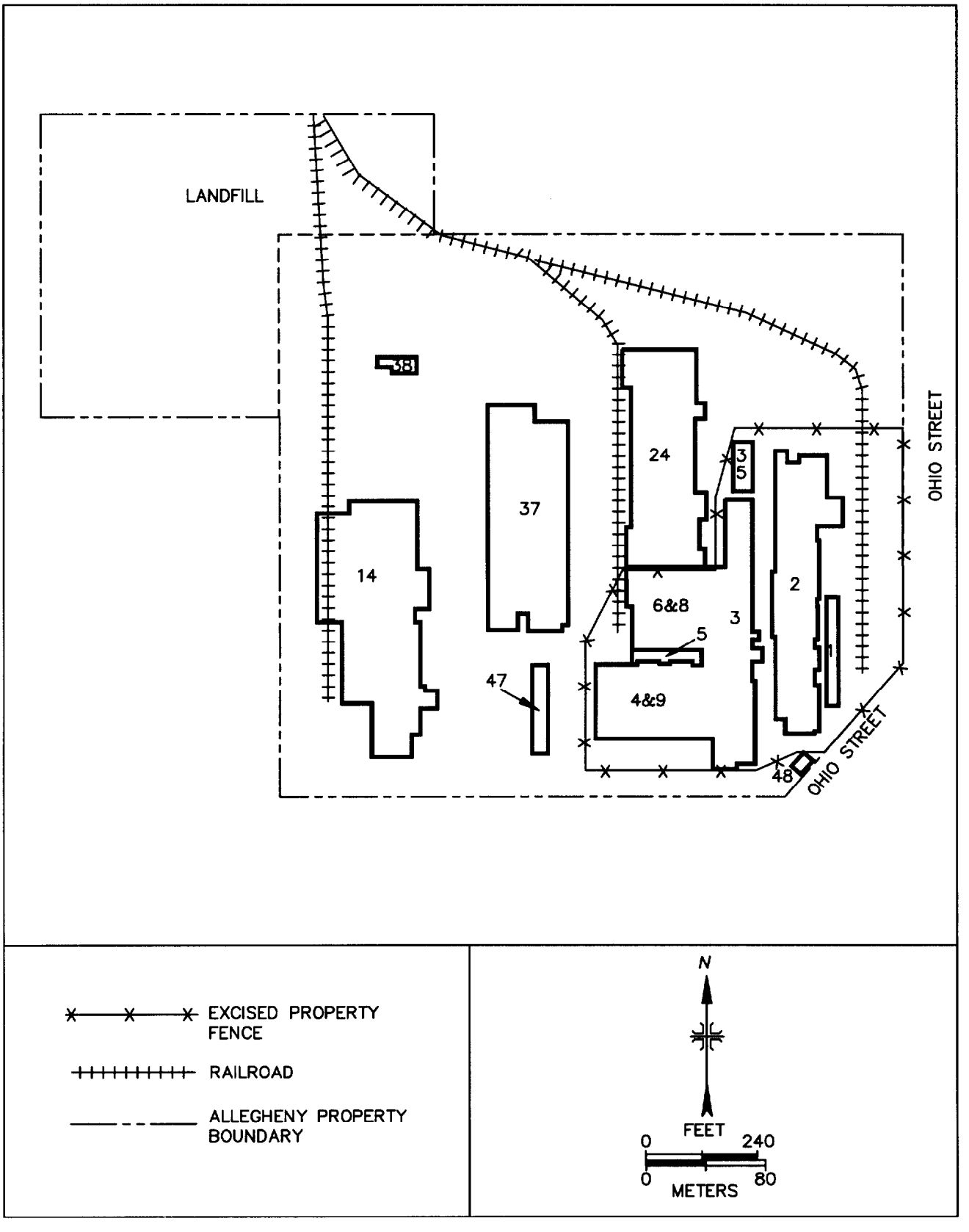

FIGURE 2: Plot Plan of the Guterl Specialty Steel Corporation – Lockport, NY

401-002 (1)

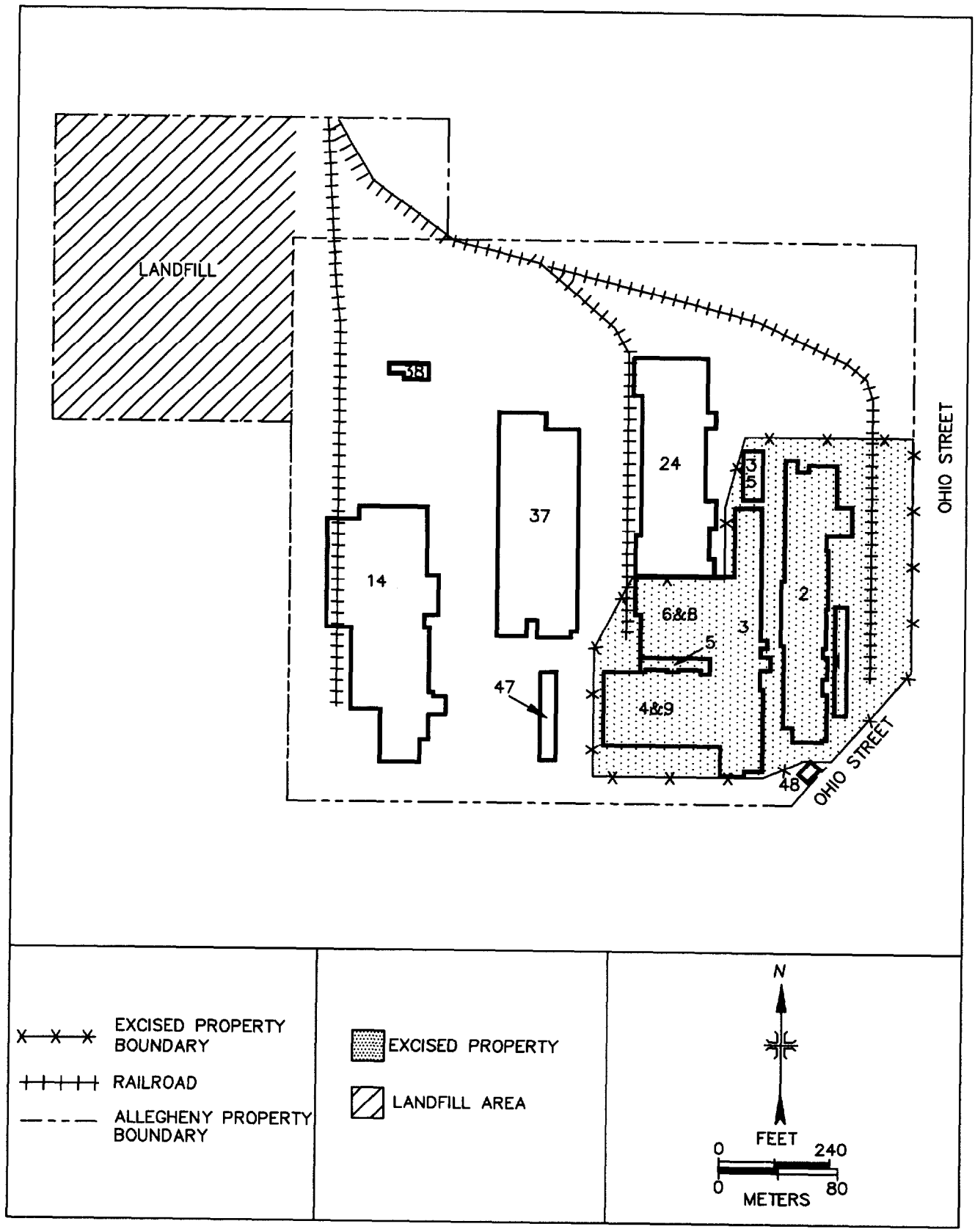

FIGURE 3: Excised Property, Landfill, Allegheny Property – Guteri Specialty Steel Corporation

401-008 (x)

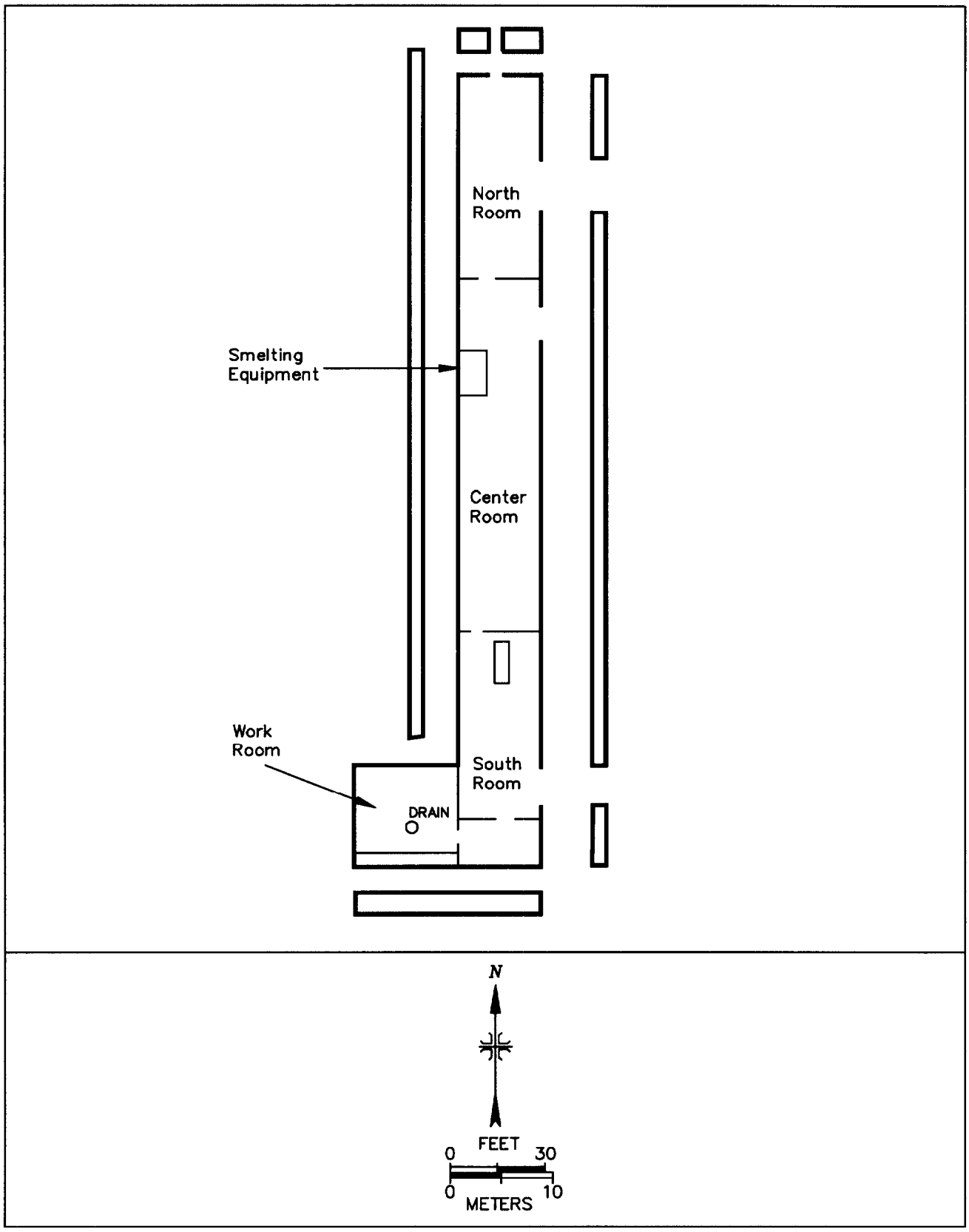

FIGURE 4: Building 1 – Floor Plan

401-020 (x)

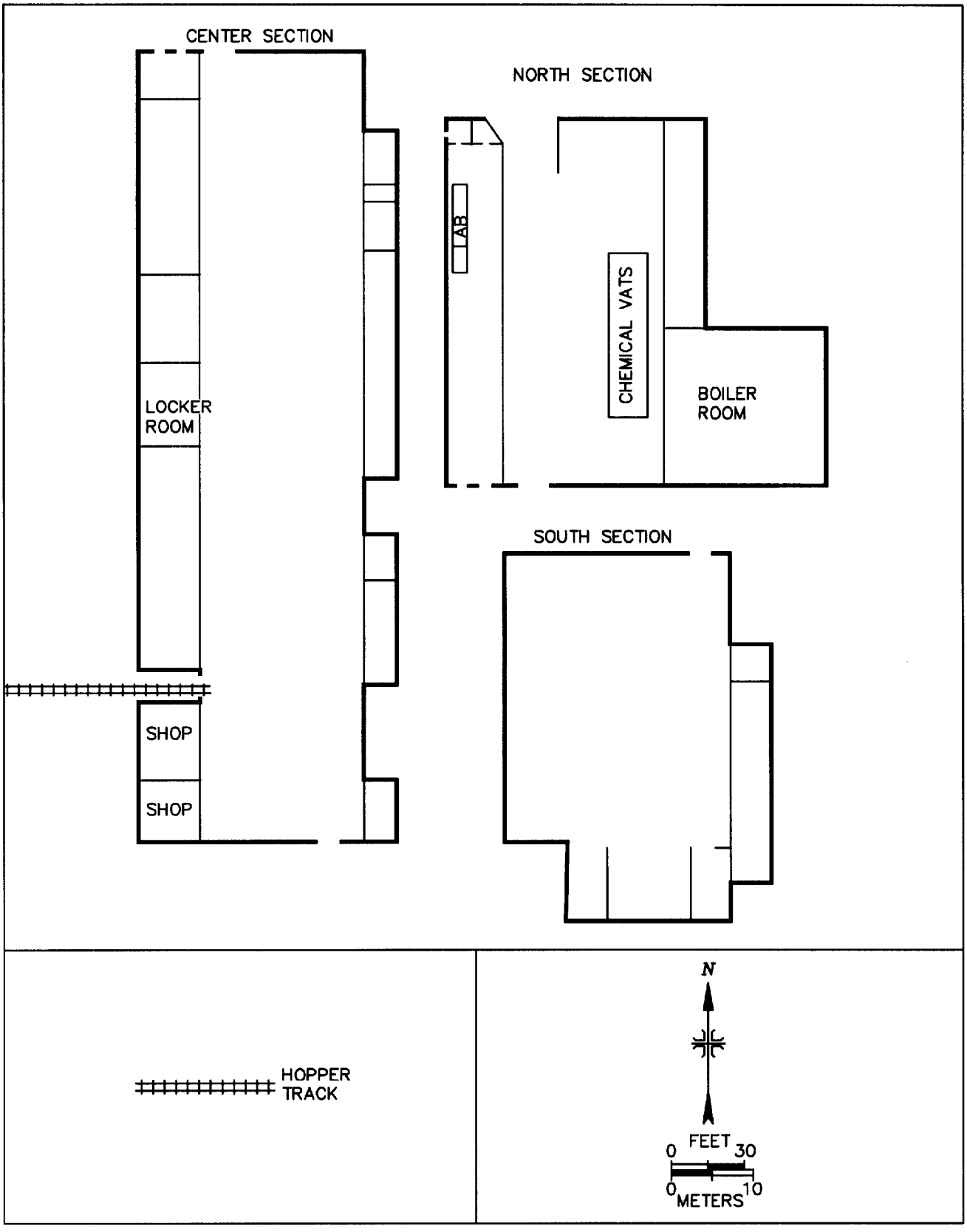

FIGURE 5: Building 2 – Floor Plan

401-021 (x)

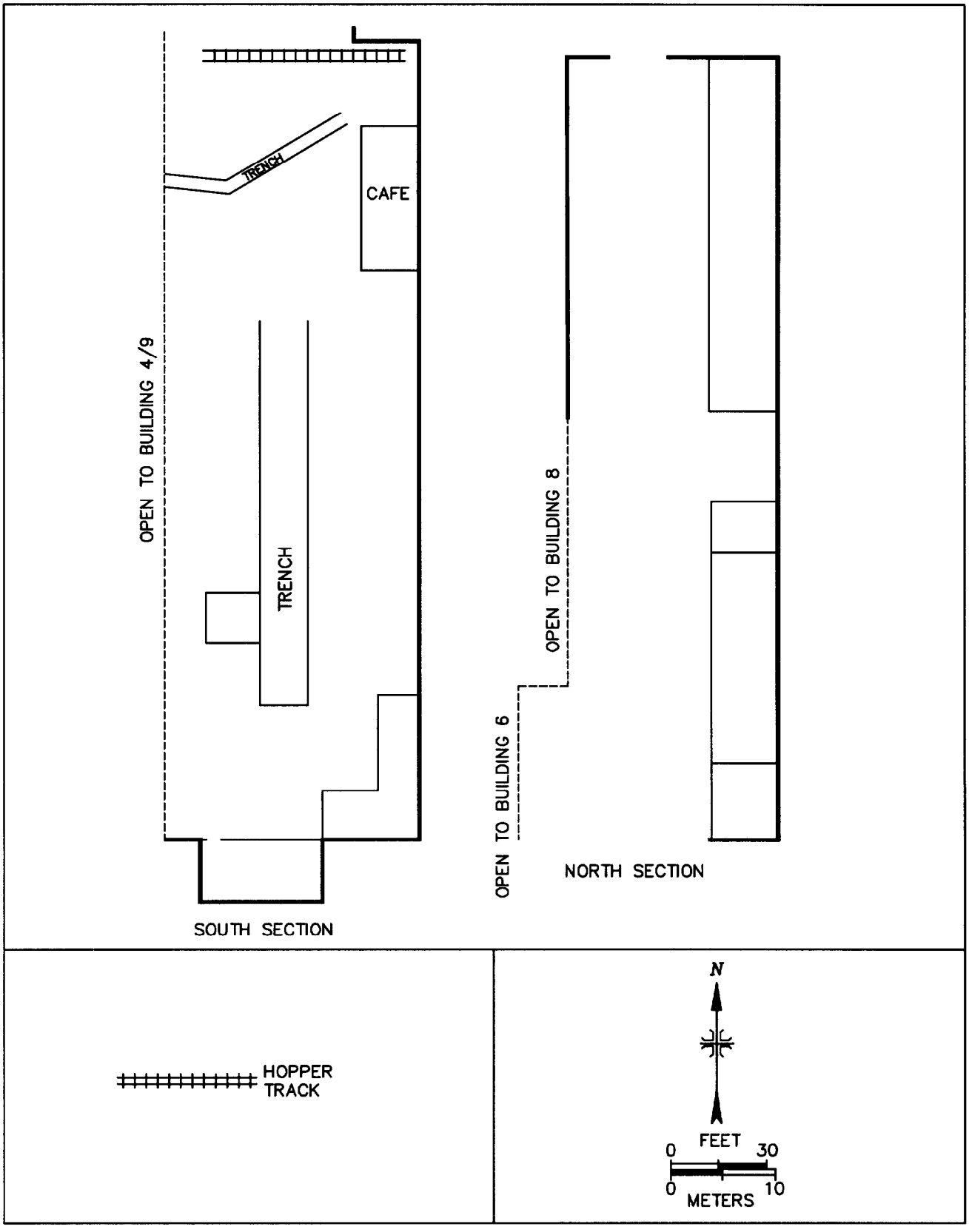

FIGURE 6: Building 3 – Floor Plan

401-042 (x)

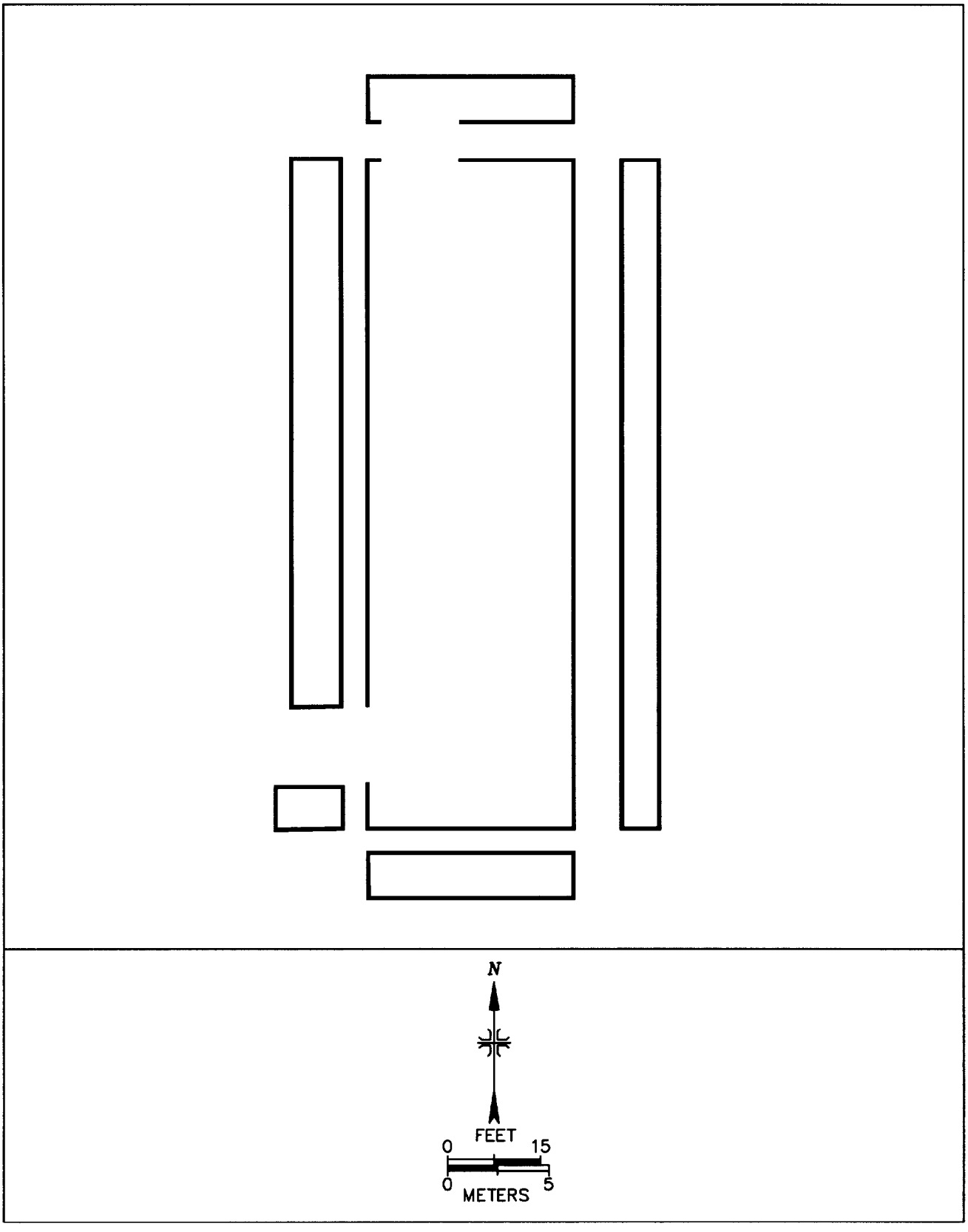

FIGURE 7: Building 35 – Floor Plan

401–043 (x)

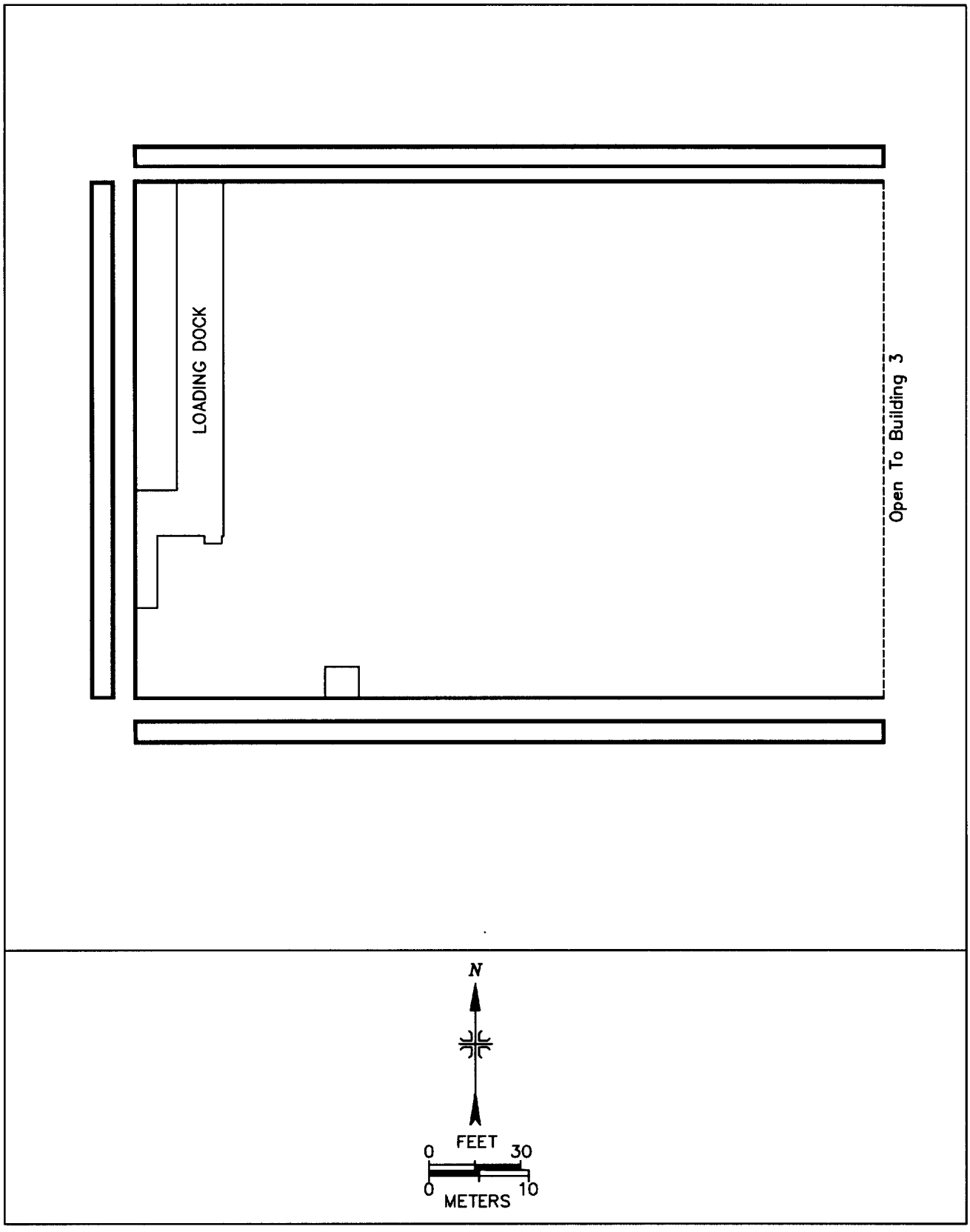

FIGURE 8: Building 4 and 9 – Floor Plan

401-045 (x)

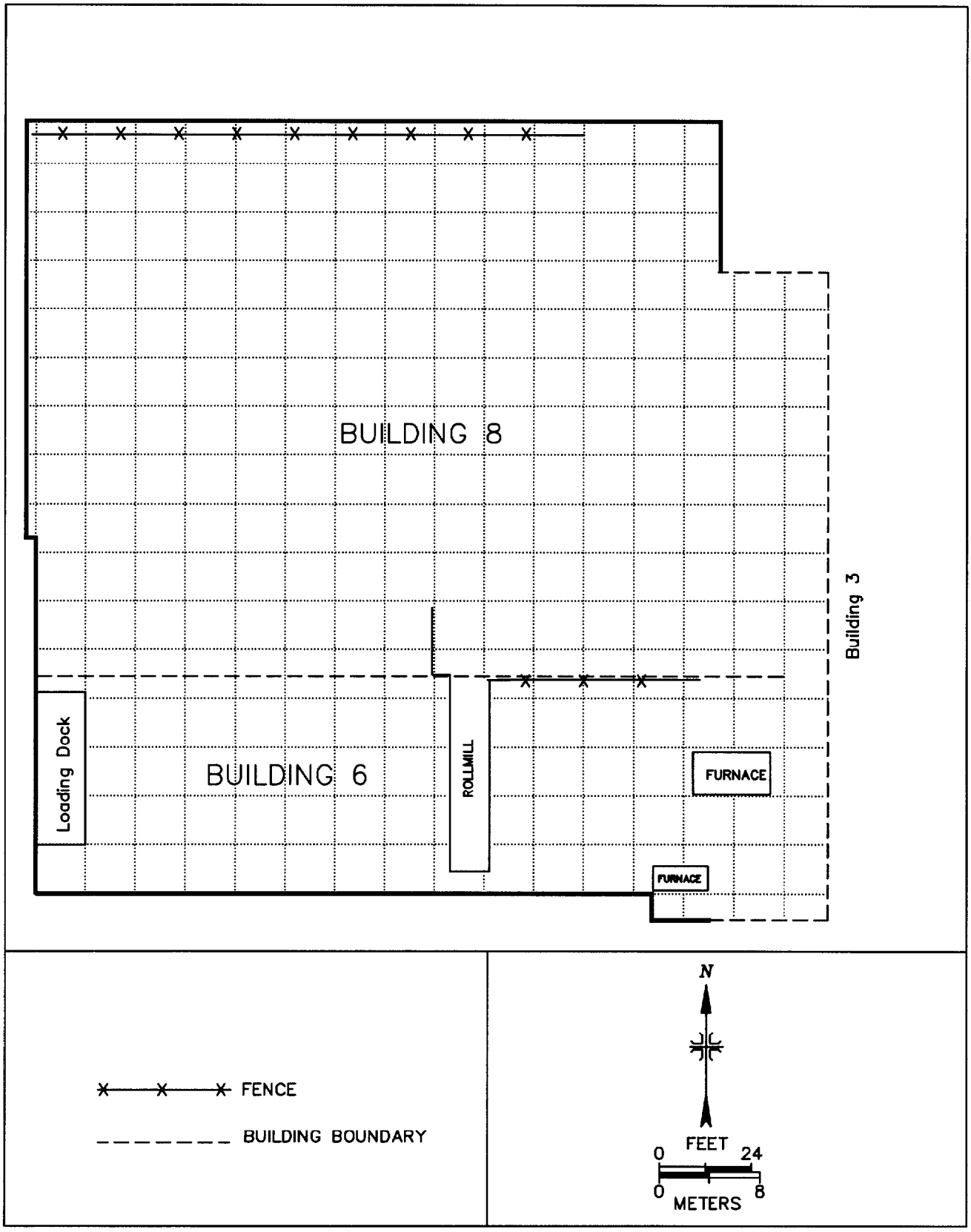

FIGURE 9: Building 6 and 8 – Floor Plan

401-046 (x)

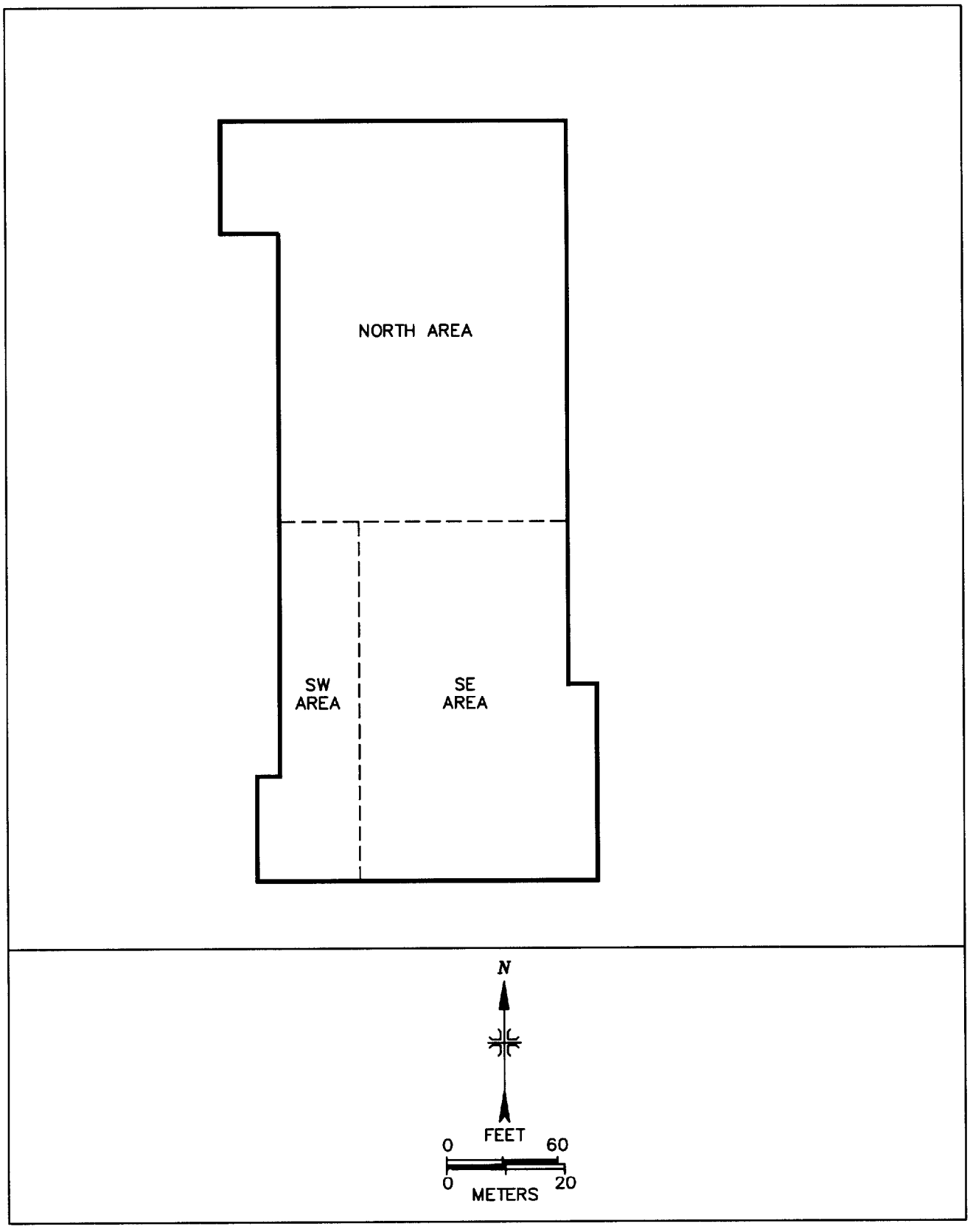

FIGURE 10: Building 24 – Floor Plan

401–011 (x)

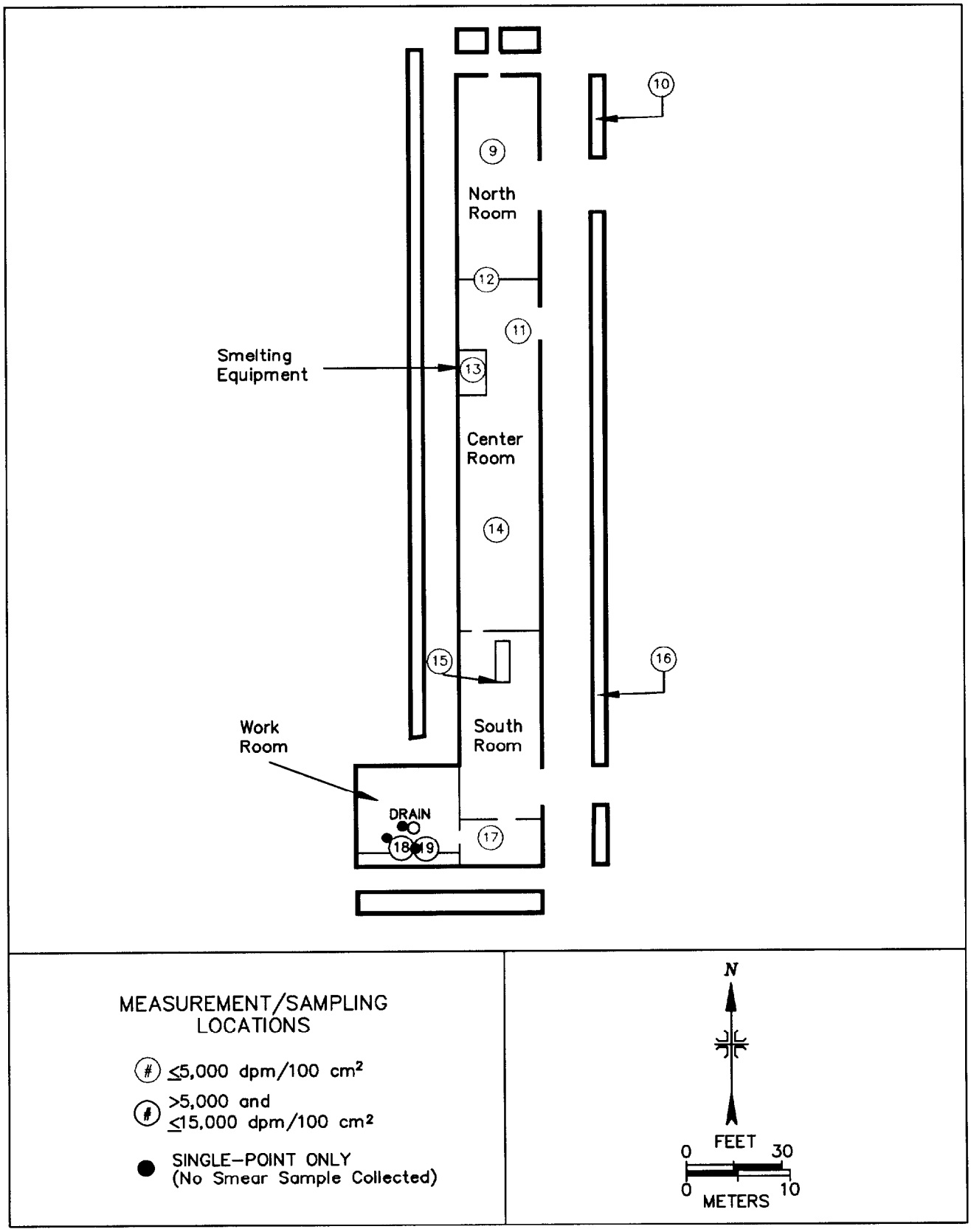

FIGURE 11: Building 1, Floors, Lower Walls, and Equipment – Direct Measurement and Sampling Locations

401-013 (2)

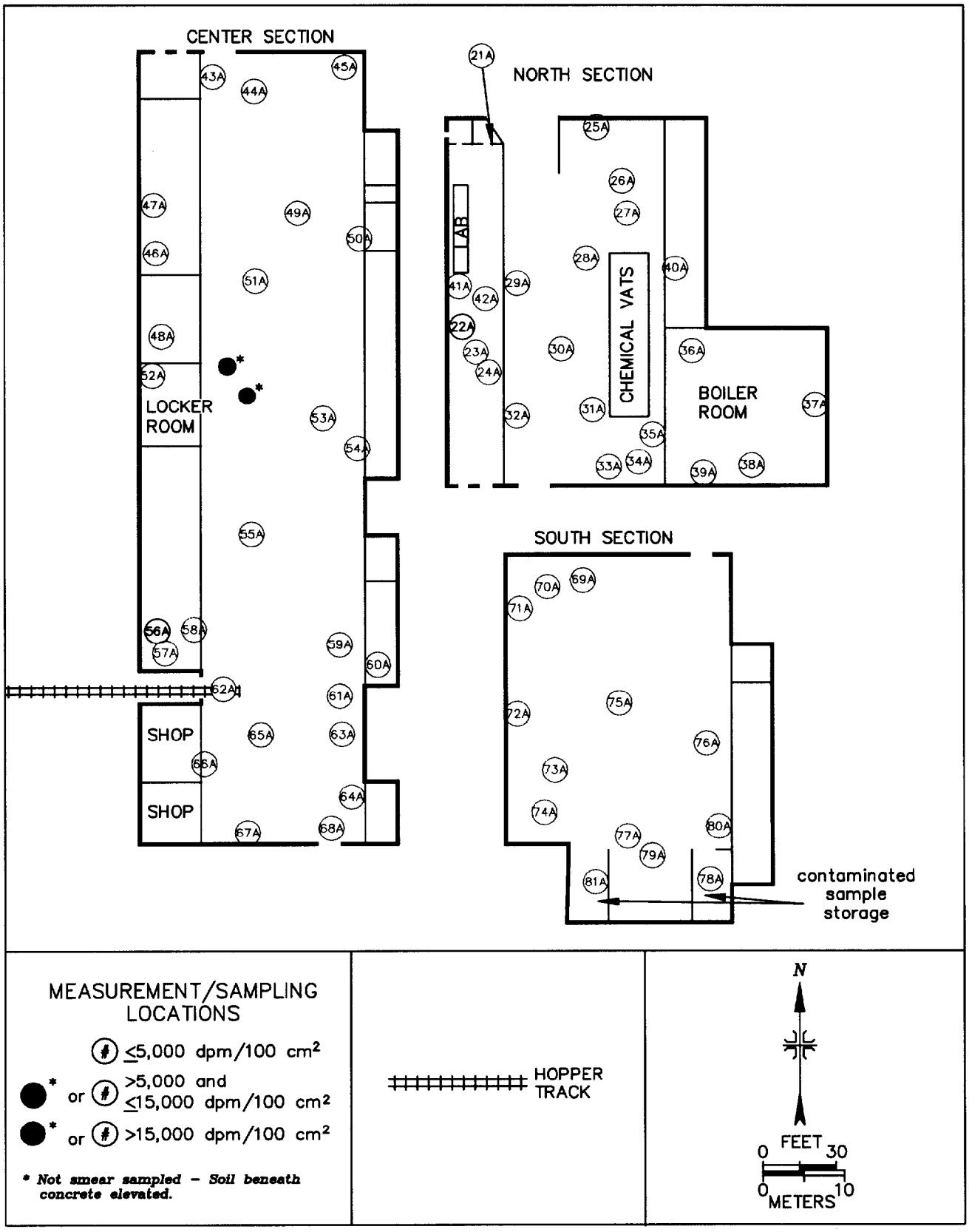

FIGURE 12: Building 2, Floor, Lower Walls, and Equipment – Direct Measurement and Sampling Locations

401–027 (x)

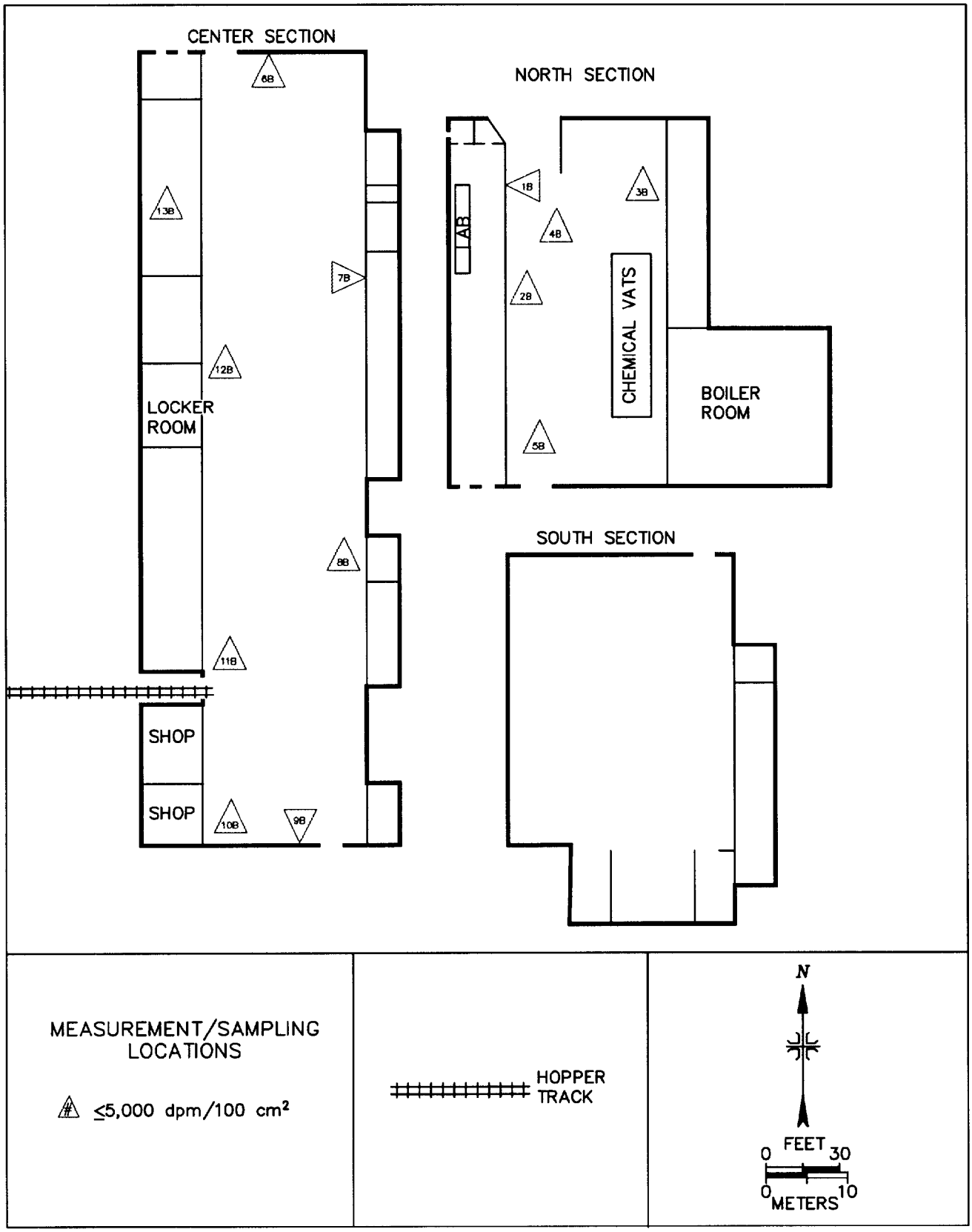

FIGURE 13: Building 2, Upper Surfaces – Direct Measurement and Sampling Locations

401-015 (1)

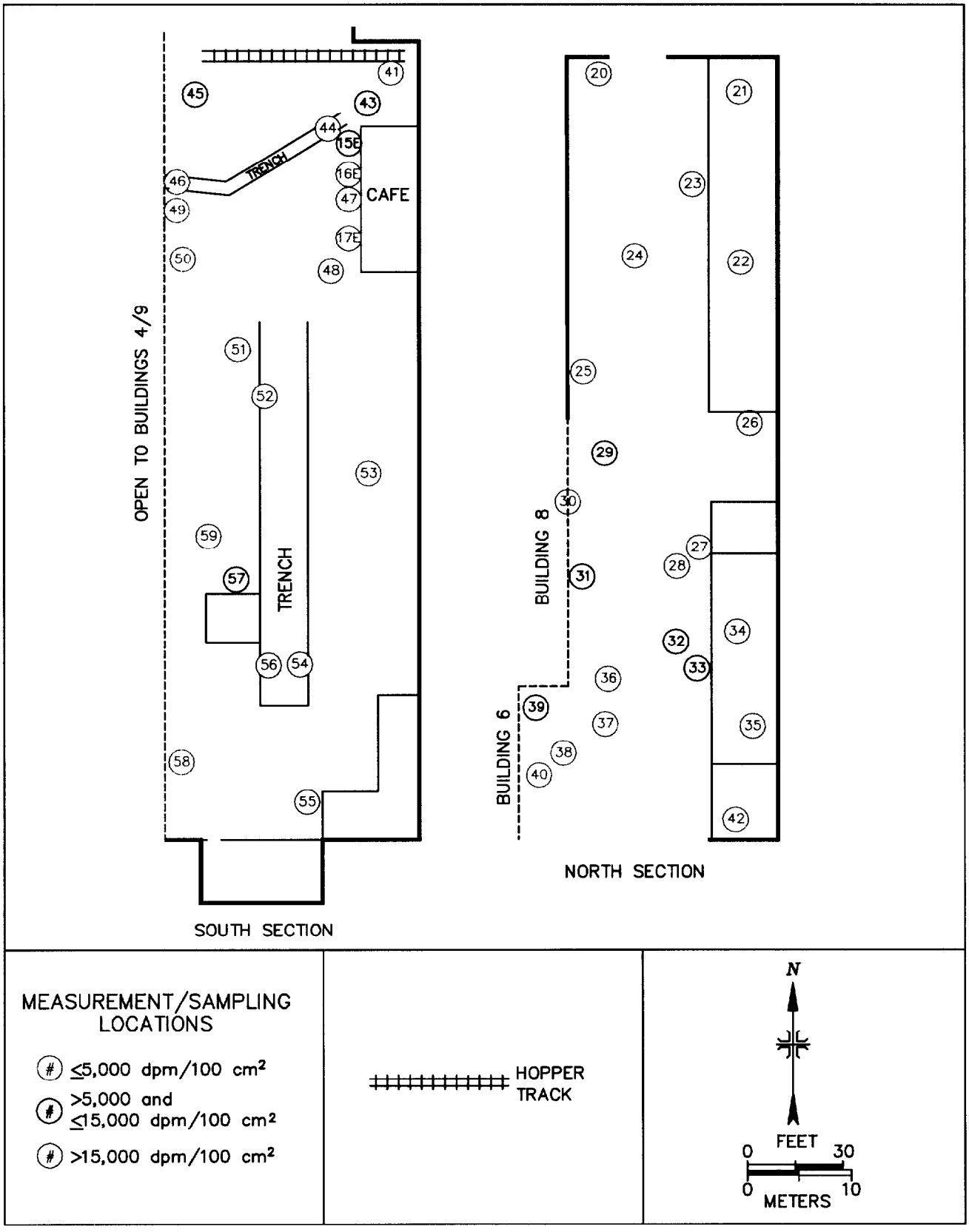

FIGURE 14: Building 3, Floors, Lower Walls, and Equipment – Direct Measurement and Sampling Locations

401-016 (x)

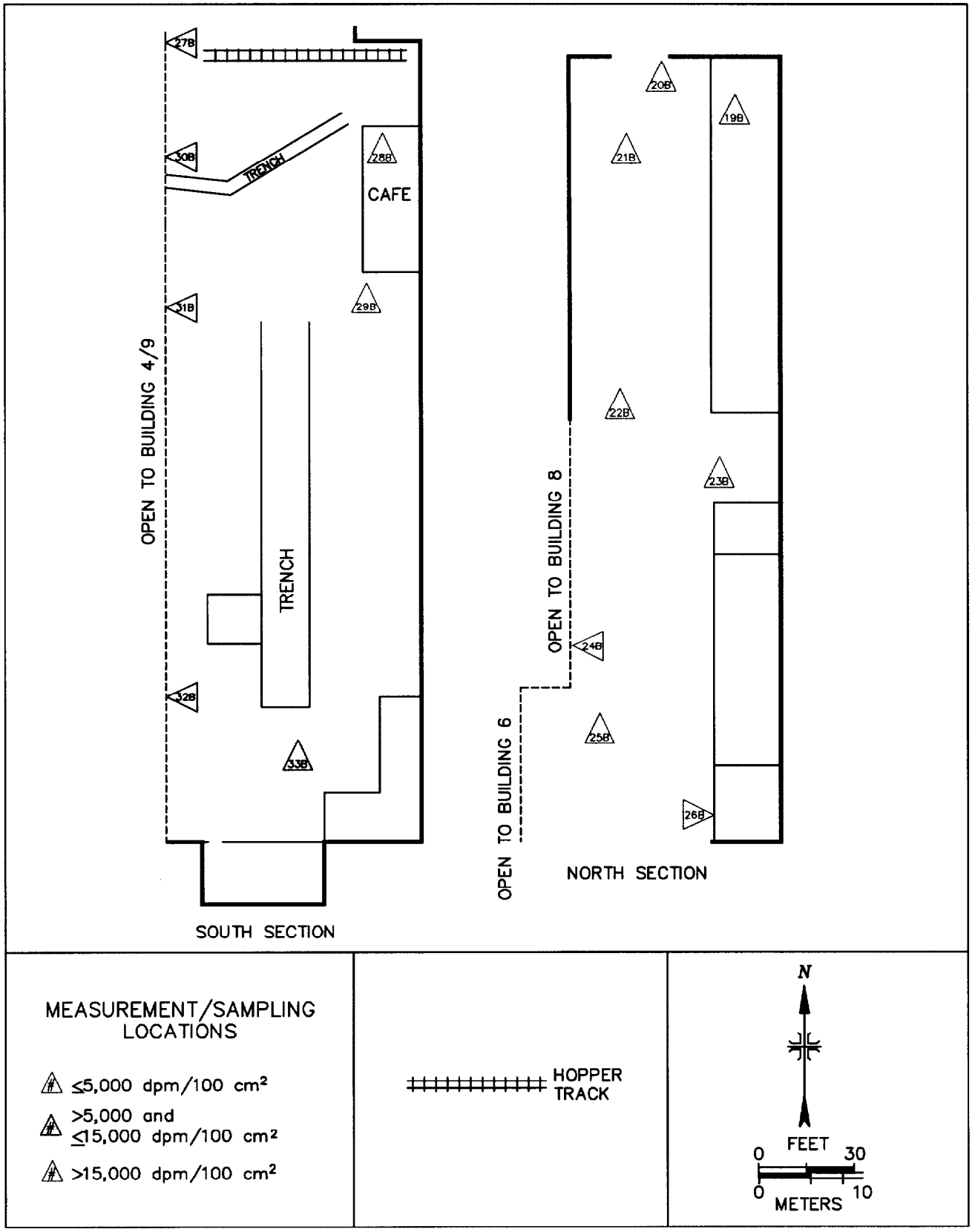

FIGURE 15: Building 3, Upper Surfaces – Direct Measurement and Sampling Locations

401-018 (1)

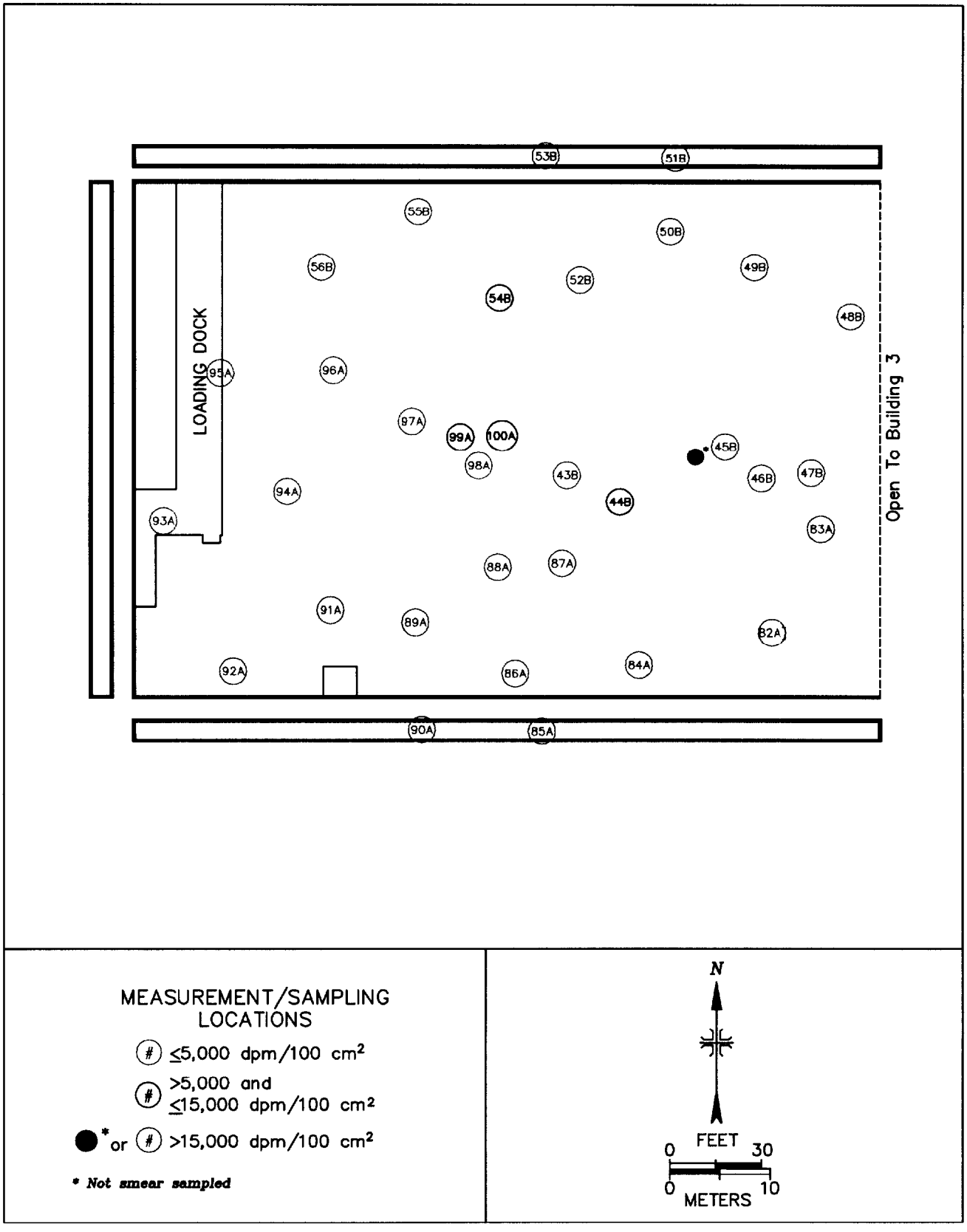

FIGURE 16: Building 4 and 9, Floors, Lower Walls, and Equipment – Direct Measurement and Sampling Locations

401-019 (1)

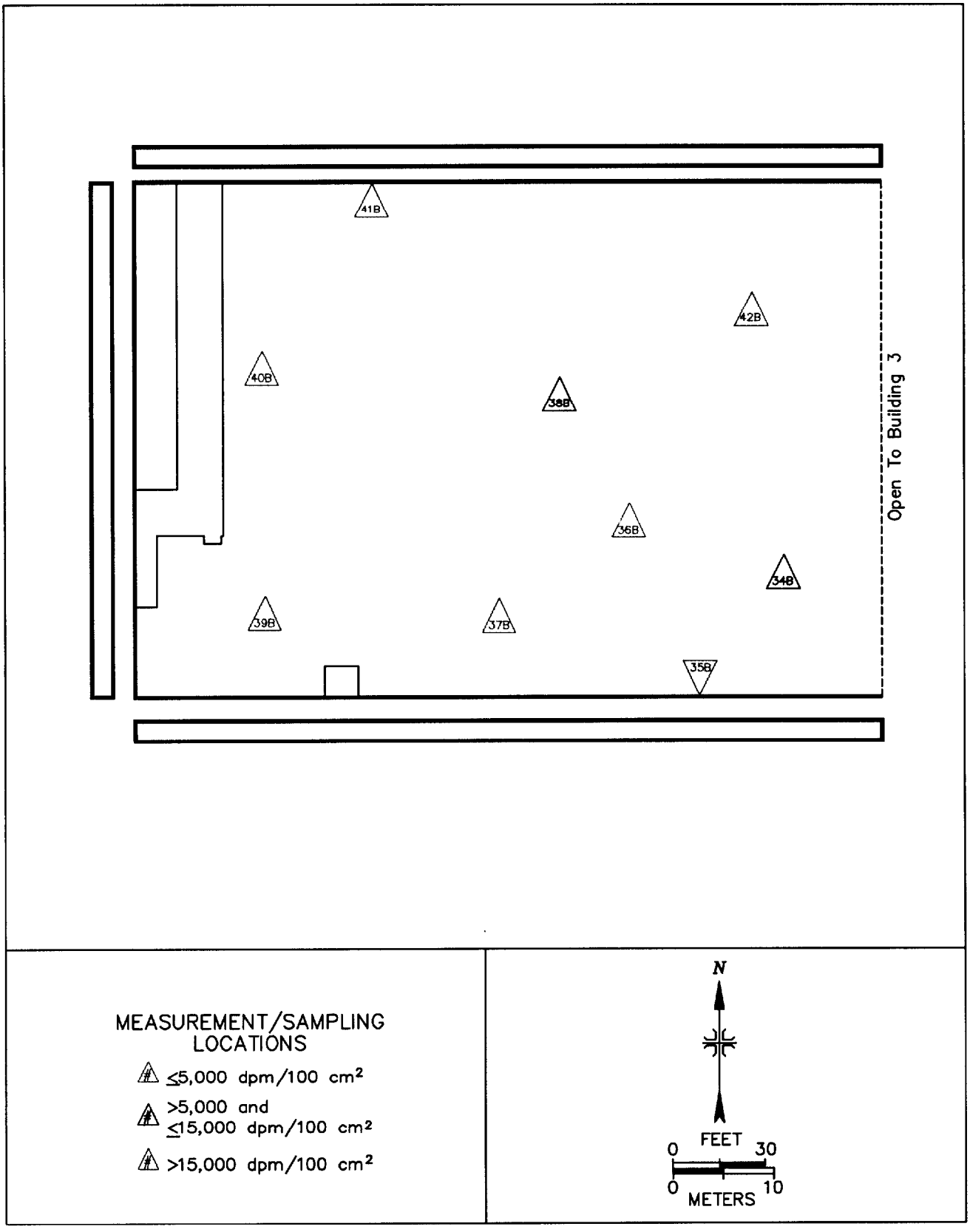

FIGURE 17: Building 4 and 9, Upper Surfaces – Direct Measurement and Sampling Locations

401–022 (x)

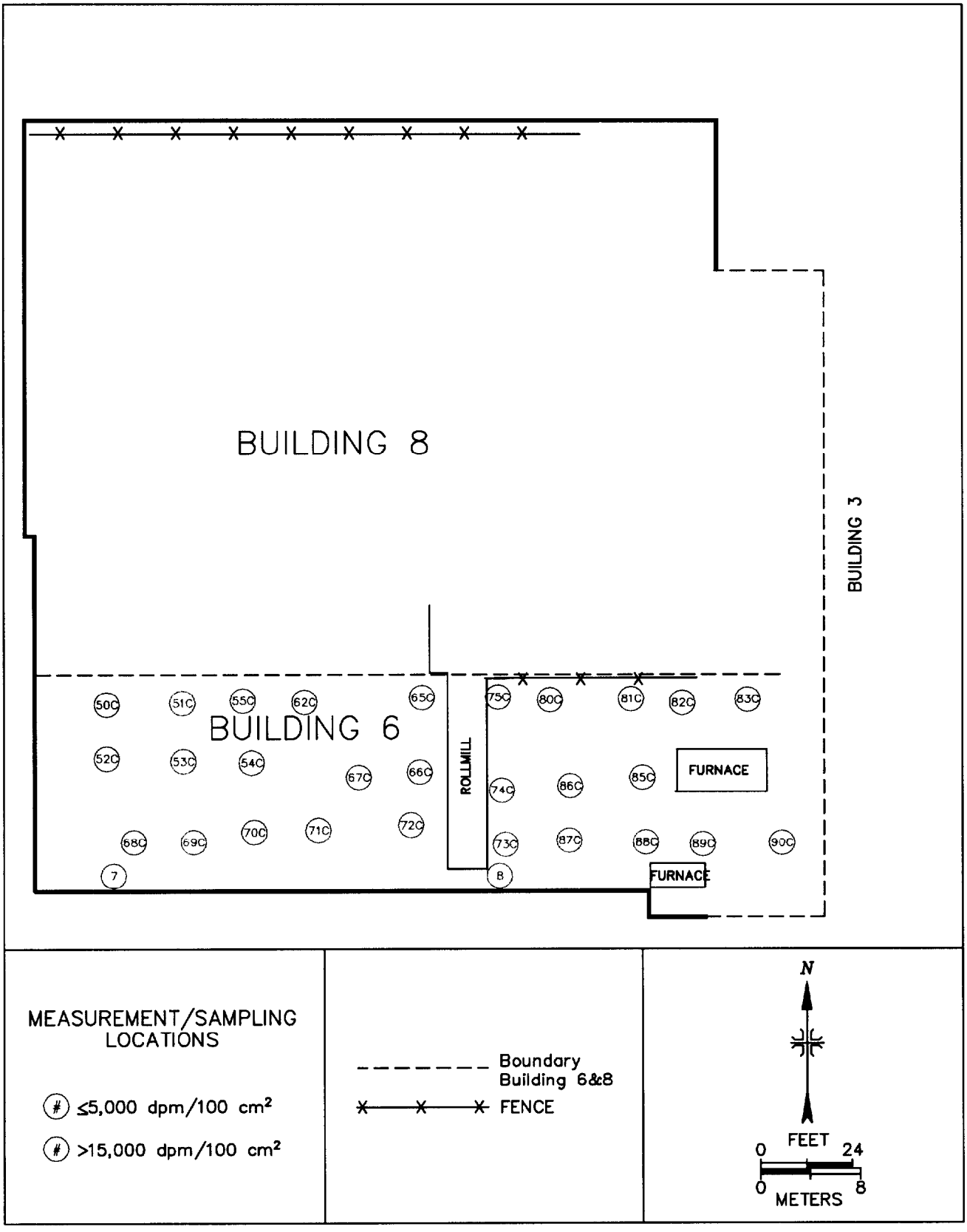

FIGURE 18: Building 6, Floors, Lower Walls, and Equipment – Direct Measurement and Sampling Locations

401-037 (2)

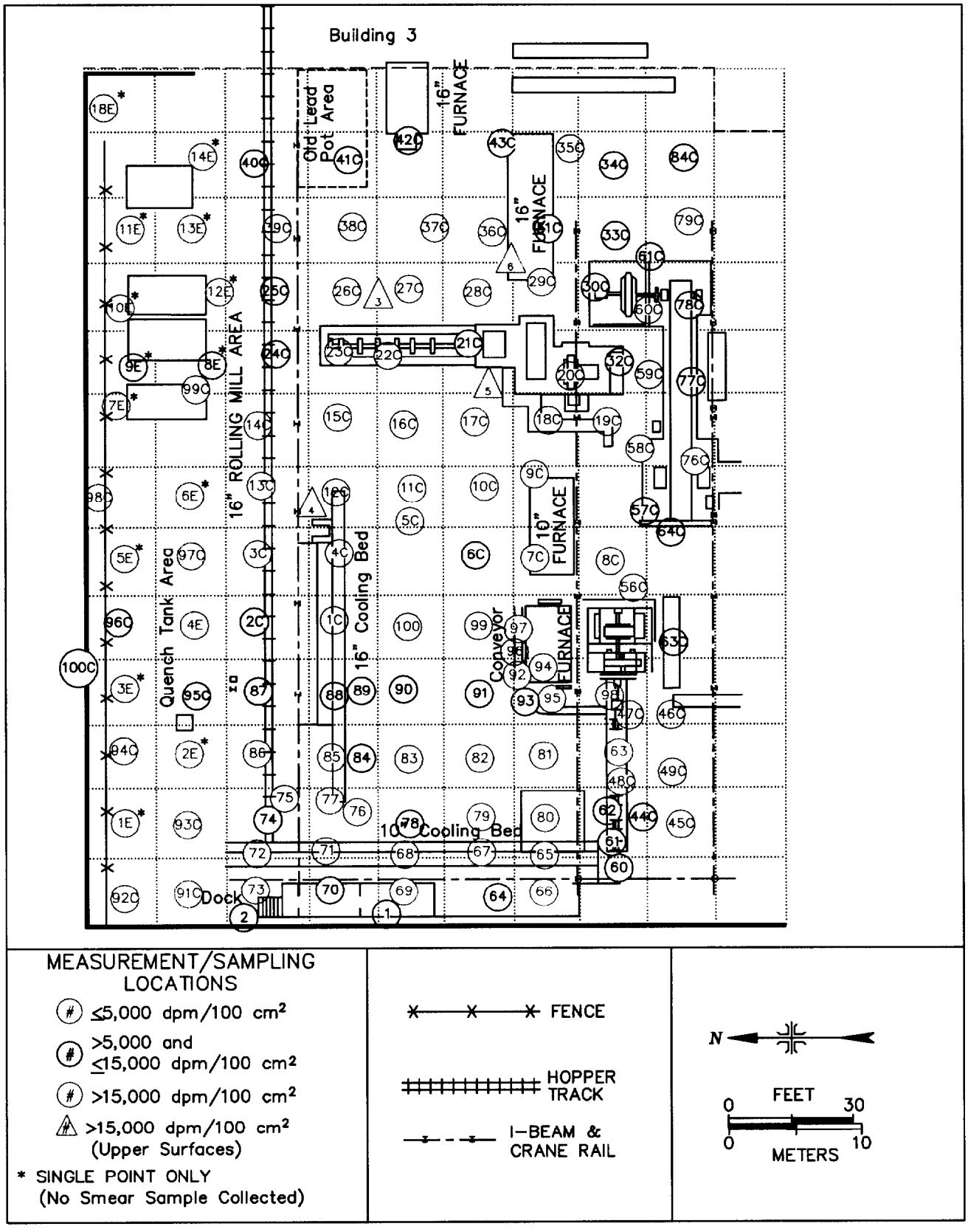

FIGURE 19: Building 8, Floors, Lower Walls, and Equipment – Direct Measurement and Sampling Locations

401-024 (x)

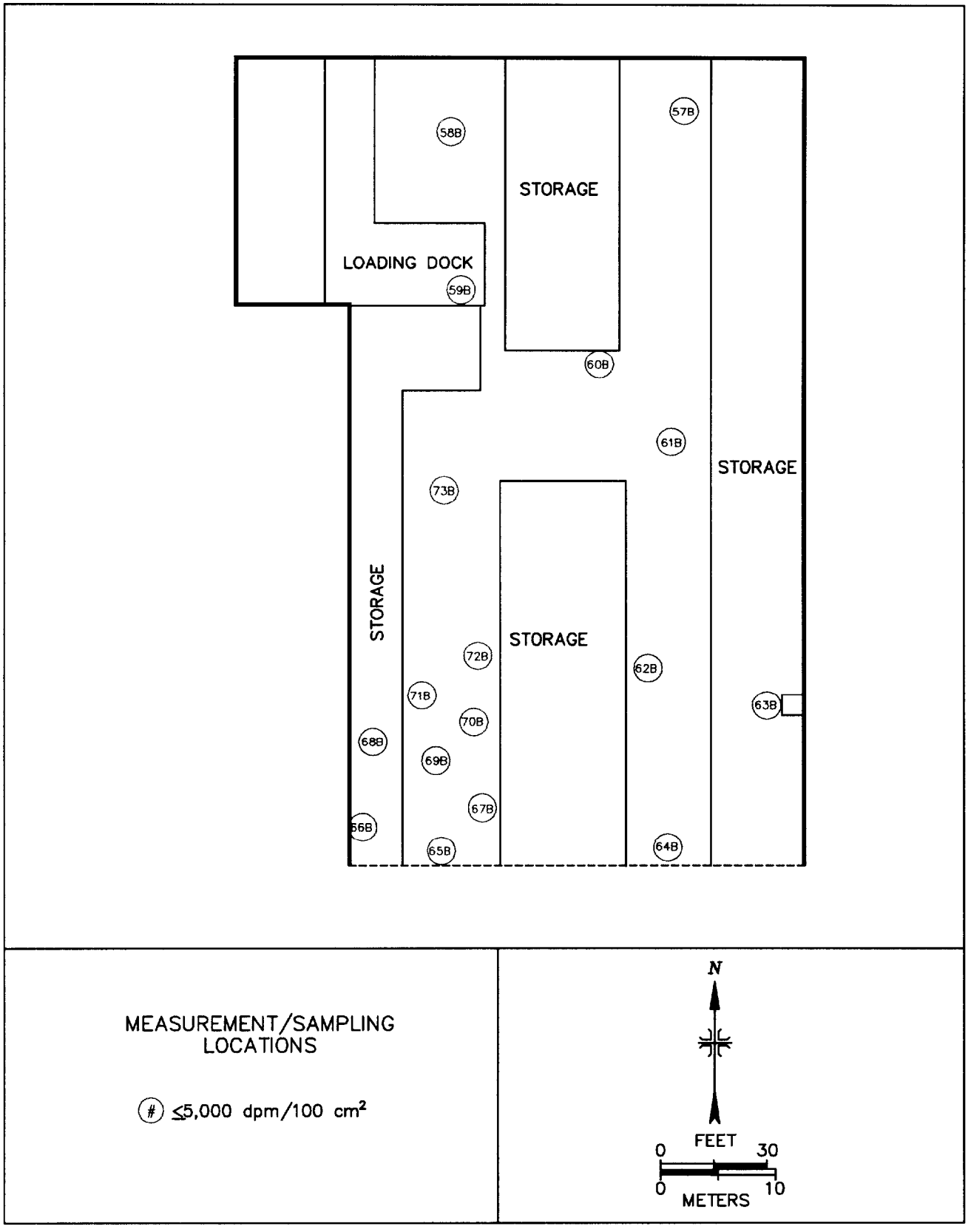

FIGURE 20: Building 24, North Area, Floor, Lower Walls, and Equipment – Direct Measurement and Sampling Locations

401-033 (x)

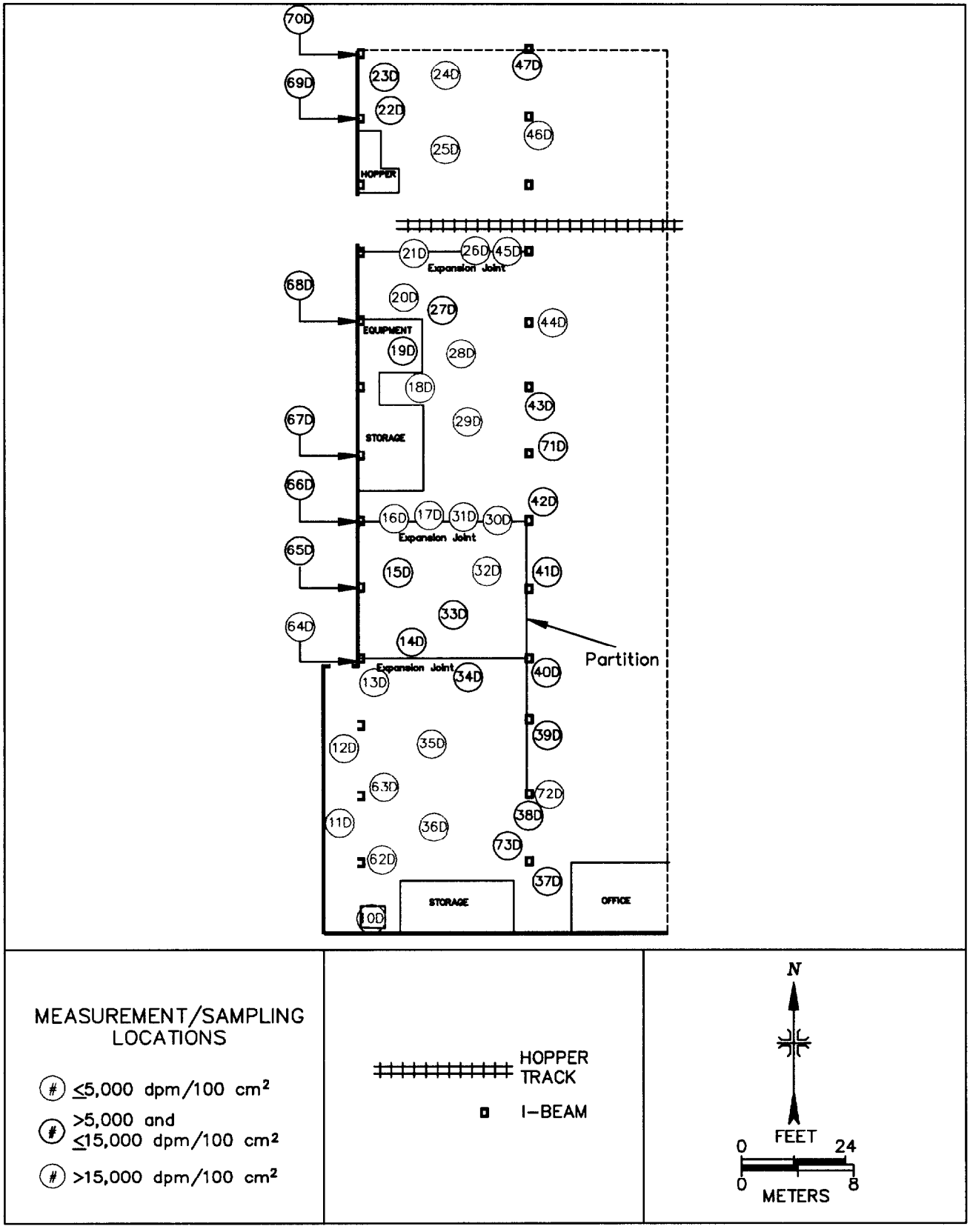

FIGURE 21: Building 24, Southwest Area, Floors, Lower Walls, and Equipment – Direct Measurement and Sampling Locations

401–032 (x)

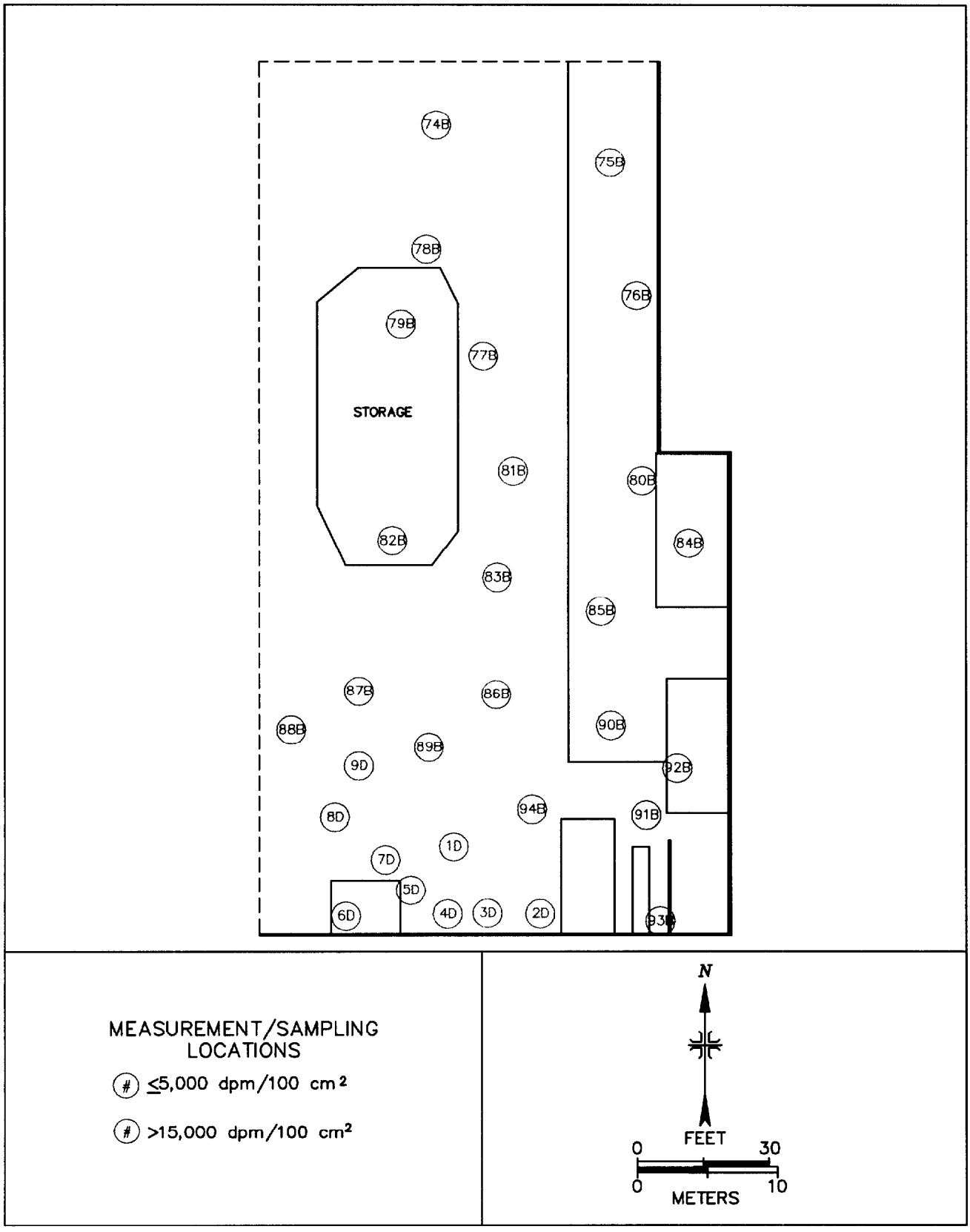

FIGURE 22: Building 24, Southeast Area, Floors, Lower Walls, and Equipment – Direct Measurement and Sampling Locations

401-034 (x)

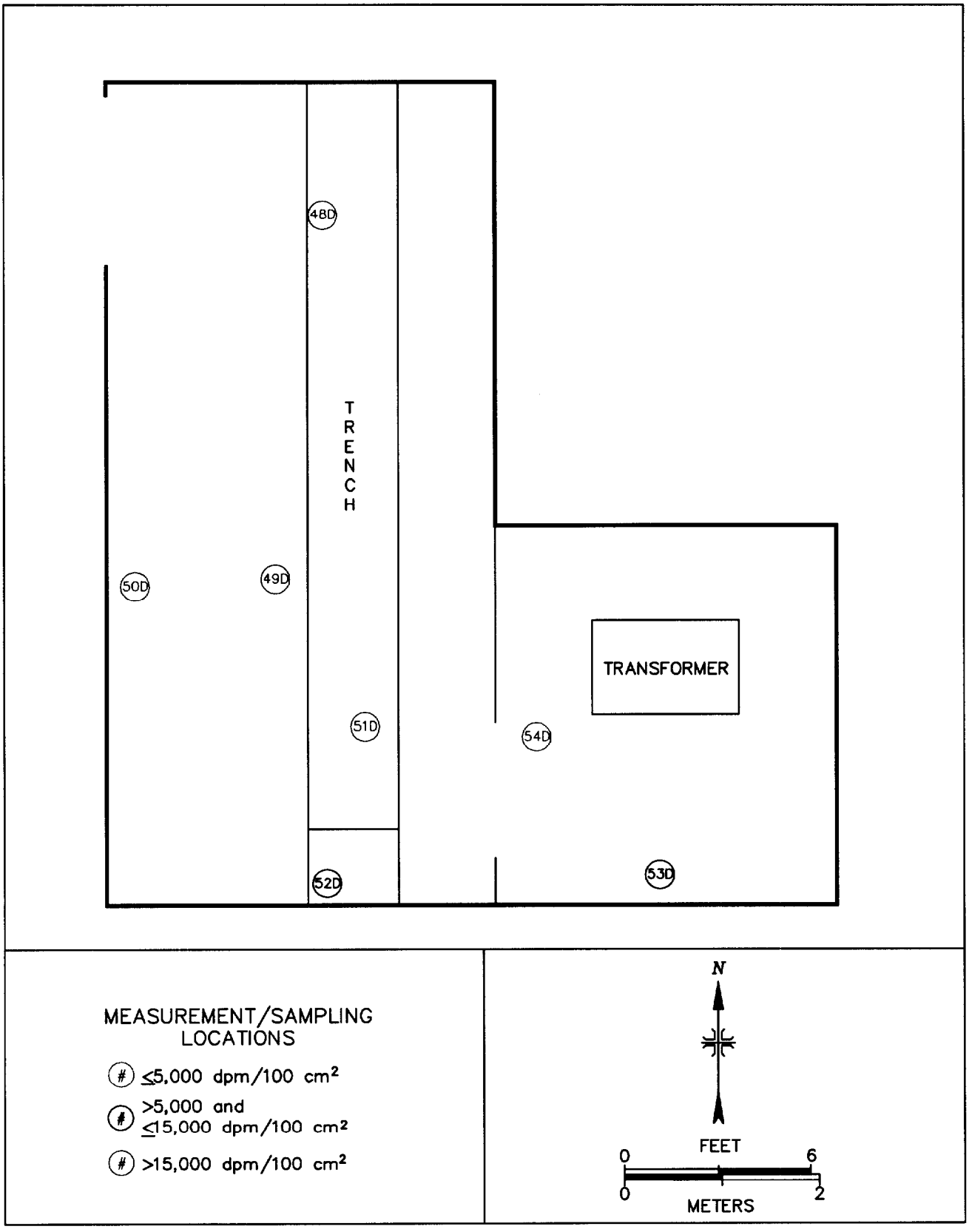

FIGURE 23: Building 24, Southeast Storage Room, Floors, Lower Walls, and Equipment – Direct Measurement and Sampling Locations

401-035 (x)

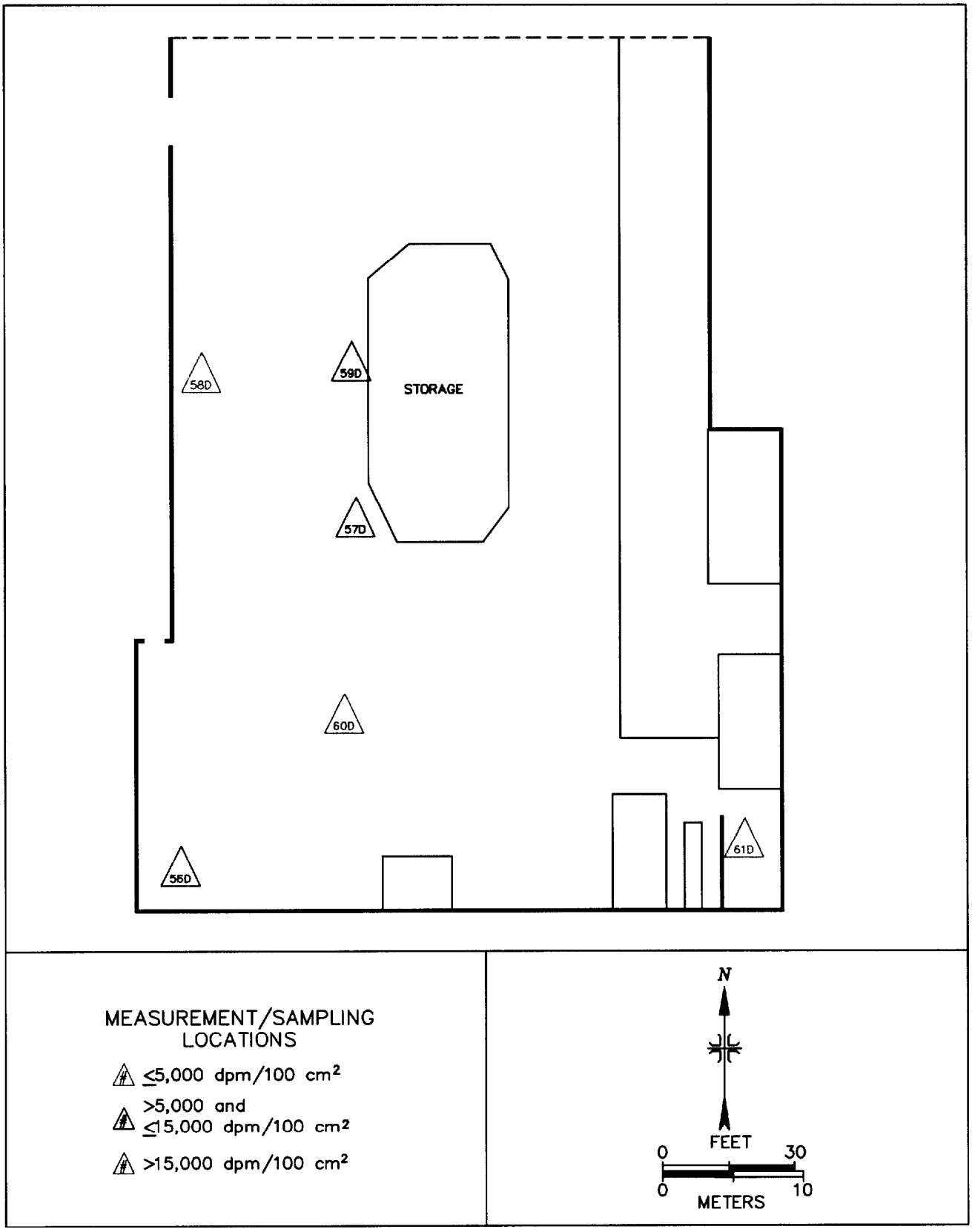

FIGURE 24: Building 24, Upper Surfaces – Direct Measurement and Sampling Locations

401-025 (x)

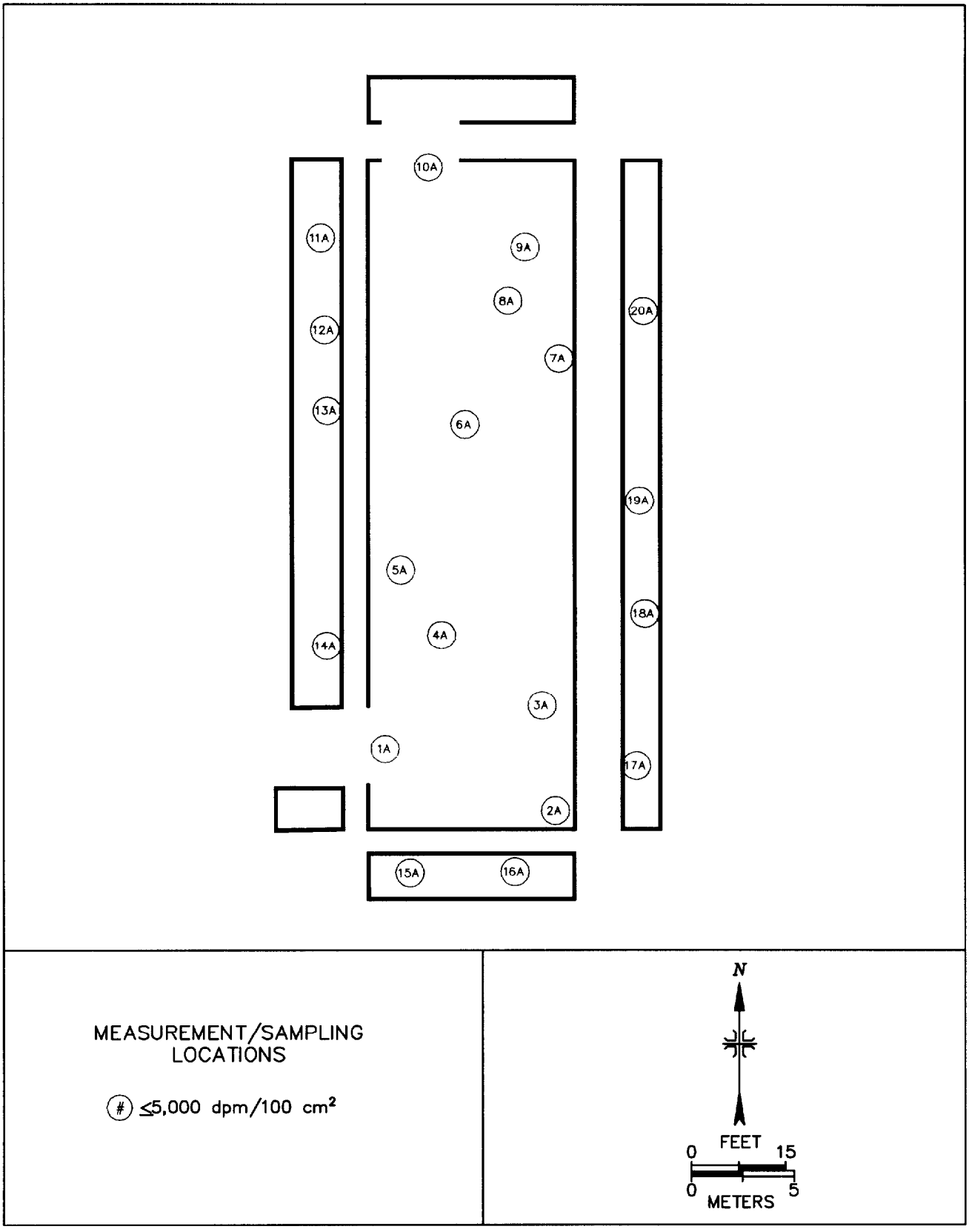

FIGURE 25: Building 35, Floor, Lower Walls, and Equipment – Direct Measurement and Sampling Locations

401-031 (x)

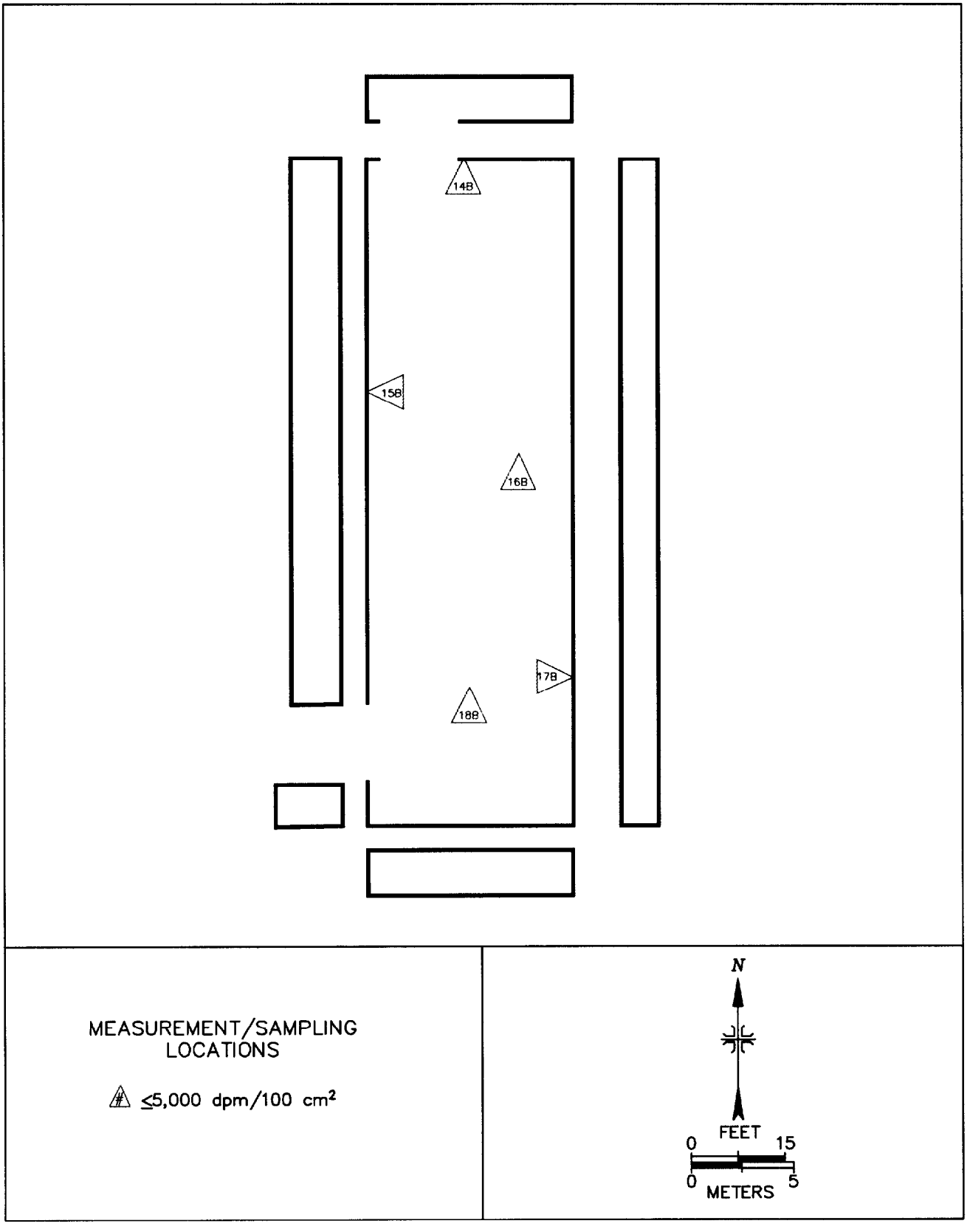

FIGURE 26: Building 35, Upper Surfaces – Direct Measurement and Sampling Locations

401-014 (2)

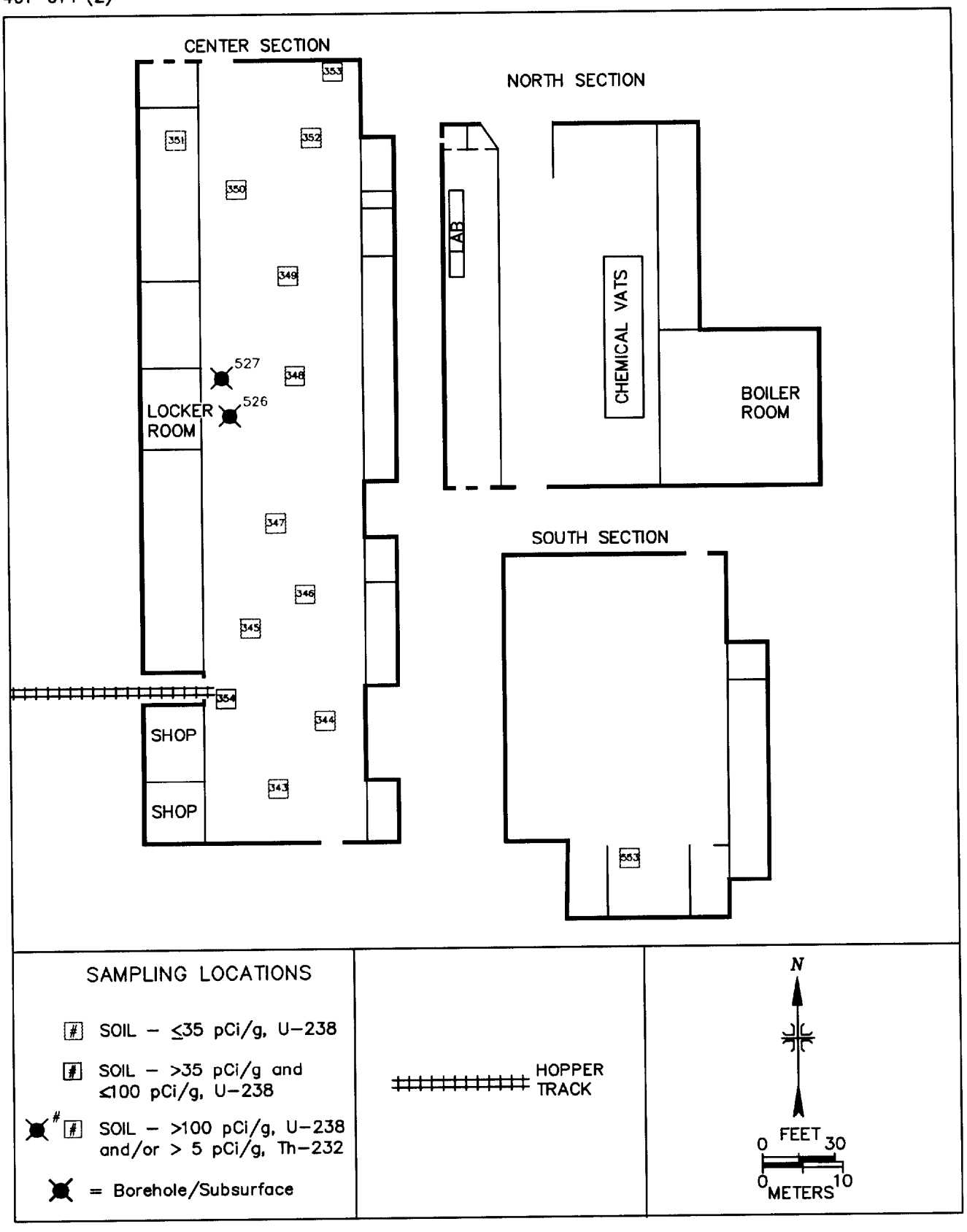

FIGURE 27: Building 2 – Sampling Locations

401-017 (2)

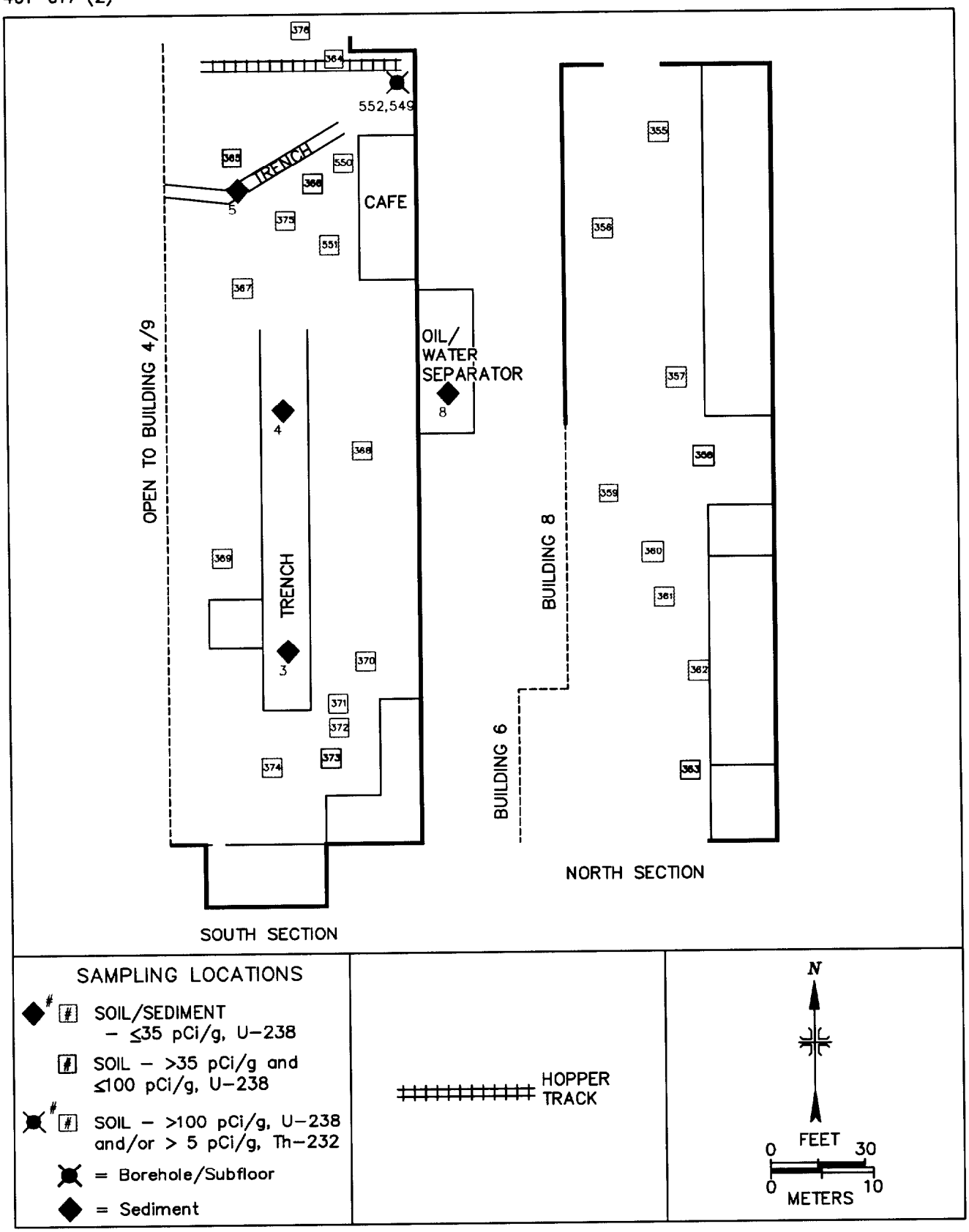

FIGURE 28: Building 3 – Sampling Locations

401–023 (1)

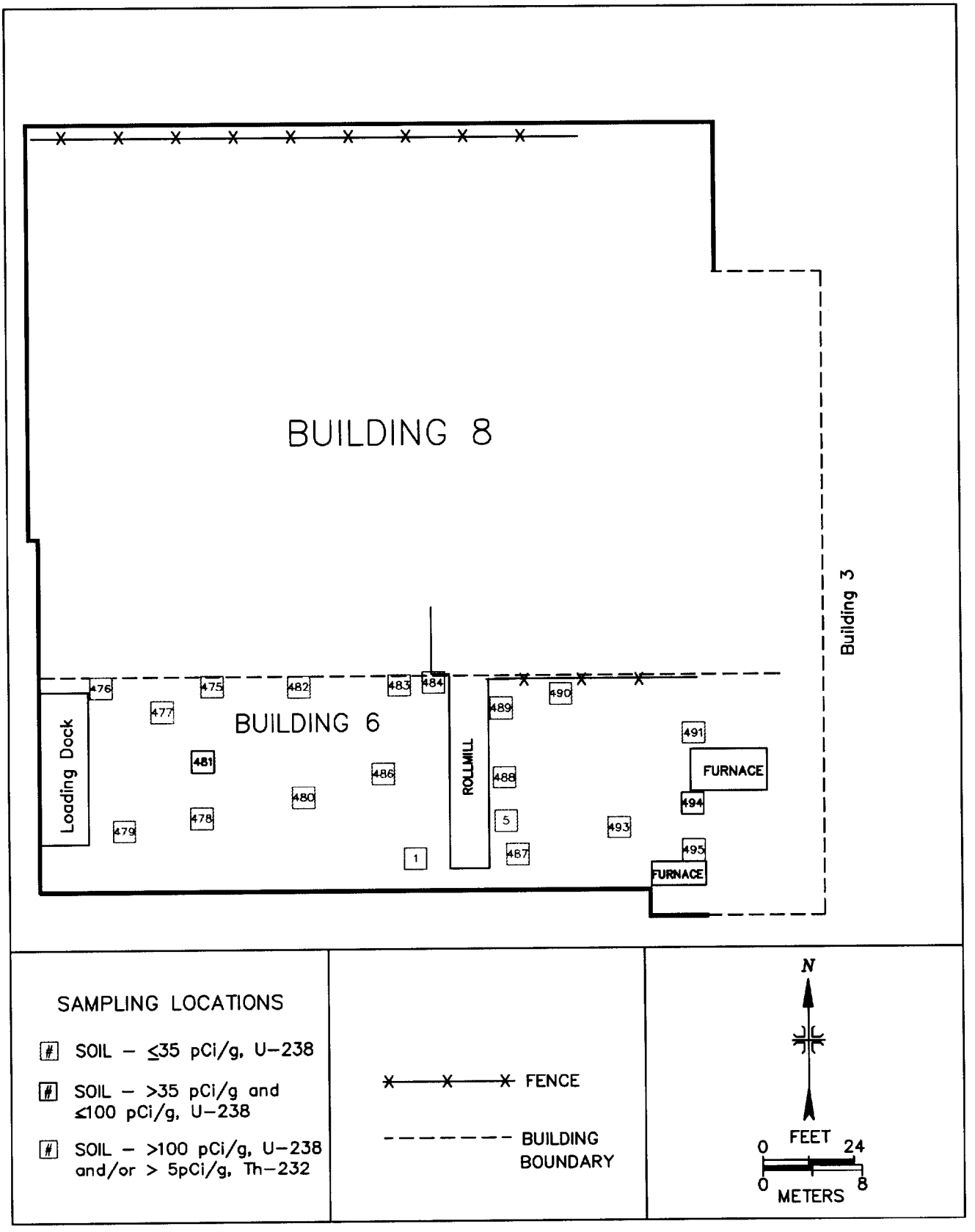

FIGURE 30: Building 6 – Sampling Locations

401-047 (1)

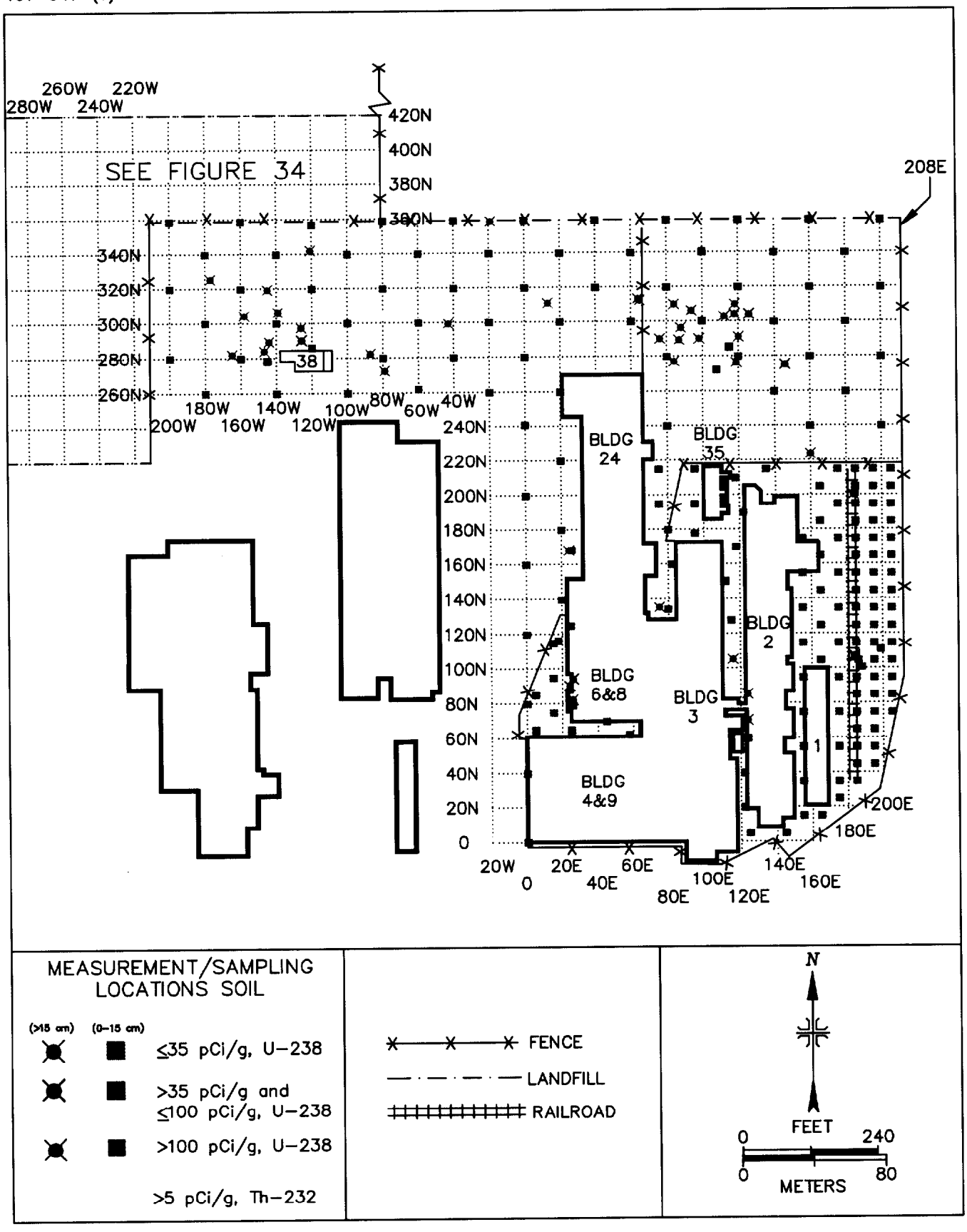

FIGURE 33: Guterl Specialty Steel Corporation – Class 1 and 2 Areas
Measurement and Sampling Locations

401-051 (x)

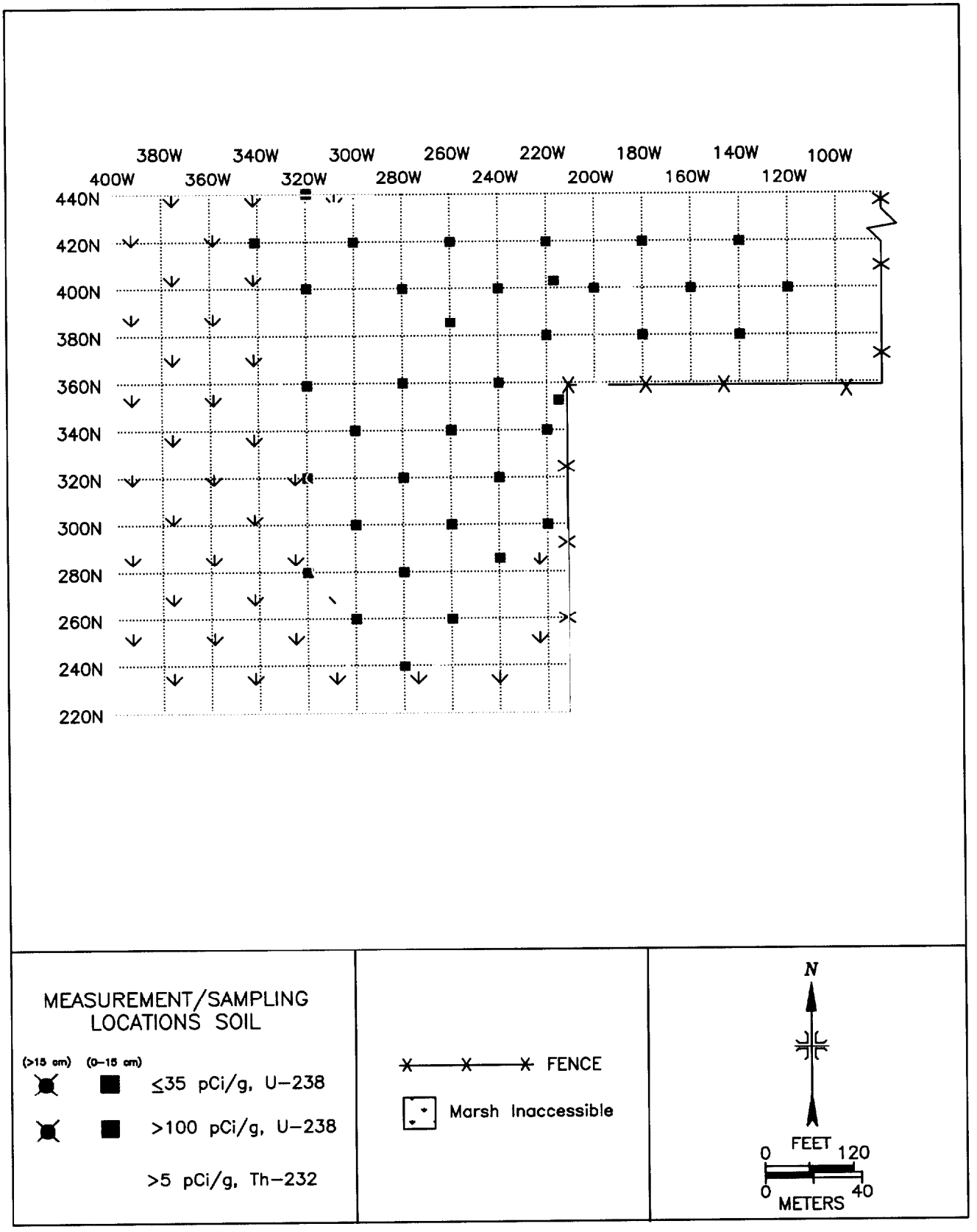

FIGURE 34: Landfill Area – Measurement and Sampling Locations

401-030 (1)

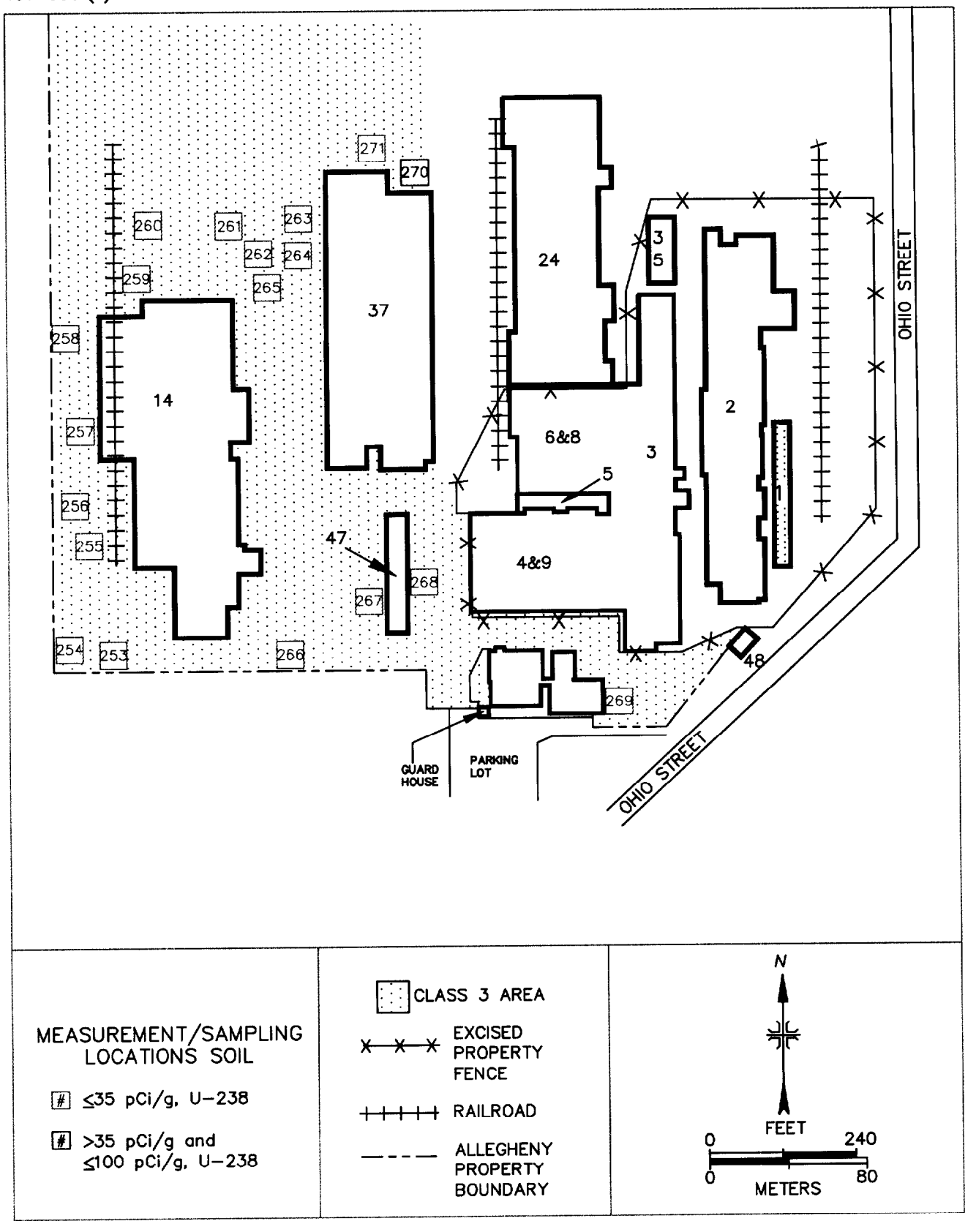

FIGURE 35: Exterior Class 3 Area – Sampling Locations

401-048 (2)

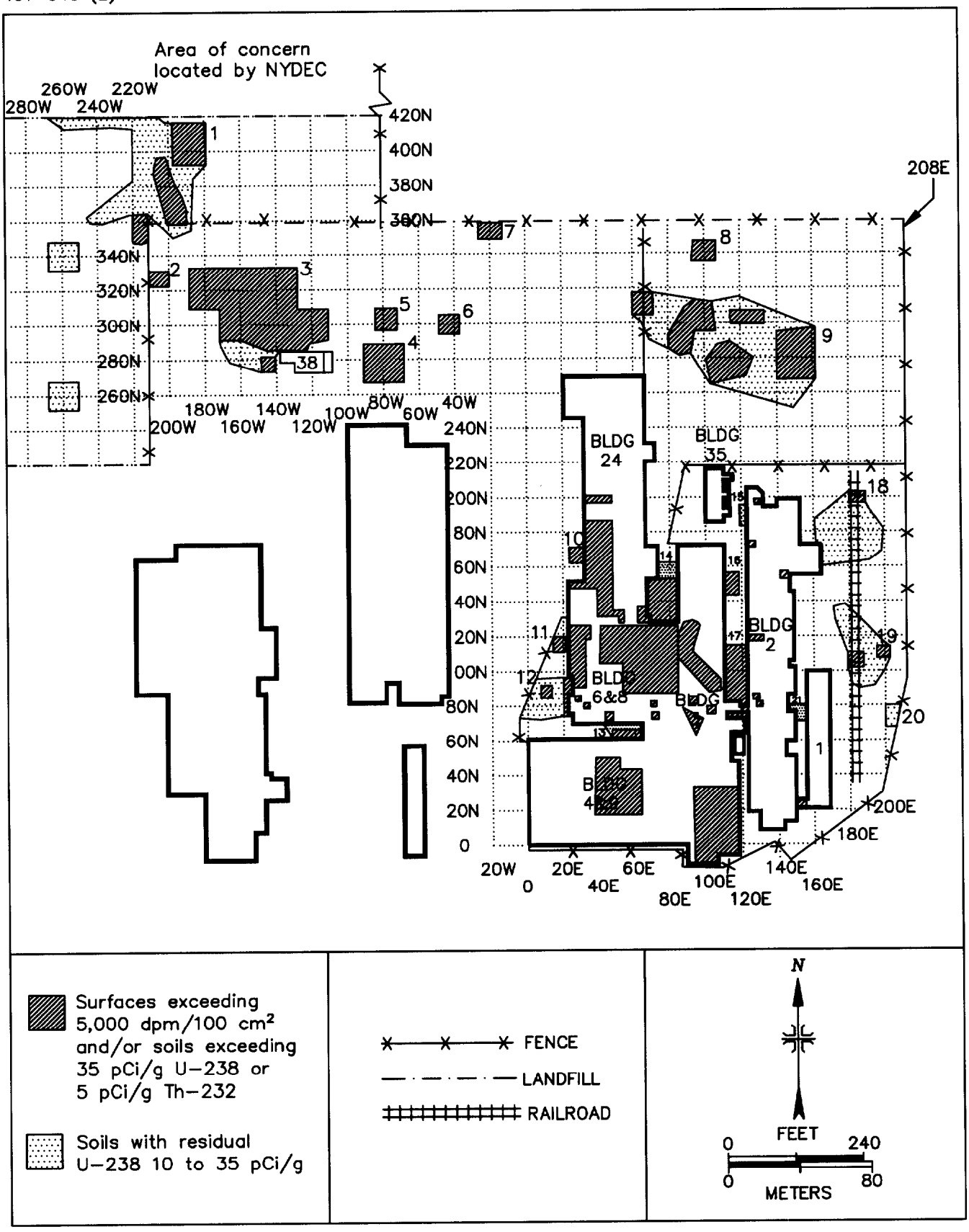

FIGURE 36: Guterl Specialty Steel Corporation – Impacted Areas

TABLES

TABLE 1

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 1 GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
North Room				
Metal Floor Plate	9	-15	1	2
East Wall	10	-540	0	-2
Center Room				
Metal Floor Plate	11	97	0	-2
North Wall	12	-38	0	-6
Melting Equip.	13	390	0	2
Metal Floor Plate	14	35	0	-3
South Room				
Pit - Lower Ledge	15	32	0	3
East Wall	16	1,700	1	-2
East Work Room				
Concrete Floor	17	-240	0	-4
West Work Room				
Countertop	18	7,700	5	7
Lower Shelf	19	11,000	0	7
Concrete Floor at Drain	--[b]	35,000	--	--
Concrete Floor below Shelf	--	100,000	--	--
Wipe Rag	--	340,000	--	--

[a] Refer to Figure 11.
[b] No smear sample collected.

TABLE 2

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 2 GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
North Section				
Door Facing	21A	24,000	3	-1
WorkBench	22A	12,000	1	-1
Near Workbench	23A	-88	0	3
Concrete Floor	24A	-140	0	2
North Wall at 0.5 m	25A	-160	1	-4
Concrete Floor	26A	-410	0	-1
Vat	27A	-270	0	-2
Concrete Floor	28A	-280	1	-1
West Wall at 1.0 m	29A	-190	0	2
Concrete Floor at Track	30A	-360	0	-2
Concrete Floor	31A	-150	1	-2
Tank	32A	-79	0	-1
Concrete Floor	33A	-360	1	-5
Fan	34A	-190	3	3
East Wall at 1.0 m	35A	-190	0	-1
Concrete Floor	36A	-240	0	-1
East Wall at 1.5 m	37A	-65	0	-1
Concrete Floor	38A	-280	0	-3
South Wall at 1.5 m	39A	-97	0	-4
Stair	40A	160	1	-1
Concrete Floor	41A	210	0	-2
Lift Platform	42A	510	0	4
I-beam at 8 m	1B	-29	1	1
On Shed	2B	410	0	5
Platform at 8 m	3B	-88	0	7
Lift Frame at 5 m	4B	150	0	1
Crane at 8 m	5B	-380	3	-1

TABLE 2 (Continued)

SUMMARY OF SURFACE ACTIVITY LEVELS
FOR BUILDING 2
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
Center Section				
Roofing Debris	43A	1,800	1	-1
Concrete Floor	44A	-26	0	-3
North Wall at 0.5 m	45A	-240	0	2
Concrete Floor	46A	-560	0	1
West Wall at 1.0 m	47A	360	0	1
Concrete Floor	48A	-320	0	-4
Equipment	49A	210	0	-3
East Wall at 1.0 m	50A	-270	0	-3
Metal Floor Plate	51A	-94	0	1
Concrete Floor	--[b]	1,800	--	--
Locker	52A	18,000	5	3
Concrete Floor	--[b]	11,000	--	--
Equipment	53A	-41	1	-2
East Wall at 1.0 m	54A	130	0	3
Concrete Floor	55A	-300	0	16
Concrete Floor	56A	7,300	1	2
Concrete Floor	57A	4,400	0	2
Shelving	58A	150	1	1
Concrete Floor	59A	-170	3	-3
East Wall at 1.0 m	60A	-160	0	3
Equipment	61A	230	1	-2
Metal Floor Plate at Track	62A	3,900	0	2
Pit Wall	63A	-270	0	-3
East Wall at 0.5 m	64A	-310	1	-4
Metal Floor Plate	65A	340	3	-2
West Wall at 1.0 m	66A	-130	0	2
Stairs	67A	230	3	3
Concrete Floor	68A	-200	0	-4

TABLE 2 (Continued)

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 2 GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
North End at 6 m	6B	-320	1	1
I-beam at 8 m	7B	240	0	2
East Wall Light at 6 m	8B	650	0	1
I-beam at 5 m	9B	1,200	0	-3
Crane Operator Bench at 7 m	10B	59	1	2
West Wall at 4 m	11B	1,100	0	-1
West Platform at 6 m	12B	29	0	-1
Light Fixture	13B	500	0	-1
South Section				
Furnace	69A	97	0	1
Concrete Floor	70A	-350	0	2
Countertop	71A	6	0	-2
West Wall at 1.0 m	72A	-50	0	-1
Exhaust Hood at 2.5 m	73A	-9	1	3
Concrete Floor	74A	-410	3	3
Concrete Floor	75A	-380	0	-3
Pedestal	76A	-390	0	-1
Steps to Vat	77A	-120	0	3
Wood Floor	78A	260	0	-1
Door Facing at 1.5 m	79A	-300	0	18
Concrete Floor	80A	-490	0	4
Concrete Floor	81A	-530	0	3

[a] Refer to Figures 12 and 13

[b] No sample collected (smear or soil). Contamination was beneath concrete.

TABLE 3

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 3 GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
North Section				
Stairs	20	300	0	2
Concrete Floor at Track Intersect	21	-530	1	2
Concrete Floor	22	-420	1	-2
Incinerator Ledge	23	460	5	-1
Concrete Floor	24	310	1	1
Exhaust Fan Flange	25	2,700	0	2
Concrete Floor	26	-550	1	-2
I-Beam at 1.5 m	27	660	3	2
Roller	28	4,500	5	2
Concrete Floor Near Track	29	8,300	3	10
Electric Wire Casing	30	2,700	0	3
Roller Stack Pedestal	31	9,600	3	9
Concrete Floor	32	10,000	3	6
Concrete Floor	33	13,000	13	12
Equipment Room	34	270	1	2
Equipment Room	35	-510	1	-2
Roller Stack Pedestal	36	6,900	3	2
Roller	37	2,800	7	3
Stairs Near Bldg. 6 Opening	38	3,600	7	5
Concrete Floor Near Bldg. 6	39	6,500	14	16
Concrete Floor Near Bldg. 6	40	640	1	4
Center Throughway Near Track	41	67,000	0	-1
Bathroom Floor	42	650	0	3
Top of Furnace at 4 m	19B	790	1	-1
North Wall at 7 m	20B	2,400	1	-3
Light at 6 m	21B	3,400	0	-3
Overhang at 4 m	22B	2,200	0	3
Furnace I-beam at 4 m	23B	3,100	3	1
Top of Electric Box at 4 m	24B	3,700	1	7

TABLE 3 (Continued)

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 3 GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
Truss above Furnace at 4 m	25B	56,000	9	4
Window Ledge at 8 m	26B	25,000	3	2
South Section				
I-beam Pedestal	43	5,400	5	10
Trench Cover	44	2,600	3	1
Cabinet Top	45	5,000	11	17
Trench Cover	46	660	9	2
Exterior Wall of Cafeteria at 1.5 m	47	630	3	-2
Concrete Floor	48	-28	0	7
West Wall at 1.5 m	49	-1,300	0	-3
Concrete Floor	50	470	0	-1
Concrete Floor	51	1,500	7	3
North End of Trench	52	-57	0	-3
Equipment Pedestal	53	-620	1	-4
South End of Trench	54	16,000	14	16
Roller Cap	55	340,000	130	195
South End of Trench	56	160,000	185	248
Concrete Floor Near Trench	57	12,000	3	6
Concrete Floor at Track	58	-550	0	1
Concrete Floor at Track Intersect	59	-620	0	3
Window Ledge at 8 m	27B	8,300	9	1
Top of Room at 3 m	28B	4,000	3	-3
Crane Rail I-beam at 8 m	29B	21,000	3	4
I-beam at 5 m	30B	5,200	0	1
I-beam at 7 m	31B	12,000	0	3
I-beam at 5 m	32B	10,000	1	-1
Crane Stand at 5 m	33B	6,100	1	-3
Sidewalk at Cafeteria	15E[b]	5,700	--	--
Sidewalk at Cafeteria	16E[b]	4,400	--	--
Sidewalk at Cafeteria	17E[b]	3,800	--	--

[a]See Figures 14 and 15.

[b] No smear sample collected.

TABLE 4

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 4 AND 9 GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
Brick Floor	82A	490	1	4
Equipment Pedastal	83A	550	0	-4
Concrete Floor	84A	-56	1	-2
South Wall at 0.25 m	85A	59	7	-1
Roller Furnace	86A	500	0	2
Brick Floor	87A	310	3	3
Concrete Floor	88A	44	0	4
Press	89A	-110	3	-4
South Wall at 1 m	90A	-220	0	7
Concrete Floor	91A	-260	3	5
Concrete Floor	92A	-330	1	-3
Loading Dock	93A	280	3	4
Concrete Floor	94A	-450	0	-3
Stairs	95A	-240	3	-5
Furnace	96A	130	1	4
Concrete Floor	97A	-210	0	-3
Brick Floor	98A	16,000	24	32
Brick Floor	99A	5,200	11	12
Brick Floor	100A	13,000	14	20
Roller Furnace	43B	210	1	3
Brick Floor	44B	11,000	26	110
Brick Floor	--[b]	23,000	--	--
Brick Floor	45B	190	0	1
Platform	46B	1,500	0	-4
Furnace	47B	3,300	3	2
Brick Floor	48B	390	1	2
Concrete Floor	49B	47	0	-4
Misc. Equipment	50B	1,300	1	1

TABLE 4 (Continued)

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 4 AND 9 GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
North Wall at 1.5 m	51B	230	0	-2
Pit	52B	-440	1	-1
I-beam at 1.5 m	53B	110	3	-3
Brick Floor	54B	5,300	9	9
Air Duct	55B	210	3	14
Concrete Floor	56B	-85	0	-1
Furnace Hood at 4 m	34B	6,300	0	1
Crane Rail I-beam at 7 m	35B	88	5	2
Roof Truss at 10 m	36B	5,000	0	2
Light at 7 m	37B	650	3	-2
Roof Truss at 10 m	38B	9,800	7	-1
Roof Truss at 10 m	39B	180	3	-2
Roof Truss at 10 m	40B	1,700	1	-4
Crane Rail I-beam at 7 m	41B	740	0	-2
Light at 7 m	42B	2,300	1	-1

[a] Refer to Figures 16 and 17.

[b] No smear sample collected.

TABLE 5

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 6 GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
South Wall at 1 m	7	-24	1	-2
South Wall at 1 m	8	100	1	1
Metal Floor Plate	50C	30,000	1	-1
Metal Floor Plate	51C	810	3	5
Concrete Floor	52C	-330	1	4
Concrete Floor	53C	4,200	0	2
Brick Floor	54C	0	1	2
Brick Floor	55C	780	0	15
Brick Floor	62C	-480	0	2
Concrete Floor	65C	1,000	0	2
Metal Floor Plate	66C	680	0	4
Brick Floor	67C	320	0	3
Metal Floor Plate	68C	1,200	0	2
Brick Floor	69C	1,200	1	-2
Brick Floor	70C	440	1	-2
Brick Floor	71C	740	0	-1
Brick Floor	72C	1,600	1	-3
Metal Floor Plate	73C	350	1	-1
Metal Floor Plate	74C	970	0	4
Metal Floor Plate	75C	450	0	1
Metal Floor Plate	80C	1,900	7	3
Concrete Floor	81C	1,900	1	9
Concrete Floor	82C	2,200	0	-3
Concrete Floor	83C	2,400	7	4
Metal Floor Plate	85C	420	5	-2
Metal Floor Plate	86C	920	1	1
Brick Floor	87C	1800	1	2
Concrete Floor	88C	1500	0	-1
Brick Floor	89C	860	1	4
Concrete Floor	90C	250	0	-1

[a] Refer to Figure 18.

TABLE 6

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 8 GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
West Wall	1	10,000	7	9
Saw Horse	--[b]	62,000	--	--
West Wall	2	8,000	11	10
I-beam at 4 m	3	64,000	3	2
Electric Box at 5 m	4	39,000	20	19
I-beam at 3 m	5	29,000	13	46
Furnace Support at 3 m	6	30,000	27	35
Equipment, 10" Rolling Mill - Side	60	8,800	1	1
Equipment, 10" Rolling Mill - Base	61	4,600	0	7
Equipment, 10" Rolling Mill - Side	62	10,000	1	-2
Equipment, 10" Rolling Mill - Side	63	3,000	1	-1
Concrete Floor	64	5,500	5	-2
Equipment, 10" Cooling Bed	65	510	1	2
Concrete Floor	66	960	1	2
Equipment, 10" Cooling Bed	67	1,400	1	4
Equipment, 10" Cooling Bed	68	660	0	-2
Concrete Floor	69	4,200	3	-3
Concrete Floor	70	6,000	0	-1
Equipment, 10" Cooling Bed	71	740	1	4
Equipment, 10" Cooling Bed	72	980	1	-1
Brick Floor	73	2,000	0	-1
Concrete Floor	74	5,300	3	7
Brick Floor	75	54,000	54	40
Concrete Floor	76	1,500	7	8
Equipment, 16" Cooling Bed	77	850	0	6
Metal Floor Plate	78	5,600	0	2
Metal Floor Plate	79	870	1	21
Metal Floor Plate	80	1,600	5	5
Metal Floor Plate	81	890	1	1
Metal Floor Plate	82	3,000	1	-2
Metal Floor Plate	83	2,800	0	1
Concrete Floor	84	5,000	3	15
Equipment, 16" Cooling Bed, Roller	85	1,200	1	-4

TABLE 6 (Continued)

SUMMARY OF SURFACE ACTIVITY LEVELS
FOR BUILDING 8
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
Concrete Floor	86	2,400	3	7
Concrete Floor	87	4,800	3	4
Equipment, 16" Cooling Bed, Tray	88	5,600	3	4
Metal Floor Plate	89	6,300	1	6
Metal Floor Plate	90	7,600	3	10
Metal Floor Plate	91	5,800	3	6
Furnace Interior	92	2,500	0	-3
Conveyor	93	14,000	3	16
Furnace - Top	94	4,200	3	1
Furnace - Side	95	690	1	-1
Conveyor	96	16,000	5	12
Conveyor	97	260	3	7
Stair to 16" Cooling Bed	98	1,300	0	-2
Metal Floor Plate	99	19,000	22	17
Metal Floor Plate	100	22,000	20	23
Equipment, 16" Cooling Bed, Tray	1C	16,000	7	9
Concrete Floor	2C	5,900	11	10
Concrete Floor	3C	1,700	3	2
Equipment, 16" Cooling Bed, Tray	4C	16,000	20	19
Motor	5C	29,000	13	46
Metal Floor Plate	6C	13,000	27	35
Furnace - Top	7C	19,000	5	9
Metal Floor Plate	8C	2,900	1	-2
Furnace - Top	9C	18,000	9	6
Concrete Floor	10C	35,000	74	120
Metal Floor Plate	11C	38,000	14	16
Equipment, 16" Cooling Bed	12C	20,000	18	9
Concrete Floor	13C	3,300	7	2
Concrete Floor	14C	7,300	7	4
Equipment, 16" Cooling Bed	15C	18,000	22	17
Metal Floor Plate	16C	24,000	37	33
Metal Floor Plate	17C	23,000	13	25
Metal Floor Plate	18C	26,000	22	17

TABLE 6 (Continued)

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 8 GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
Motor Mount	19C	33,000	22	23
Motor	20C	24,000	26	31
Equipment, 16" Rolling Mill	21C	10,000	7	5
Equipment, 16" Rolling Mill	22C	40,000	24	15
Equipment, 16" Rolling Mill	23C	36,000	18	27
Wood Platform - Step	24C	14,000	9	8
Metal Basin	25C	7,000	16	18
Lip of Platform	26C	20,000	7	10
Wood Platform	27C	25,000	27	15
Metal Floor Plate	28C	20,000	14	19
Grating	29C	26,000	14	20
Gear Shaft	30C	13,000	5	2
Furnace - Top	31C	13,000	14	16
Metal Floor Plate	32C	5,200	1	-2
Concrete Floor	33C	4,800	11	9
Concrete Floor	34C	5,600	7	2
Metal Floor Plate	35C	20,000	5	11
Furnace	36C	1,400	0	2
Wood Platform	37C	15,000	13	37
Wood Platform	38C	3,300	3	1
Wood Shelf	39C	21,000	5	7
Concrete Floor	40C	6,600	5	6
Bench	41C	11,000	5	11
Furnace Door	42C	5,900	3	5
Concrete Floor	43C	12,000	5	8
Press	44C	12,000	0	-2
Metal Floor Plate	45C	17	0	1
Metal Floor Plate	46C	110	1	-2
Rolling Mill	47C	870	0	1
Rolling Mill	48C	2,300	0	-3
Metal Floor Plate	49C	450	0	1
Metal Floor Plate	56C	990	0	5
Wood Platform	57C	8,100	7	11

TABLE 6 (Continued)

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 8 GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
Wood Platform	58C	16,000	13	18
Wood Platform	59C	14,000	22	20
Concrete Footer	60C	13,000	37	95
Wood Platform	61C	7,000	7	5
Metal Floor Plate	63C	5,700	5	4
Wood Platform	64C	7,400	26	19
Concrete Floor	76C	3,600	0	1
Concrete Floor	77C	6,600	0	4
Concrete Floor	78C	12,000	5	3
Concrete Floor	79C	1,300	3	20
Concrete Floor	84C	6,700	1	1
Concrete Floor	91C	550	5	2
Concrete Floor	92C	860	0	-4
Concrete Floor	93C	3,100	0	1
Concrete Floor	94C	3,800	3	6
Concrete Floor	95C	6,100	9	8
Concrete Floor	96C	5,100	5	6
Metal Floor Plate	97C	2,500	0	3
Vat	98C	16,000	1	3
Concrete Floor	99C	15,000	5	11
I-beam at 1 m	100C	12,000	1	-2
Brick Floor	1E[b]	200	--	--
Brick Floor	2E[b]	500	--	--
Concrete Floor at Track	3E[b]	840	--	--
Concrete Floor	4E[b]	430	--	--
Concrete Floor at Track	5E[b]	860	--	--
Metal Floor Plate	6E[b]	2,300	--	--
Metal Floor Plate	7E[b]	1,600	--	--
Concrete Floor	8E[b]	6,700	--	--
Frame for Tank	9E[b]	5,000	--	--
Metal Floor Plate	10E[b]	2,000	--	--

TABLE 6 (Continued)

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 8 GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
Concrete Floor	11E[b]	3,800	--	--
Metal Floor Plate	12E[b]	2,300	--	--
Metal Floor Plate	13E[b]	2,300	--	--
Metal Floor Plate	14E[b]	430	--	--
North Wall	18E[b]	16,000	--	--

[a] Refer to Figure 19.

[b] No smear sample collected.

TABLE 7

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 24, NORTH SECTION GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
Concrete Floor	57B	-240	1	-1
Concrete Floor	58B	-230	0	-2
Concrete Floor	59B	-370	3	4
Concrete Floor	60B	-390	0	-2
Concrete Floor	61B	-360	1	-1
Concrete Floor	62B	-390	3	2
I-beam at 1.5 m	63B	-240	0	1
Concrete Floor	64B	-390	0	1
Concrete Floor	65B	-240	1	1
Ledge	66B	120	0	-2
Concrete Floor	67B	-300	0	1
Concrete Floor	68B	-290	0	2
Concrete Floor	69B	-200	0	1
Concrete Floor	70B	-260	0	6
Concrete Floor	71B	-90	0	1
Concrete Floor	72B	-240	1	1
Concrete Floor	73B	-240	0	-3

[a] Refer to Figure 20.

TABLE 8

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 24, SOUTH SECTION GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
Concrete Floor	74B	-210	0	-2
Concrete Floor	75B	-140	1	-3
Concrete Floor	76B	-190	0	1
Concrete Floor	77B	-270	3	3
Concrete Floor at Expansion Joint	78B	-320	0	2
Concrete Floor	79B	-160	0	14
East Wall at 1.5 m	80B	-610	0	7
Trench Cover	81B	170	1	1
Concrete Floor	82B	-200	0	-1
Concrete Floor	83B	-190	0	3
Concrete Floor	84B	-220	0	-2
Concrete Floor	85B	-40	3	3
Concrete Floor	86B	-100	3	5
Concrete Floor at Expansion Joint	87B	-100	5	2
Electric Box	88B	150	1	11
Concrete Floor	89B	200	0	-1
Concrete Floor	90B	-130	3	14
Concrete Floor	91B	19,000	27	20
Concrete Floor	92B	230	0	7
Concrete Floor	93B	4,300	0	1
Concrete Floor	94B	100	3	5
Concrete Floor	1D	190	0	-3
Concrete Floor	2D	130	1	1
Concrete Floor	3D	1,100	5	-2
Rail Track	4D	4,200	1	2
Concrete Floor	5D	-510	5	4
Concrete Floor	6D	-650	1	1

TABLE 8 (Continued)

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 24, SOUTH SECTION GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
Concrete Floor	7D	250	5	4
Concrete Floor	8D	350	7	2
Concrete Floor	9D	-60	1	1
Pit	10D	4,100	1	15
Concrete Floor	11D	360	0	3
Concrete Floor	12D	750	0	1
Concrete Floor	13D	20,000	3	4
Concrete Floor	14D	6,600	1	5
Concrete Floor	15D	12,000	3	8
Concrete Floor	16D	40,000	5	-1
Concrete Floor	17D	99,000	65	80
Concrete Floor	18D	36,000	3	5
Concrete Floor	19D	12,000	1	1
Concrete Floor	20D	19,000	5	1
Concrete Floor	21D	18,000	9	31
Concrete Floor	22D	11,000	1	6
Concrete Floor	23D	8,500	0	-1
Concrete Floor	24D	-140	0	4
Concrete Floor	25D	-20	1	4
Concrete Floor	26D	18,000	5	-2
Concrete Floor	27D	13,000	3	-5
Concrete Floor	28D	1,200	1	-4
Concrete Floor	29D	830	0	3
Concrete Floor	30D	23,000	0	4
Concrete Floor	31D	21,000	3	2
Concrete Floor	32D	19,000	1	2
Concrete Floor	33D	14,000	0	1

TABLE 8 (Continued)

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 24, SOUTH SECTION GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
Concrete Floor	34D	11,000	0	1
Concrete Floor	35D	610	3	2
Concrete Floor	36D	870	3	4
Concrete Floor	37D	7,700	1	-1
Concrete Floor	38D	15,000	22	7
Concrete Floor	39D	5,900	0	-1
Concrete Floor	40D	8,800	1	6
Concrete Floor	41D	10,000	0	4
Concrete Floor	42D	6,600	0	-5
Concrete Floor	43D	6,700	1	-1
Concrete Floor	44D	2,500	0	-1
Concrete Floor	45D	31,000	13	10
Concrete Floor	46D	3,500	1	5
Concrete Floor	47D	6,600	1	2
Concrete Floor	48D	24,000	0	1
Concrete Floor	49D	26,000	0	-3
Concrete Floor	50D	26,000	0	3
Concrete Floor	51D	31,000	1	-2
Concrete Floor	52D	14,000	1	-3
Concrete Floor	53D	10,000	3	8
Concrete Floor	54D	1,400	1	-3
I-beam (above 2 m)	56D	8,100	3	2
I-beam (above 2 m)	57D	12,000	26	21
Roll-Up Door (above 2 m)	58D	150	1	3
I-beam (above 2 m)	59D	14,000	5	3
Electric Box (above 2 m)	60D	66,000	16	22
I-beam, Top of Kiln (above 2 m)	61D	2,600	0	3

TABLE 8 (Continued)

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 24, SOUTH SECTION GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
I-beam 1W at 1.5 m	62D	60	0	-2
I-beam 2W at 2 m	63D	2,800	5	4
I-beam 4W at 2 m	64D	15,000	7	11
I-beam 5W at 2 m	65D	8,800	7	7
I-beam 6W at 2 m	66D	15,000	13	14
I-beam 7W at 1.5 m	67D	7,100	3	1
I-beam 9W at 1.5 m	68D	13,000	11	3
I-beam 12W at 1.5 m	69D	9,800	1	5
I-beam 13W at 1.5 m	70D	7,300	9	14
I-beam 7E at 1.5 m	71D	6,000	0	2
I-beam 2E at 1.2 m	72D	20,000	1	9
I-beam 1E at 1.5 m	73D	6,900	1	3

[a] Refer to Figures 21 through 24.

TABLE 9

SUMMARY OF SURFACE ACTIVITY LEVELS FOR BUILDING 35 GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location Description[a]	Location #	Total Activity (dpm/100 cm^2)	Removable Activity (dpm/100 cm^2)	
			Alpha	Beta
Concrete Floor	1A	-210	3	-1
Concrete Floor	2A	-270	1	-2
Concrete Floor	3A	-200	0	-4
Floor Drain	4A	85	0	3
Concrete Floor	5A	-290	0	2
Floor Drain	6A	120	0	-1
Concrete Floor	7A	-380	0	-2
Concrete Floor	8A	-260	0	-3
Misc. Equipment	9A	-26	0	-3
Concrete Floor	10A	-260	1	-3
I-beam at 1.5 m	11A	-250	0	-1
West Wall at 1 m	12A	-760	0	-4
West Wall at 1 m	13A	-640	0	-2
Workbench	14A	100	0	-2
South Wall at 1.5 m	15A	-44	0	2
South Wall at 1 m	16A	-160	1	-1
East Wall at 1 m	17A	-270	1	1
I-beam at 1.5 m	18A	-230	0	-1
East Wall at 0.5 m	19A	-230	0	-4
East Wall at 1 m	20A	-720	0	4
North Wall at 4 m	14B	-59	0	-5
Crane Rail I-beam at 5 m	15B	180	1	2
Crane Center at 6 m	16B	-59	0	2
Crane Rail at 5 m	17B	290	1	-5
Roof Truss at 7 m	18B	650	0	-4

[a] Refer to Figures 25 and 26.

TABLE 10

SUMMARY OF EXPOSURE RATES
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Location	Number of Measurements	Exposure Rate Range (μR/h at 1 meter)
Interior		
Building 1	5	6 to 12
Building 2	17	5 to 12
Building 3	20	5 to 11
Building 4/9	5	5 to 10
Building 6	7	5 to 12
Building 8	8	6 to 50
Building 24, South Section	5	5 to 9
Building 35	5	5 to 8
Exterior		
Excised Property	131	3 to 50
All Remaining Property	129	3 to 25

TABLE 11

RADIONUCLIDE CONCENTRATIONS IN SEDIMENT SAMPLES GUTERL SPECIALTY STEEL CORPORATION LOCKPORT, NEW YORK

Location	Sample ID[a]	Radionuclide Concentration (pCi/g wet weight)				
		Sample Quanity (g)	Ra-226	Th-232	U-235	U-238
Building 3	3	1290	< 0.1	< 0.1	0.2 ± 0.1[b]	3.8 ± 0.1
Building 3	4	341	0.2 ± 0.1	< 0.1	1.3 ± 0.4	29.9 ± 12.5
Building 3	5	1545	0.1 ± 0.1	0.5 ± 0.1	0.3 ± 0.1	7.8 ± 1.9
Building 8	6	1272	0.2 ± 0.1	1.2 ± 0.2	3.6 ± 0.4	96.8 ± 7.6
Building 8	7	875	0.1 ± 0.1	0.7 ± 0.1	3.9 ± 0.4	90.2 ± 7.3
Oil/Water Separator	8	1296	0.2 ± 0.1	0.2 ± 0.1	0.3 ± 0.1	9.6 ± 2.2

[a] Refer to Figures 28 and 31

[b] Uncertainties are total propagated uncertainties at the 95% confidence level.

TABLE 12

RADIONUCLIDE CONCENTRATIONS IN SOIL
INTERIOR LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Location [a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
Building 2					
343	781	1.0 ± 0.2	1.0 ± 0.3[b]	< 0.3	< 10 *(2.8 ± 1.2)* [c]
344	907	0.7 ± 0.2	0.7 ± 0.2	< 0.3	< 6.6 *(< 1.3)*
345	749	1.1 ± 0.2	1.1 ± 0.3	0.6 ± 0.3	12.0 ± 5.2
346	816	1.3 ± 0.4	< 1.0	0.2 ± 0.4	< 16 *(5.3 ± 1.7)*
347	896	0.8 ± 0.2	1.0 ± 0.2	< 0.3	< 6.8 *(1.6 ± 1.1)*
348	790	0.8 ± 0.2	< 0.4	0.2 ± 0.2	< 9.2 *(3.3 ± 0.9)*
349	993	0.7 ± 0.1	0.7 ± 0.2	< 0.2	< 5.4 *(1.8 ± 0.6)*
350	1,001	0.4 ± 0.1	< 0.6	< 0.4	< 8.9 *(1.1 ± 0.8)*
351	798	0.8 ± 0.3	0.8 ± 0.3	0.4 ± 0.3	< 16 *(6.1 ± 1.3)*
352	797	0.5 ± 0.1	1.0 ± 0.3	0.4 ± 0.3	11.6 ± 5.8
353	774	0.4 ± 0.1	2.3 ± 0.4	4.4 ± 0.6	113 ± 15
354	716	0.8 ± 0.2	< 0.6	1.9 ± 0.5	56 ± 12
526 subfloor	*[d]	< 480	119,000 ± 11,000	< 1300	< 18,000
527 subfloor	*[d]	< 350	14,200 ± 1600	< 900	< 15,000
553	927	8.4 ± 0.7	1.9 ± 0.3	0.9 ± 0.3	13.4 ± 4.1
Building 3					
355	1,179	0.2 ± 0.1	< 0.3	0.2 ± 0.2	3.5 ± 3.0
356	775	< 0.2	< 0.2	< 0.2	< 5.9 *(1.7 ± 0.8)*
357	905	0.7 ± 0.1	1.1 ± 0.2	0.6 ± 0.3	17.6 ± 4.8
358	1,035	< 0.3	1.3 ± 0.3	4.0 ± 0.7	98 ± 17
359	776	0.5 ± 0.1	0.6 ± 0.2	0.5 ± 0.2	< 11 *(5.2 ± 1.3)*
360	957	< 0.2	< 0.5	14.1 ± 1.4	374 ± 30
361	902	< 0.2	< 0.3	0.8 ± 0.3	22.9 ± 5.8
362	879	1.1 ± 0.2	0.8 ± 0.4	0.5 ± 0.3	16.4 ± 8.4
363	930	< 0.2	1.0 ± 0.3	1.4 ± 0.5	43.6 ± 9.3
364	957	< 0.2	1.0 ± 0.3	1.3 ± 0.5	33.6 ± 9.2
365	821	0.9 ± 0.2	1.0 ± 0.2	2.7 ± 0.4	58.1 ± 9.4

TABLE 12 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SOIL
INTERIOR LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Location [a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
Building 3 (Continued)					
366	715	0.7 ± 0.2	2.3 ± 0.5	2.1 ± 0.5	63 ± 14
367	724	0.7 ± 0.2	0.8 ± 0.2	0.2 ± 0.2	< 9.3 *(3.4 ± 1.4)*
368	883	0.4 ± 0.1	< 0.4	< 0.2	< 6.0 *(< 1.0)*
369	1,019	0.3 ± 0.1	0.6 ± 0.1	0.4 ± 0.2	14.7 ± 3.7
370	879	< 0.4	< 0.4	10.3 ± 1.2	264 ± 27
371	1,014	< 0.3	< 0.5	33.6 ± 2.7	850 ± 53
372	1,083	< 0.2	< 0.3	12.3 ± 1.1	338 ± 24
373	985	< 0.2	< 0.3	2.6 ± 0.5	64 ± 12
374	695	< 0.3	< 0.4	18.7 ± 1.9	444 ± 39
375	818	< 0.8	< 1.1	60.4 ± 5.1	6,020 ± 290
376	938	< 3.0	< 3.4	796 ± 53	41,600 ± 1900
550	1,184	< 0.3	< 0.3	64.6 ± 4.3	1595 ± 76
551	1,002	0.7 ± 0.1	0.6 ± 0.1	0.2 ± 0.1	5.4 ± 2.1
552 Subfloor (0 to 4 cm)	999	< 0.3	78.5 ± 7.3	1.9 ± 0.6	90 ± 11
549 Subfloor (4 to 25 cm)	775	0.7 ± 0.1	27.0 ± 2.5	< 0.4	< 6.6 *(3.7 ± 1.3)*
Building 4					
528 (Residue)	505	0.3 ± 0.1	0.4 ± 0.2	4.4 ± 0.5	274 ± 19
529 Subfloor soil	707	0.6 ± 0.1	0.6 ± 0.1	< 0.1	< 3.0 *(1.8 ± 0.4)*
530 (Residue)	490	0.6 ± 0.1	0.4 ± 0.2	6.8 ± 0.7	140.2 ± 13.4
531 Subfloor soil	883	0.4 ± 0.1	0.4 ± 0.1	< 0.1	< 4.1 *(1.9 ± 0.6)*
Building 6					
1	768	< 0.5	58.2 ± 5.7	< 1.6	50 ± 30
5	705	< 0.2	< 0.4	0.8 ± 0.3	24.2 ± 7.8
475	806	0.5 ± 0.1	< 0.4	< 0.2	< 9.1 *(1.2 ± 0.9)*

TABLE 12 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SOIL
INTERIOR LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Location [a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
Building 6 (Continued)					
476	1,151	< 0.5	68.7 ± 6.6	7.8 ± 1.6	297 ± 32
477	920	0.5 ± 0.1	< 0.4	< 0.3	< 8.1 *(1.7 ± 1.1)*
478	724	< 0.4	< 0.6	< 0.4	< 12 *(< 2.1)*
479	693	< 0.2	0.4 ± 0.2	< 0.3	< 9.5 *(3.9 ± 1.4)*
480	687	0.5 ± 0.1	0.7 ± 0.2	< 0.3	< 8.1 *(4.8 ± 1.4)*
481	664	< 0.3	1.1 ± 0.3	1.8 ± 0.6	39 ± 10
482	613	0.7 ± 0.2	1.4 ± 0.4	0.7 ± 0.4	17 ± 11
483	896	0.2 ± 0.1	0.6 ± 0.2	0.2 ± 0.1	6.6 ± 3.9
484	737	< 0.3	8.7 ± 1.1	10.9 ± 1.3	272 ± 29
486	804	0.4 ± 0.2	0.7 ± 0.3	< 0.4	< 11 *(1.5 ± 1.5)*
487	735	0.6 ± 0.1	< 0.4	< 0.3	< 10 *(1.1 ± 0.8)*
488	488	0.6 ± 0.2	0.9 ± 0.4	< 0.4	< 12 *(1.6 ± 1.4)*
489	788	< 0.2	2.1 ± 0.4	0.8 ± 0.3	26.5 ± 7.8
490	771	< 0.3	0.6 ± 0.3	< 0.4	< 12 *(< 1.7)*
491	1,030	< 0.2	0.6 ± 0.2	0.7 ± 0.3	13.4 ± 6.1
493	742	0.6 ± 0.2	0.5 ± 0.2	< 0.3	< 8.5 *(1.4 ± 1.0)*
494	637	0.5 ± 0.1	1.7 ± 0.4	2.2 ± 0.5	61 ± 12
495	674	< 0.4	36.7 ± 3.6	1.2 ± 0.9	54 ± 14
Building 8					
2	829	< 2.2	< 2.8	213 ± 15	25,200 ± 1200
3	1,120	< 0.7	213 ± 20	84.4 ± 6.1	2,520 ± 130
4	633	< 2.1	< 2.3	238 ± 17	9,300 ± 460
435	1,135	< 0.1	< 0.1	0.6 ± 0.2	17.7 ± 4.8
436	808	0.5 ± 0.1	0.6 ± 0.2	< 0.2	< 5.6 *(0.8 ± 0.8)*
437	1,215	< 0.2	2.0 ± 0.4	5.1 ± 0.8	151 ± 17
438	846	< 0.2	1.0 ± 0.3	4.5 ± 0.7	132 ± 17
439	939	< 0.2	< 0.4	1.7 ± 0.4	41.1 ± 8.6

TABLE 12 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SOIL
INTERIOR LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Location [a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
Building 8 (Continued)					
440	924	< 0.2	< 0.3	9.2 ± 0.9	251 ± 21
441	841	0.5 ± 0.2	< 0.6	0.5 ± 0.3	13.0 ± 7.1
442	953	< 0.2	0.4 ± 0.2	1.3 ± 0.4	35.0 ± 7.7
443	735	< 0.2	0.8 ± 0.2	0.5 ± 0.2	12.8 ± 4.9
444	1,018	< 0.5	2.5 ± 0.6	142.6 ± 9.5	4,200 ± 200
445	1,141	< 0.7	5.4 ± 0.9	78.5 ± 5.5	2,470 ± 130
446	1,139	< 1.1	< 1.7	275 ± 18	10,250 ± 480
447 (0 to 15 cm)	1,100	< 1.2	< 1.4	187 ± 13	9,720 ± 450
539 (15 to 30 cm)	1,130	< 0.1	0.7 ± 0.1	25.2 ± 1.7	660 ± 31
448 (0 to 15 cm)	652	0.7 ± 0.3	2.8 ± 0.6	26.2 ± 2.1	722 ± 47
538 (15 to 20 cm)	692	1.0 ± 0.3	1.1 ± 0.2	18.0 ± 1.4	430 ± 26
450	725	< 0.3	< 0.5	17.6 ± 1.7	471 ± 38
451 (0 to 15 cm)	1,105	< 1.4	9.2 ± 1.8	348 ± 23	14,680 ± 680
536 (15 to 30 cm)	367	1.3 ± 0.2	1.3 ± 0.3	10.4 ± 0.9	238 ± 19
537 (30 to 45 cm)	404	1.6 ± 0.2	1.7 ± 0.3	1.8 ± 0.3	36.9 ± 7.4
452	1,136	< 0.6	30.3 ± 3.0	128.5 ± 8.6	4,970 ± 230
453	1,025	< 0.8	3.5 ± 0.8	103.7 ± 7.2	3,270 ± 170
454	1,087	< 0.1	< 0.1	0.6 ± 0.2	29.6 ± 6.6
455	865	< 0.2	< 0.3	2.1 ± 0.5	57 ± 12
456	1,049	< 0.2	1.4 ± 0.3	36.5 ± 2.7	1,028 ± 56
457	1,142	< 0.2	< 0.3	0.9 ± 0.3	26.5 ± 7.1
458 (0 to 15 cm)	1,196	< 0.7	< 1.0	164 ± 11	5,400 ± 260

TABLE 12 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SOIL
INTERIOR LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Location [a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
Building 8 (Continued)					
532 (15 to 30 cm)	522	1.3 ± 0.2	1.5 ± 0.2	4.3 ± 0.4	84.8 ± 7.8
533 (30 to 45 cm)	597	0.8 ± 0.1	1.0 ± 0.2	1.6 ± 0.3	37.2 ± 6.1
459	582	< 0.3	1.2 ± 0.4	7.4 ± 1.0	194 ± 24
460	1,137	< 0.7	< 0.9	280 ± 18	9,350 ± 430
461	1,232	< 0.5	< 0.7	39.4 ± 3.1	1,144 ± 67
462	1,107	< 0.3	1.3 ± 0.5	26.6 ± 2.2	692 ± 45
463	726	< 0.6	< 0.8	158 ± 11	3,980 ± 200
464	844	< 0.7	< 0.8	156 ± 10	5,990 ± 280
465	992	< 0.2	0.8 ± 0.2	0.6 ± 0.4	21.3 ± 7.8
466	995	< 0.3	10.3 ± 1.2	2.6 ± 0.7	49 ± 16
467	676	< 0.4	12.0 ± 1.5	38.8 ± 3.2	1,133 ± 71
468	872	0.8 ± 0.2	4.4 ± 0.6	4.2 ± 0.6	116 ± 15
469	826	< 0.6	7.4 ± 1.0	14.9 ± 1.7	736 ± 53
470	1,154	< 0.3	20.7 ± 2.1	10.5 ± 1.4	332 ± 31
471	830	< 0.3	5.2 ± 0.8	15.2 ± 1.4	486 ± 37
472	1,016	< 2.0	442 ± 41	7.2 ± 3.0	158 ± 53
473	758	0.4 ± 0.1	0.5 ± 0.2	0.2 ± 0.2	< 5.9 *(2.0 ± 0.9)*
474	802	< 0.3	0.9 ± 0.3	< 0.5	< 15 *(4.4 ± 1.6)*
485	751	0.5 ± 0.1	< 0.4	0.5 ± 0.3	12.5 ± 5.6
492	616	< 0.6	15.1 ± 1.9	25.6 ± 2.5	730 ± 58
497	1,034	< 0.5	7.6 ± 1.1	27.5 ± 2.4	763 ± 53
498	827	0.2 ± 0.1	< 0.4	1.2 ± 0.3	32.1 ± 6.2
534 (0 to 15 cm)	886	< 0.2	1.3 ± 0.4	128.8 ± 8.4	3260 ± 150
535 (15 to 30 cm)	469	1.0 ± 0.3	< 0.5	13.8 ± 1.2	313 ± 22

TABLE 12 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SOIL
INTERIOR LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Location [a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
Building 8 (Continued)					
540 (0 to 15 cm)	855	0.7 ± 0.4	1.9 ± 0.6	221 ± 15	5610 ± 260
541 (15 to 30 cm)	526	1.5 ± 0.4	1.4 ± 0.3	1.8 ± 0.3	38.2 ± 7.4
542 (30 to 45 cm)	603	1.0 ± 0.1	1.2 ± 0.2	1.2 ± 0.3	23.5 ± 5.7
Building 24					
543 (25 to 30 cm)	676	0.7 ± 0.1	0.9 ± 0.2	1.5 ± 0.2	37.4 ± 4.9
544 (30 to 45 cm)	546	1.2 ± 0.3	1.2 ± 0.3	0.5 ± 0.2	14.9 ± 6.6
545 (15 to 30 cm)	567	1.1 ± 0.1	1.2 ± 0.2	0.2 ± 0.2	8.4 ± 3.6
546 (10 to 15 cm)	418	1.7 ± 0.2	1.7 ± 0.3	1.2 ± 0.3	24.9 ± 4.8
547 (15 to 30 cm)	436	1.4 ± 0.3	1.3 ± 0.3	< 0.4	< 7.3 *(3.4 ± 0.9)*
548 (30 to 45 cm)	537	1.0 ± 0.1	1.2 ± 0.2	0.3 ± 0.2	< 6.2 *(4.8 ± 1.0)*

[a] Refer to Figures 27 through 32.

[b] Uncertainties are total propagated uncertainties at the 95% confidence level.

[c] Pa-234m (1001 keV) peak was used to determine activity except where values were less than the MDC in which case the Th-234 (63 keV) result was included in parenthesis.

[d] Semi-quantatative data, results are total activity. Sample collected was piece of a slag-like material.

TABLE 13

RADIONUCLIDE CONCENTRATIONS IN SURFACE SOIL
EXTERIOR SYSTEMATIC LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Grid Coordinates[a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
0N, 0E	987	< 0.2	0.5 ± 0.2[b]	< 0.3	< 8.3 *(4.3 ± 1.1)*[c]
5N, 125E	921	0.2 ± 0.1	< 0.5	< 0.3	< 7.1 *(1.6 ± 0.9)*
5N, 145E	900	0.2 ± 0.1	< 0.2	< 0.2	< 4.8 *(0.4 ± 0.6)*
15N, 155E	907	< 0.3	< 0.4	< 0.4	< 8.0 *(1.6 ± 1.0)*
15N, 165E	825	0.8 ± 0.2	1.0 ± 0.3	< 0.4	< 6.0 *(2.1 ± 1.3)*
20N, 122E	728	< 0.1	< 0.3	< 0.2	< 4.6 *(0.5 ± 0.7)*
25N, 175E	759	0.8 ± 0.2	0.7 ± 0.3	< 0.3	< 7.7 *(1.4 ± 1.2)*
35N, 155E	850	0.3 ± 0.1	0.3 ± 0.1	< 0.2	< 6.0 *(2.8 ± 0.8)*
35N, 175E	1164	0.1 ± 0.1	< 0.2	< 0.1	< 2.4 *(< 0.5)*
35N, 185E	867	< 0.2	< 0.3	< 0.2	< 6.2 *(0.6 ± 0.7)*
40N, 0E	939	< 0.1	< 0.1	< 0.1	< 2.4 *(< 0.5)*
40N, 122E	1141	< 0.1	< 0.3	0.2 ± 0.2	< 5.5 *(1.3 ± 0.5)*
45N, 185E	775	0.6 ± 0.1	< 0.4	< 0.2	< 8.6 *(3.1 ± 1.1)*
45N, 195E	939	0.4 ± 0.1	< 0.4	< 0.3	< 7.8 *(1.3 ± 1.0)*
55N, 155E	790	0.6 ± 0.1	1.2 ± 0.3	0.6 ± 0.3	< 9.2 *(6.4 ± 1.6)*
55N, 175E	880	0.5 ± 0.1	< 0.3	0.2 ± 0.2	< 5.0 *(2.2 ± 0.8)*
55N, 185E	936	0.6 ± 0.1	0.6 ± 0.2	< 0.2	< 4.4 *(2.0 ± 0.7)*
55N, 195E	792	0.7 ± 0.1	0.9 ± 0.2	< 0.2	< 5.9 *(1.8 ± 1.0)*
60N, 124E	877	0.4 ± 0.1	< 0.4	0.5 ± 0.4	6.5 ± 4.0
65N, 5E	1214	< 0.1	0.2 ± 0.1	< 0.2	< 5.8 *(1.2 ± 0.7)*
65N, 25E	856	0.2 ± 0.1	0.4 ± 0.1	0.2 ± 0.2	6.4 ± 2.6
65N, 185E	796	0.7 ± 0.2	0.8 ± 0.2	< 0.3	< 9.3 *(3.4 ± 1.2)*
65N, 195E	1077	0.4 ± 0.1	0.5 ± 0.2	< 0.2	4.3 ± 3.1
70N, 45E	789	0.5 ± 0.2	1.3 ± 0.3	1.1 ± 0.4	24.8 ± 9.6
75N, 15E	1230	0.2 ± 0.1	0.4 ± 0.1	0.4 ± 0.2	9.2 ± 3.8
75N, 155E	831	< 0.3	1.0 ± 0.3	0.7 ± 0.4	9.2 ± 6.9
75N, 175E	1086	0.6 ± 0.1	< 0.3	< 0.2	< 4.5 *(1.8 ± 0.5)*

TABLE 13 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SURFACE SOIL
EXTERIOR SYSTEMATIC LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Grid Coordinates[a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
75N, 185E	843	1.3 ± 0.3	1.4 ± 0.3	< 0.6	< 13 *(2.5 ± 1.0)*
75N, 195E	850	0.9 ± 0.2	0.9 ± 0.2	< 0.3	< 6.5 *(2.8 ± 1.0)*
75N, 205E	667	0.8 ± 0.2	1.2 ± 0.3	< 0.4	17.4 ± 9.4
80N, 0E	736	0.6 ± 0.2	0.8 ± 0.3	< 0.5	< 15 *(2.0 ± 0.8)*
85N, 5E	1253	0.3 ± 0.1	0.5 ± 0.1	< 0.2	< 4.8 *(1.7 ± 0.6)*
85N, 185E	737	0.5 ± 0.1	0.9 ± 0.2	< 0.2	6.4 ± 3.4
85N, 195E	1147	0.5 ± 0.1	0.6 ± 0.2	< 0.3	< 7.9 *(1.6 ± 0.9)*
85N, 205E	684	0.5 ± 0.2	0.5 ± 0.2	< 0.4	< 9.6 *(1.9 ± 0.9)*
95N, 15E	1552	< 0.1	< 0.1	0.2 ± 0.1	10.2 ± 3.0
95N, 155E	744	0.5 ± 0.2	0.9 ± 0.3	< 0.5	< 15 *(2.6 ± 1.1)*
95N, 175E	544	1.0 ± 0.2	< 0.6	< 0.3	5.2 ± 5.1
95N, 185E	679	1.1 ± 0.2	1.4 ± 0.3	0.3 ± 0.3	12.0 ± 6.1
95N, 195E	901	0.2 ± 0.1	< 0.3	< 0.2	< 4.2 *(0.5 ± 0.8)*
95N, 205E	967	0.6 ± 0.1	0.9 ± 0.2	0.4 ± 0.2	6.7 ± 4.2
105N, 165E	544	0.9 ± 0.2	< 0.7	< 0.5	< 11 *(7.2 ± 1.8)*
105N, 195E	835	< 0.1	< 0.2	< 0.1	< 2.9 *(< 0.7)*
105N, 205E	958	0.5 ± 0.1	0.7 ± 0.2	< 0.3	< 7.4 *(2.0 ± 0.8)*
115N, 15E	936	< 0.2	< 0.4	< 0.3	< 9.9 *(< 1.5)*
115N, 155E	878	0.5 ± 0.1	0.4 ± 0.2	< 0.4	< 12 *(< 1.5)*
115N, 175E	1162	0.4 ± 0.1	0.4 ± 0.1	0.2 ± 0.1	2.8 ± 2.3
115N, 185E	946	0.4 ± 0.1	0.6 ± 0.2	0.5 ± 0.2	14.0 ± 4.7
115N, 195E	702	1.0 ± 0.2	0.6 ± 0.3	0.9 ± 0.3	19.8 ± 7.0
115N, 205E	873	< 0.2	0.5 ± 0.2	< 0.3	< 8.6 *(1.6 ± 1.0)*
120N, 0E	580	< 0.1	0.2 ± 0.1	< 0.2	< 4.8 *(0.9 ± 0.7)*
125N, 25E	259	< 0.3	< 0.6	0.9 ± 0.6	28 ± 13
125N, 165E	866	0.5 ± 0.2	< 0.7	< 0.5	< 11 *(1.8 ± 1.1)*
125N, 185E	548	0.9 ± 0.2	0.7 ± 0.3	< 0.4	< 9.9 *(2.4 ± 1.4)*

TABLE 13 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SURFACE SOIL
EXTERIOR SYSTEMATIC LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Grid Coordinates[a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
125N, 195E	611	3.0 ± 0.7	1.2 ± 0.4	0.6 ± 0.5	< 18 *(7.2 ± 1.9)*
125N, 205E	893	0.4 ± 0.1	0.5 ± 0.2	< 0.4	< 7.6 *(1.9 ± 0.9)*
128N, 115E	837	0.4 ± 0.1	0.6 ± 0.2	0.2 ± 0.2	8.0 ± 4.7
135N, 155E	730	1.1 ± 0.2	1.2 ± 0.3	< 0.3	< 11 *(1.9 ± 1.2)*
135N, 175E	1153	0.3 ± 0.1	< 0.5	0.9 ± 0.3	21.1 ± 6.3
135N, 185E	524	< 0.3	< 0.4	< 0.3	< 8.7 *(0.4 ± 1.0)*
135N, 195E	643	< 0.3	0.8 ± 0.3	< 0.3	< 7.0 *(1.5 ± 1.2)*
135N, 205E	919	0.6 ± 0.1	< 0.3	0.3 ± 0.2	4.4 ± 2.6
140N, 20E	568	< 0.1	< 0.2	< 0.1	< 3.0 *(0.6 ± 0.5)*
145N, 165E	596	0.7 ± 0.1	1.1 ± 0.3	0.7 ± 0.3	< 9.7 *(7.1 ± 1.4)*
145N, 185E	639	1.0 ± 0.2	0.9 ± 0.3	< 0.3	< 6.9 *(< 1.2)*
145N, 195E	712	0.6 ± 0.1	< 0.3	< 0.3	< 6.8 *(1.4 ± 1.0)*
145N, 205E	522	2.1 ± 0.3	1.5 ± 0.4	< 0.5	< 11 *(3.7 ± 1.7)*
150N, 112E	891	< 0.2	0.4 ± 0.2	1.2 ± 0.4	34.6 ± 7.7
155N, 155E	808	0.4 ± 0.1	0.5 ± 0.2	< 0.2	< 5.4 *(1.7 ± 0.6)*
155N, 175E	1164	0.2 ± 0.1	< 0.4	< 0.3	5.5 ± 3.9
155N, 185E	985	< 0.1	< 0.2	< 0.2	< 4.6 *(0.1 ± 0.4)*
155N, 195E	659	< 0.2	0.9 ± 0.2	< 0.3	< 7.9 *(2.3 ± 1.0)*
155N, 205E	638	1.1 ± 0.2	1.0 ± 0.3	< 0.3	< 8.8 *(1.8 ± 1.3)*
160N, 0E	508	0.3 ± 0.1	0.6 ± 0.2	< 0.2	< 4.6 *(1.4 ± 0.8)*
160N, 82E	814	0.5 ± 0.1	1.3 ± 0.3	0.8 ± 0.3	14.6 ± 6.3
165N, 165E	521	0.5 ± 0.2	< 0.5	0.8 ± 0.4	20.7 ± 9.1
165N, 185E	851	0.2 ± 0.1	< 0.3	< 0.2	< 4.0 *(1.2 ± 0.8)*
165N, 195E	697	0.7 ± 0.2	< 0.7	0.3 ± 0.4	< 15 *(8.7 ± 1.8)*
165N, 205E	857	0.7 ± 0.2	1.1 ± 0.3	< 0.3	< 8.4 *(2.5 ± 1.3)*
170N, 118E	1059	0.2 ± 0.1	0.5 ± 0.1	< 0.2	< 5.4 *(2.8 ± 0.7)*
175N, 175E	1535	< 0.1	< 0.2	< 0.2	< 4.4 *(0.4 ± 0.3)*

TABLE 13 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SURFACE SOIL
EXTERIOR SYSTEMATIC LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Grid Coordinates[a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
175N, 185E	697	0.3 ± 0.2	0.7 ± 0.2	< 0.4	< 9.8 *(1.0 ± 0.9)*
175N, 195E	907	0.6 ± 0.2	0.8 ± 0.2	0.7 ± 0.5	18.5 ± 7.8
175N, 205E	1051	0.6 ± 0.1	0.6 ± 0.2	0.2 ± 0.2	< 6.9 *(1.2 ± 0.9)*
178N, 95E	959	0.4 ± 0.1	0.5 ± 0.2	< 0.2	0.7 ± 0.6
180N, 20E	1071	0.2 ± 0.1	< 0.3	< 0.2	< 6.1 *(0.8 ± 0.7)*
180N, 80E	754	0.5 ± 0.2	< 0.7	0.5 ± 0.3	3.6 ± 1.1
185N, 165E	501	< 0.3	0.8 ± 0.3	0.7 ± 0.4	13 ± 11
185N, 185E	1204	0.3 ± 0.1	0.5 ± 0.1	< 0.2	3.6 ± 2.6
185N, 195E	891	0.6 ± 0.1	< 0.7	< 0.4	< 12 *(2.3 ± 1.4)*
185N, 205E	702	1.0 ± 0.3	1.2 ± 0.3	< 0.5	< 15 *(2.8 ± 1.9)*
190N, 122E	819	0.4 ± 0.1	0.8 ± 0.2	0.4 ± 0.3	15.3 ± 7.5
195N, 75E	663	0.3 ± 0.1	0.5 ± 0.2	< 0.2	2.4 ± 1.0
195N, 95E	1023	0.4 ± 0.1	0.6 ± 0.2	< 0.2	3.1 ± 1.0
195N, 175E	1356	0.2 ± 0.1	0.4 ± 0.1	< 0.2	< 5.5 *(1.3 ± 0.5)*
195N, 185E	1349	0.2 ± 0.1	< 0.3	< 0.2	< 5.1 *(0.9 ± 0.5)*
195N, 195E	926	0.4 ± 0.1	< 0.2	< 0.2	< 4.1 *(0.7 ± 0.6)*
195N, 205E	1164	0.3 ± 0.1	0.4 ± 0.1	< 0.2	< 3.9 *(0.9 ± 0.5)*
200N, 0E	816	0.6 ± 0.1	0.8 ± 0.3	< 0.3	< 9.3 *(2.8 ± 1.2)*
205N, 165E	558	0.5 ± 0.2	0.7 ± 0.3	< 0.5	< 13 *(2.0 ± 0.9)*
205N, 185E	1435	0.2 ± 0.1	< 0.2	< 0.1	< 2.9 *(< 0.4)*
205N, 195E	710	0.4 ± 0.1	0.5 ± 0.2	< 0.3	< 8.5 *(2.1 ± 1.3)*
205N, 205E	1497	< 0.1	0.2 ± 0.1	< 0.1	< 4.2 *(0.4 ± 0.4)*
210N, 118E	929	< 0.2	0.4 ± 0.2	< 0.3	1.3 ± 0.6
215N, 75E	702	0.5 ± 0.1	0.7 ± 0.2	< 0.3	1.4 ± 0.9
215N, 95E	730	< 0.2	0.4 ± 0.2	< 0.2	1.2 ± 0.9
215N, 135E	897	0.2 ± 0.1	0.4 ± 0.2	< 0.2	1.5 ± 0.8
215N, 155E	787	0.6 ± 0.1	0.8 ± 0.2	< 0.2	< 6.2 *(1.2 ± 0.7)*

TABLE 13 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SURFACE SOIL
EXTERIOR SYSTEMATIC LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Grid Coordinates[a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
215N, 175E	1414	0.2 ± 0.1	0.4 ± 0.1	< 0.1	< 3.5 *(0.6 ± 0.3)*
215N, 185E	1509	< 0.1	0.2 ± 0.1	< 0.1	< 2.8 *(0.4 ± 0.3)*
215N, 195E	1035	< 0.1	< 0.2	< 0.2	< 5.7 *(0.8 ± 0.6)*
215N, 205E	401	0.7 ± 0.2	< 0.7	< 0.5	< 11 *(2.7 ± 1.2)*
220N, 20E	770	0.7 ± 0.2	0.8 ± 0.3	< 0.5	< 9.9 *(1.4 ± 1.2)*
240N, 80E	750	0.6 ± 0.2	0.7 ± 0.2	< 0.4	< 12 *(< 1.9)*
240N, 160E	627	< 0.2	< 0.4	< 0.2	< 6.2 *(< 1.0)*
240N, 200E	832	0.7 ± 0.2	0.7 ± 0.2	< 0.3	< 7.1 *(1.2 ± 0.9)*
241N, 0E	954	0.4 ± 0.1	0.4 ± 0.1	< 0.2	< 6.3 *(< 0.9)*
260N, 20E	681	0.6 ± 0.2	0.9 ± 0.2	< 0.3	< 5.8 *(0.7 ± 0.9)*
260N, 140E	1222	0.4 ± 0.1	1.0 ± 0.2	0.4 ± 0.2	5.4 ± 3.0
260N, 180E	940	0.4 ± 0.1	0.5 ± 0.2	< 0.4	< 7.8 *(2.2 ± 0.8)*
280N, 80E	1187	0.5 ± 0.1	0.5 ± 0.2	0.2 ± 0.2	< 7.0 *(2.0 ± 0.7)*
280N, 120E	1090	0.6 ± 0.1	0.6 ± 0.2	0.2 ± 0.2	< 6.9 *(2.4 ± 0.8)*
280N, 160E	1115	0.2 ± 0.1	< 0.2	< 0.2	< 5.6 *(0.8 ± 0.7)*
280N, 200E	785	0.6 ± 0.1	< 0.4	< 0.2	< 5.4 *(< 0.9)*
300N, 20E	778	< 0.2	0.7 ± 0.2	< 0.3	< 7.4 *(1.9 ± 1.1)*
300N, 60E	964	0.4 ± 0.1	< 0.5	< 0.4	< 5.3 *(1.5 ± 0.8)*
300N, 100E	834	0.7 ± 0.1	1.1 ± 0.3	2.6 ± 0.5	51 ± 11
300N, 140E	1108	0.3 ± 0.1	0.8 ± 0.2	0.5 ± 0.3	13.2 ± 4.6
300N, 180E	610	0.8 ± 0.2	1.0 ± 0.4	< 0.4	< 7.6 *(2.4 ± 1.6)*
320N, 40E	732	0.6 ± 0.1	0.6 ± 0.2	0.3 ± 0.2	11.5 ± 4.2
320N, 80E	1174	0.5 ± 0.1	0.6 ± 0.2	0.3 ± 0.2	4.6 ± 3.9
320N, 120E	1003	< 0.2	0.4 ± 0.1	0.2 ± 0.2	7.8 ± 4.6
320N, 160E	792	0.7 ± 0.1	< 0.4	< 0.3	< 6.4 *(2.4 ± 1.1)*
320N, 200E	732	0.6 ± 0.2	< 0.7	< 0.5	< 11 *(2.2 ± 1.3)*
340N, 20E	517	< 0.3	1.0 ± 0.3	< 0.4	< 12 *(5.1 ± 1.7)*

TABLE 13 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SURFACE SOIL
EXTERIOR SYSTEMATIC LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Grid Coordinates[a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
340N, 60E	988	< 0.2	0.5 ± 0.2	< 0.3	< 7.8 *(1.4 ± 0.7)*
340N, 100E	686	0.5 ± 0.2	< 0.8	1.4 ± 0.5	36.2 ± 9.6
340N, 140E	766	0.5 ± 0.1	0.9 ± 0.2	0.3 ± 0.2	< 7.7 *(3.4 ± 1.1)*
340N, 180E	821	< 0.2	< 0.3	< 0.2	< 4.2 *(0.9 ± 0.7)*
359N, 0E	686	0.5 ± 0.1	0.8 ± 0.3	< 0.3	< 9.6 *(0.8 ± 1.0)*
359N, 40E	852	< 0.3	< 0.5	< 0.3	< 12 *(1.8 ± 0.8)*
359N, 80E	755	0.4 ± 0.1	0.7 ± 0.2	< 0.3	< 8.0 *(1.2 ± 0.9)*
359N, 120E	728	0.6 ± 0.1	0.9 ± 0.2	< 0.3	< 6.6 *(1.2 ± 0.9)*
359N, 160E	785	1.4 ± 0.4	1.4 ± 0.4	< 0.6	< 14 *(2.1 ± 1.3)*
359N, 200E	839	0.6 ± 0.1	0.9 ± 0.2	< 0.3	< 8.2 *(2.0 ± 1.3)*
240N, 280W	649	0.5 ± 0.1	0.5 ± 0.1	0.1 ± 0.1	5.2 ± 1.8
260N, 20W	1040	0.4 ± 0.1	0.7 ± 0.2	< 0.2	< 4.4 *(1.2 ± 0.6)*
260N, 100W	775	0.5 ± 0.2	0.7 ± 0.2	< 0.3	< 10 *(1.1 ± 1.2)*
260N, 140W	911	0.5 ± 0.1	< 0.4	< 0.3	< 11 *(0.8 ± 0.8)*
260N, 180W	1027	< 0.1	0.2 ± 0.1	< 0.2	< 3.9 *(1.6 ± 0.7)*
260N, 260W	750	0.6 ± 0.1	0.5 ± 0.1	0.9 ± 0.2	18.2 ± 2.9
260N, 300W	658	0.8 ± 0.2	0.5 ± 0.1	0.2 ± 0.2	< 4.9
262N, 60W	925	0.4 ± 0.1	0.6 ± 0.2	< 0.2	< 6.6 *(< 1.1)*
280N, 0W	939	0.6 ± 0.2	0.9 ± 0.3	0.3 ± 0.3	< 13 *(3.3 ± 1.2)*
280N, 40W	742	0.5 ± 0.1	0.7 ± 0.3	< 0.3	< 9.3 *(2.5 ± 1.2)*
280N, 80W	795	0.9 ± 0.2	1.2 ± 0.3	0.5 ± 0.3	< 9.0 *(5.9 ± 1.5)*
280N, 160W	776	< 0.2	< 0.5	< 0.3	< 7.3 *(0.9 ± 1.0)*
280N, 200W	800	< 0.1	< 0.3	< 0.2	< 5.8 *(< 0.9)*
280N, 240W	613	0.5 ± 0.1	0.8 ± 0.1	0.3 ± 0.1	5.0 ± 2.1
280N, 280W	723	0.4 ± 0.1	0.4 ± 0.1	0.2 ± 0.1	< 4.9
280N, 338W	490	0.6 ± 0.1	0.7 ± 0.2	0.2 ± 0.2	5.1 ± 2.4
283N, 120W	992	0.2 ± 0.1	< 0.2	< 0.2	< 4.9 *(2.1 ± 0.7)*

TABLE 13 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SURFACE SOIL
EXTERIOR SYSTEMATIC LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Grid Coordinates[a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
300N, 20W	738	0.7 ± 0.2	< 0.8	< 0.5	< 13 *(2.8 ± 1.2)*
300N, 60W	648	0.4 ± 0.1	0.5 ± 0.2	< 0.2	< 5.6 *(1.5 ± 0.8)*
300N, 100W	891	0.4 ± 0.1	< 0.4	0.5 ± 0.3	8.6 ± 3.8
300N, 140W	1058	0.6 ± 0.1	0.9 ± 0.3	1.3 ± 0.4	32.3 ± 7.6
300N, 180W	1003	< 0.1	< 0.2	< 0.2	< 5.8 *(< 0.7)*
300N, 220W	877	0.3 ± 0.1	0.4 ± 0.1	0.2 ± 0.1	4.5 ± 2.4
300N, 260W	767	0.4 ± 0.1	0.5 ± 0.1	0.2 ± 0.1	4.9 ± 2.0
300N, 300W	618	0.3 ± 0.1	0.6 ± 0.1	0.1 ± 0.1	< 5.1 *(1.6 ± 0.5)*
320N, 0W	796	0.4 ± 0.1	0.5 ± 0.2	< 0.2	< 6.0 *(1.8 ± 1.1)*
320N, 40W	633	0.5 ± 0.1	< 0.4	< 0.3	< 7.7 *(2.3 ± 0.9)*
320N, 80W	814	0.6 ± 0.2	< 0.7	< 0.4	< 10 *(2.2 ± 1.0)*
320N, 120W	815	0.3 ± 0.1	< 0.2	0.3 ± 0.2	< 4.0 *(1.3 ± 0.7)*
320N, 160W	999	0.5 ± 0.1	0.7 ± 0.2	0.3 ± 0.2	< 12 *(3.3 ± 1.2)*
320N, 200W	767	0.5 ± 0.1	0.6 ± 0.2	< 0.3	< 8.6 *(2.6 ± 1.2)*
320N, 240W	700	0.5 ± 0.1	0.5 ± 0.1	0.2 ± 0.2	6.9 ± 2.9
320N, 280W	723	0.6 ± 0.1	0.8 ± 0.1	0.3 ± 0.1	6.5 ± 2.3
320N, 320W	644	0.6 ± 0.1	0.5 ± 0.1	< 0.2	2.0 ± 2.7
340N, 20W	758	0.5 ± 0.1	< 0.5	< 0.3	< 11 *(5.0 ± 1.4)*
340N, 60W	697	0.6 ± 0.1	0.8 ± 0.2	< 0.4	< 11 *(4.4 ± 1.3)*
340N, 100W	929	0.4 ± 0.1	0.5 ± 0.3	0.3 ± 0.2	7.4 ± 4.5
340N, 140W	964	0.8 ± 0.2	< 0.5	< 0.4	< 12 *(< 1.6)*
340N, 180W	981	0.4 ± 0.1	0.3 ± 0.1	< 0.2	< 5.7 *(2.6 ± 0.8)*
340N, 220W	567	0.4 ± 0.1	0.6 ± 0.1	0.6 ± 0.2	13.5 ± 3.2
340N, 260W	742	0.5 ± 0.1	0.5 ± 0.1	0.4 ± 0.1	10.2 ± 2.8
340N, 300W	698	0.7 ± 0.2	0.8 ± 0.2	0.3 ± 0.2	5.2 ± 2.9
357N, 120W	781	1.5 ± 0.4	< 0.7	< 0.5	< 11 *(1.9 ± 1.1)*
359N, 40W	632	0.7 ± 0.2	0.8 ± 0.3	0.3 ± 0.2	< 9.7 *(4.8 ± 1.5)*

TABLE 13 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SURFACE SOIL
EXTERIOR SYSTEMATIC LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Grid Coordinates[a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
359N, 80W	702	0.6 ± 0.1	0.8 ± 0.2	< 0.3	< 6.3 *(2.5 ± 1.1)*
359N, 160W	750	0.8 ± 0.2	0.7 ± 0.3	< 0.3	< 8.3 *(< 1.5)*
359N, 200W	737	0.7 ± 0.2	0.8 ± 0.2	< 0.3	< 8.5 *(2.6 ± 1.3)*
360N, 240W	967	0.6 ± 0.1	0.6 ± 0.2	0.8 ± 0.3	12.4 ± 8.0
360N, 280W	827	0.6 ± 0.2	0.4 ± 0.3	< 0.4	< 11 *(2.4 ± 1.0)*
360N, 320W	736	0.6 ± 0.1	0.5 ± 0.1	0.2 ± 0.1	1.9 ± 1.4
380N, 140W	683	0.6 ± 0.2	0.8 ± 0.4	< 0.3	< 8.9 *(1.0 ± 1.1)*
380N, 180W	714	0.6 ± 0.1	0.9 ± 0.3	< 0.3	< 8.2 *(1.8 ± 1.3)*
380N, 220W	842	0.4 ± 0.1	0.7 ± 0.2	1.0 ± 0.3	22.6 ± 6.9
380N, 260W	784	0.6 ± 0.1	0.7 ± 0.2	< 0.2	< 6.0 *(3.1 ± 0.9)*
380N, 300W	800	0.5 ± 0.1	0.6 ± 0.1	0.2 ± 0.1	3.6 ± 1.9
400N, 120W	579	0.7 ± 0.1	0.8 ± 0.3	< 0.3	< 8.3 *(1.0 ± 0.9)*
400N, 160W	755	< 0.3	0.7 ± 0.2	< 0.3	< 8.2 *(1.2 ± 1.0)*
400N, 200W	1014	0.4 ± 0.1	< 0.4	0.3 ± 0.2	7.3 ± 3.3
400N, 240W	861	0.7 ± 0.1	< 0.6	0.3 ± 0.3	< 9.9 *(3.2 ± 1.2)*
400N, 280W	775	0.5 ± 0.2	< 0.5	< 0.4	< 10 *(2.3 ± 1.3)*
400N, 320W	723	0.5 ± 0.1	0.6 ± 0.1	< 0.1	< 3.9
420N, 140W	596	0.8 ± 0.3	0.9 ± 0.3	< 0.5	< 12 *(< 2.3)*
420N, 180W	583	0.5 ± 0.2	< 0.6	< 0.4	< 13 *(2.8 ± 1.7)*
420N, 220W	864	0.4 ± 0.1	0.5 ± 0.2	0.2 ± 0.2	9.1 ± 6.7
420N, 260W	879	0.5 ± 0.1	0.6 ± 0.2	0.4 ± 0.2	15.5 ± 4.9
420N, 300W	707	0.6 ± 0.1	0.5 ± 0.1	0.1 ± 0.1	2.8 ± 2.4
420N, 340W	536	0.9 ± 0.2	0.6 ± 0.2	0.2 ± 0.2	< 5.5 *(1.1 ± 0.6)*
440N, 320W	653	0.5 ± 0.1	0.5 ± 0.1	0.2 ± 0.1	< 3.5

[a] Refer to Figures 33 and 34.

[b] Uncertainties are total propagated uncertainties at the 95% confidence level.

[c] Pa-234m (1001 keV) peak was used to determine activity except where values were less than the MDC in which case the Th-234 (63 keV) result was included in parenthesis.

TABLE 14

RADIONUCLIDE CONCENTRATIONS IN SOIL
EXTERIOR LOCATIONS OF ELEVATED ACTIVITY
GUTERL STEEL SPECIALTY CORPORATION
LOCKPORT, NEW YORK

Grid Coordinate[a]	Depth (cm)	Radionuclide Concentrations (pCi/g)				
		Sample Quantity (g)	Ra-226	Th-232	U-235	U-238
62N, 58E	0-15	688	< 0.4	< 0.9	5.9 ± 0.9[b]	108.5 ± 5.8
70N, 124E	0-15	1040	< 0.3	< 0.4	33.3 ± 2.5	912 ± 51
70N, 124E	15-30	928	< 0.9	< 1.2	137.1 ± 9.4	3,640 ± 190
79N, 26E	0-15	682	0.7 ± 0.2	3.8 ± 0.7	2.0 ± 0.7	48 ± 19
82N, 26E	0-15	663	1.0 ± 0.3	39.5 ± 3.8	6.8 ± 1.3	238 ± 30
83N, 26E	15-30	461	< 2.8	307 ± 30	6.6 ± 6.1	320 ± 150
85N, 124E	0-15	1082	< 0.5	95.1 ± 8.9	2.4 ± 1.2	185 ± 25
85N, 124E	15-30	924	< 0.3	17.9 ± 1.8	3.3 ± 0.7	138 ± 18
89N, 10E	0-15	834	< 0.2	7.8 ± 1.0	0.6 ± 0.4	23.4 ± 9.2
90N, 24E	0-15	843	< 0.3	6.1 ± 0.8	3.5 ± 0.7	86 ± 15
90N, 24E	15-30	651	0.5 ± 0.2	1.3 ± 0.4	1.5 ± 0.6	45 ± 10
94N, 26E	0-15	795	< 0.3	19.6 ± 2.1	3.0 ± 0.9	91 ± 17
94N, 26E	15-30	699	0.7 ± 0.1	< 0.6	< 0.3	< 9.1 *(1.6 ± 1.5)* [c]
101N, 188E	0-15	934	4.3 ± 0.6	2.3 ± 0.7	< 0.9	17 ± 16
105N, 116E	0-15	911	< 0.5	4.3 ± 0.8	35.3 ± 3.0	2,660 ± 140
105N, 116E	15-30	774	< 0.5	1.4 ± 0.4	11.1 ± 1.4	736 ± 57
105N, 186E	0-15	941	1.3 ± 0.2	0.8 ± 0.3	< 0.5	< 10 *(2.2 ± 1.2)*
106N, 184E	0-15	875	0.3 ± 0.1	< 0.3	0.8 ± 0.3	16.8 ± 6.2
106N, 184E	15-30	876	0.9 ± 0.3	39.1 ± 3.8	1.9 ± 0.8	59 ± 19
106N, 185E	0-15	412	< 6.9	< 8.7	341 ± 32	44,400 ± 2,200
111N, 199E	0-15	608	< 1.1	< 1.5	433 ± 29	13,020 ± 600
116N, 18E	0-15	1152	< 0.2	1.7 ± 0.4	11.0 ± 1.3	266 ± 25
134N, 80E	0-15	846	< 0.3	< 0.6	13.2 ± 1.4	329 ± 30
135N, 75E	0-15	683	< 1.7	< 2.1	299 ± 20	8,770 ± 430
135N, 75E	15-30	563	< 0.6	< 0.9	109.5 ± 7.6	2,750 ± 140
168N, 26E	0-15	161	< 5.3	< 5.4	1,079 ± 76	54,800 ± 2,700
201N, 185E	0-15	1159	0.4 ± 0.2	11.6 ± 1.2	10.9 ± 1.1	279 ± 21
272N, 108E	0-15	887	< 3.7	< 4.3	293 ± 23	23,500 ± 1,100
276N, 119E	0-15	809	< 0.3	33.5 ± 3.3	11.4 ± 1.5	343 ± 29
276N, 119E	15-30	825	0.4 ± 0.2	8.3 ± 1.0	8.1 ± 0.9	218 ± 19
278N, 145W	0-15	737	0.7 ± 0.2	1.9 ± 0.3	3.1 ± 0.5	84 ± 11
285N, 115E	0-15	870	0.5 ± 0.1	1.2 ± 0.3	1.8 ± 0.4	35.3 ± 7.9
289N 144W	15-30	720	< 0.6	< 0.9	118.0 ± 8.1	3,050 ± 160

TABLE 14 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SOIL
EXTERIOR LOCATIONS OF ELEVATED ACTIVITY
GUTERL STEEL SPECIALTY CORPORATION
LOCKPORT, NEW YORK

Grid Coordinate[a]	Depth (cm)	Radionuclide Concentrations (pCi/g)				
		Sample Quantity (g)	Ra-226	Th-232	U-235	U-238
289N, 144W	0-15	1032	< 1.5	< 2.0	246 ± 18	6,970 ± 370
296N, 88E	0-15	1006	< 0.7	13.0 ± 2.2	48.1 ± 4.7	1,196 ± 98
296N, 88E	15-30	736	< 0.4	8.6 ± 1.1	17.6 ± 1.8	397 ± 38
297N, 126W	0-15	1237	< 0.1	0.4 ± 0.1	1.0 ± 0.3	23.1 ± 5.8
297N, 126W	15-30	1175	< 0.7	< 1.0	61.7 ± 5.4	1,860 ± 120
306N, 139W	0-15	936	< 0.4	1.1 ± 0.5	16.9 ± 1.8	615 ± 43
306N, 139W	15-30	858	1.1 ± 0.2	1.1 ± 0.3	9.3 ± 1.0	241 ± 21
306N, 94E	0-15	654	0.6 ± 0.3	4.9 ± 0.9	15.5 ± 1.7	397 ± 38
306N, 94E	15-30	707	< 0.4	5.4 ± 0.8	19.8 ± 1.8	465 ± 40
326N, 205W	0-15	614	0.4 ± 0.2	5.5 ± 0.9	0.9 ± 0.5	17.8 ± 9.5
345N, 208W	0-15	883	0.4 ± 0.1	< 0.3	8.2 ± 0.7	182 ± 13
379N, 199W	0-15	779	1.1 ± 0.3	8.7 ± 0.9	0.5 ± 0.3	6.5 ± 4.9
379N, 199W	15-30	685	1.5 ± 0.2	21.8 ± 2.1	0.3 ± 0.4	12.8 ± 6.1
395N, 204W	0-15	781	1.4 ± 0.2	11.0 ± 1.1	0.7 ± 0.2	17.0 ± 4.0
405N, 215W	0-15	817	21.0 ± 1.8	1.2 ± 0.3	0.3 ± 0.3	< 8.6 *(5.2 ± 1.5)*

[a] Refer to Figure 33.

[b] Uncertainties are total propagated uncertainties at the 95% confidence level.

[c] Pa-234m (1001 keV) peak was used to determine activity except where values were less than the MDC in which case the Th-234 (63 keV) result was included in parenthesis.

TABLE 15

RADIONUCLIDE CONCENTRATIONS IN SOIL
EXTERIOR BOREHOLE LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Grid Coordinates[a]	Depth (cm)	Radionuclide Concentrations (pCi/g)				
		Sample Quantity (g)	Ra-226	Th-232	U-235	U-238
107N, 184E	0-15	904	< 0.2	< 0.3	0.2 ± 0.2[b]	3.8 ± 4.7
107N, 184E	15-60	438	0.6 ± 0.1	1.0 ± 0.3	1.6 ± 0.4	35.9 ± 8.5
107N, 184E	60-120	309	1.2 ± 0.3	< 0.9	< 0.7	10.4 ± 8.4
168N, 24E	0-15	931	< 0.1	< 0.3	< 0.2	< 6.9 *(0.9 ± 0.6)* [c]
168N, 24E	15-60	166	0.5 ± 0.1	< 0.4	< 0.3	< 7.4 *(1.5 ± 0.8)*
168N, 24E	60-120	646	0.6 ± 0.2	0.8 ± 0.3	< 0.4	< 9.0 *(3.2 ± 0.7)*
200N, 184E	0-15	967	0.3 ± 0.2	11.5 ± 1.2	10.4 ± 1.1	225 ± 21
200N, 184E	15-60	681	0.9 ± 0.3	2.9 ± 0.6	2.4 ± 0.6	30 ± 12
200N, 184E	60-120	382	1.0 ± 0.2	1.2 ± 0.4	0.3 ± 0.3	< 11 *(5.7 ± 0.8)*
224N, 160E	0-15	1076	1.0 ± 0.1	1.3 ± 0.2	< 0.2	< 5.8 *(2.0 ± 0.5)*
224N, 160E	15-60	193	2.1 ± 0.3	2.6 ± 0.4	< 0.4	< 9.2 *(3.3 ± 0.5)*
224N, 160E	60-120	817	1.2 ± 0.2	1.2 ± 0.3	< 0.3	< 9.4 *(1.5 ± 0.7)*
224N, 160E	120-180	169	1.0 ± 0.2	< 0.6	< 0.3	< 9.5 *(1.7 ± 0.6)*
275N, 146E	0-15	816	0.8 ± 0.3	1.9 ± 0.4	1.4 ± 0.6	83 ± 15
275N, 146E	15-60	418	1.1 ± 0.2	1.4 ± 0.4	0.8 ± 0.3	33 ± 12
275N, 146E	60-120	148	0.6 ± 0.2	1.0 ± 0.3	0.3 ± 0.4	9.0 ± 8.7
277N, 84E	0-15	1328	< 0.1	0.3 ± 0.1	0.2 ± 0.1	< 5.1 *(0.7 ± 0.4)*
277N, 84E	15-60	932	0.4 ± 0.1	0.5 ± 0.1	< 0.2	< 5.9 *(1.5 ± 0.5)*
277N, 84E	60-120	536	0.4 ± 0.1	0.5 ± 0.2	< 0.2	< 5.3 *(2.1 ± 0.4)*
289N, 87E	0-15	717	< 0.7	23.0 ± 2.6	34.7 ± 3.1	828 ± 62
289N, 87E	15-60	440	< 0.3	6.0 ± 0.8	10.3 ± 1.2	268 ± 26
290N, 76E	0-15	783	0.8 ± 0.1	0.8 ± 0.2	0.2 ± 0.3	8.5 ± 4.7
290N, 76E	15-60	403	0.7 ± 0.1	< 0.4	< 0.3	< 8.1 *(3.7 ± 0.6)*
290N, 76E	60-120	194	0.2 ± 0.1	< 0.3	< 0.3	< 7.4 *(1.1 ± 0.5)*
290N, 98E	0-15	924	0.5 ± 0.1	0.6 ± 0.3	1.1 ± 0.4	32 ± 11
290N, 98E	15-60	419	< 0.3	1.2 ± 0.3	1.7 ± 0.5	24 ± 12
290N, 98E	60-120	142	0.7 ± 0.2	1.2 ± 0.3	1.1 ± 0.3	25 ± 12
291N, 120E	0-15	1039	< 0.2	< 0.4	< 0.4	< 11 *(4.3 ± 0.7)*
291N, 120E	15-60	160	0.5 ± 0.2	< 0.6	0.6 ± 0.3	12 ± 10
291N, 120E	60-120	449	0.7 ± 0.2	< 0.6	< 0.4	< 11 *(2.4 ± 0.6)*
291N, 154E	0-15	490	0.4 ± 0.1	3.4 ± 0.5	0.3 ± 0.3	9.1 ± 6.3
291N, 154E	15-60	361	1.0 ± 0.2	7.2 ± 0.9	< 0.5	< 11 *(8.7 ± 1.1)*

TABLE 15 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SOIL
EXTERIOR BOREHOLE LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Grid Coordinates[a]	Depth (cm)	Radionuclide Concentrations (pCi/g)				
		Sample Quantity (g)	Ra-226	Th-232	U-235	U-238
291N, 154E	60-120	452	0.7 ± 0.1	1.2 ± 0.3	< 0.3	< 9.4 *(1.4 ± 0.6)*
291N, 154E	120-180	201	0.2 ± 0.1	< 0.5	< 0.4	< 9.4 *(0.7 ± 0.5)*
303N, 112E	0-15	762	0.8 ± 0.1	1.2 ± 0.3	0.8 ± 0.3	18.9 ± 6.0
303N, 112E	15-60	381	1.0 ± 0.2	1.7 ± 0.4	1.1 ± 0.4	12.5 ± 8.5
303N, 112E	60-120	177	0.9 ± 0.2	1.3 ± 0.4	< 0.4	< 14 *(6.0 ± 0.8)*
304N, 118E	0-15	873	< 0.7	< 1.1	105.7 ± 7.6	3,110 ± 160
304N, 126E	0-15	804	< 0.2	1.3 ± 0.3	3.6 ± 0.6	79 ± 13
304N, 126E	15-60	376	0.6 ± 0.2	1.9 ± 0.4	2.6 ± 0.4	79 ± 13
304N, 126E	60-120	132	< 0.4	< 0.8	0.8 ± 0.5	22 ± 12
310N, 84E	0-15	819	0.6 ± 0.2	1.0 ± 0.3	0.9 ± 0.4	14.6 ± 8.7
310N, 84E	15-60	694	0.7 ± 0.2	0.7 ± 0.3	< 0.3	< 11 *(5.4 ± 1.0)*
310N, 84E	60-120	799	0.6 ± 0.2	< 0.6	< 0.4	< 11 *(1.9 ± 0.9)*
310N, 118E	0-15	936	< 0.2	1.0 ± 0.3	1.0 ± 0.4	30.2 ± 8.4
310N, 118E	15-60	849	0.8 ± 0.1	1.1 ± 0.3	0.4 ± 0.4	14.8 ± 5.3
310N, 118E	60-120	423	0.6 ± 0.1	0.6 ± 0.2	0.5 ± 0.3	11.2 ± 6.4
311N, 13E	0-15	713	0.9 ± 0.2	2.7 ± 0.4	0.3 ± 0.4	< 9.3 *(5.8 ± 1.9)*
311N, 13E	15-60	363	0.8 ± 0.2	0.5 ± 0.3	0.2 ± 0.3	< 9.4 *(3.8 ± 1.3)*
311N, 13E	60-120	778	0.4 ± 0.1	0.7 ± 0.2	< 0.3	< 7.4 *(0.5 ± 0.7)*
312N, 65E	0-15	896	0.5 ± 0.1	4.7 ± 0.2	11.2 ± 0.4	288.4 ± 9.7
312N, 65E	15-60	579	0.5 ± 0.1	1.2 ± 0.3	1.5 ± 0.3	37.2 ± 8.5
312N, 65E	60-120	928	0.3 ± 0	0.4 ± 0.1	< 0.2	< 4.7 *(1.4 ± 0.3)*
313N, 64E	0-15	955	0.4 ± 0.3	6.7 ± 0.7	16.4 ± 1.2	397 ± 29
313N, 64E	15-60	525	0.5 ± 0.2	2.0 ± 0.3	3.3 ± 0.4	89 ± 15
313N, 64E	60-120	178	< 0.2	2.3 ± 0.5	5.6 ± 0.6	159 ± 18
272N, 79W	0-15	888	< 0.3	< 0.5	14.6 ± 1.3	428 ± 29
272N, 79W	15-60	668	< 0.3	0.8 ± 0.3	18.0 ± 1.6	471 ± 34
272N, 79W	60-120	454	0.4 ± 0.1	< 0.3	3.4 ± 0.5	85 ± 10
272N, 79W	120-180	805	< 0.3	< 0.5	1.3 ± 0.4	23 ± 10
282N, 87W	0-15	1194	< 0.2	< 0.4	12.2 ± 1.2	343 ± 26
282N, 87W	15-60	678	1.0 ± 0.2	0.8 ± 0.3	4.6 ± 0.7	118 ± 14
282N, 87W	60-120	452	0.6 ± 0.2	< 0.6	1.2 ± 0.3	34.7 ± 8.2
282N, 87W	120-180	511	0.5 ± 0.1	< 0.4	0.3 ± 0.2	11.9 ± 5.4
282N, 165W	0-15	817	0.3 ± 0.1	0.4 ± 0.1	< 0.2	< 4.4 *(1.5 ± 0.8)*

TABLE 15 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SOIL
EXTERIOR BOREHOLE LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Grid Coordinates[a]	Depth (cm)	Radionuclide Concentrations (pCi/g)				
		Sample Quantity (g)	Ra-226	Th-232	U-235	U-238
282N, 165W	15-60	343	0.6 ± 0.1	0.9 ± 0.3	0.9 ± 0.3	21.0 ± 8.8
282N, 165W	60-120	156	1.2 ± 0.2	1.2 ± 0.4	0.9 ± 0.3	22 ± 10
284N, 147W	0-15	837	< 0.2	0.7 ± 0.2	0.9 ± 0.3	15.6 ± 6.9
284N, 147W	15-60	391	< 0.2	0.7 ± 0.3	0.4 ± 0.3	7.7 ± 5.6
284N, 147W	60-120	725	0.6 ± 0.1	0.7 ± 0.2	< 0.2	5.0 ± 4.4
284N, 147W	120-180	173	< 0.2	0.4 ± 0.2	0.5 ± 0.2	10.7 ± 7.6
290N, 126W	0-15	977	0.5 ± 0.1	0.5 ± 0.2	0.6 ± 0.3	20.3 ± 6.7
290N, 126W	15-60	176	0.5 ± 0.2	< 0.5	2.6 ± 0.5	73 ± 12
290N, 126W	60-120	390	1.4 ± 0.2	1.5 ± 0.3	0.4 ± 0.3	15.1 ± 7.2
290N, 126W	120-180	166	0.7 ± 0.2	0.9 ± 0.3	0.6 ± 0.3	< 14 *(12.8 ± 1.6)*
299N, 43W	0-15	1136	0.5 ± 0.1	0.7 ± 0.2	1.9 ± 0.4	28.0 ± 1.8
299N, 43W	15-60	566	< 0.5	< 0.7	93.1 ± 6.6	2,830 ± 140
299N, 43W	60-120	641	< 0.1	0.8 ± 0.2	2.2 ± 0.3	50.2 ± 8.1
299N, 43W	120-180	836	0.5 ± 0.1	< 0.4	2.7 ± 0.4	64 ± 12
299N, 43W	180-210	298	< 0.3	0.6 ± 0.4	17.7 ± 1.6	415 ± 33
304N, 80W	0-15	750	0.7 ± 0.4	19.5 ± 2.1	< 1.0	< 13 *(< 3.6)*
304N, 80W	15-60	319	0.6 ± 0.2	2.5 ± 0.6	< 0.4	< 11 *(3.0 ± 1.4)*
304N, 80W	60-120	338	1.5 ± 0.3	1.5 ± 0.4	0.4 ± 0.4	12.8 ± 8.6
304N, 80W	120-180	467	0.8 ± 0.2	1.0 ± 0.3	0.5 ± 0.3	9.0 ± 7.5
304N, 158W	0-15	841	< 0.3	< 0.5	17.1 ± 1.6	425 ± 35
304N, 158W	15-60	572	< 1.0	< 1.3	525 ± 35	17,780 ± 810
304N, 158W	60-120	478	< 0.8	< 1.1	262 ± 18	6,970 ± 330
304N, 158W	120-180	535	< 0.3	< 0.4	4.6 ± 0.7	121 ± 17
319N, 145W	0-15	758	0.5 ± 0.2	0.8 ± 0.3	< 0.4	< 15 *(2.4 ± 1.3)*
319N, 145W	15-60	813	< 0.3	0.8 ± 0.2	8.2 ± 1.0	223 ± 23
319N, 145W	60-120	191	1.2 ± 0.3	< 0.8	31.3 ± 2.6	819 ± 56
319N, 145W	120-180	390	< 0.3	1.0 ± 0.3	0.5 ± 0.2	11.3 ± 7.4
325N, 177W	0-15	1272	< 0.4	< 0.5	63.8 ± 2.0	1,843 ± 49
325N, 177W	15-60	249	0.2 ± 0.1	0.7 ± 0.3	1.1 ± 0.4	31.7 ± 8.9
325N, 177W	60-120	198	0.4 ± 0.1	0.7 ± 0.1	1.1 ± 0.2	35.1 ± 4.1
342N, 121W	0-15	587	1.3 ± 0.2	1.7 ± 0.4	< 0.4	< 14 *(3.6 ± 1.8)*
342N, 121W	15-60	137	< 0.5	< 1.0	< 0.7	< 21 *(5.3 ± 1.7)*
342N, 121W	60-120	794	0.7 ± 0.2	1.1 ± 0.3	< 0.5	< 14 *(1.2 ± 1.1)*

TABLE 15 (Continued)

RADIONUCLIDE CONCENTRATIONS IN SOIL
EXTERIOR BOREHOLE LOCATIONS
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Grid Coordinates[a]	Depth (cm)	Radionuclide Concentrations (pCi/g)				
		Sample Quantity (g)	Ra-226	Th-232	U-235	U-238
358N, 19W	0-15	732	< 0.4	< 0.5	6.0 ± 0.9	142 ± 24
358N, 19W	15-60	459	0.6 ± 0.1	0.9 ± 0.1	5.2 ± 0.3	136.3 ± 6.5
358N, 19W	60-120	768	0.6 ± 0.1	0.8 ± 0.3	2.3 ± 0.5	48 ± 13
358N, 19W	120-180	277	0.5 ± 0.2	0.6 ± 0.3	1.0 ± 0.4	31 ± 13
362N, 197W	0-15	960	0.7 ± 0.2	2.0 ± 0.3	0.6 ± 0.4	8.0 ± 7.4
362N, 197W	15-60	174	1.1 ± 0.2	3.2 ± 0.5	1.3 ± 0.4	19 ± 16
362N, 197W	60-120	79[d]	< 0.5	3.2 ± 1.2	< 0.8	< 35 *(5.7 ± 2.5)*
362N, 197W	120-180	192	1.0 ± 0.2	5.5 ± 0.8	0.9 ± 0.5	27 ± 12
402N, 186W	0-15	833	0.7 ± 0.3	17.1 ± 1.8	< 0.9	18 ± 10
402N, 186W	15-60	175	< 0.4	15.8 ± 1.8	< 0.8	< 17 *(15.2 ± 1.8)*
402N, 186W	60-120	523	0.8 ± 0.2	3.1 ± 0.5	0.3 ± 0.3	< 11 *(6.2 ± 0.9)*
402N, 186W	120-180	159	1.2 ± 0.3	6.8 ± 0.9	< 0.6	9.8 ± 7.6
410N, 189W	0-15	435	< 2.0	371 ± 35	< 5.4	< 75 *(20 ± 10)*
410N, 189W	15-60	423	0.7 ± 0.3	13.1 ± 1.5	< 0.7	< 14 *(5.5 ± 2.7)*
410N, 189W	60-120	488	0.8 ± 0.3	17.4 ± 1.9	< 1.2	< 19 *(1.7 ± 2.8)*
410N, 189W	120-180	876	0.9 ± 0.2	3.9 ± 0.6	< 0.5	< 8.6 *(2.5 ± 1.7)*
412N, 191W	0-15	667	0.9 ± 0.2	2.9 ± 0.4	< 0.4	< 8.4 *(6.5 ± 1.9)*
412N, 191W	15-60	467	1.8 ± 0.2	5.1 ± 0.6	0.5 ± 0.3	10.7 ± 4.9
412N, 191W	60-120	475	1.2 ± 0.2	1.9 ± 0.4	< 0.5	< 12 *(3.1 ± 1.4)*
412N, 191W	120-180	510	0.9 ± 0.1	1.3 ± 0.3	< 0.3	< 7.5 *(0.9 ± 0.9)*

[a] Refer to Figures 33 and 34.

[b] Uncertainties are total propagated uncertainties at the 95% confidence level.

[c] Pa-234m (1001 keV) peak was used to determine activity except where values were less than the MDC in which case the Th-234 (63 keV) result was included in parenthesis.

[d] Sample had insufficient volume for an appropriate geometry. Values are semi-quantitative.

TABLE 16

RADIONUCLIDE CONCENTRATIONS IN SOIL
EXTERIOR CLASS 3 AREA
GUTERL SPECIALTY STEEL CORPORATION
LOCKPORT, NEW YORK

Sample ID[a]	Sample Quantity (g)	Radionuclide Concentrations (pCi/g)			
		Ra-226	Th-232	U-235	U-238
253	675	0.7 ± 0.1[b]	< 0.4	< 0.3	< 5.6 *(0.4 ± 0.7)* [c]
254	951	0.5 ± 0.1	0.6 ± 0.2	< 0.2	< 4.6 *(< 0.9)*
255	844	0.2 ± 0.1	< 0.4	< 0.3	< 7.5 *(< 1.1)*
256	831	0.5 ± 0.1	< 0.4	< 0.2	< 7.9 *(< 1.0)*
257	663	< 0.2	0.9 ± 0.2	< 0.3	< 5.8 *(1.9 ± 1.0)*
258	929	0.6 ± 0.1	0.4 ± 0.2	< 0.3	< 5.8 *(1.7 ± 1.1)*
259	1039	0.3 ± 0.1	< 0.3	< 0.2	< 6.5 *(< 0.9)*
260	1004	0.5 ± 0.1	< 0.3	< 0.2	< 5.9 *(1.1 ± 0.8)*
261	964	2.1 ± 0.2	0.9 ± 0.2	< 0.3	< 6.9 *(1.4 ± 0.9)*
262	961	0.7 ± 0.1	0.5 ± 0.2	< 0.2	< 4.8 *(0.7 ± 0.5)*
263	595	1.5 ± 0.2	0.9 ± 0.2	< 0.3	4.6 ± 4.1
264	993	5.3 ± 0.5	1.9 ± 0.5	< 0.8	< 15 *(5.7 ± 2.1)*
265	567	0.8 ± 0.1	0.5 ± 0.2	< 0.2	< 4.9 *(0.9 ± 0.8)*
266	864	0.5 ± 0.1	0.6 ± 0.2	< 0.3	< 7.5 *(1.6 ± 0.7)*
267	1225	< 0.1	< 0.2	< 0.1	< 3.7 *(< 0.6)*
268	843	< 0.3	< 0.4	< 0.3	< 8.8 *(1.4 ± 0.9)*
269	547	0.8 ± 0.2	< 1.0	< 0.6	< 13 *(1.6 ± 2.0)*
270	939	9.7 ± 0.9	2.2 ± 0.6	< 0.7	< 15 *(8.8 ± 2.4)*

[a] Refer to Figure 35.

[b] Uncertainties are total propagated uncertainties at the 95% confidence level.

[c] Pa-234m (1001 keV) peak was used to determine activity except where values were less than the MDC in which case the Th-234 (63 keV) result was included in parenthesis.

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APPENDIX A

MAJOR INSTRUMENTATION

APPENDIX A

MAJOR INSTRUMENTATION

The display of a specific product is not to be construed as an endorsement of the product or its manufacturer by the author or his employers.

DIRECT RADIATION MEASUREMENT

Instruments

Eberline Pulse Ratemeter
Model PRM-6
(Eberline, Santa Fe, NM)

Ludlum Floor Monitor
Model 239-1
(Ludlum Measurements, Inc.,
Sweetwater, TX)

Ludlum Ratemeter-Scaler
Model 2221
(Ludlum Measurements, Inc.,
Sweetwater, TX)

Ludlum Ratemeter
Model 12
(Ludlum Measurements, Inc.,
Sweetwater, TX)

Detectors

Bicron Micro-Rem Meter
(Bicron Corporation, Newburg, OH)

Eberline GM Detector
Model HP-260
Effective Area, 20 cm^2
(Eberline, Santa Fe, NM)

Ludlum Gas Proportional Detector
Model 43-37
Effective Area, 550 cm^2
(Ludlum Measurements, Inc.,
Sweetwater, TX)

Ludlum Gas Proportional Detector
Model 43-68
Effective Area, 126 cm^2
(Ludlum Measurements, Inc.,
Sweetwater, TX)

Victoreen NaI Scintillation Detector
Model 489-55
3.2 cm x 3.8 cm Crystal
(Victoreen, Cleveland, OH)

LABORATORY ANALYTICAL INSTRUMENTATION

Alpha Spectrometry System
Tennelec Model 256
(Oxford, Oak Ridge, TN)
Used in conjunction with:
Surface Barrier and Ion Implanted Detectors
(EG&G ORTEC, Oak Ridge, TN and Canberra, Meriden, CT) and
Multichannel Analyzer
3100 Vax Workstation
(Canberra, Meriden,CT)

Alpha Spectrometry System
Canberra Model 7401VR
(Canberra, Meriden, CT)
Used in conjunction with:
Ion Implanted Detectors and
Multichannel Analyzer
Alpha Workstation
(Canberra, Meriden, CT)

High Purity Extended Range Intrinsic Detectors
Model No: ERVDS30-25195
(Tennelec, Oak Ridge, TN)
Used in conjunction with:
Lead Shield Model G-11
(Nuclear Lead, Oak Ridge, TN) and
Multichannel Analyzer
Alpha Workstation
(Canberra, Meriden, CT)

High Purity Extended Range Intrinsic Detector
Model No. GMX-45200-5
(ORTEC)
Used in conjuction with:
Lead Shield Model SPG-16-K8
(Nuclear Data)
Multichannel Analyzer
Alpha Workstation
(Canberra, Meriden, CT)

High-Purity Germanium Detector
Model GMX-23195-S, 23% Eff.
(EG&G ORTEC, Oak Ridge, TN)
Used in conjunction with:
Lead Shield Model G-16
(Gamma Products, Palos Hills, IL) andMultichannel Analyzer
Alpha Workstation
(Canberra, Meriden, CT)

Low Background Gas Proportional Counter
Model LB-5100-W
(Oxford, Oak Ridge, TN)

Tri-Carb Liquid Scintillation Analyzer
Model 1900CA
(Packard Instrument Co., Meriden, CT)

APPENDIX B
SURVEY AND ANALYTICAL PROCEDURES

APPENDIX B
SURVEY AND ANALYTICAL PROCEDURES

SURVEY PROCEDURES

Surface Scans

Surface scans were performed by passing the detectors slowly over the surface; the distance between the detector and the surface was maintained at a minimum—nominally about 1 cm. A large surface area, gas proportional floor monitor was used to scan the floors of the surveyed areas. Other surfaces were scanned using small area (20 cm^2, 74 cm^2 or 126 cm^2) hand-held detectors. Identification of elevated levels was based on increases in the audible signal from the recording and/or indicating instrument. Combinations of detectors and instruments used for the scans were:

Alpha-Beta - gas proportional detector with ratemeter-scaler

Beta-Gamma - GM detector with ratemeter-scaler

Gamma - NaI scintillation detector with ratemeter

Surface Activity Measurements

Measurements of total beta activity levels were performed using gas proportional or GM detectors with portable ratemeter-scalers. Count rates (cpm), which were integrated over one minute in a static position, were converted to activity levels (dpm/100 cm^2) by dividing the net rate by the total efficiency ($\epsilon_i \times \epsilon_s$) and correcting for the active area of the detector. The 2π instrument efficiency factors (ϵ_i) ranged from 0.52 to 0.54 for the gas proportional detectors and 0.34 for the GM detectors calibrated to Tl-204. The source efficiency factor (ϵ_s) was 0.5. The total efficiency factors for gas proportional detectors were 0.26 and 0.27 and for the GM detectors were 0.17 and 0.19. The gas proportional detectors' construction material-specific backgrounds were 432 cpm for concrete, 228 cpm for metal and wood, and 595 cpm for brick. The GM detector backgrounds were 64 cpm for concrete, 43 cpm for metal and wood, and 102 cpm for brick. The MDCs ranged from 220 to 360 dpm/100 cm^2 for the gas proportional detectors and from 990 to 1,500 dpm/100 cm^2 for the GM

detectors. The physical detector area for the gas proportional detectors was 126 cm^2 and 20 cm^2 for the GM detectors.

Removable Activity Measurements

Removable gross alpha and gross beta activity levels were determined using numbered filter paper disks, 47 mm in diameter. Moderate pressure was applied to the smear and approximately 100 cm^2 of the surface was wiped. Smears were placed in labeled envelopes with the location and other pertinent information recorded.

Exposure Rate Measurements

Measurements of dose equivalent rates (μrem/h) were performed at one meter above the surface using a Bicron microrem meter. Although the instrument displays data in μrem/h, the μrem/h to μR/h conversion is essentially unity.

Soil Sampling

Approximately 1 kg of soil and/or residue was collected at each sample location. Collected samples were placed in a plastic bag or a 0.5 liter Marinelli, sealed, and labeled in accordance with ESSAP survey procedures.

ANALYTICAL PROCEDURES

Gross Alpha/Beta

Smears were counted on a low background gas proportional system for gross alpha and gross beta activity.

Gamma Spectroscopy

Samples of soil and residues were dried, mixed, crushed, and/or homogenized as necessary, and a portion sealed in a 0.5-liter Marinelli beaker or other appropriate container. The quantity placed in the beaker was chosen to reproduce the calibrated counting geometry. Net material weights were determined and the samples counted using intrinsic germanium detectors coupled to a pulse height analyzer system. Background and Compton stripping, peak search, peak identification, and concentration calculations were performed using the computer capabilities inherent in the analyzer system. All photopeaks associated with the radionuclides of concern were reviewed for consistency of activity. Energy peaks used for determining the activities of radionuclides of concern were:

Ra-226	0.352 MeV from Pb-214*
Th-232	0.911 MeV from Ac-228*
U-235	0.143 MeV
U-238	0.063 MeV from Th-234* (or 1.001 MeV from Pa-234 m)*

*Secular equilibrium assumed.

Spectra were also reviewed for other identifiable photopeaks.

Alpha Spectroscopy

Samples were crushed, homogenized and analyzed for isotopic uranium, plutonium, and americium. Samples were dissolved by potassium fluoride and pyrosulfate fusion and the elements of interest were precipitated with barium sulfate. Barium sulfate precipitate was redissolved and the specific elements of interest were individually separated by liquid-liquid extraction and re-precipitated with a cerium fluoride carrier. The precipitate was then counted using surface barrier and ion implanted detectors (ORTEC), alpha spectrometers (Tennelec and Canberra), and a multichannel analyzer (Nuclear Data).

UNCERTAINTIES AND DETECTION LIMITS

The uncertainties associated with the analytical data presented in the tables of this report represent the 95% confidence level for that data. These uncertainties represent the total propogated errors for the analytical procedure.

Detection limits, referred to as minimum detectable concentration (MDC), were based on 3 plus 4.65 times the standard deviation of the background count [$3 + (4.65\sqrt{BKG})$]. When the activity was determined to be less than the MDC of the measurement procedure, the result was reported as less than MDC. Because of variations in background levels, measurement efficiencies, and contributions from other radionuclides in samples, the detection limits differ from sample to sample and instrument to instrument.

CALIBRATION AND QUALITY ASSURANCE

Calibration of all field and laboratory instrumentation was based on standards/sources, traceable to NIST, when such standards/sources were available. In cases where they were not available, standards of an industry-recognized organization were used.

Analytical and field survey activities were conducted in accordance with procedures from the following documents of the Environmental Survey and Site Assessment Program:

- Survey Procedures Manual, (January 1998)
- Laboratory Procedures Manual, (January 1999)
- Quality Assurance Manual, (April 1998)

The procedures contained in these manuals were developed to meet the requirements of DOE Order 5700.6C and ASME NQA-1 for Quality Assurance and contain measures to assess processes during their performance.

Quality control procedures include:

- Daily instrument background and check-source measurements to confirm that equipment operation is within acceptable statistical fluctuations.
- Participation in EPA and EML laboratory Quality Assurance Programs.
- Training and certification of all individuals performing procedures.
- Periodic internal and external audits.

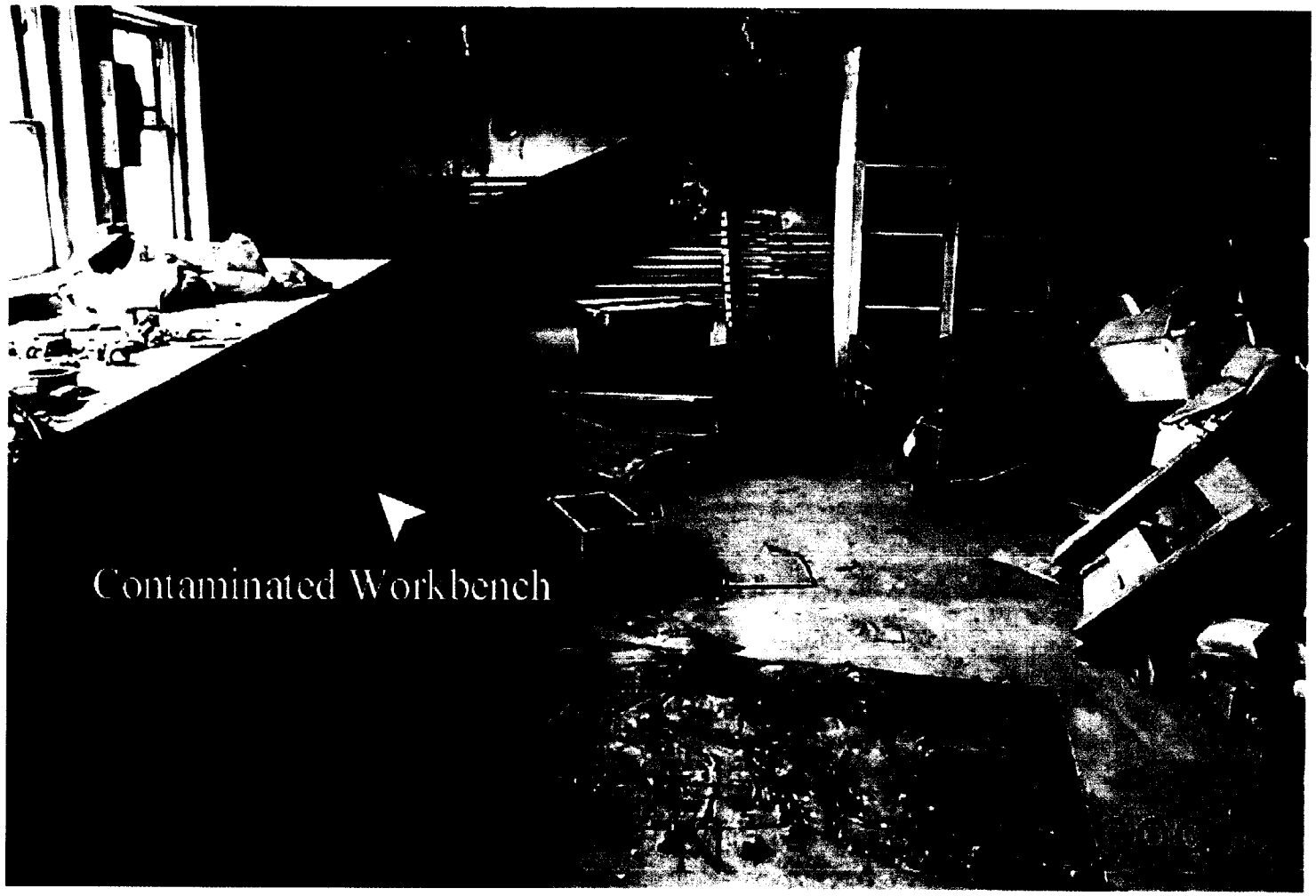

Plate 1: Building 1 - Contaminated Areas

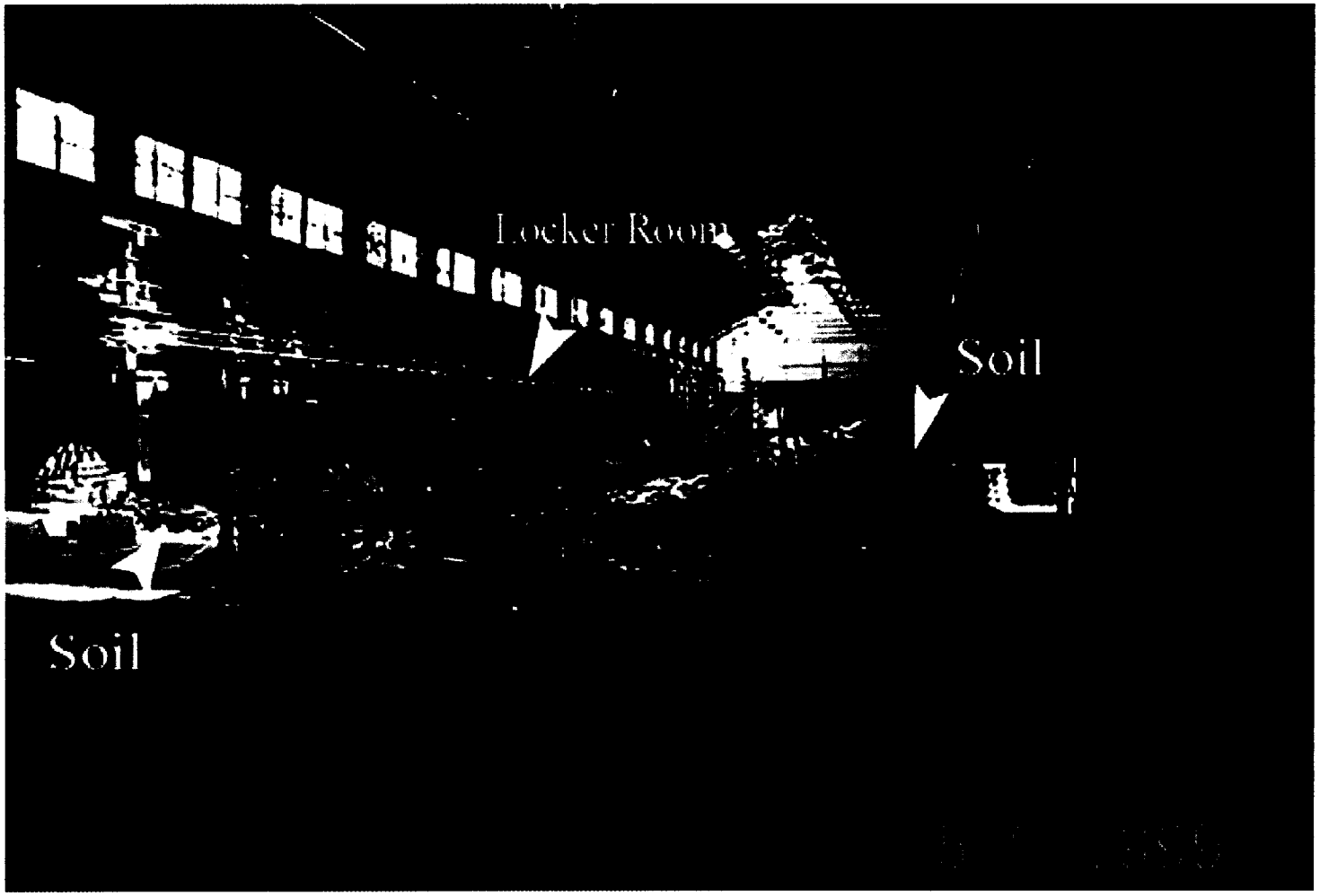

Plate 2: Building 2, Center Section - Contaminated Areas

Plate 3: Building 3, South Section - Contaminated Areas

Plate 4: Building 3 and 8 Junction - Contaminated Areas

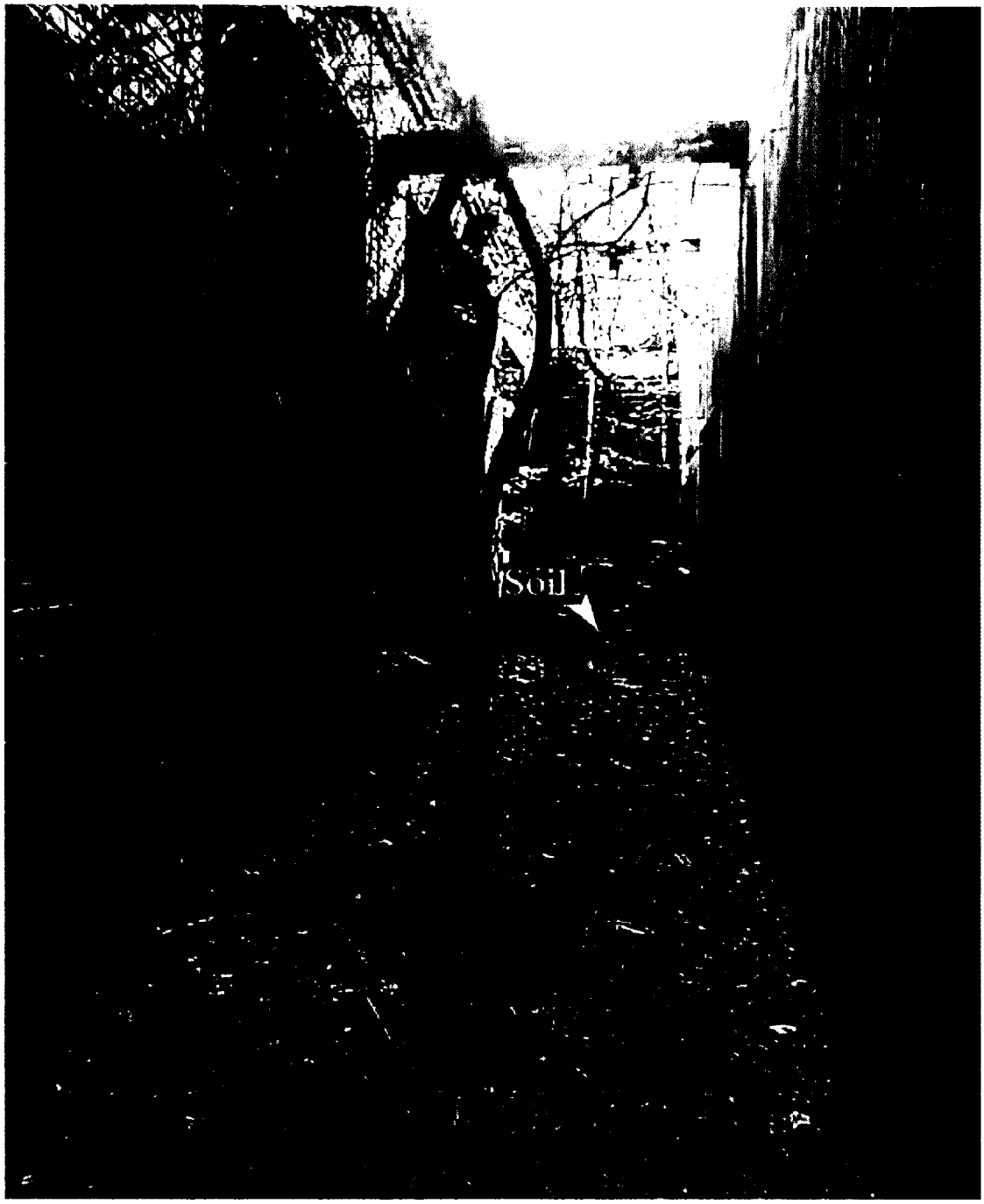

Plate 5: Exterior Alley Between Buildings 4/9 and 5 - Contaminated Soil Area

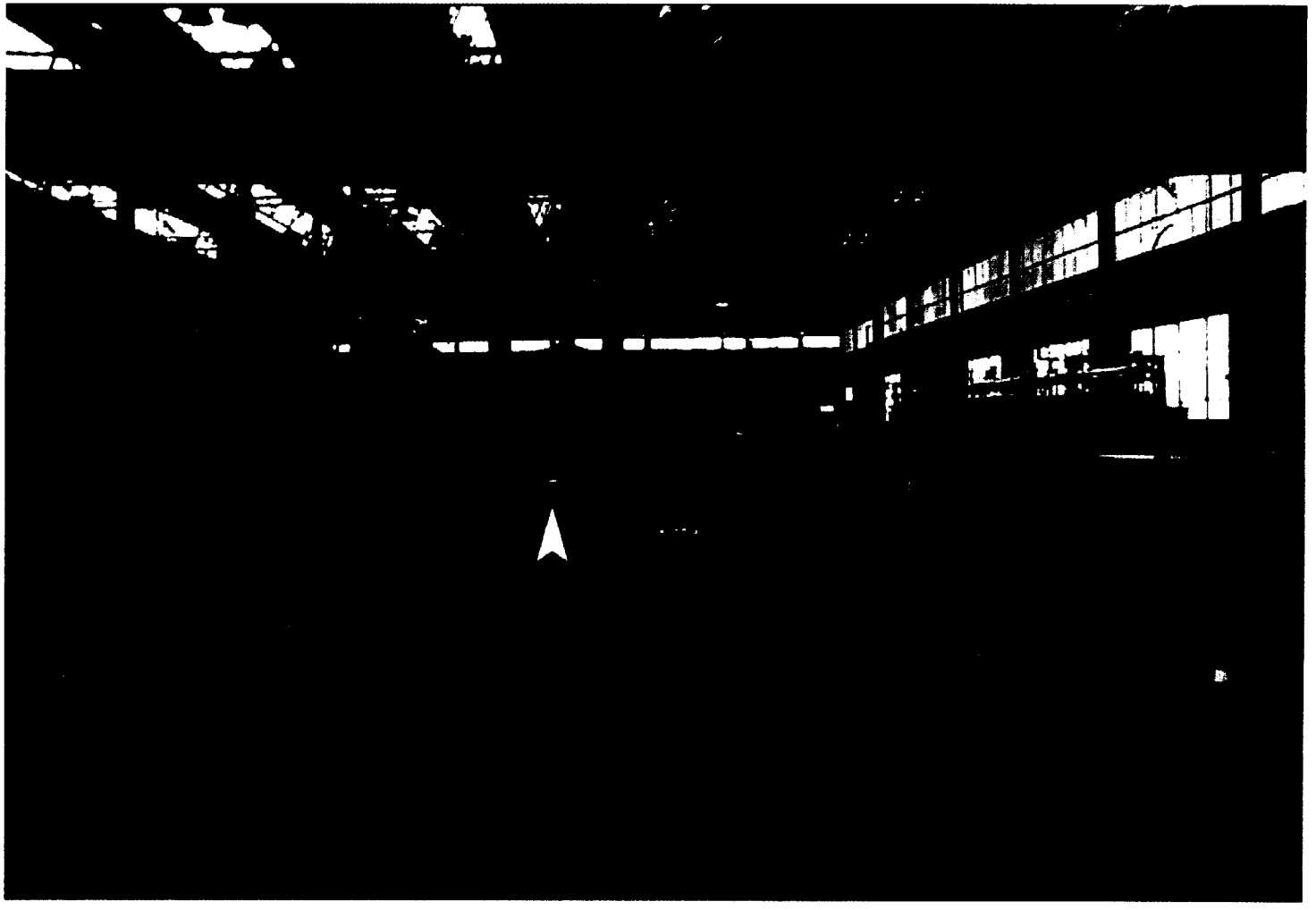

Plate 6: Building 4/9, Looking East - Contaminated Area

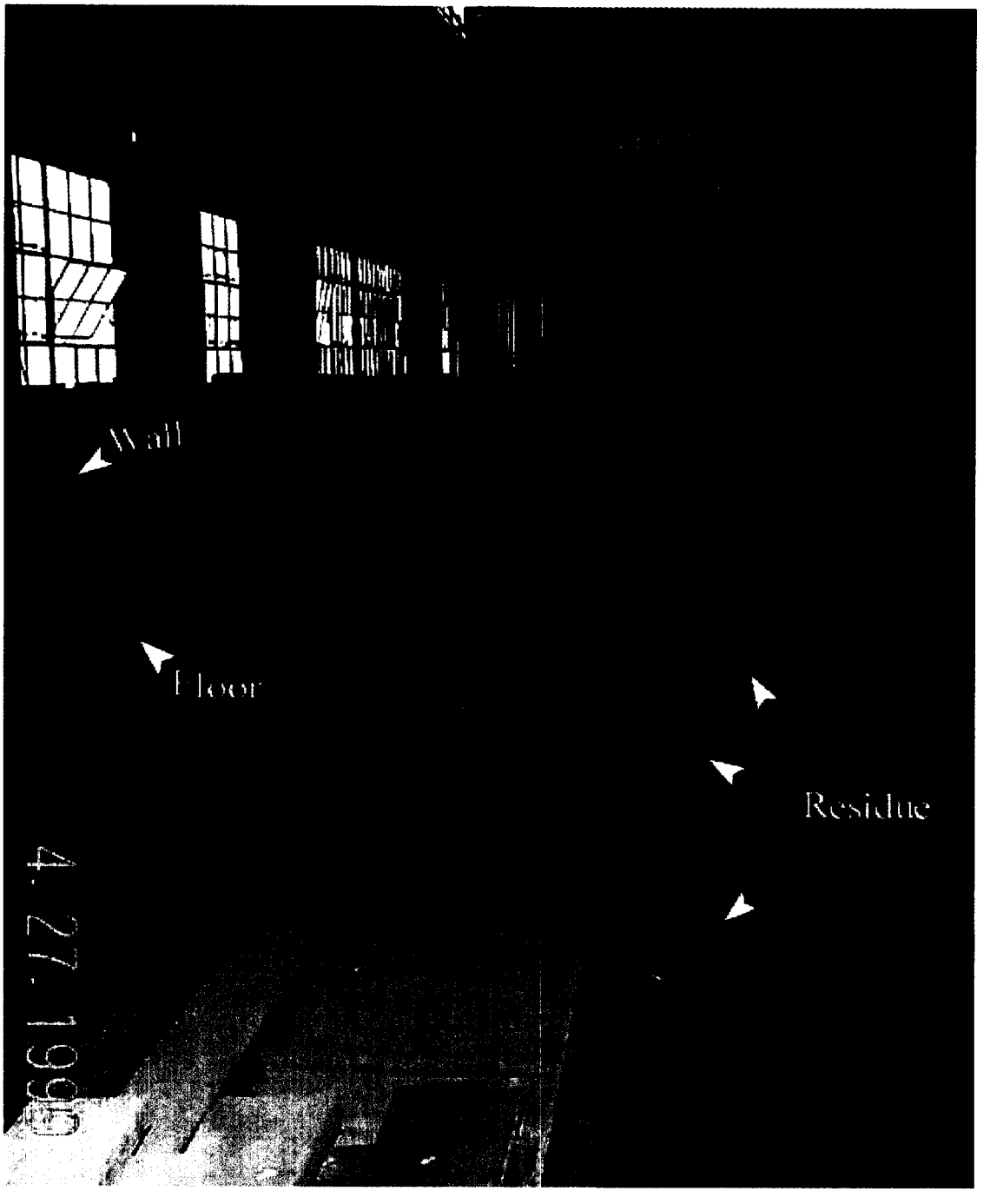

Plate 7: Building 8, 10 in. Cooling Bed - Contaminated Areas

Plate 8: Building 8, Looking East

Plate 9: Northeast View into Building 8 from Building 6 - Contaminated Rolling Mill

Plate 10: Building 8 - Radioactive Material Beneath Floor Plates

Plate 11: Building 24, Southwest Corner Looking North - Contaminated Floor Area

Plate 12: Building 24, Southeast Storage Room and Transformer Room

Plate 13: Crane Yard, Looking North

Plate 14: Alley Between Buildings 2 and 3, Looking South