RADIOLOGICAL SURVEY AND SAMPLING REPORT FOR RESIDENTIAL, PUBLIC AND COMMERCIAL PROPERTIES IN THE VICINITY OF HARVARD AVENUE

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NEWBURGH HEIGHTS, OHIO
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1.0 INTRODUCTION

This Radiological Survey and Sampling Report presents the results of the survey and sampling program conducted by Chemetron Corporation, Inc. (Chemetron) on residential, public and commercial properties located in the vicinity of the Chemetron Harvard Avenue Site, 2910 Harvard Avenue, Cleveland, Ohio. The survey and sampling program was developed consistent with the applicable guidelines contained in Draft NUREG/CR 5849, "Manual For Conducting Radiological Surveys In Support Of License Termination" (NRC,1992). The purpose of the survey and sampling program was to determine if depleted uranium had been released during operation of Chemetron's Harvard Avenue catalyst facility (Building 21) to offsite locations, at levels which exceed regulatory guidelines. The survey and sampling program was performed, and this subsequent report prepared, in response to a special inspection and radiological survey of similar properties performed by the U.S. Nuclear Regulatory Commission (NRC) on May 4-7, 1993.

The results of the NRC inspection and survey efforts, documented in an inspection report dated June 23, 1993, indicated that:

- no private residence rooftops or grounds were contaminated with depleted uranium in excess of the NRC unrestricted use release limit (35 pCi/g). [NRC, 1981]

- two locations identified at commercial locations (Ohio Crankshaft Division and Newburgh and South Shore Railroad) adjacent to the Harvard Avenue Site contained depleted uranium activity above the unrestricted use release limit

- exposure rate measurements of all areas surveyed were indistinguishable from background levels.

The NRC inspection and survey effort did identify several soil samples taken from residential areas with depleted uranium activity above the normal background level of 0.6 pCi/g, but significantly less than the unrestricted use release limit. The NRC concluded that "these concentrations did not present an undue risk to the public health and safety."

However, in light of the "above background" levels identified in residential areas, Chemetron has undertaken the commitment to perform a more thorough and comprehensive survey and sampling effort of the residential, public and commercial properties located near the Harvard Avenue Site.

During the performance of the residential survey and sampling activities by Chemetron, NRC Region III personnel conducted a special inspection and confirmatory survey (June 20-24, 1994), and a review of related Chemetron survey and analytical data (July 29, 1994 through August 16, 1994). [NRC, 1994]

The purpose of the confirmatory survey and review of survey and analytical data was to verify Chemetron survey and sampling results. The NRC Region III personnel conducted the confirmatory survey of several residential properties and the ALCOA property. The survey included direct surface surveys and collection of soil samples for gamma spectroscopy. The NRC's results from the residential properties confirmed Chemetron's results that soil concentrations of depleted uranium are below the regulatory limit (35 pCi/g). One additional area of contamination was discovered on the ALCOA property by the NRC.

A summary of the NRC confirmation survey and review of Chemetron's survey and analytical data is presented in the Addendum. A discussion of the followup activities undertaken by Chemetron as a result of the NRC confirmatory survey and related review is also presented in the Addendum.

2.0 BACKGROUND

2.1 Chemetron Corporation, Inc.

The Atomic Energy Commission (AEC) issued Chemetron Source Material License No. Sub-852 on October 8, 1965, authorizing Chemetron's possession and use of depleted UF_6 (uranium hexafluoride) for conversion to U_3O_8 (uranium oxide) at the Harvard Avenue Facility located in Newburgh Heights, Ohio (Figure 1). The production of catalyst containing depleted uranium was performed primarily in Building 21 at the Harvard Avenue Site from 1965 to 1972. Catalyst production ceased when plant operations were terminated in February 1972. Decontamination of Building 21 and the site was attempted with varying levels of effort between 1972 and 1980 (ORAU, 1988). No activities involving source material, other than decontamination, have been conducted at the site since Chemetron discontinued production of the catalyst.

A license (License No. Sub-1357) was issued to Chemetron on June 17, 1979 by the NRC allowing Chemetron to possess depleted uranium in the form of contaminants at the Harvard Avenue Site and at a nearby landfill (Bert Avenue) (Figure 1) where contaminated material was accidently placed during decontamination efforts in the 1970's. The license is continuing in effect since Chemetron's last license renewal application in October, 1990.

2.2 Aluminum Company of America (ALCOA) Radiological Survey

On April 19, 1993, the NRC Region III was informed by a representative from the Aluminum Company of America (ALCOA) that while conducting a radiological survey of ALCOA Building 65, contamination of certain areas of the roof was identified with activity ranging from 3,000 to 14,000 disintegrations per minute per 100 square centimeters (dpm/100cm^2) beta-gamma and 100 dpm/100cm^2 alpha. Building 65, which was demolished in 1993, was located on Harvard Avenue just west (Figure 2) of the Chemetron Corporation Harvard Avenue Site (former location of Building 21). Exposure rates measured at one meter from the surface of the roof ranged from

8 to 14 microRoentgen per hour (μR/hr), which is normal background for the area. As part of the survey and sampling effort, ALCOA collected samples of Building 65 roofing material for gamma spectroscopy analysis by an offsite contract laboratory. The results of the gamma spectroscopy analysis indicated the contaminant was depleted U-238. ALCOA reported that depleted U-238 was not a material used by the Company at that facility. The Company did use natural thorium in processing a magnesium-thorium alloy.

Based on the results, it was concluded by ALCOA and the NRC, that the most likely pathway for depleted uranium contamination on the ALCOA Building 65 roof was airborne transport and deposition of depleted UF_6 gas material from the former Chemetron catalyst manufacturing facility (Building 21), located nearby on Harvard Avenue. (NRC, 1993a)

2.3 NRC Radiological Survey and Inspection

Based on the discovery of a potential airborne transport pathway of depleted uranium, the NRC concluded that surveys of the local neighborhood were warranted. A summary of the NRC radiological survey, extracted from the NRC Inspection Report (June 23, 1993), is presented below.

During May 4-7, 1993, radiological scoping surveys were performed by the NRC in the immediate vicinity of the Chemetron Harvard Avenue Site to determine if radioactivity above background levels was present. The survey included eight private residences, 10 commercial businesses, and two public parks (Figure 3). The residential area included the residences located on the north side of Harvard Avenue, the south side of Hermit Avenue, East 26th Street, East 27th Street, and East 29th Street. The commercial businesses surveyed included facilities located along Harvard Avenue to the north, south, east and west of the Chemetron Harvard Avenue Site. A portion of the Newburgh and South Shore Railroad which runs along the Harvard Avenue Site southern boundary was also surveyed.

The NRC performed direct surveys using portable rate meters coupled with Geiger-Muller (GM) pancake detectors, of building roof tops, yards, parking lots, driveways, around building foundations, the ground beneath where downspouts discharge, window sills, and other horizontal surfaces. The NRC surveyed 50 percent of several roofs and 10 percent of several yards, driveways, or parking lots. Direct measurements of business rooftops were conducted at one to three meter intervals using portable rate meters coupled with G-M pancake detectors.

Walk over surveys were conducted of yards, driveways, and parking lots using a micro R survey meter at one meter above surfaces for exposure rate measurements.

Eight soil samples, including a background sample were collected for gamma spectroscopy analysis. A sample of the roofing material (shingles) from a residence at 2727 Harvard Avenue and two samples of the gravel roofing material from ALCOA Building 65 were also collected for gamma spectroscopy analysis.

Several wipes at various locations were also collected for gross alpha and gross beta analysis. These included four wipes of outside air intake vents at American Steel and Wire and two wipes of bricks, one from 4027 East 49th Street and the other from 2505 Harvard Avenue.

The results of the NRC radiological survey and inspection conducted on May 4-7, 1993 are presented in Tables 1 and 2. The findings are summarized below:

1. The results of the exposure rate walk over survey of residential, public and commercial areas were all indistinguishable from local background (10 - 12 μR/hr).

2. The results of the wipes of air intake vents (American Steel and Wire) (2 dpm/100cm^2 - alpha/beta) and the wipes of bricks from 4027 East 49th Street and 2505 Harvard Avenue (2 dpm/100cm^2 - alpha/beta) were less than the removable activity limit for unrestricted release (1000 dpm/100cm^2).

3. The direct measurements (2600 - 16,700 dpm/100cm^2 - beta/gamma) of the ALCOA Building 65 rooftop were consistent with ALCOA's measurements.

4. Elevated (above background) readings were identified along the Chemetron Site east fence boundary (2600-5200 dpm/100cm^2 - beta/gamma) and at the Newburgh and South Shore Railroad Track location (6080 dpm/100cm^2).

5. The analysis of soil samples from the Chemetron Harvard Avenue Site's eastern and southern boundaries (Ohio Crankshaft Division Facility and the Newburgh South Shore Railroad right-of-way) indicated locations with U-238 contamination above the NRC unrestricted use release limit for depleted uranium in soil of 35 pCi/g.

6. The isotopic analysis of soil samples collected from the Chemetron Harvard Avenue Site's eastern boundary, ALCOA roof, and residential areas (4039 East 27th Street and 2727 Harvard Avenue) indicated the uranium is depleted.

7. The analysis of the soil sample collected from the soccer field on Washington Park Boulevard indicated the presence of natural uranium at normal background levels (<0.6 pCi/g U-238).

8. Analysis of soil from residential areas (4039 East 27th Street and 2727 Harvard Avenue, public area (East 29th Street and Hermit Avenue) and commercial area (2701 Harvard Avenue - Cleveland Electric and Illuminating Company (CEI) Electrical Substation) indicated areas above the average background concentration for U-238 (<0.6 pCi/g) but significantly lower than the release limit of 35 pCi/g.

9. Based upon the results of the NRC radiological survey, the NRC has reported that concentrations in the residential areas do not present an undue risk to the public health and safety.

3.0 CHEMETRON CORPORATION INC., RADIOLOGICAL SURVEY AND SAMPLING PROGRAM

3.1 General

As presented in Section 2.3, a special inspection and radiological survey of selected residential, public and commercial properties in the vicinity of the Chemetron Corporation Inc. (Chemetron), Harvard Avenue Site was conducted by the NRC on May 4-7, 1993. The inspection and radiological survey was conducted in response to the identification of depleted uranium contamination on the roof of ALCOA Building 65 which appears to have come from the former Chemetron catalyst manufacturing facility (Building 21).

The residential properties surveyed and/or sampled by the NRC are shown in Figure 3. As shown in this figure, the NRC inspection and sampling efforts concentrated on properties in close proximity to the former catalyst production facility (i.e. along Harvard Avenue, Hermit Avenue) that would most likely be impacted by the airborne transport and deposition of depleted uranium from the former, Harvard Avenue facility.

Based on a review of the NRC data, a radiological survey and sampling program was developed by Chemetron to provide for a more comprehensive and through characterization of the local neighborhood in the vicinity of the Harvard Avenue Site (B. Koh and Associates, Inc. 1993).

The Chemetron radiological survey and sampling program was developed consistent with the applicable guidelines contained in Draft NUREG/CR 5849, "Manual For Conducting Radiological Surveys In Support Of License Termination" (NRC, 1992). The sampling and survey program consisted of exposure rate walk over surveys, surface scans, direct measurements and soil sampling of selected residential, public and commercial properties located in the vicinity of the Harvard Avenue Site. Since the results of the NRC survey indicated no apparent depleted uranium on any residential or commercial rooftops, the primary emphasis of the Chemetron radiological survey and sampling program was on the characterization of soil (gardens, yards) on or within the selected residential, public and commercial properties.

The main purpose of the program was to confirm the NRC's findings that offsite depleted uranium concentrations, if any, exist at concentrations that are below the NRC release limit.

3.1.1 Survey and Sampling Strategy

Based on the evaluation of the NRC radiological sampling and survey results, the areas in the vicinity of the Harvard Avenue site were separated into two general classifications "affected areas" and "unaffected areas". The classifications, "affected areas" and "unaffected areas" were chosen for purposes of conducting the radiological survey and establishing the sampling and measurement frequency and pattern (NRC, 1992).

The basis for the classifications (affected and unaffected) are described in the subsequent section.

- Affected Areas - Areas that have known U-238 contamination based on previous preliminary radiological characterization/surveillance. This includes areas where radioactive materials were used and stored, where records indicate there were spills or other unusual occurrences that could have resulted in the spread of contamination, and where radioactive materials were buried. Areas immediately surrounding or adjacent to locations where radioactive materials were used or stored, spilled or buried are included in this classification because of the potential for inadvertent spread of contamination.

- Unaffected Areas - All areas not classified as affected. These areas are not expected to contain residual radioactivity, based on a knowledge of site history and previous survey information.

Each of the survey and sampling protocols are described in detail in the following sections.

3.2 Exposure Rate Measurements

Walk over surveys of yards/gardens, driveways, and parking lots of selected residential, public and commercial properties were conducted using a calibrated microRem meter (Bicron) or microR survey meter (Ludlum Model 19), at one meter above the ground surface for exposure rate measurements.

3.2.1 Residential and Public Properties

Initially eleven residential properties were classified as unaffected areas (Figure 4). One additional residential property, Lot #10 (Figure 4), was added to the survey and sampling plan at the request of the resident. Walk over surveys of yards, gardens and driveways were conducted on at least 20 % of each of the twelve properties using a 2m x 2m grid.

For the public properties, Lots #278 and #279 (Figure 4),walk over surveys were conducted on 5m x 5m grids. The public property located on Washington Park Boulevard, was used for conducting background measurements.

3.2.2 Commercial Properties

Walk over surveys were conducted on 100% of affected areas and 10% of unaffected areas on all four commercial properties, Ohio Crankshaft Division, ALCOA, Newburgh and South Shore Railroad and CEI (Figure 5). The location of CEI is shown on Figure 4. In the areas designated as affected, four exposure rate measurements were taken per 10m x 10m grid. In areas classified as unaffected, exposure rate measurements were taken at random locations.

3.3 Surface Scans

Surface scans (at least 50% of selected rooftops and 20% yards/gardens) of rooftops, yard/garden, driveways, and parking lots of selected residential, public and commercial properties were performed using a calibrated portable rate meter (Ludlum Model 2221) coupled with a Geiger-Muller (G-M) pancake detector (Ludlum 44-9).

3.3.1 Residential and Public Properties

The twelve residential properties were classified as unaffected, therefore surface scans where conducted on 20% of the yards/gardens of the twelve properties and 50% of the rooftops of three homes (Figure 4 and Table 4).

For the public properties, Lots #278 and #279 (Figure 4), scans were performed on 20% of the area of each lot. Scans of the soccer field located on Washington Park Boulevard were not performed because this location was only used for background information for beta, gamma and alpha direct measurements and depleted uranium soils analyses.

3.3.2 Commercial Properties

For the areas of the four commercial properties classified as affected, surface scans were performed on 100% of the accessible areas. For the unaffected areas, scans were performed on 10% of the area (Figure 5).

3.4 Direct Radiation Measurements

Direct measurements (one minute count time) of rooftops, yards, parking lots and driveways of selected residential, public and commercial properties were conducted at one to five meter

intervals using a calibrated portable rate meter (Ludlum Model 2221) coupled with a G-M pancake detector (Ludlum 44-9) or alpha scintillation detector (Ludlum 43-5).

3.4.1 Residential and Public Properties

The twelve residential properties were classified as unaffected (Figure 4). Direct measurements (beta-gamma) were conducted on 2m x 2m grids covering 20% of the yard/garden. Direct alpha measurements were conducted on 10% of the beta-gamma measurement locations.

For the public properties, Lots #278 and #279, direct measurements (beta-gamma) were conducted on 5m x 5m grids (Figure 4). Direct alpha measurements were conducted on 10% of the beta-gamma measurement locations.

3.4.2 Commercial Properties

Direct measurements were made at the four commercial properties (Figure 5 and Figure 5A). The measurements (beta-gamma) were conducted at four locations within a 10m x 10m grid for areas classified as affected and at random locations for areas classified as unaffected. Direct alpha measurements were conducted on 10% of the beta-gamma measurement locations.

3.5 Soil Sampling

3.5.1 Residential and Public Properties

Three random surface (6") soil samples (800-1000g) from yards or gardens of the twelve residential and three public properties were collected (Appendix C-1) using a "cookie cutter" type soil sampling device. Direct measurements were made at each soil sample location. If

elevated areas were identified in the yard/garden by the surface scan or direct measurement, these locations were sampled in addition to the random sampling locations.

The initial vegetation layer was removed prior to sampling. The grass "divot" was replaced or the spot was backfilled with soil and seeded to restore the sampled location to its original state.

Isotopic uranium analysis was performed using alpha spectroscopy on all of the soil samples collected from the residential properties. The soil samples collected from the public property were analyzed for U-238.

3.5.2 Commercial Properties

3.5.2.1 Initial Survey and Sampling Efforts

During August, 1993, five random surface soil samples were collected along the east (Ohio Crankshaft Division) fenceline of the Chemetron Harvard Site. Ten random surface soil samples were collected along the southern boundary between the fenceline and the Newburgh and South Shore Railroad.

3.5.2.2 Revised Survey and Sampling Efforts

In response to NRC comments (NRC, 1993b), soil samples were collected at locations reclassified as affected and unaffected along the south, east and west perimeter from facilities (Newburgh and South Shore Railroad, Ohio Crankshaft Division, and ALCOA, respectively) adjacent to the McGean-Rohco complex (Figure 5 and 5A). The sampling included four surface soil samples per 10m x 10m grid for accessible affected areas and at random locations in the accessible unaffected areas. The soil samples collected from commercial properties were analyzed for U-238, except for ALCOA, which were analyzed for U-234, U-235 and U-238.

3.6 Management Controls

The survey and sampling activities were performed by trained and qualified individuals, using calibrated instruments and approved field procedures. Results of surveys and sampling locations were documented on field survey forms.

The results of the surveys, soil sampling locations, soil sampling analytical results, calibration records, field procedures and plan/reports related to this survey and sampling effort are being maintained as part of the Chemetron Project files. A list of survey equipment that was used to perform the survey/sampling activities are presented in Table 3.

4.0 SURVEY AND SAMPLING LOCATIONS

The locations of residential, public and commercial properties that were surveyed/sampled and the type of survey and sampling activities that were performed on the various properties are presented in Figure 4 and Table 4. In addition to the 11 original residential properties originally planned to be surveyed/sampled (B. Koh & Associates, 1993), Lot #10 (4008 East 26th Street) was survey/sampled at the request of the resident.

5.0 RESULTS AND DISCUSSION

5.1 Residential

The results of the radiological surveys performed on the residential properties are given in Appendix A and Appendix C-1. As discussed in Section 3.2.1, all residential properties were considered as unaffected. A summary of the residential property survey and soil sampling data is provided in the following sections.

5.1.1 Exposure Rate Measurements

Exposure rates were measured at one meter above the ground surface using a calibrated microRem survey instrument (Bicron) at the 12 residential properties.

The results are given in Appendix A. A summary of the results are given in Table 5. As can be seen from the data in Table 5, the exposure rate measurements were comparable to background levels of 6 to 12 μRem/hr.

5.1.2 Surface Scans

Surface scans were performed using a calibrated ratemeter (Ludlum Model 2221) coupled with a pancake Geiger-Muller detector (Ludlum Model 44-9). The scans were conducted on 50% of the rooftops of three homes (Lots #16, #145 and #308 from Figure 4) and on 20% of the yards of all the homes. No radioactivity above background levels was detected as a result of performing the scans.

5.1.3 Direct Radiation Measurements

Direct measurements of alpha and beta-gamma radiation were performed at the twelve locations listed on Table 4. The results of the measurements are given in Appendix A and Appendix C-1 for the soil sample locations. A summary of the results are given in Table 5. As can be seen from Table 5, all of the values were below the NRC surface contamination release limits (NRC, 1987).

5.1.4 Soils

Thirty-six surface soil samples were collected from the 12 locations (three per location) listed in Table 4 and were analyzed for U-234, U-235 and U-238 via alpha spectroscopy. The results of the analyses are given in Appendix C-2. The maximum value of any sample for Total Uranium is 7.7 pCi/g which is much less than the NRC unrestricted release limit of 35 pCi/g. Figure 6 shows the ratio of U-234 to U-238 for the 36 samples. From Figure 6, it can be seen that the majority of the values were below 0.6 which is indicative of depleted uranium. The ratio of U-234 to U-238 for natural uranium is approximately one.

5.2 Public

The public radiological surveys were performed at the three locations listed on Table 4.

The results of the radiological surveys performed on the public properties are given in Appendix A. A summary of the public property survey and soil sampling data is provided in the following sections.

5.2.1 Exposure Rate Measurements

Exposure rates were measured at one meter above the ground surface using a calibrated microRem survey instrument (Bicron) at the three public properties.

The results are given in Appendix A. A summary of the results are given in Table 5. As can be seen from the data in Table 5, the exposure rate measurements were comparable to background levels of 6 to 12 μRem/hr.

5.2.2 Surface Scans

Surface scans were performed using a calibrated Ludlum Model 2221 audible ratemeter coupled with a G-M pancake detector (Ludlum 44-9). The scans were conducted on 20% of the area of vacant lots (278 and 279) and near the vicinity of the sampling locations at the Washington Park Boulevard, soccer field. No radioactivity above background levels was detected as a result of performing the scans.

5.2.3 Direct Radiation Measurements

Direct measurements of alpha and beta-gamma radiation were performed at the three locations listed on Table 4. The results of the measurements are given in Appendix A. A summary of the results are given in Table 5. As can be seen from Table 5, all of the values were below the NRC surface contamination release limits (NRC, 1987).

5.2.4 Soils

Three soil samples were collected from the vacant lots (#278 and #279) and three soil samples were collected from the Washington Park Boulevard soccer field (Appendix A). The results are summarized in Table 5. The average background U-238 concentration in soil from the soccer field was <3.2 pCi/g.

5.3 Commercial

Radiological surveys were performed at the four commercial locations and shown on Figure 5 and listed on Table 4.

The results of the analyses performed for the affected and unaffected areas are given in Appendix B.

Chemetron performed the surveys of the commercial areas in accordance with the NRC's requested changes (NRC, 1993b), with one exception. Chemetron was unable to perform surveys of roof and storm drains surrounding ALCOA Buildings 65, 71 and other related buildings. Such surveys were not possible since these buildings were demolished and the related storm drain lines filled in by ALCOA, rendering them inaccessible. However, surveys were performed in the closest catch basins and sewers (Figure B-1, Appendix B), which collected runoff from the roof and storm drains from these buildings. These same catch basins and sewers were also surveyed by the NRC Region III personnel during their confirmatory survey conducted on June 23, 1994 (see Addendum).

A summary of the commercial property survey and soil sampling results are provided in the following sections.

5.3.1 Exposure Rate Measurements

Exposure rates were measured at one meter above the ground surface using a calibrated microRem survey instrument Bicron or a Ludlum Model 19 microR survey meter, at the four commercial properties. The results are given in Appendix B. A summary of the results are given in Table 5. As can be seen from the data in Table 5, the exposure rate measurements are comparable to background levels of 6 to 12 μRem/hr.

5.3.1.1 Ohio Crankshaft Division

The exposure rate measurements ranged from 5 to 12 μRem/hr in the affected areas and between 7 to 8 μRem/hr in the unaffected areas along the east fenceline (Figure B-5, Appendix B).

5.3.1.2 Aluminum Company of America (ALCOA)

The exposure rate measurements ranged from 2 to 7 μRem/hr in the affected and unaffected areas (Figure B-1 to B-3, Appendix B).

5.3.1.3 Newburgh and South Shore Railroad

The exposure rate measurements ranged from 5 to 19 μR/hr in the affected areas and between 12 to 14 μR/hr in the unaffected areas (Figure B-6 and B-6A, Appendix B).

5.3.1.4 Cleveland Electric and Illuminating Company (CEI) and McGean-Rohco North Perimeter

Both the CEI and McGean-Rohco north perimeter were classified as unaffected areas. The exposure rates ranged from 5 to 6 μRem/hr and 6 to 9 μRem/hr, respectively.

5.3.2 Surface Scans

Surface scans were performed using a calibrated Ludlum Model 2221 audible ratemeter or Model 3, coupled with a pancake Geiger-Muller detector (Ludlum 44-9). The scans were conducted on 100% of the affected areas (Figure 5) and 10% of the unaffected areas.

5.3.2.1 Ohio Crankshaft Division

Surface scans were conducted on 100% of the affected areas and 10% of the unaffected areas along the McGean-Rohco, Inc. east fenceline (Figure B-5, Appendix B).

Radioactivity above background levels was detected along grids O-1 to P-1 on the McGean-Rohco, Inc. side of the fence (affected area). No radioactivity above background was detected in the unaffected area.

5.3.2.2 Aluminum Company of America (ALCOA)

Surface scans were conducted on 100% of the affected areas and 10% of the unaffected areas (Figure 5). Radioactivity above background levels was detected along grid T-1 and was located between Chemetron's west fenceline and an asphalt curb on ALCOA's property (Figure B-1, Appendix B). The soil in this area appeared to have been pushed up against the fence during the remediation and demolition of Building 21.

5.3.2.3 Newburgh and South Shore Railroad

Surface scans were conducted on 100% of the accessible affected areas and 10% of the unaffected areas along the south fenceline (Figures B-6 and B-6A, Appendix B). Radioactivity above background levels was detected at grid locations C-2, D-2 and E-2. No radioactivity above background was detected in the unaffected area.

5.3.2.4 Cleveland Electric and Illuminating Company (CEI) and McGean-Rohco North Perimeter

Both CEI (Figure 4) and the North Perimeter (Figure B-4, Appendix B) were classified as unaffected; therefore 10% of these areas were scanned. No radioactivity above background was detected in these areas.

5.3.3 Direct Radiation Measurements

Direct measurements of alpha and beta-gamma radiation were performed at the four locations listed on Table 4. The results of the measurements are given in Appendix B. A summary of the results are given in Table 5.

5.3.3.1 Ohio Crankshaft Division

The maximum direct beta-gamma reading was 1,083 dpm/100 cm^2 for the affected area (Figure B-5, Appendix B) and 1,000 dpm/100 cm^2 for the unaffected area. The maximum direct alpha reading was <95 dpm/100 cm^2 for the affected and unaffected areas.

5.3.3.2 Aluminum Company of America (ALCOA)

The maximum direct beta-gamma reading was 1,028 dpm/100 cm^2 for the affected area and 5,565 dpm/100 cm^2 for the unaffected area (Figure B-1 to B-3, Appendix B). The maximum direct alpha reading was <145 dpm/100 cm^2 for the affected and unaffected areas.

5.3.3.3 Newburgh and South Shore Railroad

The maximum direct beta-gamma reading was 22,406 dpm/100 cm^2 for the affected areas and 3,556 dpm/100 cm^2 for the unaffected areas (Figure B-6 and B-6A, Appendix B). The maximum direct alpha reading was 1,450 dpm/100 cm^2 for the affected area and <103 dpm/100 cm^2 for the unaffected area.

5.3.3.4 Cleveland Electric and Illuminating Company (CEI) and McGean-Rohco North Perimeter

The maximum direct beta-gamma reading for CEI was <758 dpm/100 cm^2 (Figure B-8, Appendix B) and for the McGean-Rohco north perimeter 917 dpm/100 cm^2 (Figure B-4, Appendix B). The maximum direct alpha readings were 98 dpm/100 cm^2 and <112 dpm/100 cm^2, respectively.

5.3.4 Soils

5.3.4.1 Ohio Crankshaft Division

The maximum U-238 concentration in soil in the affected area was 25.1 pCi/g and 6.05 pCi/g for the unaffected area (Figure B-5, Appendix B). The results of the analyses are provided in Appendix C-5 and C-6. As a result of performing the survey/sampling on the Ohio Crankshaft

Division property soil, samples were taken on the McGean-Rohco side of the fence (Appendix C-6). The maximum U-238 concentration from these soil samples was 63 pCi/g.

5.3.4.2 Aluminum Company of America (ALCOA)

The maximum total uranium concentration in soil was 8.63 pCi/g (Figure B-1A, Appendix B). The results of the analyses are provided in Appendix C-4.

5.3.4.3 Newburgh and South Shore Railroad

The maximum U-238 concentration in soil in the affected area was 455 pCi/g and 59.8 pCi/g for the unaffected area (Figure B-6 and B-6A, Appendix B). The results of the analyses are provided in Appendix C-5.

5.3.4.4 Cleveland Electric and Illuminating Company (CEI) and McGean-Rohco North Perimeter

The maximum U-238 concentration in soil from the CEI property (Figure B-8, Appendix B) was 6.4 pCi/g and from the McGean-Rohco north perimeter 17.2 pCi/g (Figure B-4, Appendix B). The results of the analyses are provided in Appendix C-5.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 General

The main purpose of the survey and sampling program was to determine if depleted uranium had been released during operation of Chemetron's Harvard Avenue catalyst facility (Building 21) to offsite locations, at levels which may have posed a public health and safety problem.

Based upon surface soil results for U-238, areas of the Newburgh and South Shore Railroad has soil contaminated with U-238 at concentrations greater than the NRC's unrestricted use limit (35 pCi/g).

Based upon surface soil results for U-234, U-235, and U-238 from the residential and public areas, depleted uranium concentrations are much less than the NRC's unrestricted use limit (35 pCi/g).

The levels of contamination do not pose a public health and safety problem.

Specific conclusions and recommendations regarding the residential, public and commercial properties are presented in the subsequent sections.

6.2 Residential Properties

6.2.1 Exposure Rate Measurements

Exposure rate surveys (μRem/hr) of the twelve residential properties are comparable to background levels of 6 to 12 μRem/hr.

6.2.2 Surface Scans

As a result of performing surface scans on the twelve residential properties, no areas of elevated radiation were detected.

6.2.3 Direct Radiation Measurements

Direct radiation measurements (beta-gamma and alpha) of the twelve residential properties were all below the NRC's surface contamination release limits.

6.2.4 Soils

Soil samples from the twelve residential properties were below the NRC release limit of 35 pCi/g for depleted uranium.

6.3 Public Properties

6.3.1 Exposure Rate Measurements

Exposure rate surveys (μRem/hr) of the three public properties were comparable to background levels of 6 to 12 μRem/hr.

6.3.2 Surface Scans

As a result of performing surface scans on the three public properties, no areas of elevated radiation were detected.

6.3.3 Direct Radiation Measurements

Direct radiation measurements (beta-gamma and alpha) of the three public properties were all below the NRC's surface contamination release limits.

6.3.4 Soils

Soil samples from the public property were all below the NRC release limit of 35 pCi/g for depleted uranium.

6.4 Commercial Properties

6.4.1 Exposure Rate Measurements

6.4.1.1 Ohio Crankshaft Division

Exposure rate measurements (μRem/hr) for the affected and unaffected areas were comparable to background levels of 6 to 12 μRem/hr.

6.4.1.2 Aluminum Company of America (ALCOA)

Exposure rate measurements (μRem/hr) for the affected and unaffected areas were comparable to background levels of 6 to 12 μRem/hr.

6.4.1.3 Newburgh and South Shore Railroad

Exposure rate measurements (μR/hr) for the affected areas were slightly elevated. Exposure rate measurements of the unaffected areas were comparable to background levels of 6 to 12 μRem/hr.

6.4.1.4 Cleveland Electric and Illuminating Company (CEI) and McGean-Rohco North Perimeter

Exposure rate measurements (μRem/hr) for the CEI and McGean-Rohco north perimeter location were comparable to background levels of 6 to 12 μRem/hr.

6.4.2 Surface Scans

6.4.2.1 Ohio Crankshaft Division

Surface scans of the affected and unaffected areas of the Ohio Crankshaft Division's west fenceline resulted in radiation levels comparable to background. However areas on the west side of the fence (On the McGean-Rohco side) were found to have elevated radiation levels.

6.4.2.2 Aluminum Company of America (ALCOA)

Surface scans of the affected and unaffected areas on the ALCOA property resulted in elevated radiation levels.

6.4.2.3 Newburgh and South Shore Railroad

Surface scans of the affected areas resulted in elevated radiation levels.

6.4.2.4 Cleveland Electric and Illuminating Company (CEI) and McGean-Rohco North Perimeter

Surface scans of the CEI and McGean-Rohco north perimeter resulted in radiation levels comparable to background.

6.4.3 Direct Radiation Measurements

6.4.3.1 Ohio Crankshaft Division

Direct radiation measurements (beta-gamma and alpha) of the affected and unaffected areas were all below the NRC's surface contamination release limits.

6.4.3.2 Aluminum Company of America (ALCOA)

Direct radiation measurements (beta-gamma and alpha) of the affected and unaffected areas were all below the NRC's surface contamination release limits.

6.4.3.3 Newburgh and South Shore Railroad

Direct radiation measurements of the affected areas resulted in radiation levels above the NRC's surface contamination release limits.

6.4.3.4 Cleveland Electric and Illuminating Company (CEI) and McGean-Rohco North Perimeter

Direct radiation measurements (beta-gamma and alpha) were all below the NRC's surface contamination release limits.

6.4.4 Soils

6.4.4.1 Ohio Crankshaft Division

Soil sample analyses from the affected and unaffected areas resulted in U-238 concentrations below 35 pCi/g. However, samples taken on the McGean-Rohco side of the fence bordering the Ohio Crankshaft Division property resulted in concentrations (U-238) above 35 pCi/g. This area will require remediation and will be remediated in accordance with the Chemetron Remediation Plan.

6.4.4.2 Aluminum Company of America (ALCOA)

Soil sample analyses from the ALCOA property resulted in total uranium concentrations below 35 pCi/g.

6.4.4.3 Newburgh and South Shore Railroad

Soil sample analyses from the affected and unaffected areas resulted in U-238 concentrations above the NRC's 35 pCi/g limit.

As a result of the soil sample analyses being greater than 35 pCi/g in the affected and unaffected areas, it is recommended that a more thorough survey and sampling program be developed for

the Newburgh and South Shore Railroad location. The area should then be remediated in accordance with the Chemetron Remediation Plan.

6.4.4.4 Cleveland Electric and Illuminating Company (CEI) and McGean-Rohco North Perimeter

Soil sample analyses from the CEI electrical substation and the McGean-Rohco north perimeter resulted in U-238 concentrations below 35 pCi/g.

7.0 REFERENCES

B. Koh and Associates Inc., July 1993. Radiological Survey Plan For Residential, Public and Commercial Properties In the Vicinity of Harvard Avenue Chemetron Corporation, Newburgh Heights, Ohio.

Oak Ridge Associated Universities. August 1988. "Confirmatory Radiological Survey of an Industrial Dumpsite", Chemetron Corporation, Newburgh Heights, Ohio Final Report.

US Nuclear Regulatory Commission. October 1981. Branch Technical Position 46 FR 52061. "Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations."

US Nuclear Regulatory Commission. August 1987. NRC Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for By-Product, Source or Special Nuclear Material.

US Nuclear Regulatory Commission. 1992. Draft NUREG/CR-5849 "Manual For Conducting Radiological Surveys In Support Of License Termination."

US Nuclear Regulatory Commission. June 1993a. Inspection Report No. 040-08724/93-001. "Offsite locations in the Vicinity of the Harvard Avenue Site", Newburgh Heights, Ohio.

US Nuclear Regulatory Commission. December 29, 1993b. Letter from Timothy C. Johnson to Mr. Sargent. Docket No. 040-08724.

US Nuclear Regulatory Commission. October 4, 1994. Inspection Report No. 040-08724/94004 (DRSS) "Offsite Locations in the Vicinity of the Harvard Avenue Site, Newburgh Heights, Ohio."

FIGURES

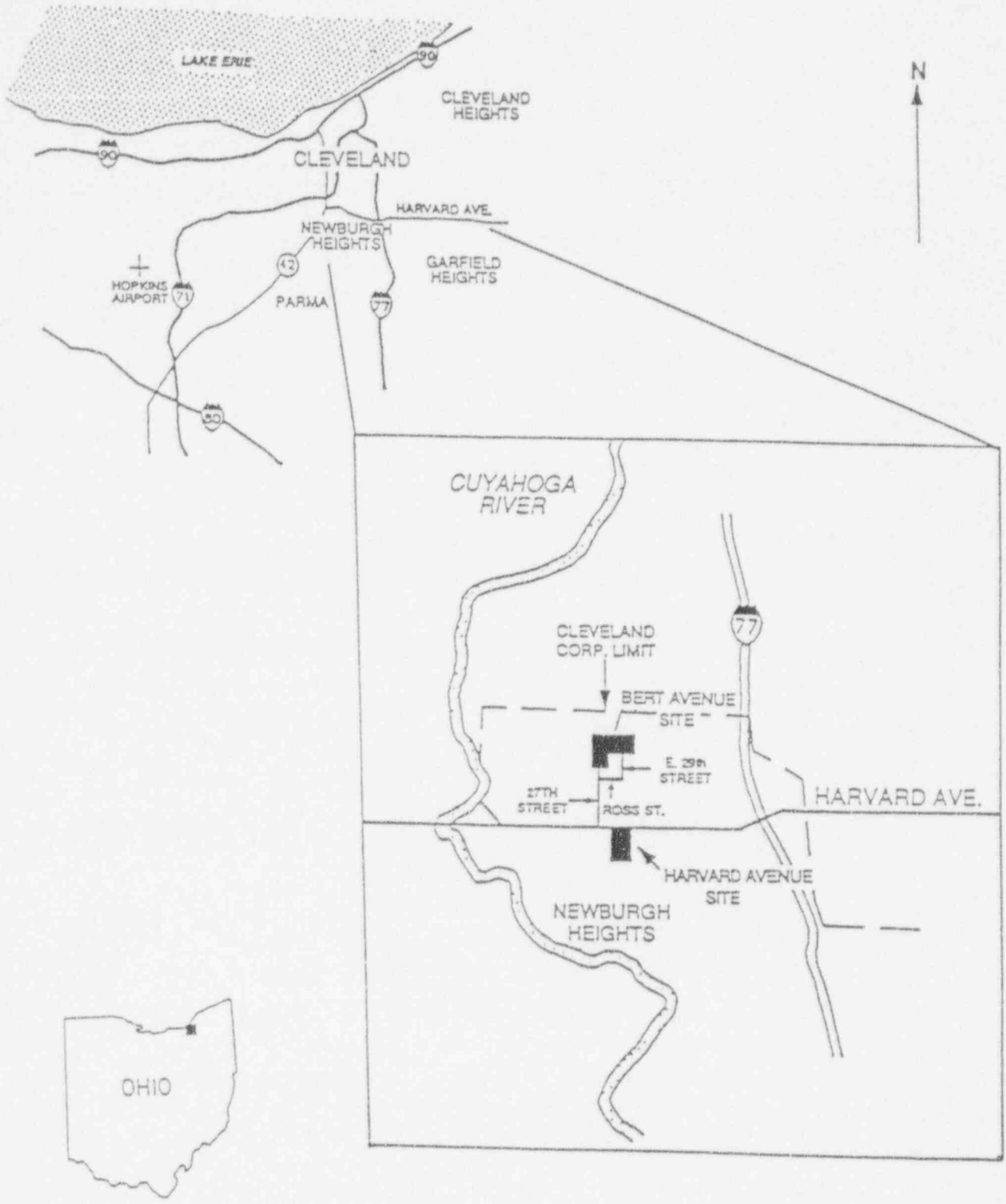


FIGURE 1

CHEMETRON CORPORATION
Site Location Map

B. KOH & ASSOCIATES, INC.

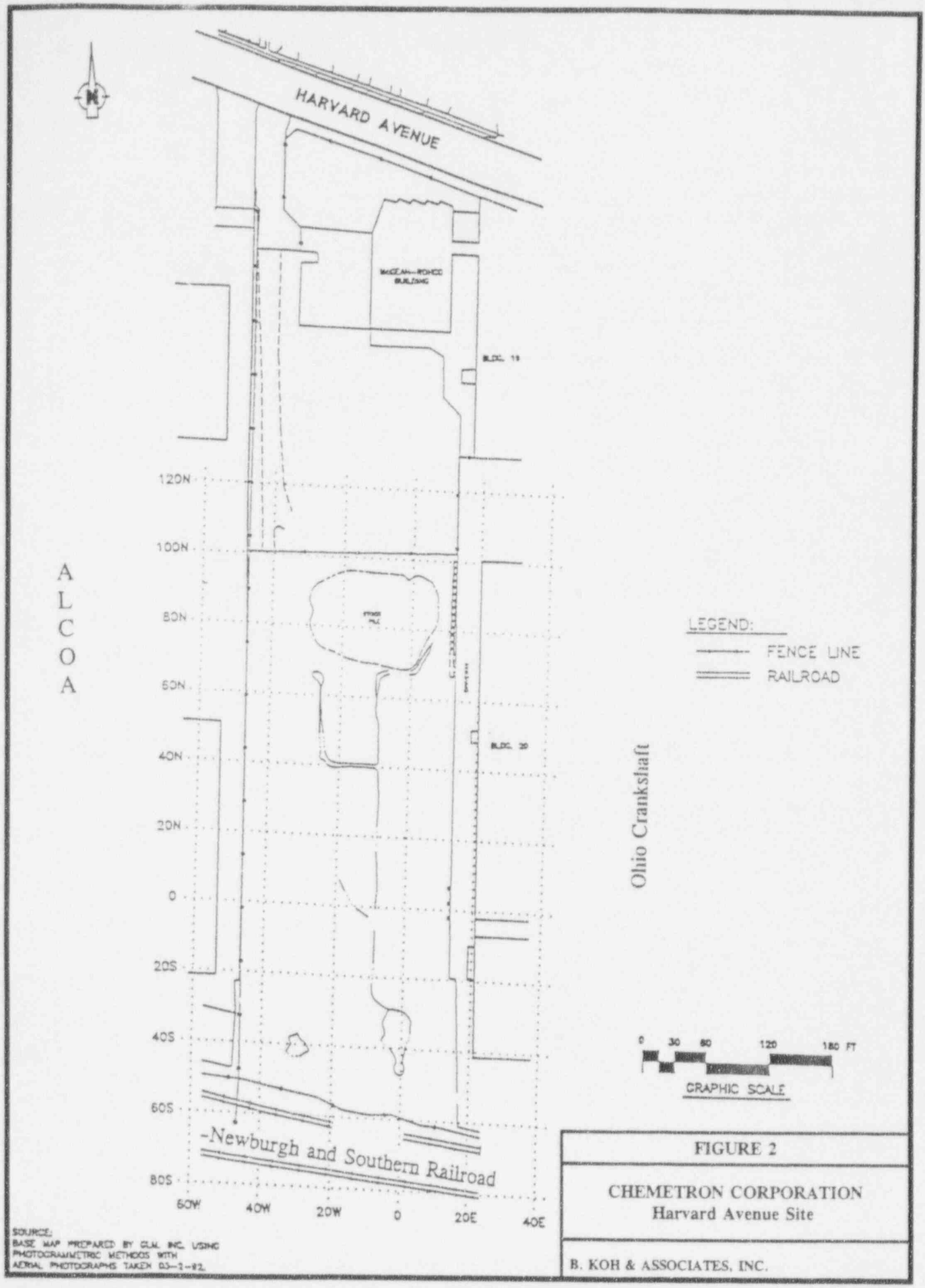


FIGURE 2

CHEMETRON CORPORATION
Harvard Avenue Site

B. KOH & ASSOCIATES, INC.

FIGURE 3
NRC SAMPLING AND SURVEY LOCATIONS

DATE: SEPTEMBER 14, 1994

NOT TO SCALE

NOTE: NOT ALL COMMERCIAL OR PUBLIC PROPERTIES ARE SHOWN

B. Kohn & Associates, Inc.

Figure 3. Survey Locations Key

Residential Areas

2717 Harvard Avenue
2727 Harvard Avenue
2716 Hermit Avenue
2816 Hermit Avenue
4031 E 26th Street
4036 E 27th Street
4039 E 27th Street
4027 E 29th Street

Businesses

1600 Harvard Avenue, ALCOA
2505 Harvard Avenue, UAW Local 1050
2601 Harvard Avenue, Wildwood Tavern
2609 Harvard Avenue, Speedway Gas Station
2701 Harvard Avenue, CEI Electrical Substation
2819 Harvard Avenue, Harvard Metal Treating, Inc.
3201 Harvard Avenue, Goodmans Furniture Warehouse
3800 Harvard Avenue, Ohio Crankshaft
4300 E 49th Street, American Steel and Wire
Parcel No. 511-06086 and 511-06088, Garage on Hermit Street
Newburgh and South Shore Railroad right of way south of Chemetron

Parks

Soccer Field on Washington Parkway
Park and Playground, corner of Hermit Street and E 29th Street

NOTE: Not all public and commercial properties shown on Figure 3

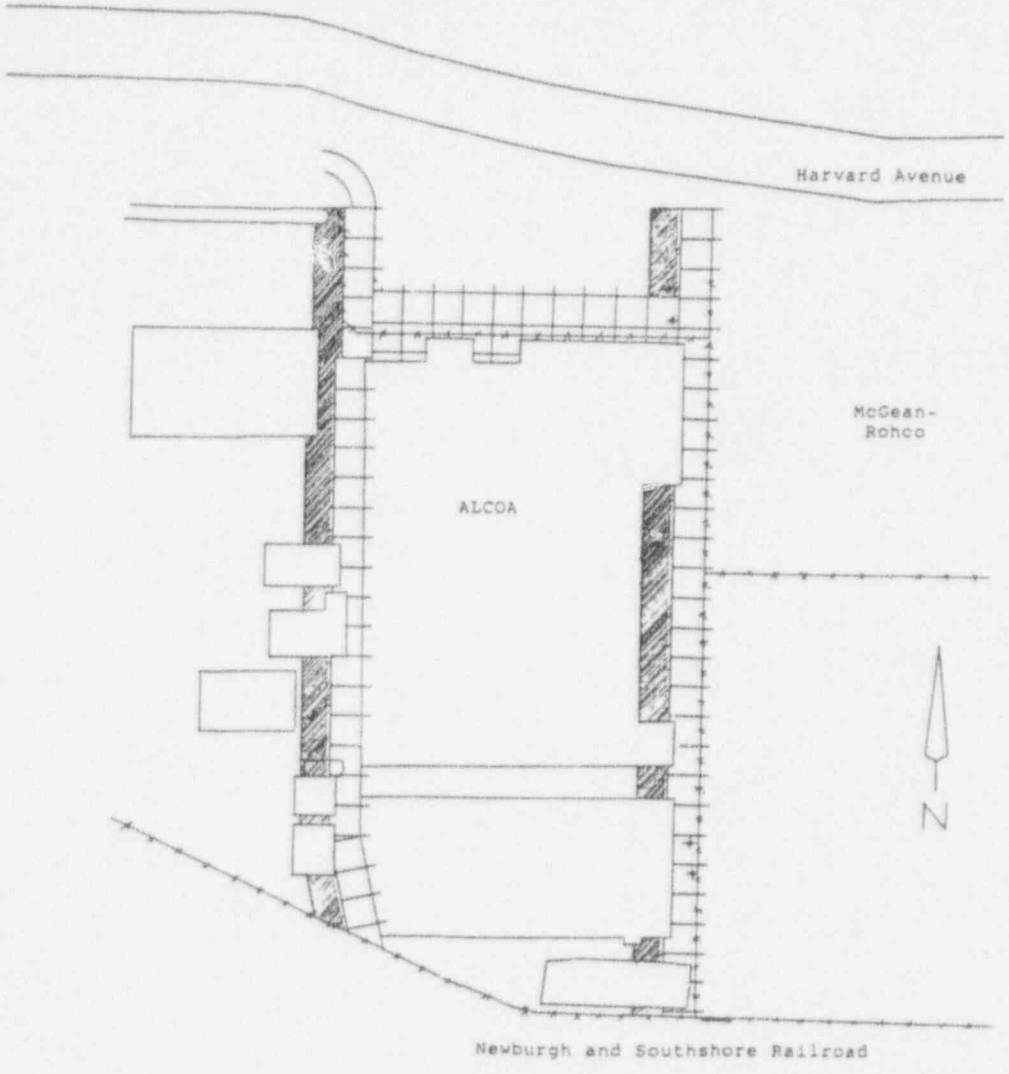
NOTE: NOT ALL COMMERCIAL OR PUBLIC PROPERTIES ARE SHOWN

FIGURE 4
CHEMETRON SURVEY AND SAMPLING LOCATIONS

DATE: SEPTEMBER 14, 1994

NOT TO SCALE

B. Koh & Associates, Inc.



+ = Sewers
= Fencelines
= Affected Areas
= Unaffected Areas

FIGURE 5

Commercial Properties

B. KOH & ASSOCIATES, INC.

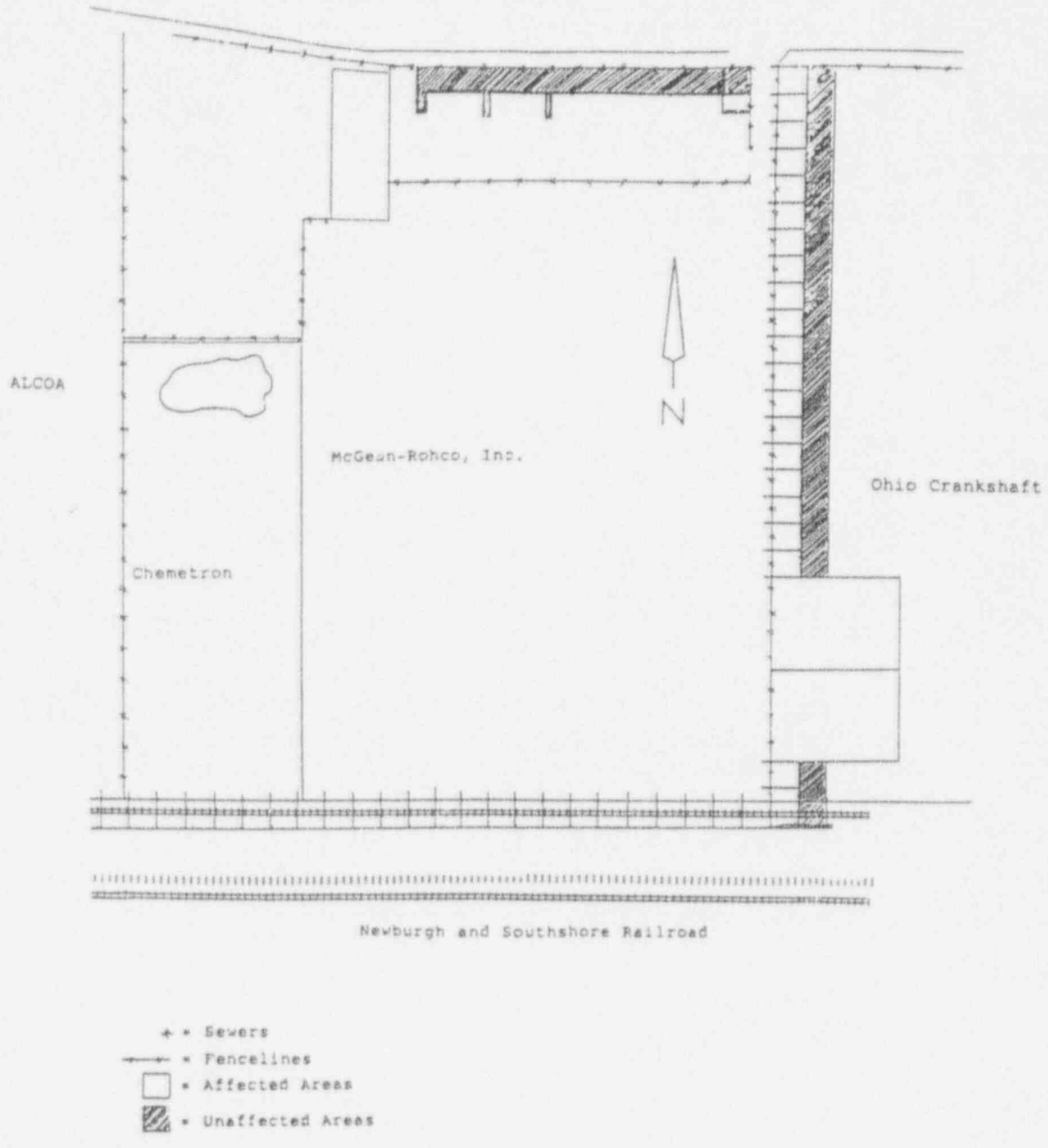
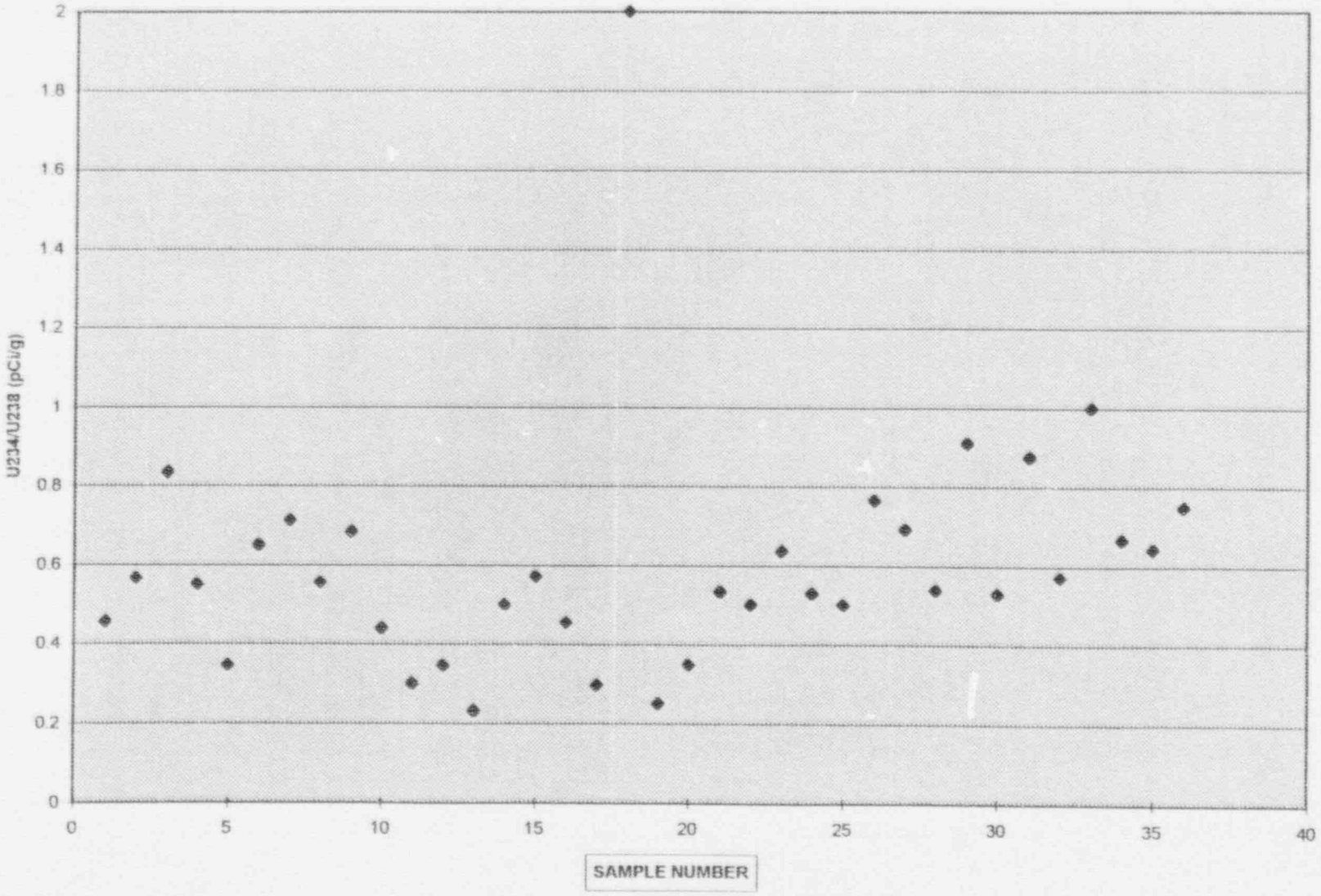


FIGURE 5A

Commercial Properties

B. KOH & ASSOCIATES, INC.

FIGURE 6
RESIDENTIAL SOIL ANALYSES



TABLES

TABLE 1
NRC SURVEY AND SAMPLING
CONCENTRATION OF U-235 AND U-238 IN SOILS OF RESIDENTIAL, PUBLIC AND COMMERCIAL PROPERTIES

Location	NRC Results pCi/g		ORISE Results pCi/g		
	U-235	U-238	U-234	U-235	U-238
4039 E 27th St Garden Soil	0.22 ± 0.03	6.8 ± 2	1.63 ± 0.20	0.09 ± 0.06	4.32 ± 0.33
E 29th St and Hermit Ave Park Soil	0.25 ± 0.02	10.5 ± 3	--	--	--
2701 Harvard Ave Soil CEI Electrical Substation	0.29 ± 0.02	14.2 ± 3	--	--	--
2727 Harvard Ave Soil	0.23 ± 0.02	11.4 ± 2	1.86 ± 0.22	0.99 ± 0.06	7.25 ± 0.43
2727 Harvard Ave Shingle Material	0.25 ± 0.05	ND	--	--	--
ALCOA, Building 65 Roofing Material 25 ft North of South Wall	3.58 ± 0.13	3.36 ± 12	--	--	--
ALCOA, Building 65 Roofing Material 5 ft North of South Wall	4.45 ± 0.09	408 ± 13	analysis pending	analysis pending	analysis pending
Ohio Crankshaft Soil, Small Particles East Fence Line 100 ft South of Stop Sign	0.66 ± 0.03	14.5 ± 4	--	--	--
Ohio Crankshaft Soil, Large Particles East Fence Line 10 ft South of Stop Sign	0.62 ± 0.04	13.0 ± 5	--	--	--
Ohio Crankshaft Soil West Fence Line 10 ft North of Stop Sign	1.65 ± 0.03	146 ± 4	--	--	--
Newburgh and South Shore RR Soil 70 ft West of ALCOA and 8 ft North of Tracks	1.65 ± 0.03	144 ± 5	--	--	--
Soccer Field Background Soil Washington Park Blvd	ND	<0.06	0.35 ± 0.1	0.04 ± 0.03	0.37 ± 0.09

ND = Not Detected

* NRC analysis consisted of gamma spectrometry on dried sieved soil counted in a 500 ml maronelli beaker geometry. Counting times from 12-16 hours. U-238 quantified from 1001 KeV peak of Pa-234m. ORISE analysis consisted of dissolution of soil, followed by radiochemical purification.

TABLE 2
NRC SURVEY AND SAMPLING
DIRECT MEASUREMENTS, EXPOSURE RATE MEASUREMENTS AND WIPES
OF VARIOUS RESIDENTIAL, PUBLIC AND COMMERCIAL PROPERTIES

Location	Direct (dpm/100 cm^2)	Exposure Rate (μR/hr)	Wipe (dpm/100 cm^2)
Residential			
4039 East 27th Street Rooftop	2,300	Indistinguishable from Background	
2727 Harvard Avenue Rooftop	2,600	Indistinguishable from Background	
4027 East 49th Street Bricks		Indistinguishable from Background	2
2505 Harvard Avenue Bricks		Indistinguishable from Background	2
Commercial			
Ohio Crankshaft West Fence Soil	2,600 - 5,200	Indistinguishable from Background	
Newburgh's South Shore RR West Fenceline Soil	6,080	Indistinguishable from Background	
ALCOA Building 65 Rooftop	2,600 - 16,700	Indistinguishable from Background	
American Steel and Wire Air Intake Vents		Indistinguishable from Background	2
Public			
Soccer Field Washington Park Blvd Background (Soil)	50 cpm	10-12	

* Beta/Gamma
** Alpha/Beta

TABLE 3
LIST OF SURVEY INSTRUMENTS

Instruments	Model No.	SN	Detector	Efficiency
Ludlum	19	98071	Micro R Meter	
Bicron		B709J	Micro Rem Meter	
Ludlum	3	92631	44-9	0.23 (Tc-99)
Ludlum	2221	108858 108880 99138	44-9 43-5	0.24 (Cs-137)

TABLE 4
SAMPLING AND SURVEY LOCATIONS OF RESIDENTIAL, PUBLIC AND COMMERCIAL PROPERTIES IN VICINITY OF HARVARD AVENUE SITE

Location	Rooftop	Yard/Garden	Driveway/Sidewalk/Parking Lot
Residential			
#9		X	X
#10*		X	X
#16	X	X	X
#120		X	X
#125		X	X
#145	X	X	X
#262		X	X
#264		X	X
#285		X	X
#293/294		X	X
#308	X	X	X
#317		X	X
Public			
#278/279		X	X
Soccer Field Washington Park Blvd. (Background)		X	X
Commercial			
East Fenceline (Ohio Crankshaft)		X	X
West Fenceline (ALCOA)		X	X
South Fenceline (Newburgh and South Shore Right-of-way)		X	
#270 (CEI)		X	

**Survey and sampling performed at the request of the resident.*

TABLE 5
DIRECT MEASUREMENTS, EXPOSURE RATE MEASUREMENTS AND SOIL SAMPLE RESULTS FOR RESIDENTIAL, PUBLIC AND COMMERCIAL PROPERTIES

Location	Direct[a] β/γ (dpm/100 cm^2)	Direct[a] α (dpm/100 cm^2)	Exposure Rates μRem/hr	Soil[d,e] (pCi/g)
RESIDENTIAL				
4012 E 26th Street #9	<1,044	<77	3-9	3.3
4008 E 26th Street #10	<1,056	<135	4-8	2.8
3982 E 26th Street #16	<1,000	131[b]	3-11	2.1
3999 E 26th Street #125	972[b]	<135	5-9	2.5
4016 E 27th Street #145	1,361[b]	<130	3-8	4.7
2701 Ross Avenue #262	1,000[b]	<86	3-11	3.0
4013 E 27th Street #264	1,361[b]	95[b]	4-8	7.7
4013 E 29th Street #285	1,200[b]	162[b]	3-9	2.9
3975 E 29th Street #294	<944	114[b]	2-8	2.1
2809 Ross Avenue #308	1,303[b]	505[c]	4-6	2.5
2813 Hermitt Avenue #317	960[b]	<124	1-8	4.7
3969 E 26th Street #120	<1,044	<77	4-10	2.1
PUBLIC				
Empty Lots Hermit and E 29th St	1,250[b]	102[b]	5-12	5.12
Soccer Field Washington Park Blvd (Background)	<788	98[b]	6	5.7
COMMERCIAL (AFFECTED)				
Ohio Crankshaft	1,083[b]	108	5-12	25.1
ALCOA	1,028[b]	<145	2-7	N/A[f]
South Fenceline Newburgh and Southshore	22,406[b]	1,450[b]	9-19	455
COMMERCIAL (UNAFFECTED)				
Ohio Crankshaft	1,000[b]	<138[b]	7-8	6.05
ALCOA	5,565[b]	<131	2-7	8.63
South Fenceline Newburgh and Southshore	3,556[b]	<103	12-14	59.8
North Perimeter McGean-Rohco	917[b]	<112	6-9	17.2
CEI	<758	98[b]	5-6	6.4

[a] NRC surface contamination release limits: 1,000 dpm/100 cm^2 α,β-γ removable activity
5,000 dpm/100 cm^2 α,β-γ average over 1 m^2
15,000 dpm/100 cm^2 α,β-γ maximum over 100 cm^2

[b] Maximum recorded value.

[c] Elevated reading due to clay tile sidewalk.

[d] Maximum recorded Total U concentration (Residential and ALCOA samples analyzed for U-234, U-235 and U-238).

[e] Maximum U-238 concentration (Public and commercial samples analyzed for U-238 only).

[f] No soil samples available due to concrete covering the affected areas.

APPENDIX A

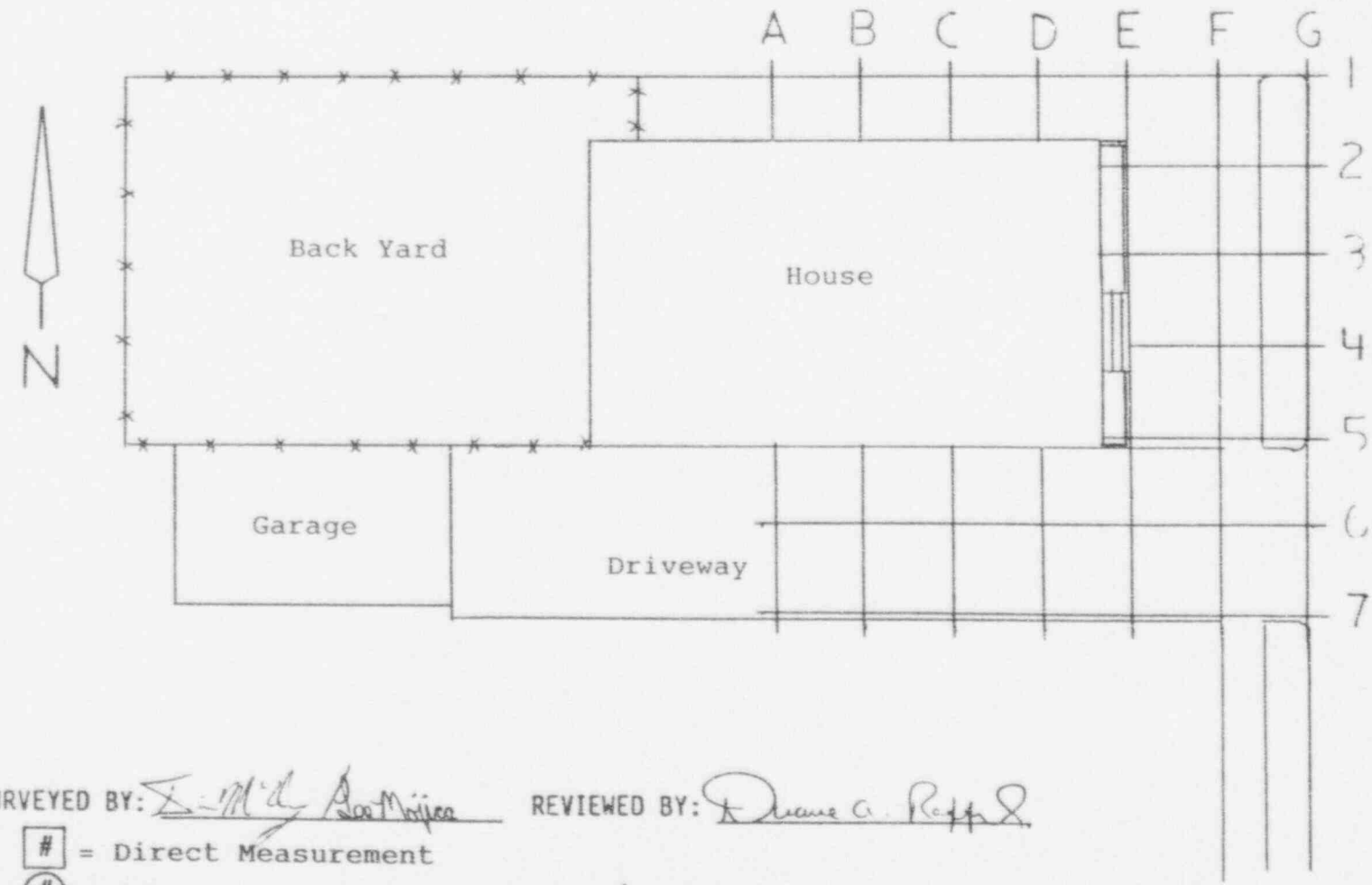
RESIDENTIAL AND PUBLIC PROPERTY SURVEY DATA

FIELD SURVEY MAP LOCATION Lot 9 /AREA 4012 E. 26th Street Newburgh Hts, OH

DATE 6-20-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/MicroRem SERIAL NO. 108856/108858/B709J

REMARKS _____



SURVEYED BY: [signature] REVIEWED BY: [signature]

[#] = Direct Measurement

(#) = Smear Location

⚠# = Exposure Rate

SURVEY RECORD

DATE 6-20-94

TIME

FIGURE #

LOCATION: 4012 E. 26TH ST. Lot #9

REASON FOR SURVEY: Residential Scoping Survey

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A-1	YARD	<MDCR	<MDA	<MDCR	<MDA	9	1M	N/A	N/A
B-1						8			
C-1						6			
D-1						8			
D-5	DRIVEWAY					7			
D-6						7			
D-7						6			
E-1	YARD					5			
E-2						8			
E-3						6			
E-4						9			
E-5						5			
E-6	DRIVEWAY					5			
E-7						6			
F-1	YARD					7			
F-2						6			
F-3						7			
F-4						5			
F-5						5			
F-6	DRIVEWAY					6			
F-7						6			
G-1	YARD					7			
G-2						6			
G-3						5			
G-4						7			

DIRECT SURVEY INSTRUMENTS

α INST	L-2221	β & γ INST	L-2221
S.N.	108880	S.N.	108858
CAL DUE	11-26-94	CAL DUE	11-20-94
EFF	0.12	EFF	0.23
BKG	0.3 cpm	BKG	52 cpm
MDA	77 dpm/100cm²	MDA	1044 dpm/100cm²
MDCR	4.6 cpm	MDCR	88 cpm

SMEARABLE CONTAMINATION INSTRUMENTS

α INST	N/A	β & γ INST	N/A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

EXPOSURE RATE INSTRUMENT

γ INST Micro-REM

S.N. B709J

CAL DUE 8-30-94

REMARKS:

Surveyor (signature) D. Milby Bee Major Date 6/20/94

Reviewed by (signature) Dwena A. Rapp Date 10/24/94

SURVEY RECORD
CONTINUATION

DATE: 6-20-94

TIME:

FIGURE #:

LOCATION: Lot #9 / 4012 E. 26th St. Newburgh Hts. OH

REASON FOR SURVEY: Residential Scraping Survey.

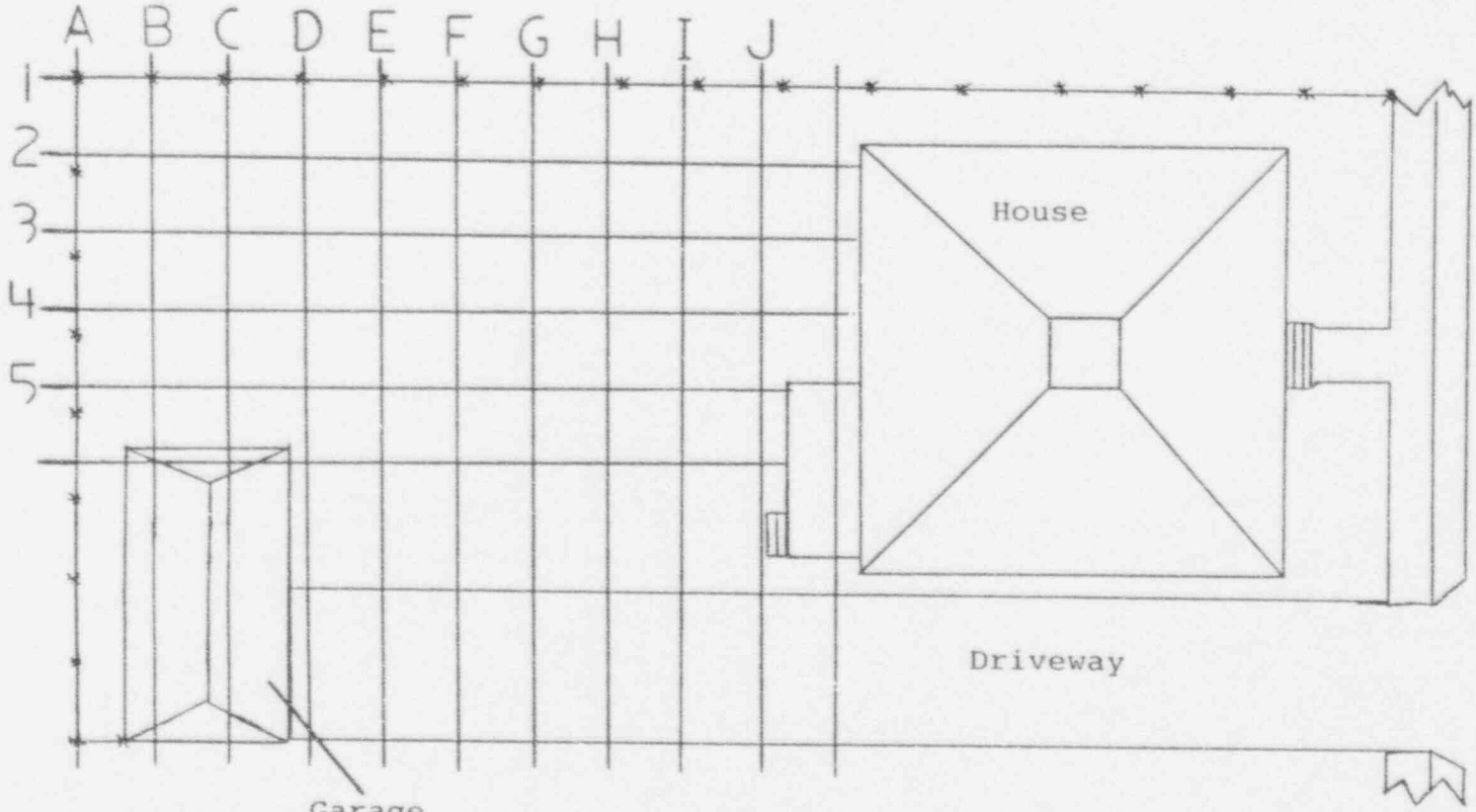
NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
G5	Yard	<MDCR	<MDA	<MDCR	<MDA	5	1	N/A	N/A
G6	Driveway	↓	↓	↓	↓	7	↓	↓	↓
G7	↓	↓	↓	↓	↓	4	↓	↓	↓
			N/A						

FIELD SURVEY MAP LOCATION Lot 10 /AREA 4008 E. 26th Street Newburgh Hts. OH

DATE 6-25-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221 / L-2221 / Micro Rem SERIAL NO. 108550 / 105855 / B709J

REMARKS _____



SURVEYED BY: _____ REVIEWED BY: _____

[#] = Direct Measurement

(#) = Smear Location

⚠# = Exposure Rate

SURVEY RECORD

DATE 6-25-94

LOCATION: Lot # 10 4008 E. 26TH St.

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A-1	Yard	<MDCR	<MDA	<MDCR	<MDA	7	1 m	N/A	N/A
A-2		N/A	N/A			6			
A-3		↓	↓			7			
A-4		↓	↓			7			
B-1		<MDCR	<MDA			5			
B-2		N/A	N/A			7			
B-3		↓	↓			5			
B-4		↓	↓			6			
C-1		<MDCR	<MDA			7			
C-2		N/A	N/A			5			
C-3		↓	↓			6			
C-4		↓	↓			6			
D-1		<MDCR	<MDA			4			
D-2		N/A	N/A			6			
D-3		↓	↓			8			
D-4		↓	↓			5			
E-1		<MDCR	<MDA			6			
E-2		N/A	N/A			7			
E-3		↓	↓			6			
E-4		↓	↓			7			
E-5		↓	↓			7			
F-1		<MDCR	<MDA			5			
F-2		N/A	N/A			6			
F-3		↓	↓			6			
F-4	↓	↓	↓	↓	↓	5	↓	↓	↓

DIRECT SURVEY INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221
S.N.	108880	S.N.	108858
CAL DUE	11-26-94	CAL DUE	11-20-94
EFF	0.13	EFF	0.24
BKG	1.7 cpm	BKG	57 cpm
MDA	135 DPM/100cm²	MDA	1056 DPM/100cm²
MDCR	10.5 cpm	MDCR	45 cpm

SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	N/A	β & γ INST	N/A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS: Alpha readings were taken on 6-30-94 due to the fact that the 43-5 alpha probe was out for calibration and repair.

EXPOSURE RATE INSTRUMENT	
γ INST	Micro Rem
S.N.	B709J
CAL DUE	8-30-94

Surveyor (signature) Joe Mojica Date 6-25-94

Reviewed by (signature) [signature] Date 6-30-94

SURVEY RECORD
CONTINUATION

DATE 6-25-94

LOCATION: Lot #10 4005 E. 26TH ST.

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

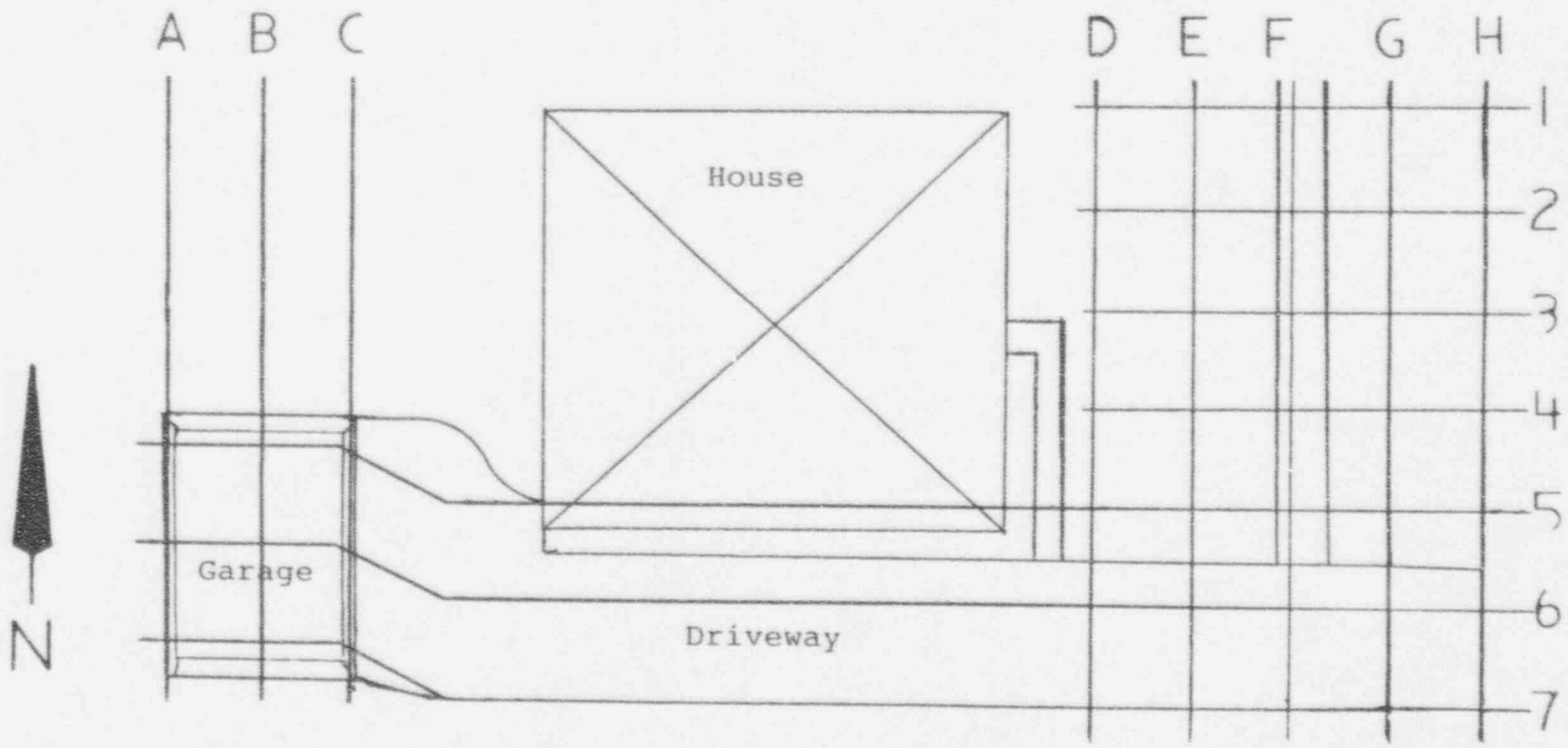
NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
F-5	Yard	N/A	N/A	<MDCR	<MDA	5	1m	N/A	N/A
G-1		<MDCR	<MDA			6			
G-2		N/A	N/A			7			
G-3						8			
G-4						5			
G-5						7			
H-1		<MDCR	<MDA			7			
H-2		N/A	N/A			6			
H-3						6			
H-4						5			
H-5						7			
I-1		<MDCR	<MDA			7			
I-2		N/A	N/A			6			
I-3						8			
I-4						5			
I-5						7			
J-1		<MDCR	<MDA			5			
J-2		N/A	N/A			5			
J-3						6			
J-4						5			
J-5						4			
			N		A				

FIELD SURVEY MAP LOCATION Lot 16/AREA 3982 E. 26th Street Newburgh Hts., OH

DATE 7-8-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/MicroRem SERIAL NO. 108980/108858/B709J

REMARKS _____



SURVEYED BY: J. Miller REVIEWED BY: D. M. L.

[#] = Direct Measurement

(#) = Smear Location

⚠# = Exposure Rate

SURVEY RECORD

DATE 7-8-94

LOCATION: 3982 E. 26th St Lot #16

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A-5	Garage Roof	N/A	N/A	<MDCR	<MDA	5	1	N/A	N/A
A-6		↓	↓			4			
A-7		<MDCR	<MDA			5			
B-5		7.2	130.9			5			
B-7		<MDCR	<MDA			3			
C-5		N/A	N/A			4			
C-6						5			
C-7						4			
D-1	Front Yard					6			
D-2						6			
D-3						5			
D-4						4			
D-5						4			
D-6						5			
D-7						7			
E-1						9			
E-2						7			
E-3						5			
E-4						6			
E-5						9			
E-6						7			
E-7		↓	↓			6			
F-1		<MDCR	<MDA			8			
F-2						5			
F-3		↓	↓	↓	↓	6	↓	↓	↓

DIRECT SURVEY INSTRUMENTS				SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221	α INST		β & γ INST	
S.N.	159990	S.N.	128658	S.N.		S.N.	
CAL DUE	11-26-94	CAL DUE	11-22-94	CAL DUE		CAL DUE	
EFF	0.11	EFF	0.23	EFF	N/A	EFF	N/A
BKG	0.8 cpm	BKG	49 cpm	BKG		BKG	
MDA	105 DPM/100cm²	MDA	1030 DPM/100cm²	MDA		MDA	
MDCR	6.6 cpm	MDCR	84 cpm	MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B707J

CAL DUE 9-30-94

Surveyor (signature) [signature] Date 7-8-94

Reviewed by (signature) [signature] Date 7-13-94

SURVEY RECORD
CONTINUATION

DATE 7-8-94

LOCATION: 3982 E. 21st St Lot #16

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

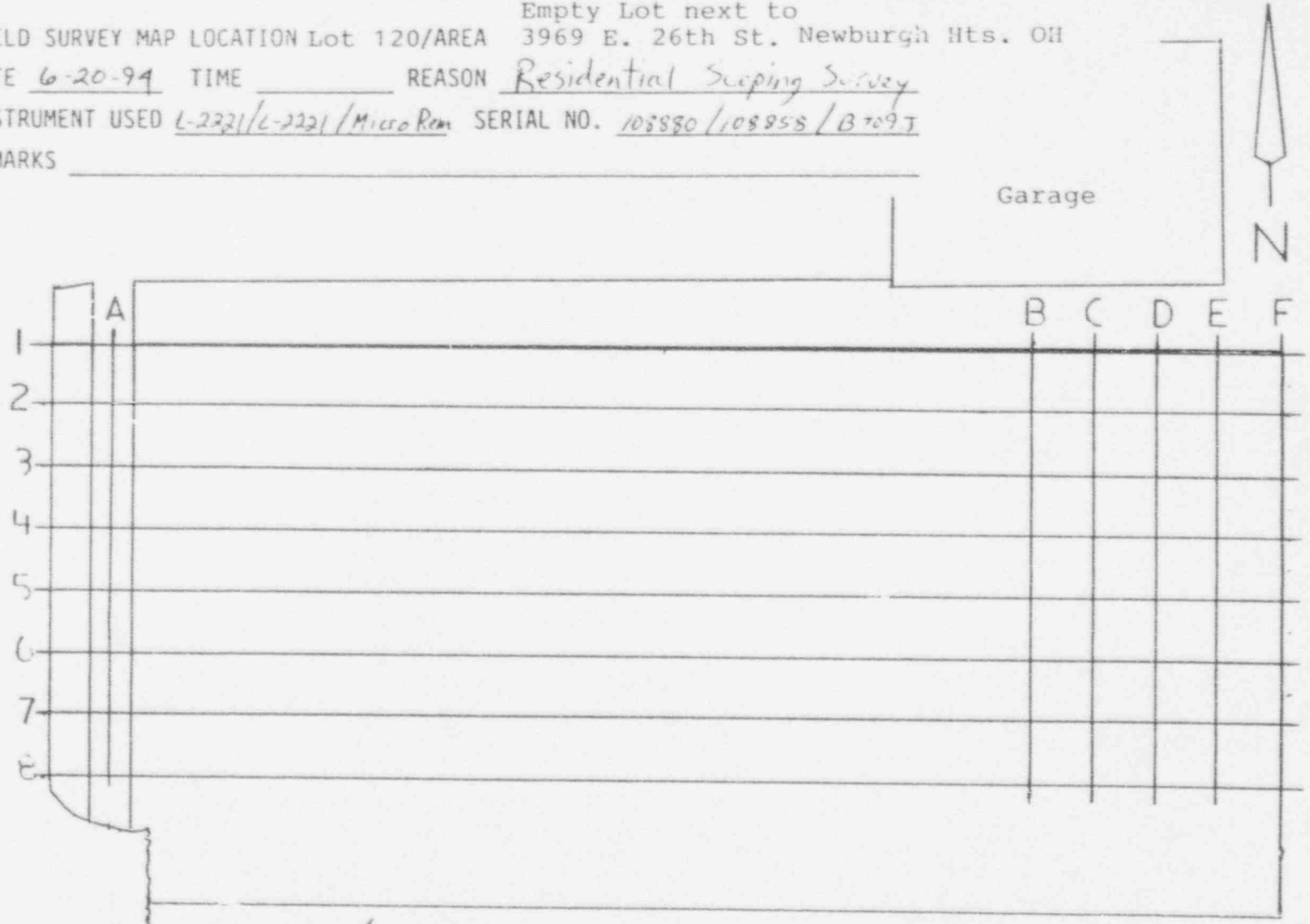
NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
F-4	Front Yard	< MDCR	< MDA	< MDCR	< MDA	7	1	N/A	N/A
5						3			
6						4			
7		▼	▼			5			
G-1		N/A	N/A			4			
2						6			
3						9			
4						6			
5						7			
6						5			
7						5			
H-1						5			
2						11			
3						5			
4						5			
5						5			
6						5			
7	▼	▼	▼	▼	▼	5	▼	▼	▼
			N	A					

FIELD SURVEY MAP LOCATION Lot 120/AREA Empty Lot next to 3969 E. 26th St. Newburgh Hts. OH

DATE 6-20-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/MicroRem SERIAL NO. 108880/108855/B709J

REMARKS _____



SURVEYED BY: [signature] REVIEWED BY: [signature]

[#] = Direct Measurement

(#) = Smear Location

⚠# = Exposure Rate

SURVEY RECORD

DATE 6-20-94

TIME

FIGURE #

LOCATION: Empty Lot, NEXT TO 3969 E. 26TH ST.

REASON FOR SURVEY: Residential Scoping Survey

NO.	ITEM	DIRECT SURVEY MEASUREMENTS α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	EXPOSURE RATE uR/hr	EXPOSURE DISTANCE meters	SMEARABLE CONTAMINATION α dpm/100cm²	β & γ dpm/100cm²
//	//////////////////////								
A-1	WALKWAY	N/A	N/A	<MDCR	<MDA	5	1M	N/A	N/A
A-2						5			
A-3						5			
A-4						5			
A-5						7			
A-6						5			
A-7						6			
A-8						4			
B-1	GRASS LOT (EAST)					4			
B-2						6			
B-3						6			
B-4						6			
B-5						5			
B-6						7			
B-7						6			
B-8						8			
C-1						6			
C-2						7			
C-3						8			
C-4						7			
C-5						5			
C-6						7			
C-7						6			
C-8						5			
D-1						4			

DIRECT SURVEY INSTRUMENTS

α INST	L-2221	β & γ INST	L-2221
S.N.	108880	S.N.	108858
CAL DUE	11-26-94	CAL DUE	11-20-94
EFF	0.12	EFF	0.23
BKG	0.3 cpm	BKG	52 cpm
MDA	77 dpm/100cm²	MDA	1044 Dpm/100cm²
MDCR	4.6 cpm	MDCR	88 cpm

SMEARABLE CONTAMINATION INSTRUMENTS

α INST	N/A	β & γ INST	N/A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

EXPOSURE RATE INSTRUMENT

γ INST MICRO REM

S.N. B 709 J

CAL DUE 8-30-94

REMARKS:

Surveyor (signature) [signature] Date 6/20/94

Reviewed by (signature) [signature] Date 10/1/94

SURVEY RECORD
CONTINUATION

DATE 6-20-94

LOCATION: EMPTY LOT NEXT TO 3969 E. 26TH ST.

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α cepo probe	α dpm/100cm²	β & γ cepo probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
D-2	GRASS LOT (EAST)	N/A	N/A	<MDCR	<MDA	9	1m	N/A	N/A
D-3						7			
D-4						7			
D-5						7			
D-6						9			
D-7						6			
D-8						6			
E-1						9			
E-2						10			
E-3						7			
E-4						8			
E-5						8			
E-6						6			
E-7						8			
E-8						9			
F-1		<MDCR	<MDA			9			
F-2						9			
F-3						8			
F-4						8			
F-5						6			
F-6						7			
F-7						5			
F-8						7			

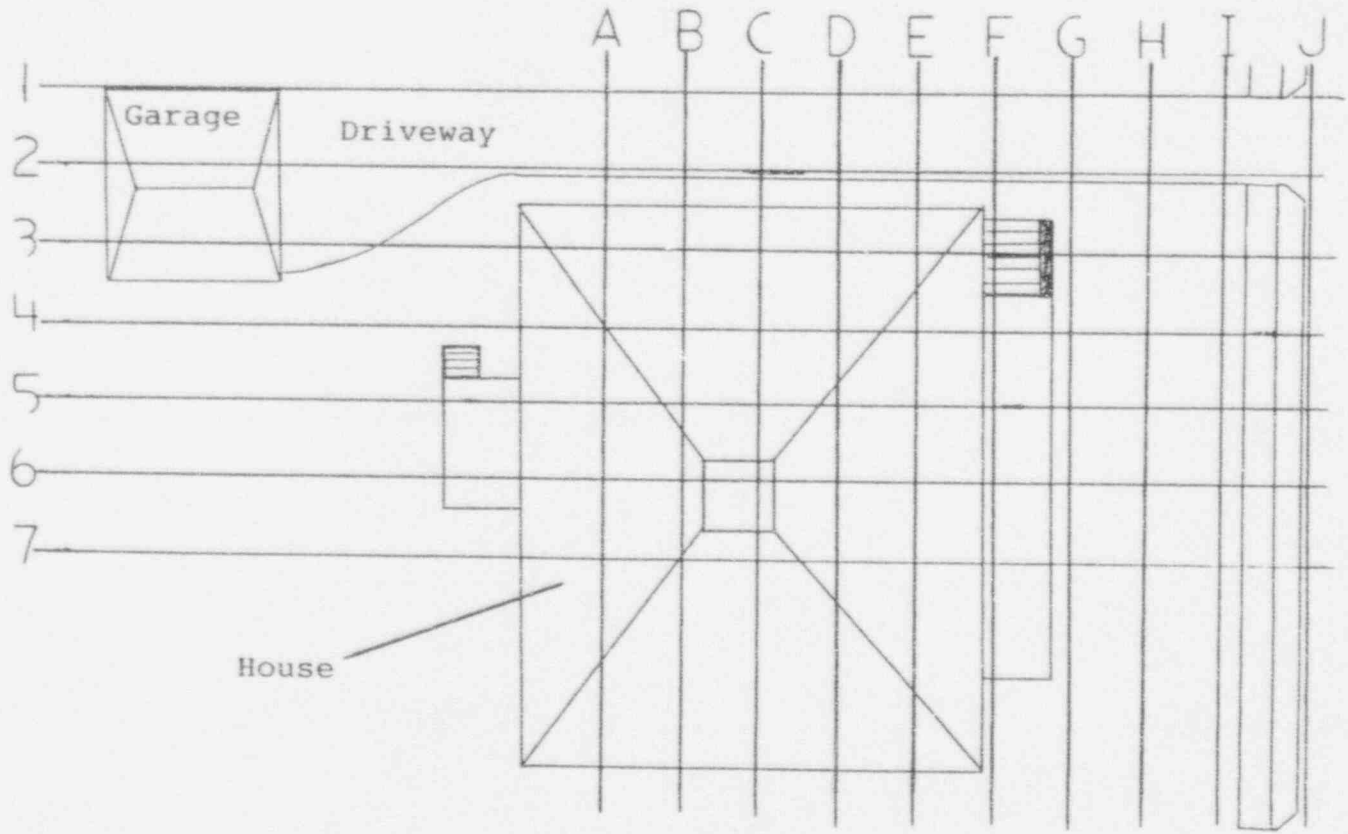
N/A

FIELD SURVEY MAP LOCATION Lot 125/AREA 3999 E. 26th Street Newburgh Hts., OH

DATE 6-24-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/MicroRem SERIAL NO. 105550/105552/18709

REMARKS _____



N

SURVEYED BY: _____ REVIEWED BY: _____

[#] = Direct Measurement

(#) = Smear Location

⚠# = Exposure Rate

SURVEY RECORD

DATE 6-24-94

LOCATION: 3999 E. 26TH ST. LOT # 125

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A-1	DRIVEWAY	<MDCR	<MDA	<MDCR	<MDA	7	1m	N/A	N/A
A-2		N/A	N/A			8			
A-3						8			
B-1		<MDCR	<MDA			8			
B-2		N/A	N/A			8			
B-3				35	972	9			
C-1		<MDCR	<MDA	<MDCR	<MDA	7			
C-2		N/A	N/A			7			
C-3						6			
D-1		<MDCR	<MDA			6			
D-2		N/A	N/A			5			
D-3						6			
E-1		<MDCR	<MDA			6			
E-2		N/A	N/A			5			
E-3						5			
F-1		<MDCR	<MDA			5			
F-2		N/A	N/A			7			
F-3						7			
G-1		<MDCR	<MDA			6			
G-2		N/A	N/A			6			
G-3	STAIRS					7			
H-1	DRIVEWAY	<MDCR	<MDA			6			
H-2		N/A	N/A			5			
H-3						7			
H-4	FRONT YARD					6			

DIRECT SURVEY INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221
S.N.	108880	S.N.	108854
CAL DUE	11-26-94	CAL DUE	11-20-94
EFF	0.13	EFF	0.24
BKG	1.7 cpm	BKG	42 cpm
MDA	135 DPM/100cm²	MDA	917 DPM/100cm²
MDCR	10.5 cpm	MDCR	75 cpm

SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	N/A	β & γ INST	N/A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS: Alpha readings were taken on 6-30-94 due to the fact that the 43-5 alpha probe was out for calibration and repair.

EXPOSURE RATE INSTRUMENT	
γ INST	Micro Rem
S.N.	B709J
CAL DUE	8-30-94

Surveyor (signature) [signature] Date 6-24-94

Reviewed by (signature) [signature] Date 6-29-94

SURVEY RECORD
CONTINUATION

DATE 6-24-94

LOCATION: 3999 E. 26TH ST. LOT # 125

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	µR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
H-5	FRONT YARD	N/A	N/A	<MDCR	<MDA	6	1m	N/A	N/A
H-6						6			
H-7						6			
I-1		<MDCR	<MDA			7			
I-2		N/A	N/A			5			
I-3						6			
I-4						6			
I-5						6			
I-6						6			
I-7						6			
J-1		<MDCR	<MDA			5			
J-2		N/A	N/A			6			
J-3						5			
J-4						6			
J-5						6			
J-6						5			
J-7						5			

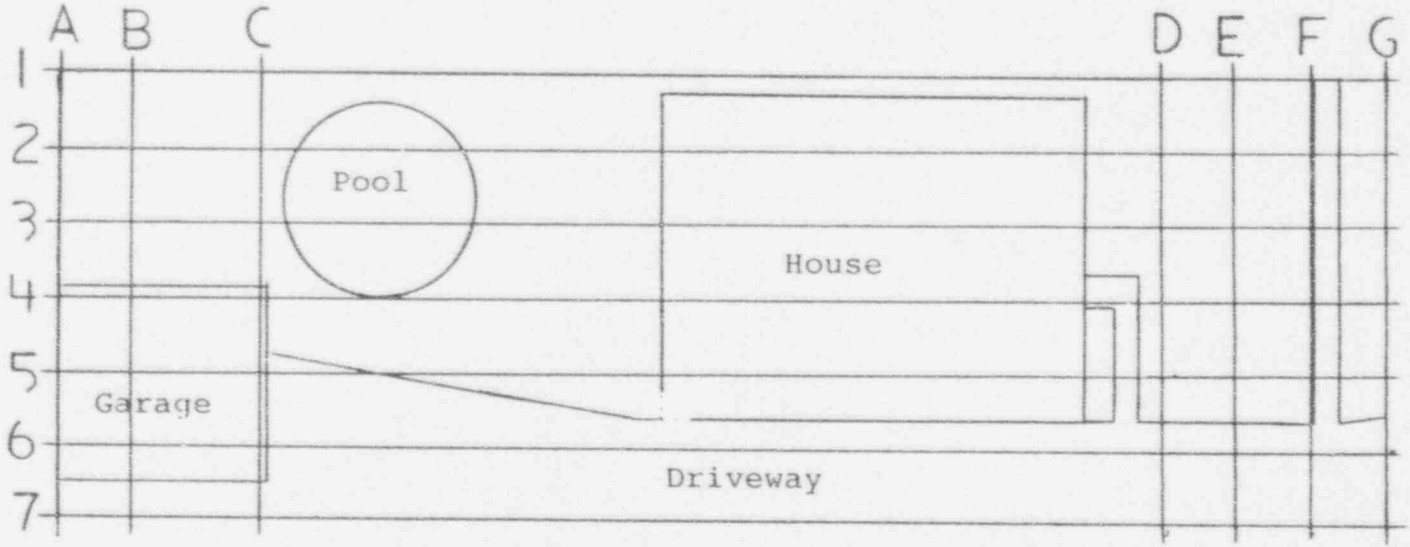
N/A

FIELD SURVEY MAP LOCATION Lot 145 / AREA 4016 E. 27th Street Newburgh Hts., OH

DATE 6-22-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221 / L-2221 / MicroRem SERIAL NO. 108880 / 108858 / B709J

REMARKS _____



SURVEYED BY: Joe Mayo / Dan Mike REVIEWED BY: Duane A. Roffel

[#] = Direct Measurement

(#) = Smear Location

⚠# = Exposure Rate

SURVEY RECORD

DATE 6-22-94

LOCATION: 4016 E. 27th ST. LOT # 145

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A-4	GARAGE ROOF	N/A	N/A	<MDCR	<MDA	6	1m	N/A	N/A
A-5						4			
A-6						6			
B-4						4			
B-6						6			
C-4		<MDCR	<MDA			8			
C-5						8			
C-6						7			
D-1	FRONT YARD	N/A	N/A			5			
D-2				41	139	7			
D-3				39	1083	4			
D-4				<MDCR	<MDA	5			
D-5						5			
D-6						3			
D-7						7			
E-1						5			
E-2						8			
E-3						6			
E-4				33	917	5			
E-5				41	1139	5			
E-6				<MDCR	<MDA	4			
E-7						4			
F-1						5			
F-2						4			
F-3						4			

DIRECT SURVEY INSTRUMENTS		SMEARABLE CONTAMINATION INSTRUMENTS	
α INST L-2221	β & γ INST L-2221	α INST	β & γ INST
S.N. 108880	S.N. 108858	S.N.	S.N.
CAL DUE 11-26-94	CAL DUE 11-20-94	CAL DUE	CAL DUE
EFF 0.12	EFF 0.24	EFF N/A	EFF N/A
BKG 2.3 cpm	BKG 39 cpm	BKG	BKG
MDA 130 DPM/100cm²	MDA 889 DPM/100cm²	MDA	MDA
MDCR 10.1 cpm	MDCR 71 cpm	MDCR	MDCR

REMARKS:

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B709J

CAL DUE 8-30-94

Surveyor (signature) [signature] Date 6-22-94

Reviewed by (signature) [signature] Date 10/11/94

SURVEY RECORD
CONTINUATION

DATE 6-22-94

TIME

FIGURE #

LOCATION: 4016 E. 27TH ST. LOT #145

REASON FOR SURVEY: Residential Scoping Survey

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
F-4	FRONT YARD	N/A	N/A	<MDCR	<MDA	5	1m	N/A	N/A
F-5						6			
F-6						5			
F-7						6			
G-1		<MDCR	<MDA			5			
G-2	DM	~~N~~		33		5			
G-3				<MDCR	<MDA	3			
G-4				33		4			
G-5				33		6			
G-6				<MDCR	<MDA	4			
G-7						5			

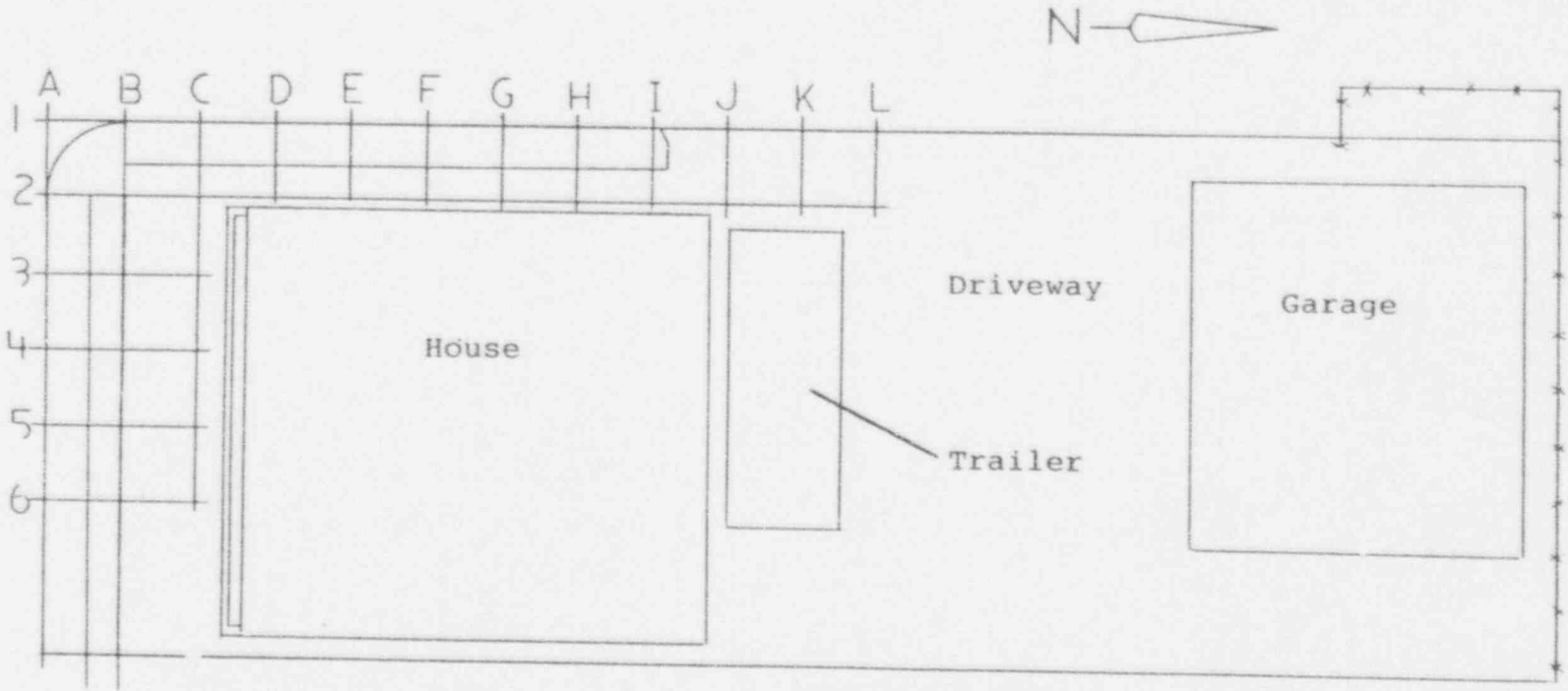
N/A

FIELD SURVEY MAP LOCATION Lot 262/AREA 2701 Ross Ave. Newburgh Hts, OH

DATE 6-21-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/Micro Rem SERIAL NO. 105880/108858/87097

REMARKS _____



SURVEYED BY: Don Miller, Ann Mejia REVIEWED BY: Duane A. Rotter

[#] = Direct Measurement

(#) = Smear Location

⚠# = Exposure Rate

SURVEY RECORD

DATE 6-21-94

LOCATION: 2701 ROSS AVE LOT #262

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	EXPOSURE RATE µR/hr	EXPOSURE DISTANCE meters	SMEARABLE CONTAMINATION α dpm/100cm²	SMEARABLE CONTAMINATION β & γ dpm/100cm²
//	//////////////////////								
A-1	FRONT YARD	N/A	N/A	<MDCR	<MDA	6	1m	N/A	N/A
A-2				36	1000	4			
A-3				<MDCR	<MDA	4			
A-4						5			
A-5						5			
A-6						5			
B-1		<MDCR	<MDA			8			
B-2						7			
B-3						7			
B-4						6			
B-5						3			
B-6						7			
C-1		N/A	N/A			8			
C-2						8			
C-3						9			
C-4						9			
C-5						8			
C-6						9			
D-1	~~NORTH~~ SIDE OF YARD					8			
D-2	WEST DY					11			
E-1						10			
E-2				34	944	6			
F-1				<MDCR	<MDA	8			
F-2						7			
G-1						6			

DIRECT SURVEY INSTRUMENTS

α INST	L-2221	β & γ INST	L-2221
S.N.	108880	S.N.	108858
CAL DUE	11-26-94	CAL DUE	11-20-94
EFF	0.13	EFF	0.24
BKG	1.9 cpm	BKG	43 cpm
MDA	86 DPM/100cm²	MDA	917 DPM/100cm²
MDCR	7.5 cpm	MDCR	76 cpm

SMEARABLE CONTAMINATION INSTRUMENTS

α INST	N/A	β & γ INST	N/A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B709J

CAL DUE 5-30-94

Surveyor (signature) [signature] Date 6-21-94

Reviewed by (signature) [signature] Date 10/11/94

SURVEY RECORD
CONTINUATION

DATE 6-21-94

LOCATION: 2701 ROSS AVE. LOT # 262

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
G-2	WEST SIDE OF YARD	N/A	N/A	< MDCR	< MDA	8	1 m	N/A	N/A
H-1						8			
H-2						7			
I-1						7			
I-2						6			
J-1						8			
J-2						9			
K-1						7			
K-2						7			
L-1						8			
L-2						7			
			N/A						

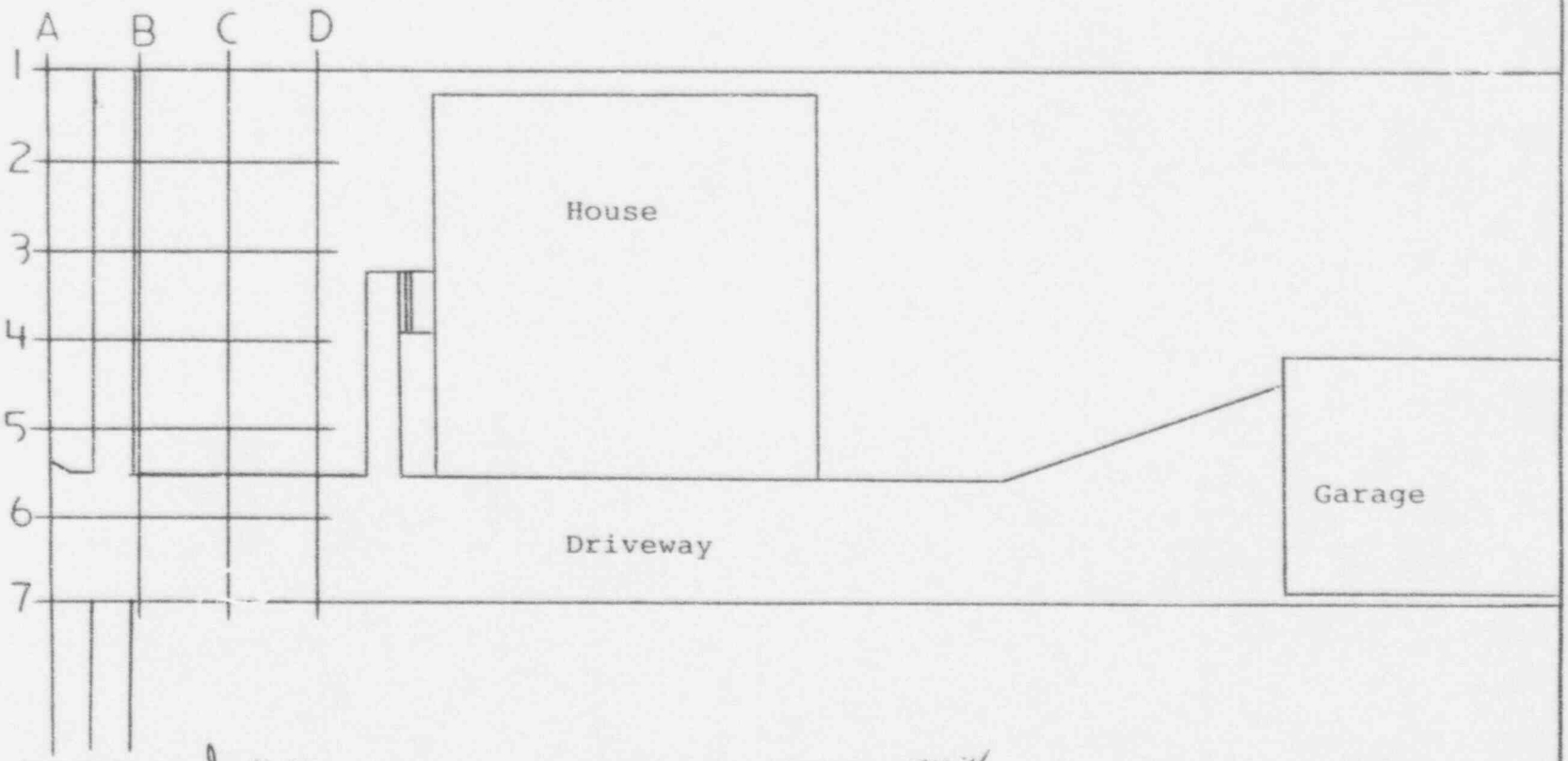
FIELD SURVEY MAP LOCATION Lot 264/AREA 4013 E. 27th Street Newburgh Hts, O

DATE 6-21-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/Micro Rem SERIAL NO. 108880/108858/BT093

REMARKS _____

N



SURVEYED BY: Lee Mojica REVIEWED BY: D. Miller

[#] = Direct Measurement

(#) = Smear Location

⚠# = Exposure Rate

SURVEY RECORD

DATE 6-21-94

LOCATION: Lot # 264 / 4013 E. 27th St. Newburgh Hts. OH

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	EXPOSURE RATE µR/hr	EXPOSURE DISTANCE meters	SMEARABLE CONTAMINATION α dpm/100cm²	SMEARABLE CONTAMINATION β & γ dpm/100cm²
//	//////////////////////								
A1	Yard	<MDCR	<MDA	<MDCR	<MDA	5	1	N/A	N/A
A2						5			
A3						5			
A4						4			
A5						4			
A6						5			
A7						4			
B1	Sidewalk					5			
B2						8			
B3						6			
B4						4			
B5						5			
D6						5			
B7						5			
C1	Yard					5			
C2				39	1083	6			
C3				<MDCR	<MDA	4			
C4						6			
C5				37	1028	6			
C6				<MDCR	<MDA	4			
C7				49	1361	5			
D1				<MDCR	<MDA	6			
D2						8			
D3						5			
D4						6			

DIRECT SURVEY INSTRUMENTS

α INST	L-2221	β & γ INST	L-2221
S.N.	108890	S.N.	108858
CAL DUE	~~5-24-94~~ 11/94	CAL DUE	~~5-24-95~~ 11/95
EFF	0.12	EFF	0.24
BKG	0.3 cpm	BKG	43 cpm
MDA	77 DPM/100cm²	MDA	917 DPM/100cm²
MDCR	4.6 cpm	MDCR	76 cpm

SMEARABLE CONTAMINATION INSTRUMENTS

α INST	N A	β & γ INST	N A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B709J

CAL DUE 8-30-94

Surveyor (signature) Lee Majors Date 6-21-94

Reviewed by (signature) [illegible] Date 6-23-94

SURVEY RECORD
CONTINUATION

DATE 6-21-94

LOCATION: Lot # 264 / 4013 E. 27th St. Newburgh Hts. OH

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

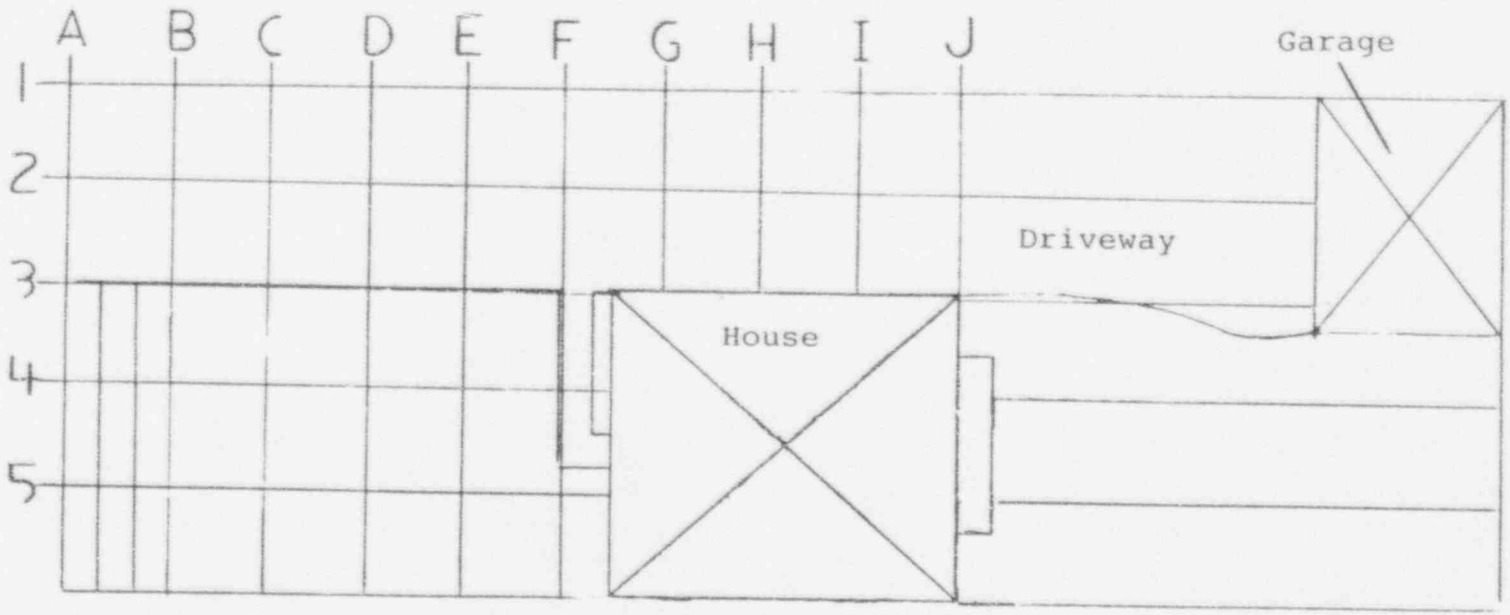
NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
D5	Yard	5.7	95	<MDCR	<MDA	5	1	N/A	N/A
D6	↓	<MDCR	<MDA	↓	↓	5	↓	↓	↓
D7	↓	↓	↓	↓	↓	6	↓	↓	↓
		N	A						

FIELD SURVEY MAP LOCATION Lot 285/AREA 4013 E. 29th Street Newburgh Hts., OH

DATE 6-23-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/MicroRem SERIAL NO. 109880/108859/B709J

REMARKS _____



SURVEYED BY: Lee Mejia

REVIEWED BY: D. M. Hay

[#] = Direct Measurement

(#) = Smear Location

⚠# = Exposure Rate

SURVEY RECORD

DATE 6-23-94

LOCATION: 4013 E. 29TH ST LOT #285

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A-1	FRONT YARD	<MDCR	<MDA	<MDCR	<MDA	6	1m	N/A	N/A
A-2		▼	▼			7			
A-3		7.3	162			4			
A-4		<MDCR	<MDA			6			
A-5		6.3	140	▼	▼	4			
A-6		<MDCR	<MDA	45	1000	5			
B-1		N/A	N/A	<MDCR	<MDA	8			
B2						3			
B3						5			
B4						9			
B5						6			
B6						9			
C-1						6			
C-2						6			
C-3						7			
C-4						6			
C-5						6			
C-6						7			
D-1						6			
D2						6			
D3						8			
D-4						7			
D-5						9			
D-6						6			
E-1	▼	▼	▼	▼	▼	4	▼	▼	▼

DIRECT SURVEY INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221
S.N.	109850	S.N.	109855
CAL DUE	11-26-94	CAL DUE	11-20-94
EFF	0.09	EFF	0.25
BKG	0.7 cpm	BKG	47 cpm
MDA	124 DPM/100cm²	MDA	933 DPM/100cm²
MDCR	6.3 cpm	MDCR	82 cpm

SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	N/A	β & γ INST	N/A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT	
γ INST	Micro Rem
S.N.	B709J
CAL DUE	8-30-94

Surveyor (signature) [signature] Date 6/23/94

Reviewed by (signature) [signature] Date 6-23-94

SURVEY RECORD
CONTINUATION

DATE 6-23-94

LOCATION: 4013 E. 29TH ST LOT #285

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
E-2	FRONT YARD	N/A	N/A	<MDCR	<MDA	4	1m	N/A	N/A
E-3						6			
E-4				49	1089	8			
E-5				<MDCR	<MDA	6			
E-6						6			
F-1	DRIVE WAY					5			
F-2						5			
G-1						5			
G-2						5			
H-1						6			
H-2						6			
I-1						5			
I-2						5			
J-1						7			
J-2						7			

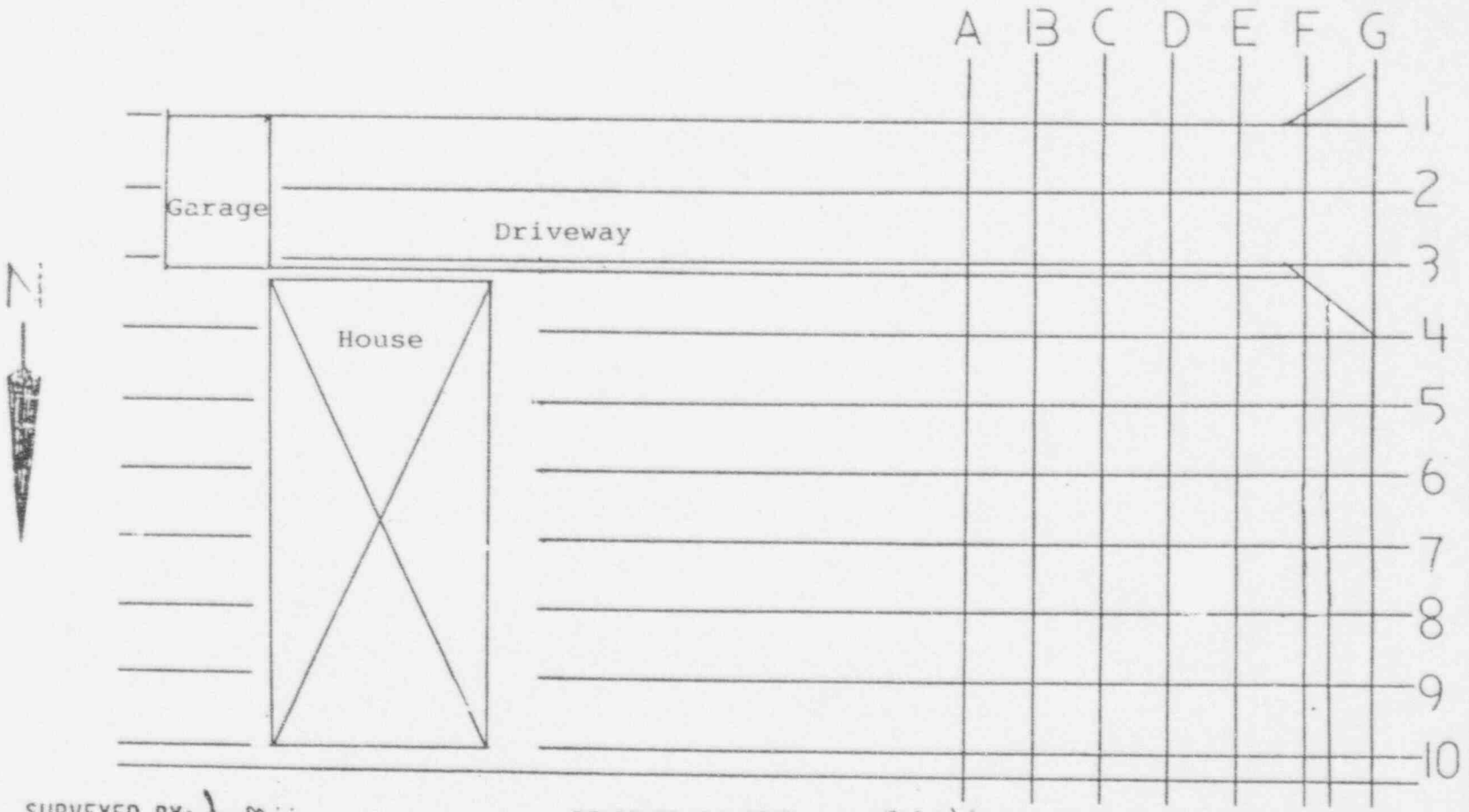
N/A

FIELD SURVEY MAP LOCATION Lot 294 / AREA 3975 E. 29th Street Newburgh Hts., OH

DATE 7-5-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/Micro Rem SERIAL NO. 108850/108858/B709J

REMARKS _____



SURVEYED BY: Jon Mayer REVIEWED BY: [signature]

[#] = Direct Measurement

(#) = Smear Location

⚠# = Exposure Rate

SURVEY RECORD

DATE 7-5-94

LOCATION: 3975 E. 29TH ST LOT #294

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A-1	FRONT YARD	<MDCR	<MDA	<MDCR	<MDA	5	1m	N/A	N/A
A-2						5			
A-3						5			
A-4						4			
A-5						4			
A-6						3			
A-7						6			
A-8						3			
A-9						3			
A-10						3			
B-1						5			
B-2						4			
B-3						6			
B-4						5			
B-5						4			
B-6						4			
B-7						5			
B-8						3			
B-9						5			
B-10						4			
C-1						4			
C-2						5			
C-3						5			
C-4						5			
C-5						5			

DIRECT SURVEY INSTRUMENTS

α INST	L2221	β & γ INST	L-2221
S.N.	109980	S.N.	108858
CAL DUE	11-26-94	CAL DUE	11-20-94
EFF	0.13	EFF	0.24
BKG	1.6 cpm	BKG	46 cpm
MDA	105 DPM/100cm²	MDA	944 DPM/100cm²
MDCR	5.7 cpm	MDCR	50 cpm

SMEARABLE CONTAMINATION INSTRUMENTS

α INST	N/A	β & γ INST	N/A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B709J

CAL DUE 8-30-94

Surveyor (signature) [signature] Date 7-5-94

Reviewed by (signature) [signature] Date 7-8-94

SURVEY RECORD
CONTINUATION

DATE 7-5-94

TIME

FIGURE #

LOCATION: 3975 E. 29TH ST. LOT #294

REASON FOR SURVEY: Residential Scoping Survey

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
C-6	FRONT YARD	<MDCR	<MDA	<MDCR	<MDA	4	1m	N/A	N/A
C-7						5			
C-8						6			
C-9						5			
C-10						4			
D-1						4			
D-2		7.4	114			4			
D-3		<MDCR	<MDA			5			
D-4						5			
D-5						5			
D-6						5			
D-7						4			
D-8						4			
D-9						5			
D-10						5			
E-1						5			
E-2						6			
E-3						5			
E-4						4			
E-5						4			
E-6						5			
E-7						5			
E-8						6			
E-9						5			
E-10						5			
F-1						4			
F-2						5			
F-3						6			
F-4		7.4	114			7			
F-5		<MDCR	<MDA			4			
F-6						6			
F-7						5			
F-8		7.4	114			6			
F-9		<MDCR	<MDA			5			
F-10						5			
G-1						6			
G-2		7.4	114			6			
G-3		<MDCR	<MDA			7			
G-4						5			

SURVEY RECORD
CONTINUATION

DATE 7-5-94

LOCATION: 3975 E. 29th ST. LOT # 294

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
G-5	FRONT YARD	< MDCR	< MDA	< MDCR	< MDA	8	1m	N/A	N/A
G-6						5			
G-7						8			
G-8						7			
G-9						4			
G-10						6			

N/A

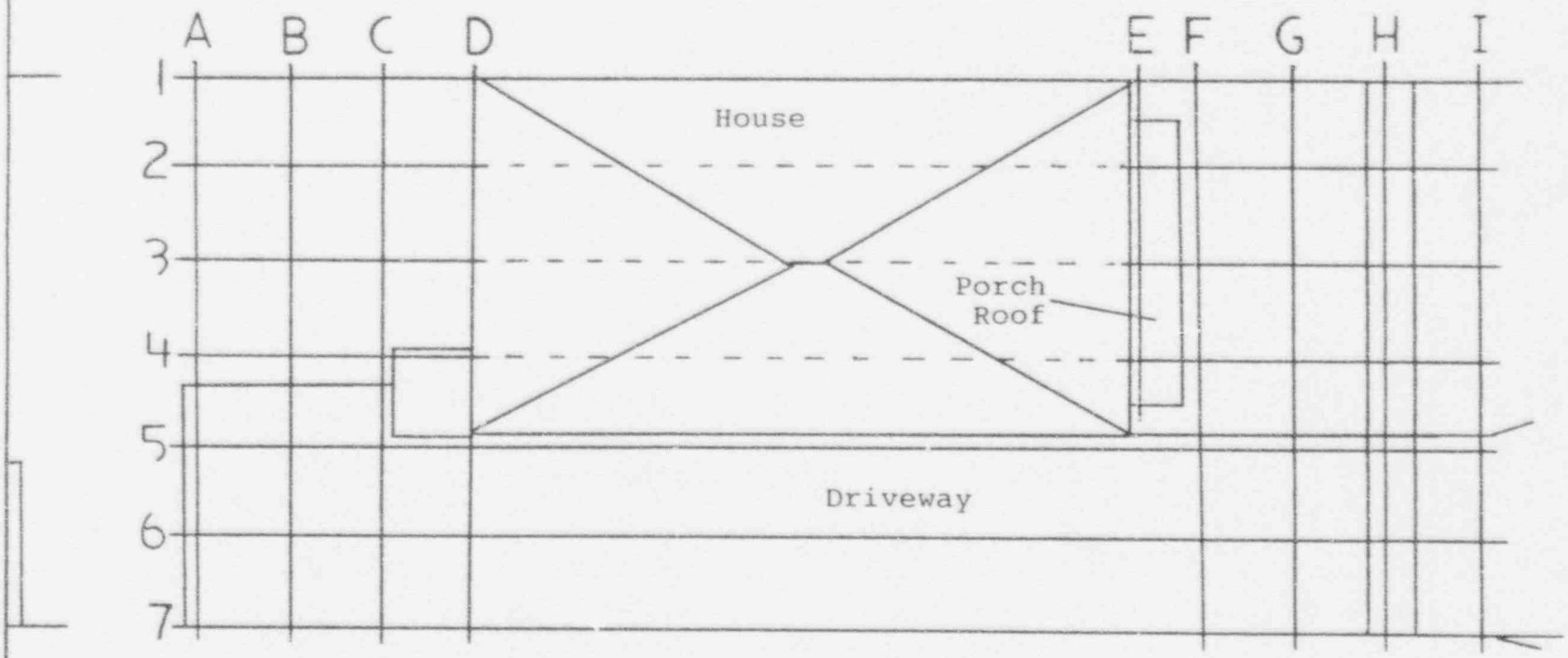
FIELD SURVEY MAP LOCATION Lot 308/AREA 2809 Ross Ave. Newburgh Hts., OH

DATE 7-1-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/MicroRem SERIAL NO. 108890/108858/B709J

REMARKS _____

N



SURVEYED BY: [signature]

REVIEWED BY: [signature]

[#] = Direct Measurement

(#) = Smear Location

⚠# = Exposure Rate

SURVEY RECORD

DATE 7-1-94

LOCATION: 2809 ROSS AVE. LOT # 308

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A-1	BACK YARD	N/A	N/A	<MDCR	<MDA	5	1m	N/A	N/A
A-2						5			
A-3						5			
A-4						5			
B-1						5			
B-2						6			
B-3						5			
B-4						6			
C-1						5			
C-2						6			
C-3						5			
C-4						5			
D-1		<MDCR	<MDA			5			
D-2						6			
D-3						5			
E-2	PORCH ROOF	8.8	160			4			
E-4		<MDCR	<MDA			4			
F-1	FRONT YARD	N/A	N/A			6			
F-2						4			
F-3						4			
F-4						5			
F-5						5			
F-6						6			
F-7						5			
G-1						5			

DIRECT SURVEY INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221
S.N.	108880	S.N.	108858
CAL DUE	11-26-94	CAL DUE	11-20-94
EFF	0.11	EFF	0.22
BKG	1.2 cpm	BKG	47 cpm
MDA	109 DPM/100cm²	MDA	1061 DPM/100cm²
MDCR	7.2 cpm	MDCR	92 cpm

SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	N/A	β & γ INST	N/A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS: Grid locations H-1 thru H-7 are on clay tile sidewalk which accounts for higher readings.

EXPOSURE RATE INSTRUMENT	
γ INST	Micro Rem
S.N.	B709J
CAL DUE	8-30-94

Surveyor (signature) [signature] Date 7-1-94

Reviewed by (signature) [signature] Date 7-11-94

SURVEY RECORD
CONTINUATION

DATE 7-1-94

LOCATION: 2809 ROSS AVE. LOT # 305

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	µR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
G-2	FRONT YARD	N/A	N/A	<MDCR	<MDA	6	1m	N/A	N/A
G-3						4			
G-4						5			
G-5						5			
G-6						5			
G-7						5			
H-1		7.8	142			4			
H-2		6.8	124			5			
H-3		7.8	142			5			
H-4		8.8	160			5			
H-5		7.8	142			5			
H-6		15.8	287			5			
H-7		27.8	505	43	1303	5			
I-1		<MDCR	<MDA	<MDCR	<MDA	5			
I-2						5			
I-3		7.8	142			5			
I-4		<MDCR	<MDA			4			
I-5						5			
I-6						5			
I-7						5			

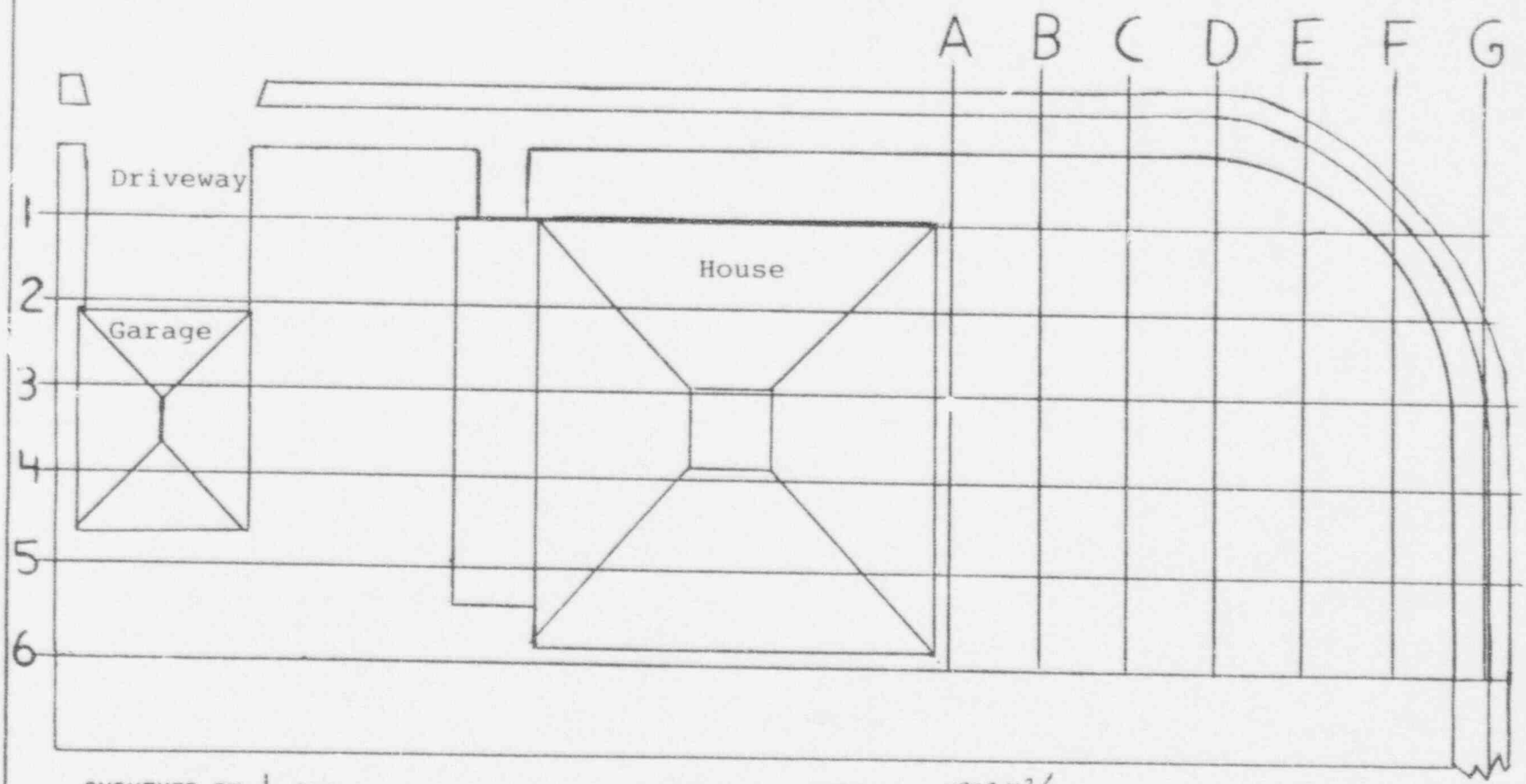
N/A

FIELD SURVEY MAP LOCATION 2813 Hermit Avenue Lot 317/AREA Newburgh Hts., OH

DATE 6-23-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/Micro Rem SERIAL NO. 108880/108858/B709J

REMARKS _____



SURVEYED BY: Lee Myers REVIEWED BY: Dan Mc

[#] = Direct Measurement

(#) = Smear Location

⚠# = Exposure Rate

SURVEY RECORD

DATE 6-23-94

LOCATION: 2813 HERMIT AVE. LOT #317

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS α ugpa probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	EXPOSURE RATE uR/hr	EXPOSURE DISTANCE meters	SMEARABLE CONTAMINATION α dpm/100cm²	SMEARABLE CONTAMINATION β & γ dpm/100cm²
A-1	FRONT YARD	<MDCR	<MDA	<MDCR	<MDA	6	1M	N/A	N/A
A-2				↓	↓	5			
A-3				36	960	5			
A-4				<MDCR	<MDA	5			
A-5						6			
A-6						6			
B-1						5			
B-2						7			
B-3						6			
B-4						6			
B-5						7			
B-6		↓	↓			6			
C-1		N/A	N/A			7			
C-2						8			
C-3						8			
C-4						8			
C-5						6			
C-6						7			
D-1						5			
D-2						6			
D-3						7			
D-4						7			
D-5						6			
D-6						6			
E-1						6			

DIRECT SURVEY INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221
S.N.	108890	S.N.	108858
CAL DUE	11-20-94	CAL DUE	11-20-94
EFF	0.09	EFF	0.25
BKG	0.7 cpm	BKG	47 cpm
MDA	124 DPM/100cm²	MDA	933 DPM/100cm²
MDCR	6.3 cpm	MDCR	82 cpm

SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	N/A	β & γ INST	N/A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT	
γ INST	Micro Rem
S.N.	8709J
CAL DUE	5-30-94

Surveyor (signature) [signature] Date 6-23-94

Reviewed by (signature) [signature] Date 6-30-94

SURVEY RECORD
CONTINUATION

DATE 6-23-94

LOCATION: 7813 HERMIT AVE LOT #317

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
E-2	FRONT YARD	N/A	N/A	<MDCR	<MDA	7	1m	N/A	N/A
E-3						6			
E-4						7			
E-5						7			
E-6						7			
F-1						5			
F-2						5			
F-3						6			
F-4						6			
F-5						7			
F-6						6			
G-3						6			
G-4						5			
G-5						6			
G-6						5			

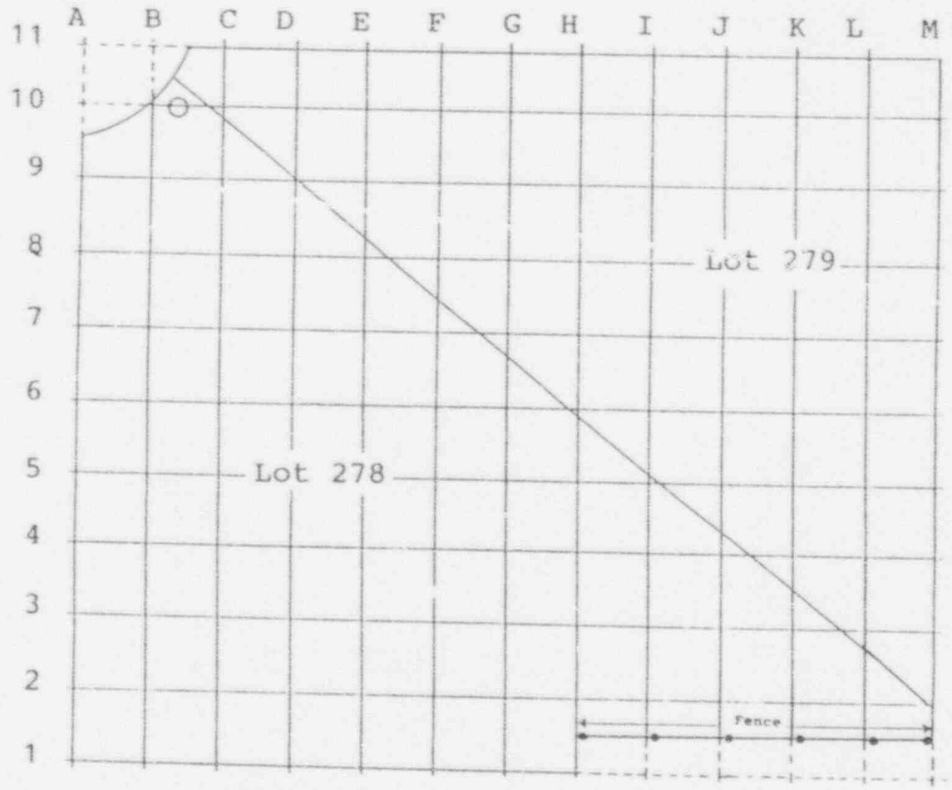
N/A

FIELD SURVEY MAP LOCATION Lot 278&279 /AREA 2816 Hermit Ave. Newburgh Hts., OH

DATE 9-13-93 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/Micro Rem SERIAL NO. 108858/99138/B7095

REMARKS _____



SURVEYED BY: Dan McKay REVIEWED BY: Thomas A. Rathel

SURVEY RECORD

DATE 9-13-94

TIME

FIGURE #

LOCATION: Corner of Hermit Ave. & E. 279th St. / Lot #278-279

REASON FOR SURVEY: Residential Scoping Survey

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A-1	Lot #278-279 Ground	<MDCR	<MDA	31	861	12	1	N/A	N/A
A-2		N/A	N/A	43	1194	N/A			
A-3				<MDCR	<MDA	10			
A-4				29	806	N/A			
A-5				45	1250	7			
A-6				<MDCR	<MDA	N/A			
A-7						9			
A-8						N/A			
A-9						7			
B-1		<MDCR	<MDA	33	917	N/A			
B-2		N/A	N/A	39	1083				
B-3				39	1093				
B-4				31	861				
B-5				<MDCR	<MDA				
B-6				27	750				
B-7				<MDCR	<MDA				
B-8				39	1083				
B-9				39	1083				
B-10		<MDCR	<MDA	<MDCR	<MDA				
C-1		5.6	102			9			
C-2		N/A	N/A			N/A			
C-3						8			
C-4						N/A			
C-5						5			
C-6						N/A			

DIRECT SURVEY INSTRUMENTS		SMEARABLE CONTAMINATION INSTRUMENTS	
α INST L-2221	β INST L-2221	α INST	β & γ INST
S.N. 108858	S.N. 97139	S.N.	S.N.
CAL DUE 4-20-95	CAL DUE 4-7-94	CAL DUE	CAL DUE
EFF 0.11	EFF 0.24	EFF N/A	EFF N/A
BKG 0.1 cpm	BKG 41 cpm	BKG	BKG
MDA 89 DPM/100cm²	MDA 694 DPM/100cm²	MDA	MDA
MDCR 5.3 cpm	MDCR 66 cpm	MDCR	MDCR

REMARKS: Alpha readings were taken on 10-24-94.

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B7095

CAL DUE 4-24-94

Surveyor (signature) [signature] Date 10-24-94

Reviewed by (signature) [signature] Date 10-24-94

SURVEY RECORD
CONTINUATION

DATE 9-13-93

LOCATION: Lot # 278 - 279

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
//	//////////////////////								
C-7	Lot # 278-279 Ground	N/A	N/A	< MDLR	< MDA	8	1	N/A	N/A
C-8				27	750	N/A			
C-9				< MDLR	< MDA	7			
C-10		< MDLR	< MDA			N/A			
C-11						8			
D-1						N/A			
D-2		N/A	N/A						
D-3				27	750				
D-4				29	806				
D-5				< MDLR	< MDA				
D-6									
D-7				33	917				
D-8				35	972				
D-9				29	806				
D-10				27	750				
D-11				< MDLR	< MDA				
E-1		< MDLR	< MDA			9			
E-2		N/A	N/A	31	861	N/A			
E-3				45	1250	7			
E-4				29	806	N/A			
E-5				35	972	6			
E-6				< MDLR	< MDA	N/A			
E-7						7			
E-8				43	1194	N/A			
E-9				43	1194	8			
E-10				< MDLR	< MDA	N/A			
E-11						7			
F-1		< MDLR	< MDA			N/A			
F-2		N/A	N/A	45	1250				
F-3				< MDLR	< MDA				
F-4				29	806				
F-5				37	1028				
F-6				39	1083				
F-7				< MDLR	< MDA				
F-8				29	806				
F-9				41	1139				
F-10				27	750				
F-11				< MDLR	< MDA				
G-1		< MDLR	< MDA			9			

SURVEY RECORD
CONTINUATION

DATE 9-13-93

LOCATION: Lot # 278-279

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
G-2	Lot # 278-279 Ground	N/A	N/A	<MDCR	<MDA	N/A	1	N/A	N/A
G-3				43	1194	8			
G-4				<MDCR	<MDA	N/A			
G-5						8			
G-6				33	917	N/A			
G-7				29	806	6			
G-8				<MDCR	<MDA	N/A			
G-9						7			
G-10						N/A			
G-11				43	1194	7			
H-1		<MDCR	<MDA	37	1028	N/A			
H-2		N/A	N/A	<MDCR	<MDA				
H-3									
H-4				29	806				
H-5				<MDCR	<MDA				
H-6									
H-7									
H-8									
H-9				33	917				
H-10				33	917				
H-11				<MDCR	<MDA				
I-2		<MDCR	<MDA	29	806				
I-3		N/A	N/A	<MDCR	<MDA	8			
I-4						N/A			
I-5						6			
I-6						N/A			
I-7						7			
I-8						N/A			
I-9						6			
I-10						N/A			
I-11		<MDCR	<MDA			7			
J-2						N/A			
J-3		N/A	N/A						
J-4									
J-5									
J-6									
J-7									
J-8									
J-9									

SURVEY RECORD
CONTINUATION

DATE 9-13-93

LOCATION: Lot # 278-279

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

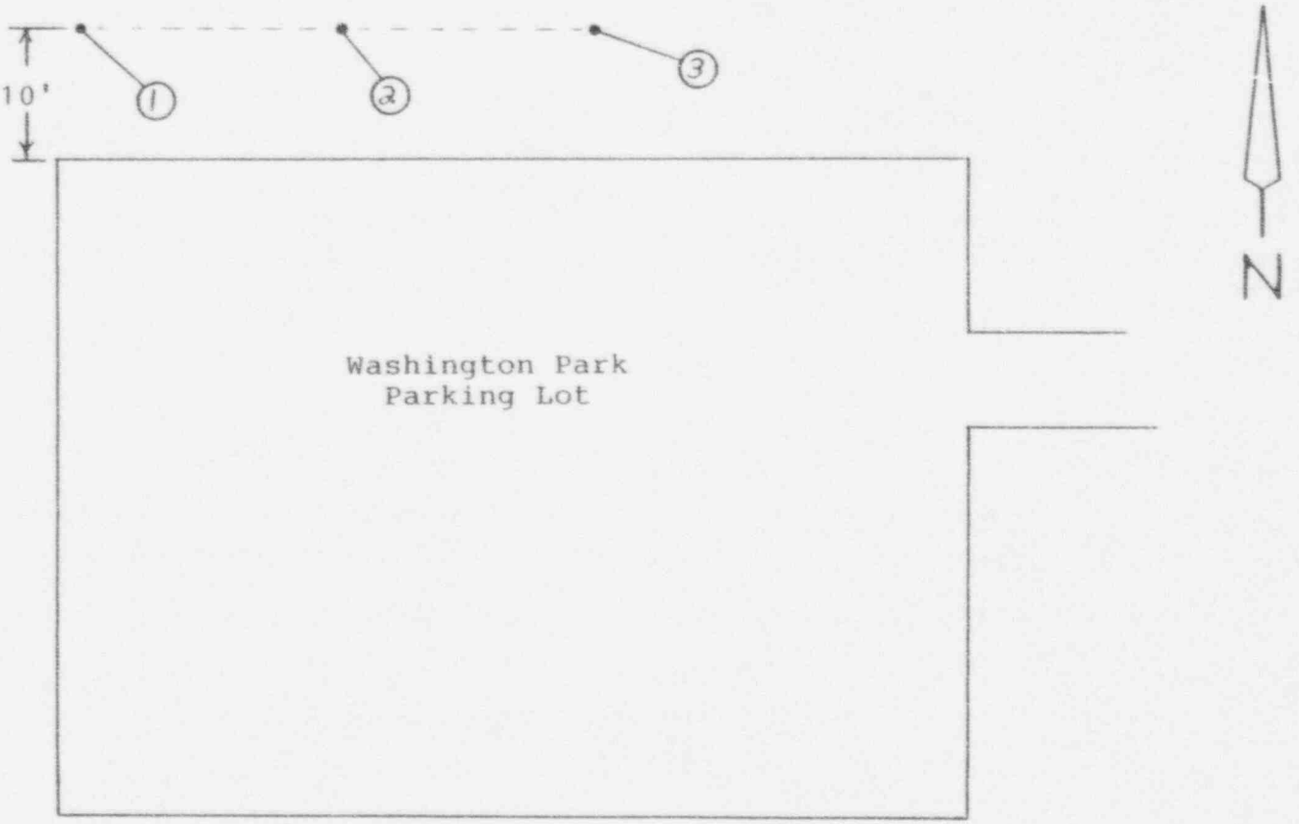
NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
J-10	Lot # 278-279 Ground	N/A	N/A	<MDCR	<MDA	N/A	1	N/A	N/A
J-11		<MDCR	<MDA	39	1083				
K-2		N/A	N/A	43	1194				
K-3				<MDCR	<MDA	5			
K-4						N/A			
K-5						7			
K-6				39	1083	N/A			
K-7				<MDCR	<MDA	6			
K-8						N/A			
K-9						6			
K-10						N/A			
K-11						7			
L-2				33	917	N/A			
L-3				<MDCR	<MDA				
L-4									
L-5									
L-6									
L-7									
L-8									
L-9									
L-10									
L-11				31	861				
M-2				29	806				
M-3				27	750	7			
M-4				43	1194	N/A			
M-5				<MDCR	<MDA	5			
M-6						N/A			
M-7						7			
M-8						N/A			
M-9				35	972	7			
M-10				<MDCR	<MDA	N/A			
M-11				29	806	7			
					A				
			N						

FIELD SURVEY MAP LOCATION /AREA Washington Park Newburgh Hts. OH

DATE 9-15-94 TIME _____ REASON Background for Vicinity Survey Report

INSTRUMENT USED L-2221 / Micro Rem SERIAL NO. 108886 / B7095

REMARKS _____



SURVEYED BY: Paul D. Johnson REVIEWED BY: Dan McClung

SURVEY RECORD

DATE 9-15-94

LOCATION: Washington Park, Newburgh Hts., OH

TIME

REASON FOR SURVEY: Background for Vicinity Survey Report

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	µR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
1	On Ground	5.9	98	<MDCR	<MDA	6	1	N/A	N/A
2	↓	<MDCR	<MDA	↓	↓	6	↓	↓	↓
3	↓	<MDCR	<MDA	↓	↓	6	↓	↓	↓

N A

DIRECT SURVEY INSTRUMENTS				SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221	α INST	N A	β & γ INST	N A
S.N.	108880	S.N.	108880	S.N.		S.N.	
CAL DUE	11-26-94	CAL DUE	11-26-94	CAL DUE		CAL DUE	
EFF	0.12	EFF	0.22	EFF		EFF	
BKG	0.1	BKG	46 cpm	BKG		BKG	
MDA	63 DPM/100 cm²	MDA	788 DPM/100cm²	MDA		MDA	
MDCR	3.9 cpm	MDCR	72 cpm	MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT

γ INST [illegible]-10 Rem

S.N. B709J

CAL DUE 1-23-95

Surveyor (signature) Paul D. Johnson Date 10/25/94

Reviewed by (signature) D. M. Ung Date 10-20-94

APPENDIX B

COMMERCIAL PROPERTY SURVEY DATA

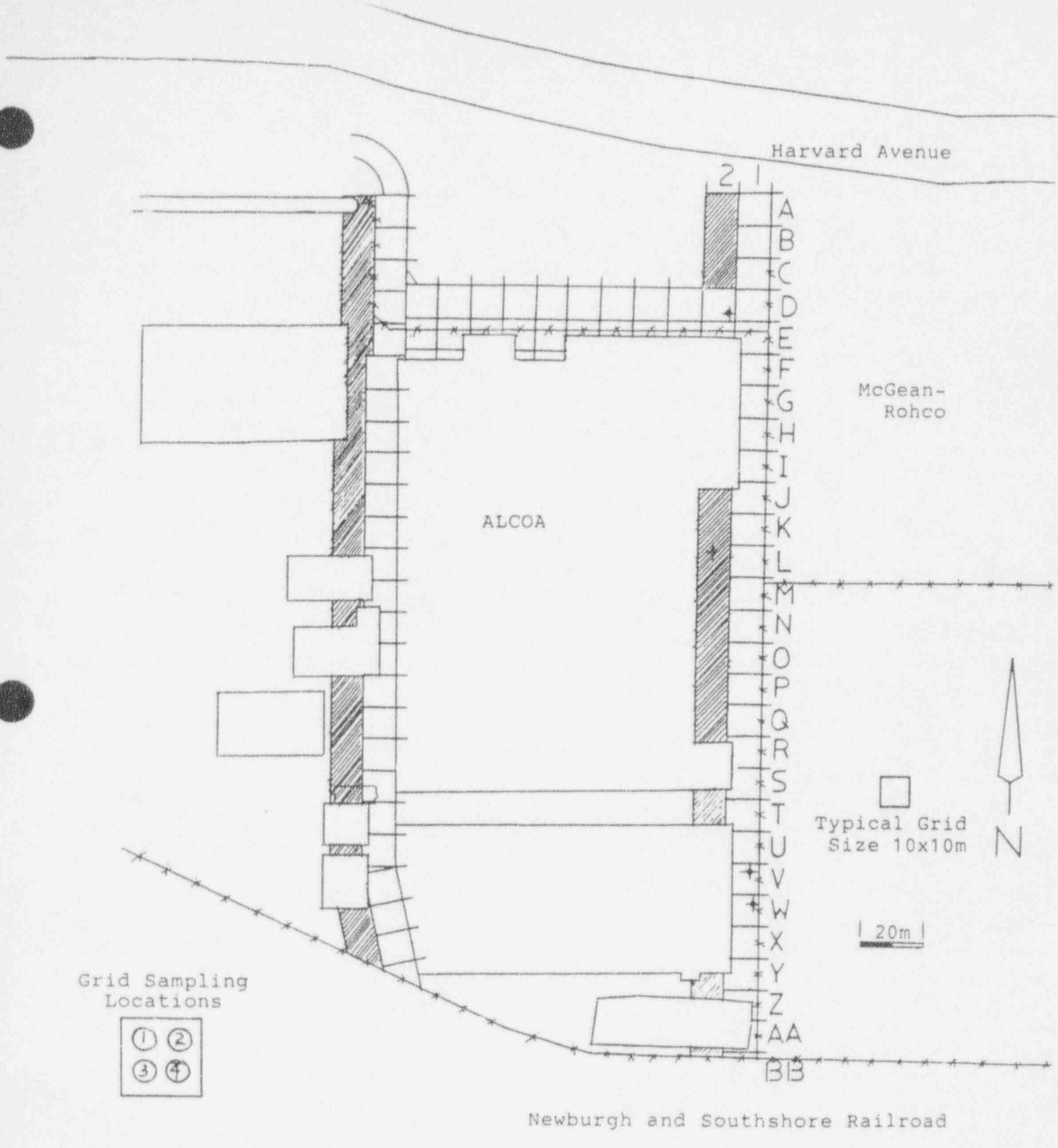


Figure B-1

ALCOA East Perimeter

SURVEY RECORD

DATE 5-18-94

TIME

LOCATION: Alcoa East Perimeter

REASON FOR SURVEY: Vicinity Scoping Survey (Affected Area)

FIGURE # B-1

NO.	ITEM	DIRECT SURVEY MEASUREMENTS α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	EXPOSURE RATE µR/hr	EXPOSURE DISTANCE meters	SMEARABLE CONTAMINATION α dpm/100cm²	SMEARABLE CONTAMINATION β & γ dpm/100cm²
A1-1	Alcoa Grounds	N/A	N/A	<MDCR	<MDA	5	1	N/A	N/A
A1-2		<MDCR	<MDA			5			
A1-3		N/A	N/A			5			
A1-4						6			
B1-1						5			
B1-2						5			
B1-3						4			
B1-4						5			
C1-1						5			
C1-2						5			
C1-3						3			
C1-4						7			
D1-1						3			
D1-2						5			
D1-3						7			
D1-4						1			
E1-1									
E1-2									
E1-3						4			
E1-4						4			
F1-1		<MDCR	<MDA	30	833	6			
F1-2		N/A	N/A	<MDCR	<MDA	3			
F1-3						5			
F1-4						5			
G1-1						5			

DIRECT SURVEY INSTRUMENTS

α INST	L 2221	β & γ INST	L-2221
S.N.	99138	S.N.	99138
CAL DUE	11-4-94	CAL DUE	11-4-94
EFF	0.13	EFF	0.24
BKG	2.5 cpm	BKG	47 cpm
MDA	126 DPM/100cm²	MDA	723 dpm/100cm²
MDCR	10.7 cpm	MDCR	73 cpm

SMEARABLE CONTAMINATION INSTRUMENTS

α INST	N/A	β & γ INST	
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS: Beta-Gamma readings were taken on 5-19-94

EXPOS RATE INSTRUMENT

γ INST Micro REM

S.N. B 709 J

CAL DUE 8-30-94

Surveyor (signature) Dian M. Young Date 5-26-94

Reviewed by (signature) for James A. Ruff Date 10-11-94

SURVEY RECORD
CONTINUATION

DATE 5-18-94

TIME

LOCATION: Alcoa East Perimeter

REASON FOR SURVEY: Vicinity Scoping Survey (Affected Area)

FIGURE # B-1

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
G1-2	Alcoa Grounds	N/A	N/A	<MDCR	<MDA	4	1	N/A	N/A
G1-3						4			
G1-4						5			
H1-1						4			
H1-2						3			
H1-3						4			
H1-4		<MDCR	<MDA			5			
I1-1		N/A	N/A			5			
I1-2						2			
I1-3						3			
I1-4						5			
J1-1						3			
J1-2						5			
J1-3						5			
J1-4						4			
K1-1						5			
K1-2						4			
K1-3						5			
K1-4		<MDCR	<MDA	27	750	3			
L1-1		N/A	N/A	<MDCR	<MDA	5			
L1-2						3			
L1-3						5			
L1-4						6			
M1-1						3			
M1-2						2			
M1-3						5			
M1-4		<MDCR	<MDA			5			
N1-1		N/A	N/A			5			
N1-2						3			
N1-3						5			
N1-4						2			
O1-1						5			
O1-2						4			
O1-3						5			
O1-4						5			
P1-1						3			
P1-2						4			
P1-3						5			
P1-4						4			

SURVEY RECORD
CONTINUATION

DATE: 5-18-94

LOCATION: Alcoa East Perimeter

TIME:

REASON FOR SURVEY: Vicinity Scoping Survey (Affected Area)

FIGURE # B-1

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
Q1-1	ALCOA Grounds	<MDCR	<MDA	<MDCR	<MDA	4	1	N/A	N/A
Q1-2		N/A	N/A			3			
Q1-3						5			
Q1-4						4			
R1-1						6			
R1-2						5			
R1-3						4			
R1-4						5			
S1-1						6			
S1-2						5			
S1-3						6			
S1-4						4			
T1-1						5			
T1-2		<MDCR	<MDA			5			
T1-3		N/A	N/A			5			
T1-4						3			
U1-1						5			
U1-2		<MDCR	<MDA			5			
U1-3		N/A	N/A			3			
U1-4						4			
V1-1						5			
V1-2		<MDCR	<MDA			2			
V1-3		N/A	N/A			7			
V1-4						5			
W1-1						5			
W1-2						3			
W1-3						4			
W1-4						4			
X1-1						5			
X1-2						4			
X1-3						5			
Y1-4		<MDCR	<MDA			3			
Y1-1		N/A	N/A			3			
Y1-2						4			
Y1-3						3			
Y1-4						4			
Z1-1						4			
Z1-2						3			
Z1-3						4			

SURVEY RECORD
CONTINUATION

DATE 5-16-94

TIME

FIGURE # B-1

LOCATION: Alcoa East Perimeter

REASON FOR SURVEY: Vicinity Scoping Survey (Affected Area)

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
Z1-4	Alcoa Grounds	N/A	N/A	<MDCE	<MDA	3	1	N/A	N/A
AA12						4			
AA14						3			
BB11						4			
BB12		<MDCR	<MDA			5			
			N	A					

SURVEY RECORD

DATE 5-20-94

LOCATION: Alcoa East Perimeter

TIME

REASON FOR SURVEY: Vicinity Scoping Survey (Unaffected Area)

FIGURE # B-1

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	B & γ ccpm probe	B & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	B & γ dpm/100cm²
AL-1	Alcoa Grounds	<MDCR	<MDA	192	5565	7		N/A	N/A
AL-3		N/A	N/A	29	841	6			
BL-1		↓	↓	30	870	6			
BL-3		<MDCR	<MDA	39	1130	6			
CL-1		N/A	N/A	<MDCR	<MDA	5			
CL-3				25	725	6			
DL-1		↓	↓	25	725	6			
DL-3		<MDCR	<MDA	40	1159	5			
EL-1		N/A	N/A	<MDCR	<MDA	4			
EL-3						5			
FL-1						4			
FL-3				30	870	4			
GL-1				<MDCR	<MDA	3			
GL-3						4			
HL-1						4			
HL-3						3			
IL-1						4			
IL-3						2			
JL-1						4			
JL-3						3			
KL-1						4			
KL-3				85	1014	5			
LL-1				<MDCR	<MDA	4			
LL-3				38	1101	4			
TL-3		↓	↓	30	870	4	↓	↓	↓

DIRECT SURVEY INSTRUMENTS

α INST	L-2221	B & γ INST	L-2221
S.N.	99138	S.N.	99138
CAL DUE	11-4-94	CAL DUE	11-4-94
EFF	0.13	EFF	0.23
BKG	2.5 cpm	BKG	42 cpm
MDA	126 Dpm/100cm²	MDA	725 Dpm/100cm²
MDCR	10.7 cpm	MDCR	67 cpm

SMEARABLE CONTAMINATION INSTRUMENTS

α INST		B & γ INST	
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF	N A	EFF	N A
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS: Alpha readings were taken on 5-18-94.

EXPOSURE RATE INSTRUMENT

γ INST MICRO REM

S.N. B709I

CAL DUE 8-30-94

Surveyor (signature) [signature] Date 5-26-94

Reviewed by (signature) [signature] Date 10/11/94

SURVEY RECORD
CONTINUATION

DATE: 5-20-94

LOCATION: Alcoa East Perimeter

TIME:

REASON FOR SURVEY: Vicinity Scoping Survey (Unaffected Area)

FIGURE #: B-1

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
423	Alcoa Grounds	N/A	N/A	<MDCR	<MDA	5	1	N/A	N/A
AA23	↓	↓	↓	↓	↓	4	↓	↓	↓
BB21	↓	↓	↓	↓	↓	4	↓	↓	↓
			N	A					

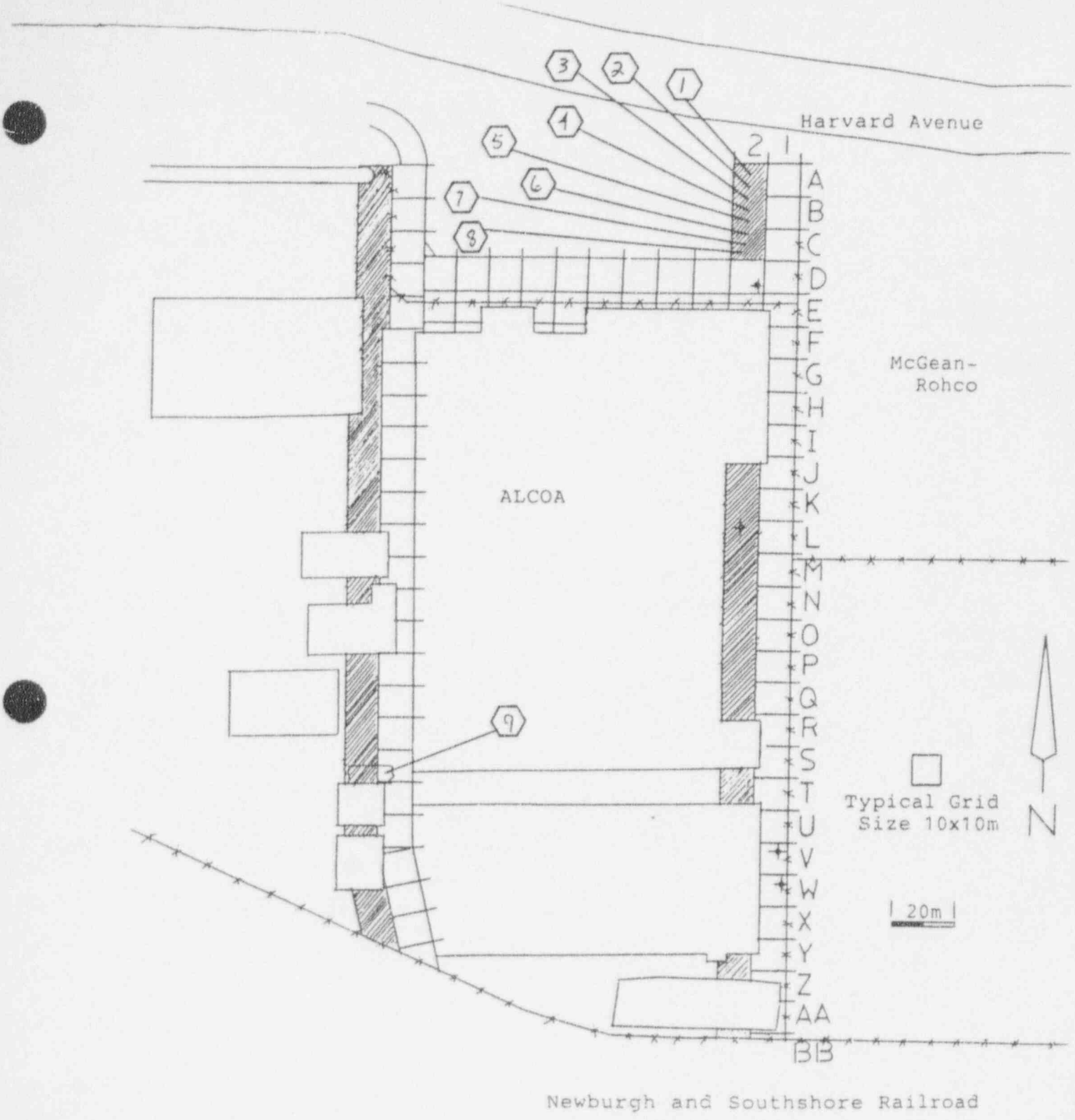


Figure B-1A

ALCOA East Perimeter

SURVEY RECORD

DATE 5-20-94

TIME

FIGURE # B-1A

LOCATION: ALCOA property along Chemetron West Fenceline

REASON FOR SURVEY: Vicinity Scoping Survey (Soil Samples)

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
1	Soil	N/A	N/A	192	5565	N/A	N/A	N/A	N/A
2				29	841				
3				30	870				
4				<MDCR	<MDA				
5				39	1130				
6				<MDCR	<MDA				
7				34	986				
8				<MDCR	<MDA				
9				25	812				
			N A						

DIRECT SURVEY INSTRUMENTS		SMEARABLE CONTAMINATION INSTRUMENTS	
α INST	β & γ INST L 2221	α INST	β & γ INST
S.N.	S.N. 95138	S.N.	S.N.
CAL DUE	CAL DUE 11-4-94	CAL DUE	CAL DUE
EFF N A	EFF 0.23	EFF N A	EFF N A
BKG	BKG 42 cpm	BKG	BKG
MDA	MDA 725 dpm/100cm²	MDA	MDA
MDCR	MDCR 67 cpm	MDCR	MDCR

REMARKS: Sample locations shown on Figure 1A map were surveyed with a Ludlum 2221 accompanied with a 44-9 pancake probe for beta-gamma. Samples were taken in areas of highest elevated reading.

EXPOSURE RATE INSTRUMENT

γ INST

S.N. N A

CAL DUE

Surveyor (signature) Dan M Kay Date 5-23-94

Reviewed by (signature) Duane C. Rapp Date 10/11/94

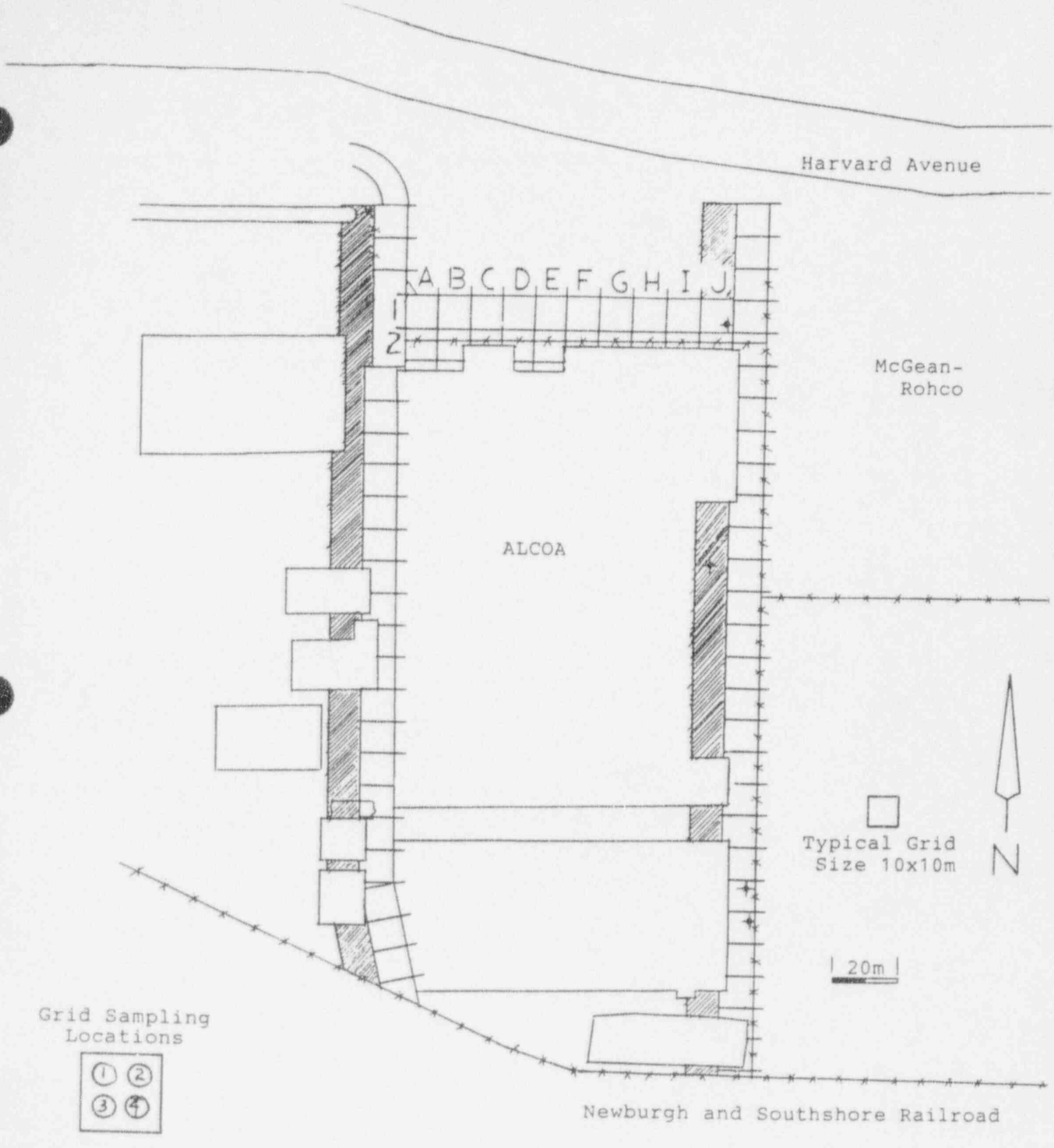


Figure B-2

ALCOA Road South of Old Bldg. 65

SURVEY RECORD

DATE 5-19-94

LOCATION: Alcoa Road Running East-West of Old Bldg. 65

TIME

REASON FOR SURVEY: Vicinity Scoping Survey

FIGURE # B-2

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
//	//////////////////////								
A1-1	ALCOA Grounds	N/A	N/A	<MDCR	<MDA	6	1	N/A	N/A
A1-2						4			
A1-3						6			
A1-4						5			
B1-1						5			
B1-2		<MDCR	<MDA			5			
B1-3		N/A	N/A			6			
B1-4						5			
C1-1						5			
C1-2						6			
C1-3						4			
C1-4						4			
D1-1						5			
D1-2						6			
D1-3						6			
D1-4						4			
E1-1						6			
E1-2		<MDCR	<MDA			6			
E1-3		N/A	N/A			6			
E1-4						6			
F1-1						6			
F1-2						6			
F1-3						6			
F1-4						6			
G1-1						5			

DIRECT SURVEY INSTRUMENTS

α INST	L-2221	β & γ INST	L-2221
S.N.	99138	S.N.	99138
CAL DUE	11-4-94	CAL DUE	11-4-94
EFF	0.13	EFF	0.24
BKG	3.5 cpm	BKG	47 cpm
MDA	145 dpm/100cm²	MDA	722 dpm/100cm²
MDCR	13.2 cpm	MDCR	73 cpm

SMEARABLE CONTAMINATION INSTRUMENTS

α INST	N/A	β & γ INST	N/A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR			

EXPOSURE RATE INSTRUMENT

γ INST MICRO 120M

S.N. B709J

CAL DUE 8-30-94

REMARKS:

Surveyor (signature) Erin McKay Date 6-6-94

Reviewed by (signature) for Duane A. Reynolds Date 10/11/94

SURVEY RECORD
CONTINUATION

DATE 5-20-94

LOCATION: Alcon Road Running East-West of Old Bldg 65

TIME

REASON FOR SURVEY: Vicinity Scoping Survey

FIGURE # B-2

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
G1-2	ALCOA Grounds	N/A	N/A	<MDCR	<MDA	6	1	N/A	N/A
G1-3						5			
G1-4						6			
H1						6			
H1-2						6			
H1-3		↓	↓			5			
H1-4		<MDCR	<MDA			6			
I1-1		N/A	N/A			5			
I1-2						5			
I1-3						4			
I1-4		↓	↓			5			
J1-1		<MDCR	<MDA			5			
J1-2		N/A	N/A			5			
J1-3						6			
J1-4						5			
A2-1						5			
A2-2						5			
A2-3						5			
A2-4						4			
B2-1						5			
B2-2		↓	↓			4			
B2-3		<MDCR	<MDA			5			
B2-4		N/A	N/A			5			
C2-1						5			
C2-2						5			
D2-1						6			
D2-2						5			
D2-3						6			
D2-4		↓	↓			6			
E2-1		<MDCR	<MDA			5			
E2-2		N/A	N/A			6			
E2-3						6			
E2-4		↓	↓			5			
F2-1		<MDCR	<MDA			5			
F2-2		N/A	N/A			5			
G2-3						5			
H2-2						5			
H2-1						0			
H2-2	↓	↓	↓	↓	↓	5	↓	↓	↓

SURVEY RECORD
CONTINUATION

DATE 5-20-94

LOCATION: ALCOA Road Running East West of Old Bldg 65

TIME

REASON FOR SURVEY: Vicinity Scoping Survey

FIGURE # B-2

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
I2-1	ALCOA GROUNDS	N/A	N/A	CMDCR	CMDA	6	1	NA	N/A
I2-6	↓	↓	↓	↓	↓	6	↓	↓	↓
I2-1	↓	↓	↓	↓	↓	5	↓	↓	↓
I2-4	↓	↓	↓	↓	↓	5	↓	↓	↓

N A

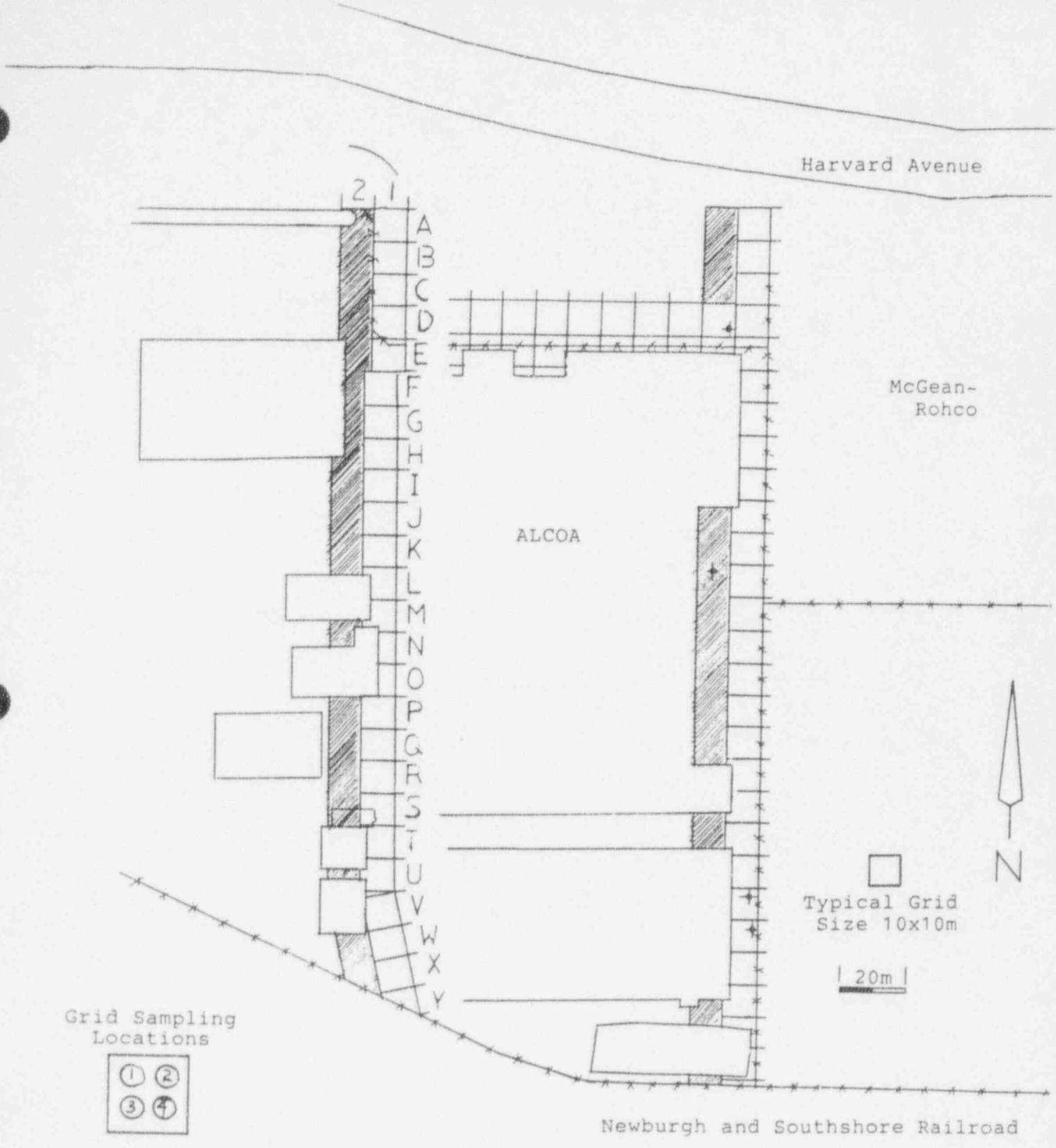


Figure B-3

ALCOA West Perimeter

SURVEY RECORD

DATE 5-19-94

LOCATION: Alcoa West Perimeter (Affected Area)

TIME

REASON FOR SURVEY: Vicinity Scoping Survey

FIGURE # B-3

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A+1	ALCOA Grounds	<MDCR	<MDA	<MDCR	<MDA	5	1	N/A	N/A
A+2						4			
A+3						6			
A+4						7			
B+1						7			
B+2						6			
B+3						7			
B+4						6			
C+1						7			
C+2						6			
C+3						6			
C+4		<MDCR	<MDA			5			
D+1		N/A	N/A			6			
D+2						6			
D+3						6			
D+4						5			
E+1						6			
E+2						6			
E+3						6			
E+4						6			
F+1						6			
F+2						6			
F+3						6			
F+4						5			
G+1						5			

DIRECT SURVEY INSTRUMENTS

α INST	L-2221	β & γ INST	L-2221
S.N.	99138	S.N.	99138
CAL DUE	1-4-94	CAL DUE	1-4-94
EFF	0.13	EFF	0.24
BKG	2.8 cpm	BKG	47 cpm
MDA	131 dpm/100cm²	MDA	722 dpm/100cm²
MDCR	11.3 cpm	MDCR	73 cpm

SMEARABLE CONTAMINATION INSTRUMENTS

α INST	N/A	β & γ INST	N/A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS: Alpha Readings were taken on 6-3-94
mR/HR Readings were taken on 5-19-94

EXPOSURE RATE INSTRUMENT

γ INST MICRO Rem
S.N. B7095
CAL DUE 8-30-94

Surveyor (signature) [signature] Date 5-23-94

Reviewed by (signature) [signature] Date 10/1/94

SURVEY RECORD
CONTINUATION

DATE: 5-19-94

LOCATION: Alcoa West Perimeter (Affected Area)

TIME:

REASON FOR SURVEY: Vicinity Scoping Survey

FIGURE # B-3

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
//	//////////////////////								
G-2	Alcoa Grounds	N/A	N/A	<MDCR	<MDA	6	1	N/A	N/A
G-3						6			
G-4						6			
H-1						5			
H-2						6			
H-3						6			
H-4						6			
I-1						7			
I-2						7			
I-3						5			
I-4						3			
J-1						4			
J-2						6			
J-3						7			
J-4						5			
K-1						7			
K-2		<MDCR	<MDA			7			
K-3		N/A	N/A			6			
K-4						7			
L-1						4			
L-2						4			
L-3						4			
L-4						5			
M-1						6			
M-2						6			
M-3						6			
M-4						6			
N-1						6			
N-2		<MDCR	<MDA			7			
O-2		N/A	N/A			7			
O-4						7			
P-1						4			
P-2						5			
P-3						4			
P-4						5			
Q-1		<MDCR	<MDA			5			
Q-2		<MDCR	<MDA			5			
Q-3		N/A	N/A			6			
Q-4		N/A	N/A			5			

SURVEY RECORD
CONTINUATION

DATE 5-19-94

TIME

FIGURE # B-3

LOCATION: Alcoa West Perimeter (Affected Area)

REASON FOR SURVEY: Vicinity Scoping Survey

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
R1-1	Alcoa Grounds	N/A	N/A	<MDCR	<MDA	6	1	N/A	N/A
R1-2						7			
R1-3						5			
R1-4						6			
S1-1						6			
S1-2						7			
S1-3		<MDCR	<MDA			4			
S1-4		<MDCR	<MDA			6			
T1-1		N/A	N/A			7			
T1-2		<MDCR	<MDA			7			
T1-3		N/A	N/A			7			
T1-4						5			
U1-1						5			
U1-2						6			
U1-3						5			
U1-4						4			
V1-1						4			
V1-2						5			
V1-3						5			
V1-4		<MDCR	<MDA			4			
W1-1		N/A	N/A			7			
W1-2						6			
W1-3						7			
W1-4				37	1038	6			
X1-1				<MDCR	<MDA	5			
X1-2		<MDCR	<MDA			4			
X1-3		N/A	N/A			5			
X1-4						6			
Y1-1						4			
Y1-2						4			
Y1-4		<MDCR	<MDA			7			
			N		A				

SURVEY RECORD

DATE 5-20-94

LOCATION: Alcoa West Perimeter (Unaffected Area)

TIME

REASON FOR SURVEY: Vicinity Scoping Survey

FIGURE # B-3

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A2-C	ALCOA Grounds	N/A	N/A	<MDCR	<MDA	6	1	N/A	N/A
A2-4						6			
B2-C						6			
B2-4						6			
C2-C						7			
C2-4						6			
D2-C						7			
D2-4						6			
E2-C						6			
F2-C		<MDCR	<MDA	29	941	5			
G-2-C		N/A	N/A	<MDCR	<MDA	6			
H2-C						5			
I2-C						7			
I2-4						7			
J2-C		<MDCR	<MDA	28	812	4			
J2-4		N/A	N/A	<MDCR	<MDA	4			
K2-C						4			
K2-4						4			
M2-C						4			
M2-4						5			
P2-C						5			
P2-4						6			
Q2-C						6			
Q2-4						4			
R2-C		<MDCR	<MDA	28	812	5			

DIRECT SURVEY INSTRUMENTS		SMEARABLE CONTAMINATION INSTRUMENTS	
α INST E-2221	β & γ INST E-2221	α INST	β & γ INST
S.N. 99138	S.N. 99138	S.N.	S.N.
CAL DUE 11-4-94	CAL DUE 11-4-94	CAL DUE	CAL DUE
EFF 0.13	EFF 0.23	EFF N/A	EFF N/A
BKG 2.8 cpm	BKG 42 cpm	BKG	BKG
MDA 131 dpm/100cm²	MDA 725 dpm/100 cm²	MDA	MDA
MDCR 11.3 cpm	MDCR 67 cpm	MDCR	MDCR

REMARKS: Alpha readings were taken on 6-3-94

EXPOSURE RATE INSTRUMENT

γ INST MICRO REM

S.N. B709J

CAL DUE 8-30-94

Surveyor (signature) [signature] Date 5-23-94

Reviewed by (signature) [signature] Date 12/1/94

SURVEY RECORD
CONTINUATION

DATE: 5-26-94

LOCATION: Alcoa West Perimeter (Unaffected Area)

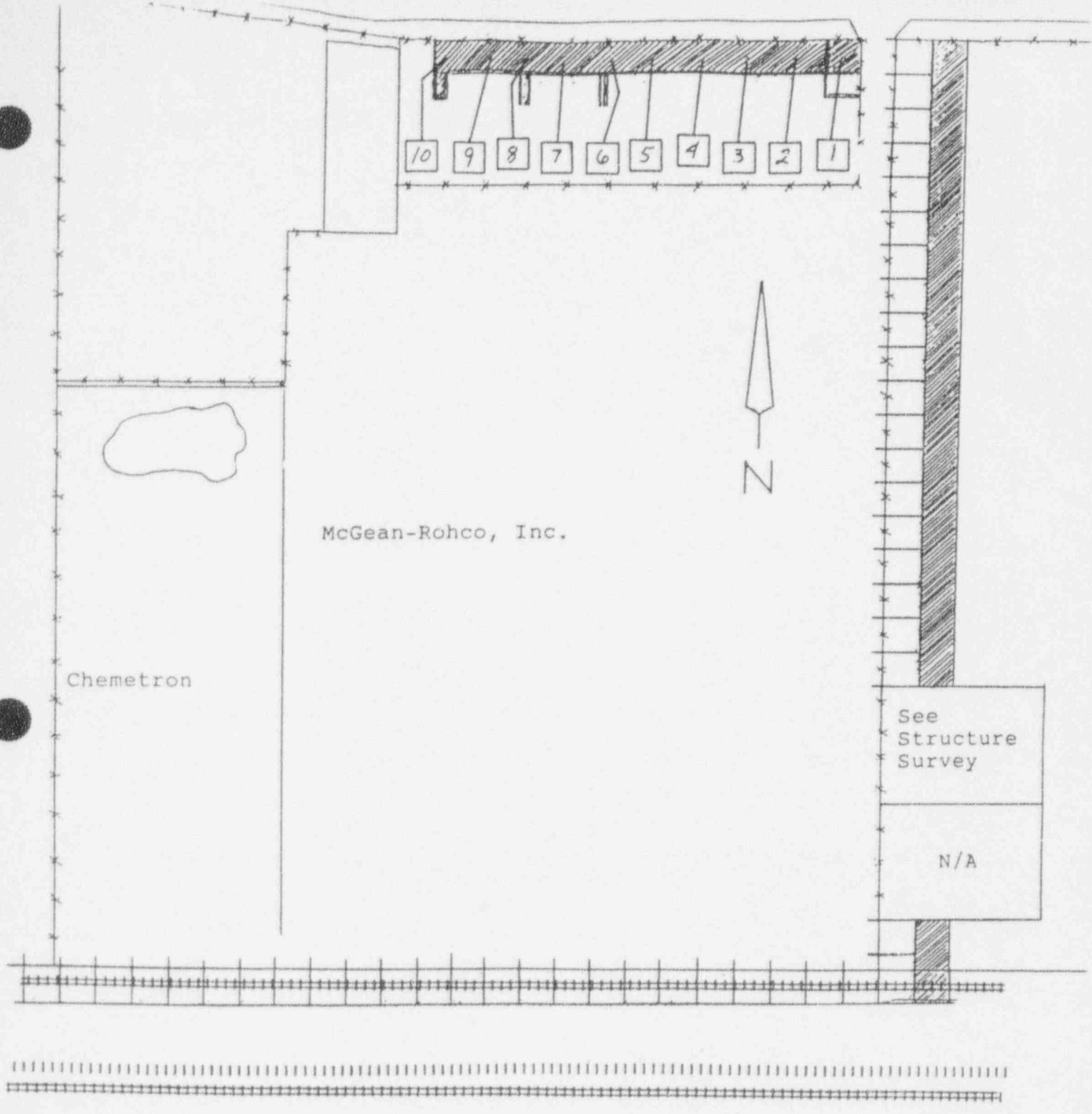
TIME:

REASON FOR SURVEY: Vicinity Scoping Survey

FIGURE # B-3

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
B2-4	Alcoa Grounds	N/A	N/A	<MDCR	<MDA	4	1	N/A	N/A
S2-3	↓	↓	↓	↓	↓	5	↓	↓	↓
S2-4		↓	↓	↓	↓	5			
W2-2		<MDCR	<MDA	29	841	6			
W2-4		N/A	N/A	<MDCR	<MDA	5			
X2-2		<MDCR	<MDA	<MDCR	<MDA	4			
X2-4	↓	<MDCR	<MDA	28	812	5	↓	↓	↓

N A



= Affected Area

= Unaffected Area

= Fencelines

Typical Grid Size 10x10m

1 2
3 4

Grid Sampling Locations

20m

Figure B-4

SURVEY RECORD

DATE 10-29-93

LOCATION: McGoon - Rehco North Perimeter

TIME

REASON FOR SURVEY: Vicinity Scoping Survey

FIGURE # B-4

NO.	ITEM	DIRECT SURVEY MEASUREMENTS α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	EXPOSURE RATE uR/hr	EXPOSURE DISTANCE meters	SMEARABLE CONTAMINATION α dpm/100cm²	β & γ dpm/100cm²
1	Soil in Planter	N/A	N/A	<MDCR	<MDA	7	1	N/A	N/A
2		<MDCR	<MDA	↓	↓	8	↓	↓	↓
3		N/A	N/A	33	917	9			
4		↓	↓	<MDCR	<MDA	7			
5				↓	↓	7			
6				↓	↓	6			
7				28	778	8			
8				<MDCR	<MDA	8			
9		↓	↓	↓	↓	7			
10	↓	<MDCR	<MDA	32	889	7	↓	↓	↓

N A

DIRECT SURVEY INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221
S.N.	99138	S.N.	99138
CAL DUE	4-7-94	CAL DUE	4-7-94
EFF	0.13	EFF	0.24
BKG	1.8 cpm	BKG	44 cpm
MDA	1.2 dpm/100cm²	MDA	722 dpm/100cm²
MDCR	9.1 cpm	MDCR	70 cpm

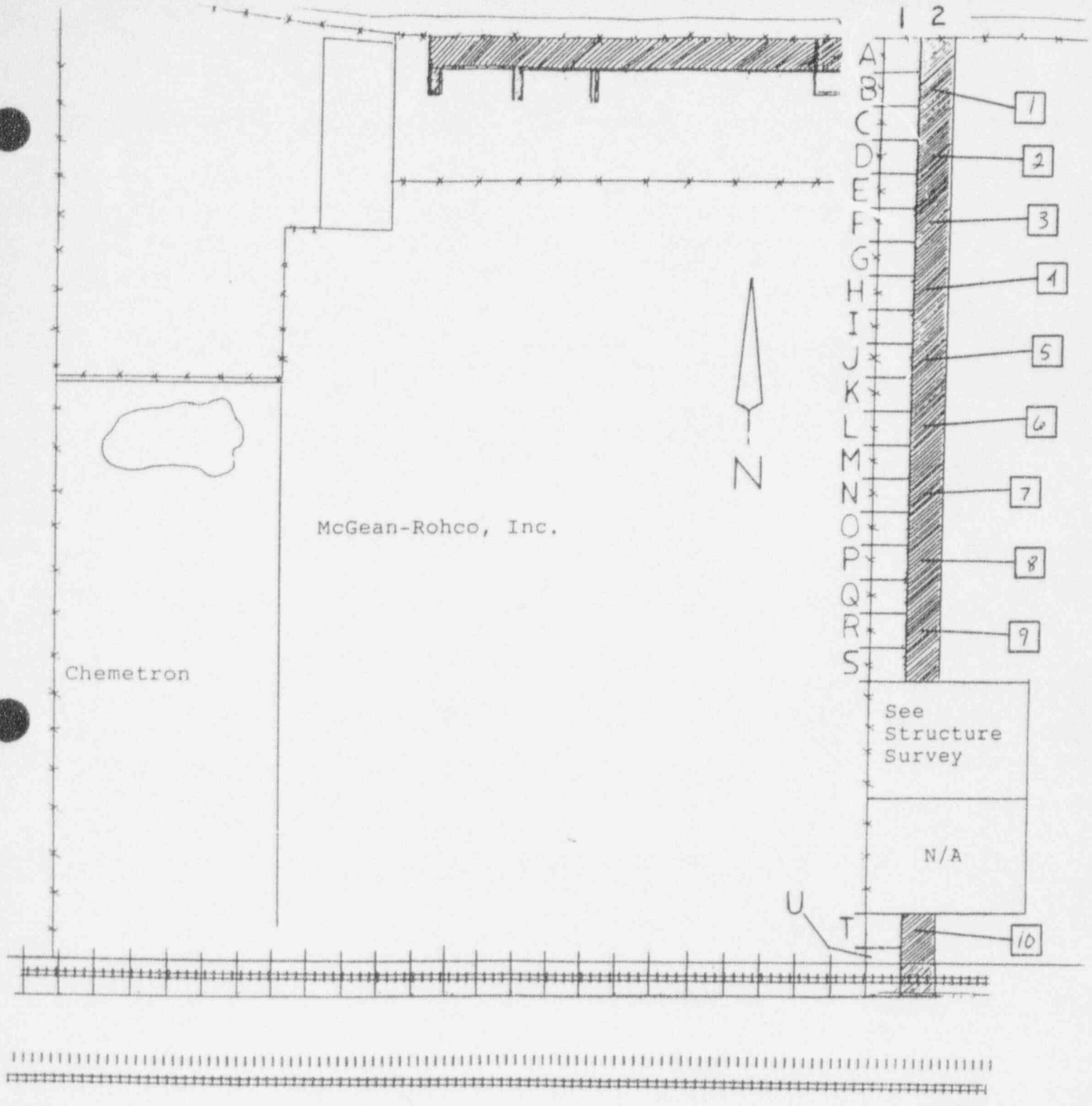
SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	N A	β & γ INST	N A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT	
γ INST	MICRO REM
S.N.	B709J
CAL DUE	8-30-94

Surveyor (signature) [signature] Date 11-1-93

Reviewed by (signature) [signature] Date 10/1/94



= Affected Area

= Unaffected Area

= Fencelines

Figure B-5

Typical Grid Size 10x10m

① ② ③ ④

Grid Sampling Locations

20m

SURVEY RECORD

DATE 10-28-93

LOCATION: Ohio Crankshaft West Perimeter

TIME

REASON FOR SURVEY: Vicinity Scoping Survey (Affected Area)

FIGURE # B-5

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A-1	Ohio Crankshaft Fixtures	N/A	N/A	<MDCR	<MDA	9	1	N/A	N/A
A-2						11			
A-3		<MDCR	<MDA			12			
A-4		N/A	N/A			10			
B-1						8			
B-2				37	1028	9			
B-3				37	1028	9			
B-4				<MDCR	<MDA	10			
C-1						8			
C-2						7			
C-3		<MDCR	<MDA			5			
C-4		N/A	N/A			7			
D-1						7			
D-2				26	722	7			
D-3				<MDCR	<MDA	7			
D-4						7			
E-1						9			
E-2						6			
E-3		<MDCR	<MDA			6			
E-4		N/A	N/A			6			
F-1						7			
F-2						8			
F-3						6			
F-4						7			
G-1						6			

DIRECT SURVEY INSTRUMENTS

α INST	L-2221	β & γ INST	L-2321
S.N.	108840	S.N.	99138
CAL DUE	1-26-94	CAL DUE	4-7-94
EFF	0.13	EFF	0.24
BKG	1 cpm	BKG	42 cpm
MDA	9.5 Dpm/100cm²	MDA	694 Dpm/100cm²
MDCR	7.2 cpm	MDCR	67 cpm

SMEARABLE CONTAMINATION INSTRUMENTS

α INST	N/A	β & γ INST	N/A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS: Alpha Readings taken on 9/14/94

EXPOSURE RATE INSTRUMENT

γ INST Micro REM

S.N. B3093

CAL DUE 8-30-94

Surveyor (signature) D. M. Kay Date 11-1-93

Reviewed by (signature) Duane A. Reed Date 10/11/94

SURVEY RECORD
CONTINUATION

DATE 10-28-93

LOCATION: Ohio Crankshaft West Perimeter

TIME

REASON FOR SURVEY: Vicinity Scoping Survey (Affected Area)

FIGURE # B-5

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
G1-2	Ohio Crankshaft Grounds	N/A	N/A	<MDCR	<MDA	8	1	N/A	N/A
E1-3		<MDCR	<MDA	↓	↓	7	↓	↓	↓
E1-4		↓	↓	↓	↓	9			
H1-1				31	861	5			
H1-2				<MDCR	<MDA	8			
H1-3				30	833	7			
H1-4				27	750	7			
I1-1				<MDCR	<MDA	6			
I1-2		↓	↓	29	806	5			
I1-3		7	108	<MDCR	<MDA	7			
I1-4		N/A	N/A	30	833	7			
J1-1				<MDCR	<MDA	8			
J1-2				↓	↓	6			
J1-3						7			
J1-4						8			
K1-1				↓	↓	8			
K1-2		↓	↓	28	778	7			
K1-3		<MDCR	<MDA	↓	↓	7			
K1-4		N/A	N/A	33	917	7			
L1-1				<MDCR	<MDA	7			
L1-2				33	917	7			
L1-3				34	944	7			
L1-4				35	972	7			
M1-1				31	861	7			
M1-2		↓	↓	<MDCR	<MDA	7			
M1-3		<MDCR	<MDA	34	944	7			
M1-4		N/A	N/A	30	833	8			
N1-1				<MDCR	<MDA	7			
N1-2				↓	↓	7			
N1-3				38	1056	8			
N1-4				37	1028	7			
O1-1				35	972	8			
O1-2				<MDCR	<MDA	7			
O1-3				↓	↓	7			
O1-4				34	944	7			
P1-1				35	972	8			
P1-2				28	778	6			
P1-3				<MDCR	<MDA	8			
P1-4	↓	↓	↓	↓	↓	8	↓	↓	↓

SURVEY RECORD
CONTINUATION

DATE 10-28-93

LOCATION: Ohio Crankshaft West Perimeter

TIME

REASON FOR SURVEY: Vicinity Scoping Survey (Affected Area)

FIGURE # B-5

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
Q1-1	Ohio Crankshaft Grounds	N/A	N/A	33	917	7	1	N/A	N/A
Q1-2		↓	↓	39	1083	9	↓	↓	↓
Q1-3		<MDCR	<MDA	<MDCR	<MDA	8			
Q1-4		N/A	N/A	32	889	7			
R1-1				34	944	8			
R1-2				34	944	7			
R1-3				<MDCR	<MDA	7			
R1-4				37	1028	7			
S1-1				<MDCR	<MDA	8			
S1-2		↓	↓	33	917	7			
S1-3		<MDCR	<MDA	29	806	8			
S1-4		N/A	N/A	27	750	7			
T1-1				32	889	7			
T1-2				30	833	7			
T1-3				36	1000	7			
T1-4				<MDCR	<MDA	6			
U1-1						7			
U1-2	↓	↓	↓	↓	↓	7	↓	↓	↓

N A

SURVEY RECORD

DATE 10-29-93

LOCATION: Ohio Crankshaft West Perimeter

TIME

REASON FOR SURVEY: Vicinity Scoping Survey (Unaffected Area)

FIGURE # B-5

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
1	Ohio Crankshaft Grounds	N/A	N/A	<MDCR	<MDA	8	1	N/A	N/A
2				3 k	1000	8			
3				24	944	7			
4		▼	▼	<MDCR	<MDA	7			
5		<MDCR	<MDA			7			
6		N/A	N/A			8			
7						7			
8		▼	▼			8			
9		<MDCR	<MDA			7			
10	▼	N/A	N/A	▼	▼	7	▼	▼	▼
			N/A						

DIRECT SURVEY INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221
S.N.	108880	S.N.	99135
CAL DUE	11-26-94	CAL DUE	4-7-94
EFF	0.13	EFF	0.24
BKG	1 cpm	BKG	44 cpm
MDA	95 dpm/100cm²	MDA	722 dpm/100cm²
MDCR	7.2 cpm	MDCR	70 cpm

SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	N/A	β & γ INST	
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	N/A
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS: Alpha readings were taken on 9/14/94

EXPOSURE RATE INSTRUMENT

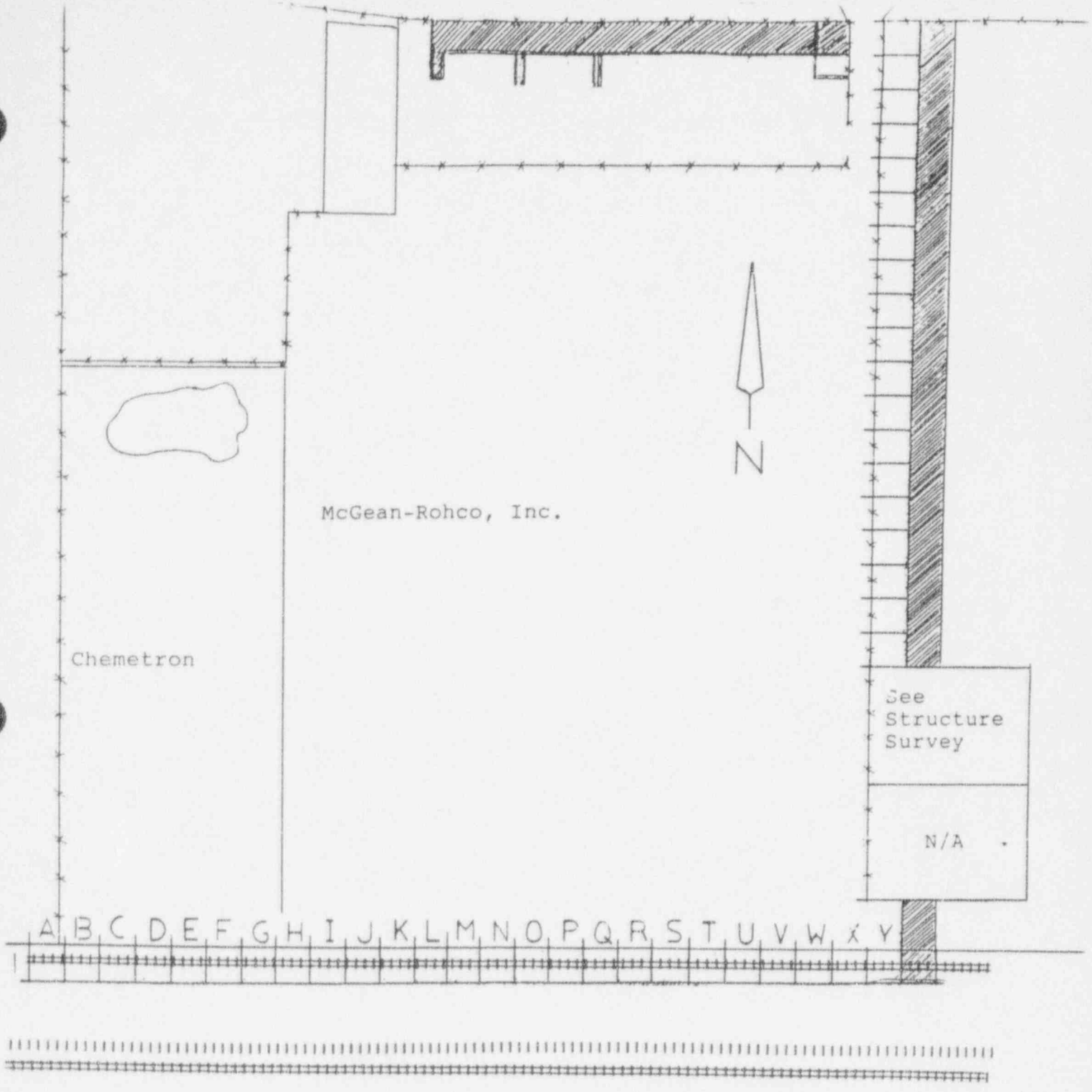
γ INST Micro REM

S.N. R7095

CAL DUE 8-30-94

Surveyor (signature) [signature] Date 11-1-93

Reviewed by (signature) [signature] Date 10/11/94



= Affected Area

= Unaffected Area

= Fencelines

Typical Grid Size 10x10m

1 2 3 4

Grid Sampling Locations

20m

Figure B-6

SURVEY RECORD

DATE 10-11-93

TIME

FIGURE # B-6

LOCATION: Newburgh Southshore Railroad

REASON FOR SURVEY: Vicinity Striping Survey

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A1-1	Newburgh Southshore Rail Bed	N/A	N/A	43	1194	7	1	N/A	N/A
A1-2	↓	↓	↓	36	1000	8			
A1-3		<MDCR	<MDA	73	2028	7			
A1-4		N/A	N/A	<MDCR	<MDA	7			
B1-1				32	889	7			
B1-2				52	1444	7			
B1-3				31	861	7			
B1-4				47	1306	9			
C1-1				40	1111	8			
C1-2		↓	↓	31	861	7			
C1-3		<MDCR	<MDA	73	2028	6			
C1-4		N/A	N/A	43	1194	7			
D1-1				62	1722	7			
D1-2		↓	↓	147	4083	8			
D1-3		<MDCR	<MDA	56	1556	7			
D1-4		N/A	N/A	40	1111	8			
E1-1				49	1361	8			
E1-2				87	2417	7			
E1-3				37	1028	9			
E1-4				35	972	7			
F1-1				63	1750	9			
F1-2				37	1028	8			
F1-3				63	1750	7			
F1-4		↓	↓	80	2222	7			
G1-1	↓	<MDCR	<MDA	106	2944	8	↓	↓	↓

DIRECT SURVEY INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221
S.N.	99138	S.N.	99138
CAL DUE	4-7-94	CAL DUE	4-7-94
EFF	0.13	EFF	0.24
BKG	1.8 cpm	BKG	45 cpm
MDA	112 Dpm/100cm²	MDA	722 Dpm/100cm²
MDCR	9.1 cpm	MDCR	71 cpm

SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	N/A	β & γ INST	N/A
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF		EFF	
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

EXPOSURE RATE INSTRUMENT

γ INST MICRO REM

S.N. B 709 J

CAL DUE 8-30-94

REMARKS: Alpha readings were taken on 11-9-93

Surveyor (signature) [signature] Date 10-13-93

Reviewed by (signature) [signature] Date 10/11/94

SURVEY RECORD
CONTINUATION

DATE: 10-11-93

TIME:

FIGURE #: B-6

LOCATION: Newburgh Southshore Railroad

REASON FOR SURVEY: Vicinity Scoping Survey

	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
G-2	Newburgh Southshore Rail Rd	N/A	N/A	44	1222	6	1	N/A	N/A
G-3		↓	↓	62	1722	7			
G-4		<MDCR	<MDA	97	2694	7			
H-1				63	1750	7			
H-2		↓	↓	79	2194	8			
H-3		N/A	N/A	38	1056	7			
H-4				35	972	7			
I-1				<MDCR	<MDA	9			
I-2						8			
I-3				↓	↓	9			
I-4				29	806	7			
J-1				<MDCR	<MDA	6			
J-2				↓	↓	8			
J-3				44	1222	8			
J-4				<MDCR	<MDA	7			
K-1				40	1111	7			
K-2				35	972	8			
K-3		↓	↓	41	1139	8			
K-4		<MDCR	<MDA	58	1611	8			
L-1		N/A	N/A	<MDCR	<MDA	7			
L-2				↓	↓	8			
L-3				41	1139	7			
L-4				31	861	6			
M-1				<MDCR	<MDA	7			
M-2						9			
M-3						8			
M-4						7			
N-1				↓	↓	7			
N-2				40	1111	7			
N-3				66	1833	7			
N-4				<MDCR	<MDA	7			
O-1				29	806	6			
O-2				42	1167	7			
O-3				64	1778	8			
O-4				<MDCR	<MDA	8			
P-1		↓	↓	↓	↓	8			
P-2		<MDCR	<MDA	151	4194	7			
P-3		↓		105	2917	7			
P-4	↓	N/A	N/A	30	833	7	↓	↓	↓

SURVEY RECORD
CONTINUATION

DATE 10-11-93

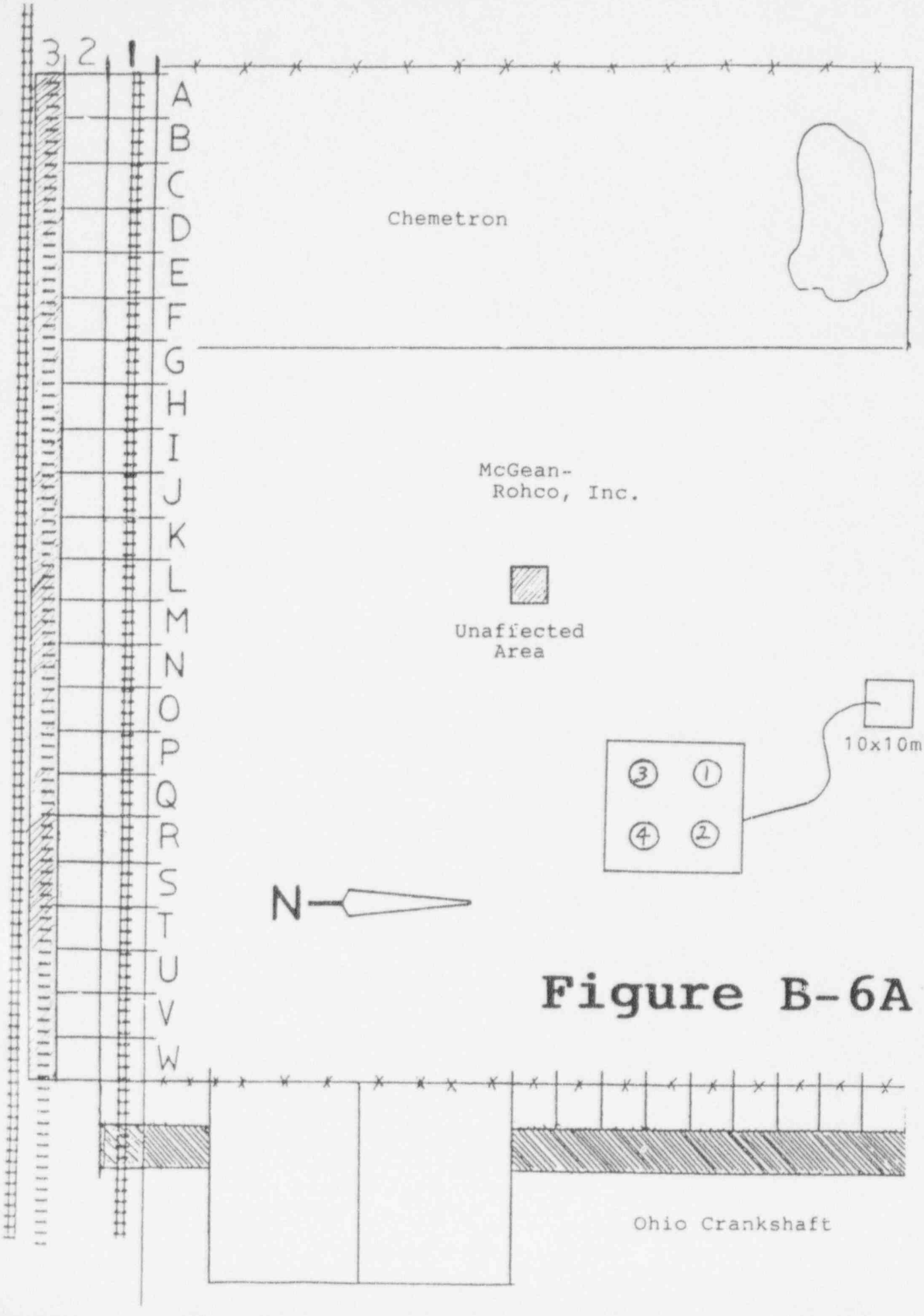
LOCATION: Newburgh Southshore Railroad

TIME

REASON FOR SURVEY: Vicinity Scoping Survey

FIGURE # B-6

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	µR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
Q1-1	Newburgh Southshore Rail Rd	N/A	N/A	<MDCR	<MDA	7	1	N/A	N/A
Q1-2		↓	↓	37	944	8			
Q1-3		<MDCR	<MDA	57	1583	8			
Q1-4		N/A	N/A	37	944	7			
R1-1				<MDCR	<MDA	9			
R1-2				41	1139	7			
R1-3				<MDCR	<MDA	7			
R1-4				34	944	6			
S1-1				<MDCR	<MDA	7			
S1-2				30	833	7			
S1-3				33	917	8			
S1-4				<MDCR	<MDA	7			
T1-1				<MDC2	<MDA	7			
T1-2				28	778	1			
T1-3				33	917	7			
T1-4				<MDCR	<MDA	5			
U1-1						8			
U1-2						7			
U1-3						8			
U1-4						7			
V1-1				↓	↓	7			
V1-2				29	806	8			
V1-3				<MDCR	<MDA	9			
V1-4						8			
W1-1						7			
W1-2				↓	↓	7			
W1-3				31	861	7			
W1-4				<MDCR	<MDA	8			
X1-1						9			
X1-2						8			
X1-3						7			
X1-4				↓	↓	8			
Y1-1				31	861	8			
Y1-2				41	1139	7			
Y1-3				<MDCR	<MDA	7			
Y1-4	↓	↓	↓	42	1167	8	↓	↓	↓
					A				
				N					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V
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Chemetron
McGean-
Rohco, Inc.
Unaffected
Area
10x10m
3
1
4
2
N
Ohio Crankshaft

Figure B-6A

SURVEY RECORD

DATE 9-20-94

LOCATION: Newburgh Southshore RailRoad

TIME

REASON FOR SURVEY: Vicinity Scoping Survey Affected Area

FIGURE # B-6A

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A2-1	On Slope Surface	N/A	N/A	<MDCR	<MDA	9	1	N/A	N/A
A2-2		↓	↓	↓	↓	10			
A2-3		↓	↓	32	928	12			
A2-4		<MDCR	<MDA	105	3044	12			
B2-1		N/A	N/A	<MDCR	<MDA	10			
B2-2		↓	↓	↓	↓	11			
B2-3		↓	↓	63	1826	13			
B2-4		<MDCR	<MDA	54	1565	12			
C2-1		N/A	N/A	30	870	10			
C2-2		↓	↓	43	1246	9			
C2-3		↓	↓	71	2058	15			
C2-4		<MDCR	<MDA	63	1826	13			
D2-1		N/A	N/A	41	1188	10			
D2-2		↓	↓	52	1507	11			
D2-3		↓	↓	87	2522	14			
D2-4		<MDCR	<MDA	773	22,406	19			
E2-1		N/A	N/A	47	1362	10			
E2-2		↓	↓	50	1449	11			
E2-3		87	1450	91	2638	14			
E2-4		N/A	N/A	122	3536	15			
F2-1		↓	↓	30	870	11			
F2-2		↓	↓	47	1362	10			
F2-3		↓	↓	110	3188	13			
F2-4		<MDCR	<MDA	61	1768	12			
G2-1	↓	↓	↓	45	1304	10	↓	↓	↓

DIRECT SURVEY INSTRUMENTS				SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221	α INST		β & γ INST	
S.N.	108880	S.N.	108880	S.N.		S.N.	
CAL DUE	11-26-94	CAL DUE	11-26-94	CAL DUE		CAL DUE	
EFF	0.12	EFF	0.23	EFF	N/A	EFF	N/A
BKG	1 cpm	BKG	37 cpm	BKG		BKG	
MDA	103 DPM/100cm²	MDA	696 DPM/100cm²	MDA		MDA	
MDCR	7.2 cpm	MDCR	61 cpm	MDCR		MDCR	

REMARKS: Alpha readings were taken on 10-6-94.

EXPOSURE RATE INSTRUMENT

γ INST L-19

S.N. 98071

CAL DUE

Surveyor (signature) Duane A. Rapp Date 10/20/94

Reviewed by (signature) Dan McL Date 10/21/94

SURVEY RECORD
CONTINUATION

DATE 9-20-94

LOCATION: Newburgh Southshore Railroad (Affected Area)

TIME

REASON FOR SURVEY: Vicinity Scoping Survey

FIGURE # B-6A

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cepo probe	α dpm/100cm²	β & γ cepo probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
K2-2	On Slope Surface	N/A	N/A	44	1275	12	1	N/A	N/A
K2-3	↓	↓	↓	91	2638	12			
K2-4		<MDLR	<MDA	104	3014	12			
H2-1		N/A	N/A	56	1623	12			
H2-2				42	1217	11			
H2-3		↓	↓	43	1246	12			
H2-4		<MDLR	<MDA	69	2000	12			
I2-1		N/A	N/A	48	1391	12			
I2-2				<MDLR	<MDA	9			
I2-3		↓	↓	45	1304	12			
I2-4		<MDLR	<MDA	73	2116	14			
J2-1		N/A	N/A	74	2145	11			
J2-2				87	2522	10			
J2-3		↓	↓	86	2493	14			
J2-4		<MDLR	<MDA	82	2377	12			
K2-1		N/A	N/A	64	1855	12			
K2-2				35	1014	11			
K2-3		↓	↓	56	1623	12			
K2-4		<MDLR	<MDA	66	1913	12			
L2-1		N/A	N/A	64	1855	10			
L2-2				68	1971	12			
L2-3		↓	↓	56	1623	13			
L2-4		<MDLR	<MDA	64	1855	11			
M2-1		N/A	N/A	64	1855	11			
M2-2				29	841	12			
M2-3		↓	↓	69	2000	12			
M2-4		<MDLR	<MDA	25	725	11			
N2-1		N/A	N/A	68	1971	12			
N2-2				37	1072	11			
N2-3		↓	↓	84	2435	12			
N2-4		<MDLR	<MDA	77	2232	13			
O2-1		N/A	N/A	32	928	12			
O2-2				35	1014	10			
O2-3		↓	↓	67	1942	10			
O2-4		<MDLR	<MDA	60	1739	12			
P2-1		N/A	N/A	60	1739	12			
P2-2				43	1246	10			
P2-3				56	1623	11			
P2-4	↓	↓	↓	34	986	12	↓	↓	↓

SURVEY RECORD
CONTINUATION

DATE 9-20-94

LOCATION: Newburgh Southshore Railroad (Affected) Area

TIME

REASON FOR SURVEY: Vicinity Scoping Survey

FIGURE # B-6A

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
Q2-1	On Slope Surface	N/A	N/A	34	986	10	1	N/A	N/A
Q2-2				27	783	11			
Q2-3				28	812	13			
Q2-4				50	1449	12			
R2-1				25	725	12			
R2-2				<MDCR	<MDA	10			
R2-3				44	1275	11			
R2-4				25	725	11			
S2-1				<MDCR	<MDA	9			
S2-2						14			
S2-3						10			
S2-4				26	754	11			
T2-1				36	1043	12			
T2-2				38	1101	11			
T2-3				31	899	12			
T2-4				29	841	12			
U2-1				<MDCR	<MDA	13			
U2-2				36	1043	11			
U2-3				29	841	11			
U2-4				52	1507	12			
V2-1				34	986	13			
V2-2				25	725	10			
V2-3				55	1594	12			
W2-4				27	783	10			
W2-1				<MDCR	<MDA	10			
W2-2				26	754	11			
W2-3				<MDCR	<MDA	12			
W2-4						12			

A

SURVEY RECORD

DATE 9-22-94

LOCATION: Newburgh Southshore Railroad (Unaffected) Area

TIME

REASON FOR SURVEY: Vicinity Scoping Survey

FIGURE # B-6A

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A3-1	On Slope Surface	N/A	N/A	34	944	12	1	N/A	N/A
A3-2				53	1472	14			
B3-1				55	1528	13			
B3-2				75	2083	14			
C3-1		<MDCR	<MDA	55	1528	12			
C3-2		N/A	N/A	76	2111	14			
D3-1		<MDCR	<MDA	94	2611	13			
D3-2		N/A	N/A	81	2250	14			
E3-1		<MDCR	<MDA	47	1306	13			
E3-2		N/A	N/A	66	1833	13			
F3-1		<MDCR	<MDA	78	2167	13			
F3-2		N/A	N/A	128	3556	13			
G3-1		<MDCR	<MDA	42	1167	12			
G3-2		N/A	N/A	85	2361	12			
H3-1				64	1778	12			
H3-2				63	1750	12			
I3-1				45	1250	12			
I3-2				27	750	12			
J3-1				40	1111	13			
J3-2				27	750	13			
K3-1				73	2028	12			
L3-1				<MDCR	<MDA	12			
M3-1				52	1444	12			
N3-1				40	1111	12			
O3-1				<MDCR	<MDA	12			

DIRECT SURVEY INSTRUMENTS

α INST	L-2221	β & γ INST	L-2221
S.N.	108880	S.N.	108880
CAL DUE	11-26-94	CAL DUE	11-26-94
EFF	0.12	EFF	0.24
BKG	1 cpm	BKG	47 cpm
MDA	103 DPM/100cm²	MDA	722 DPM/100cm²
MDCR	7.2 cpm	MDCR	73 cpm

SMEARABLE CONTAMINATION INSTRUMENTS

α INST		β & γ INST	
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF	N/A	EFF	N/A
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS: Alpha readings were taken on 10-6-94.

EXPOSURE RATE INSTRUMENT

γ INST	L-19
S.N.	98071
CAL DUE	

Surveyor (signature) Duane A. Reed Date 10/6/94

Reviewed by (signature) Eric M. Ng Date 10/21/94

SURVEY RECORD
CONTINUATION

DATE 9-22-94

LOCATION: Newburgh Southshore Railroad (unaffected) Area

TIME

REASON FOR SURVEY: Vicinity Scoping Survey

FIGURE # B-6A

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
P3-1	On Slope Surface	N/A	N/A	29	806	12	1	N/A	N/A
Q3-1				55	1528	13			
R3-1				31	861	12			
S3-1				<MDCR	<MDA	12			
T3-1				27	750	13			
U3-1				<MDCR	<MDA	12			
		N	A						

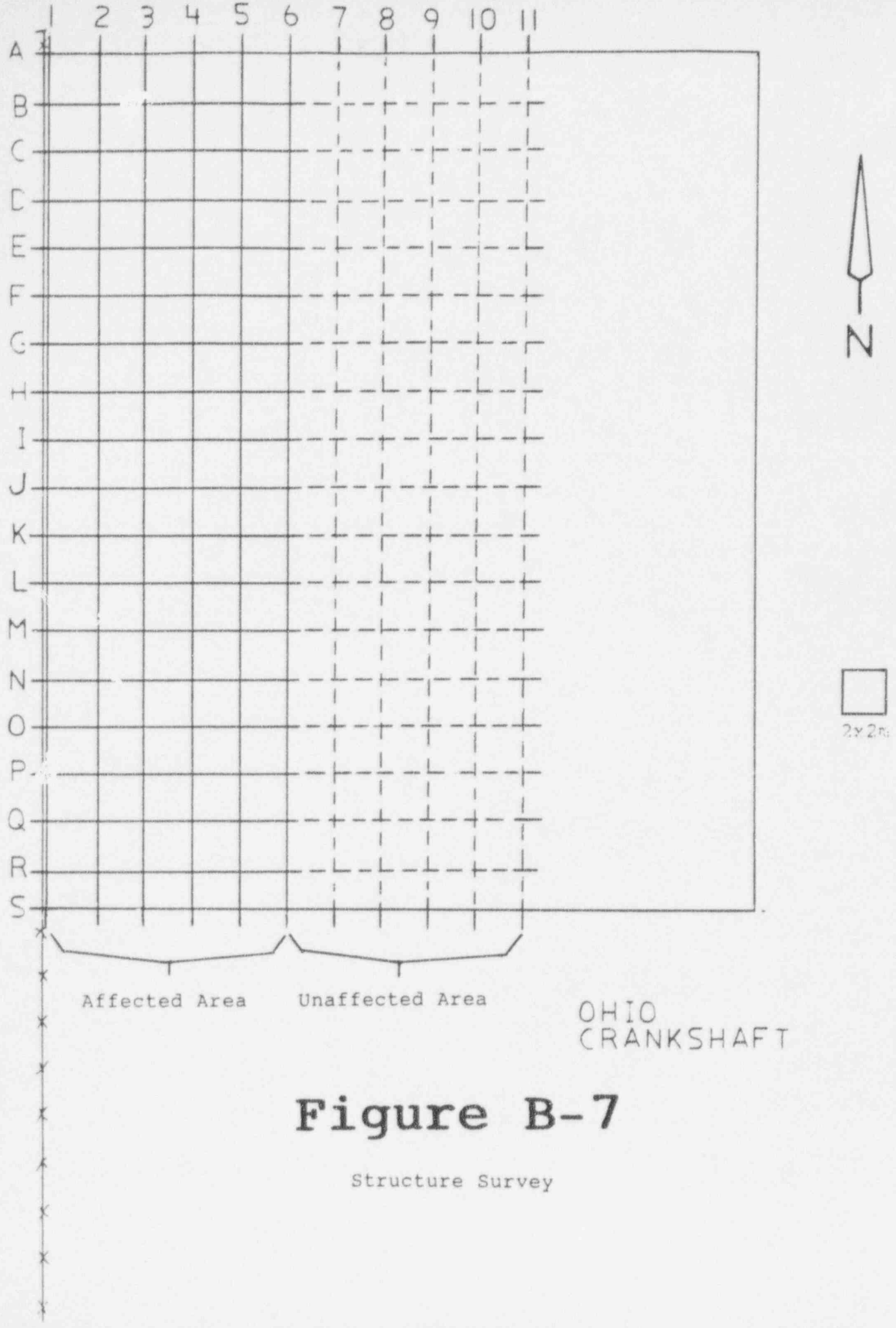


Figure B-7

Structure Survey

SURVEY RECORD

DATE 9-15-94

LOCATION: Olive Crankshaft Structure Survey

TIME

REASON FOR SURVEY: Vicinity Scoping survey (Affected Area)

FIGURE # B-7

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A-1	On Concrete	6.9	106	<MDCR	<MDA	N/A	N/A	<MDA	<MDA
A-2		6.9	106						
A-3		N/A	N/A						
A-4									
A-5									
A-6									
B-1									
B-2		3.9	60						
B-3		N/A	N/A						
B-4						5	1		
B-5						N/A	N/A		
B-6									
C-1		<MDCR	<MDA						
C-2		12.9	198						
C-3		N/A	N/A						
C-4									
C-5									
C-6									
D-1						1	1		
D-2		<MDCR	<MDA			N/A	N/A		
D-3		N/A	N/A						
D-4									
D-5									
D-6									
E-1		10.9	168						

DIRECT SURVEY INSTRUMENTS				SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221	α INST	L-2929	β & γ INST	L-2929
S.N.	109880	S.N.	109880	S.N.	91245	S.N.	91245
CAL DUE	11-26-94	CAL DUE	11-26-94	CAL DUE	2-18-95	CAL DUE	2-15-95
EFF	0.13	EFF	0.22	EFF	0.30	EFF	0.28
BKG	0.1	BKG	45 cpm	BKG	0.13	BKG	59 cpm
MDA	59 DPM/100cm²	MDA	645 DPM/100cm²	MDA	13 DPM/100cm²	MDA	166 DPM/100cm²
MDCR	3.8 cpm	MDCR	71 cpm	MDCR	4 cpm	MDCR	57 cpm

REMARKS: Alpha readings were taken on 9-14-94. Smears were counted on 10-21-94

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B709J

CAL DUE 1-23-95

Surveyor (signature) [signature] Date 10-24-94

Reviewed by (signature) [signature] Date 10-24-94

SURVEY RECORD
CONTINUATION

DATE 9-15-94

LOCATION: Ohio Crankshaft Structure Survey

TIME

REASON FOR SURVEY: Vicinity Scoping Survey (Affected Area)

FIGURE # B-7

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
//	//////////////////////								
E-2	On Concrete	5.9	91	32	970	N/A	N/A	<MDA	<MDA
E-3		N/A	N/A	<MDCR	<MDA				
E-4									
E-5									
E-6									
F-1		↓	↓						
F-2		5.9	91						
F-3		N/A	N/A						
F-4									
F-5									
F-6		↓	↓						
G-1		6.9	106						
G-2		N/A	N/A						
G-3									
G-4									
G-5									
G-6									
H-1									
H-2									
H-3									
H-4									
H-5									
H-6		↓	↓						
I-1		4.9	75			↓	↓		
I-2		N/A	N/A			6	1		
I-3						N/A	N/A		
I-4									
I-5									
I-6				↓	↓				
J-1				29	379				
J-2				<MDCR	<MDA				
J-3									
J-4									
J-5						↓	↓		
J-6		↓	↓			7	1		
K-1		3.9	60			N/A	N/A		
K-2		N/A	N/A						
K-3									
K-4	↓	↓	↓	↓	↓	↓	↓	↓	↓

SURVEY RECORD
CONTINUATION

DATE 9-15-94

LOCATION: Ohio Crankshaft Structure Survey

TIME

REASON FOR SURVEY: Vicinity Scoping Survey (Affected Area)

FIGURE # B-7

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
K-5	On Concrete	N/A	N/A	<MDCR	<MDA	N/A	N/A	<MDA	<MDA
K-6		↓	↓	↓	↓	↓	↓	↓	↓
L-1									
L-2				32	97c				
L-3				<MDCR	<MDA				
L-4									
L-5									
L-6		↓	↓			↓	↓		
M-1		9.9	152			6	1		
M-2		N/A	N/A			N/A	N/A		
M-3									
M-4									
M-5									
M-6									
N-1									
N-2									
N-3									
N-4									
N-5									
N-6		↓	↓						
O-1		<MDCR	<MDA						
O-2		N/A	N/A						
O-3						↓	↓		
O-4						5	1		
O-5						N/A	N/A		
O-6									
P-1									
P-2									
P-3									
P-4									
P-5									
P-6		↓	↓						
Q-1		7.9	122						
Q-2		N/A	N/A						
Q-3									
Q-4									
Q-5									
Q-6		↓	↓						
R-1	↓	5.9	71	↓	↓	↓	↓	↓	↓

SURVEY RECORD
CONTINUATION

DATE 9-15-94

LOCATION: Chic Crankshaft Structure Survey

TIME

REASON FOR SURVEY: Vicinity Scoping Survey (Affected Area)

FIGURE # B-7

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
R-2	On Concrete	N/A	N/A	<MDCR	<MDA	N/A	N/A	<MDA	<MDA
R-3	↓	↓	↓	↓	↓	↓	↓	↓	↓
R-4									
R-5									
R-6									
S-1									
S-2									
S-3									
S-4									
S-5									
S-6	↓	↓	↓	↓	↓	↓	↓	↓	↓
			N	A					

SURVEY RECORD

DATE 9-14-94

LOCATION: Ohio Crankshaft Structure Survey

TIME

REASON FOR SURVEY: Vicinity Scoping Survey (Unaffected Area)

FIGURE # B-7

NO.	ITEM	DIRECT SURVEY MEASUREMENTS α ccpm probe	DIRECT SURVEY MEASUREMENTS α dpm/100cm²	DIRECT SURVEY MEASUREMENTS β & γ ccpm probe	DIRECT SURVEY MEASUREMENTS β & γ dpm/100cm²	EXPOSURE RATE µR/hr	EXPOSURE DISTANCE meters	SMEARABLE CONTAMINATION α dpm/100cm²	SMEARABLE CONTAMINATION β & γ dpm/100cm²
A-8	On Concrete	<MDCR	<MDA	<MDCR	<MDA	N/A	N/A	<MDA	<MDA
A-9		N/A	N/A						
B-8		<MDCR	<MDA			↓	↓		
B-9		N/A	N/A			4	1		
C-8		9	138			N/A	N/A		
C-9		N/A	N/A						
D-8		9	138						
D-9		N/A	N/A						
E-8		9	138						
E-9		N/A	N/A						
F-8									
F-9									
G-8									
G-9									
H-8									
H-9									
I-8									
I-9									
J-8									
J-9									
K-8									
K-9						↓	↓		
L-8						5	1		
M-8						N/A	N/A		
N-8		↓	↓	↓	↓	↓	↓	↓	↓

DIRECT SURVEY INSTRUMENTS

α INST	L-2221	β & γ INST	L-2221
S.N.	108880	S.N.	108880
CAL DUE	11-26-94	CAL DUE	11-26-94
EFF	0.13	EFF	0.23
BKG	1 cpm	BKG	60 cpm
MDA	95 DPM/100cm²	MDA	841 DPM/100cm²
MDCR	7.2 cpm	MDCR	89 cpm

SMEARABLE CONTAMINATION INSTRUMENTS

α INST	L-2929	β & γ INST	L-2929
S.N.	91245	S.N.	91245
CAL DUE	2-16-95	CAL DUE	2-16-95
EFF	0.30	EFF	0.28
BKG	0.13 cpm	BKG	59 cpm
MDA	13 dpm/100cm²	MDA	100 dpm/100cm²
MDCR	4.04 cpm	MDCR	87 cpm

REMARKS:

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B7095

CAL DUE 1-23-95

Surveyor (signature) [signature] Date 10-24-94

Reviewed by (signature) [signature] Date 10-21-94

SURVEY RECORD
CONTINUATION

DATE 9-14-94

LOCATION: Ohio Crankshaft Structure Survey

TIME

REASON FOR SURVEY: Vicinity Scoping Survey (Unaffected Area)

FIGURE # B-7

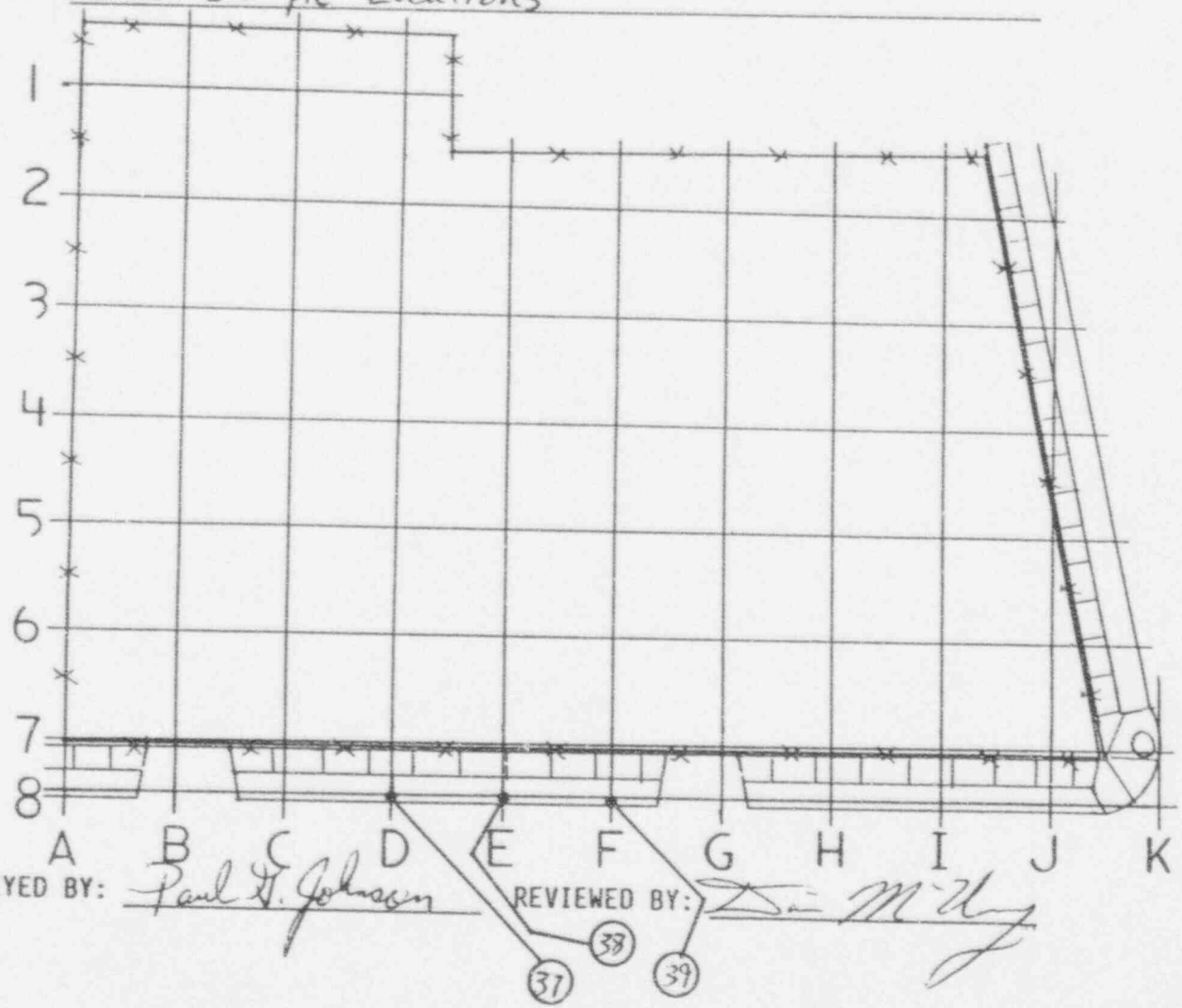
NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
0-8	On Concrete	N/A	N/A	<MDA	<MDA	N/A	N/A	<MDA	<MDA
F-3	↓	↓	↓	↓	↓	↓	↓	↓	↓
Q-8	↓	↓	↓	↓	↓	↓	↓	↓	↓
S-8	↓	↓	↓	↓	↓	↓	↓	↓	↓
			N	A					

FIELD SURVEY MAP LOCATION Lot 27)/AREA CEI East 27th St.

DATE 9-15-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-7721/Micro Rem SERIAL NO. 108880/B709J

REMARKS Soil Sample Locations



SURVEYED BY: Paul V. Johnson

REVIEWED BY:

FIGURE B-8

SURVEY RECORD

DATE 9-15-94

LOCATION: Lot # 270 (CEI)

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE # B-8

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
37	Soil	5.9	98	<MDCR	<MDA	6	1	N/A	N/A
38	↓	5.9	98	↓	↓	6	↓	↓	↓
39	↓	<MDCR	<MDA	↓	↓	5	↓	↓	↓
				N	A				

DIRECT SURVEY INSTRUMENTS				SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221	α INST		β & γ INST	
S.N.	109880	S.N.	109880	S.N.		S.N.	
CAL DUE	11-26-94	CAL DUE	11-26-94	CAL DUE		CAL DUE	
EFF	0.17	EFF	0.22	EFF	N A	EFF	N A
BKG	0.1 cpm	BKG	42 cpm	BKG		BKG	
MDA	63 DPM/100cm²	MDA	758 DPM/100cm²	MDA		MDA	
MDCR	3.9 cpm	MDCR	67 cpm	MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B7095

CAL DUE 1-23-95

Surveyor (signature) Paul H Johnson Date 10/23/94

Reviewed by (signature) Dan M. Hay Date 10-24-94

APPENDIX C

SOIL SAMPLE DATA

APPENDIX C-1

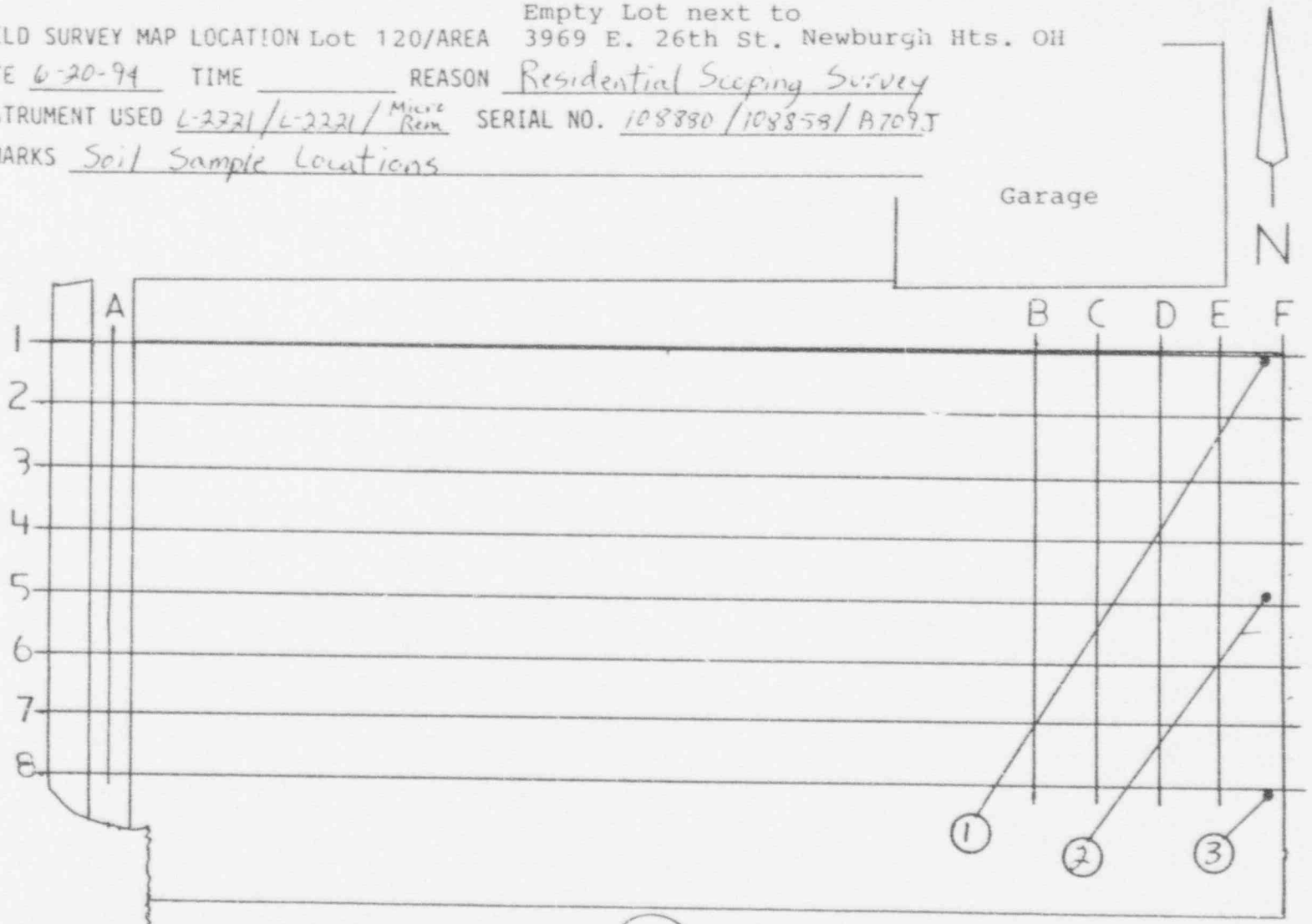
RESIDENTIAL SOIL SAMPLE LOCATIONS

FIELD SURVEY MAP LOCATION Lot 120/AREA Empty Lot next to 3969 E. 26th St. Newburgh Hts. OH

DATE 6-20-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2321/L-2221/Micro Rem SERIAL NO. 108880/108858/A709J

REMARKS Soil Sample Locations



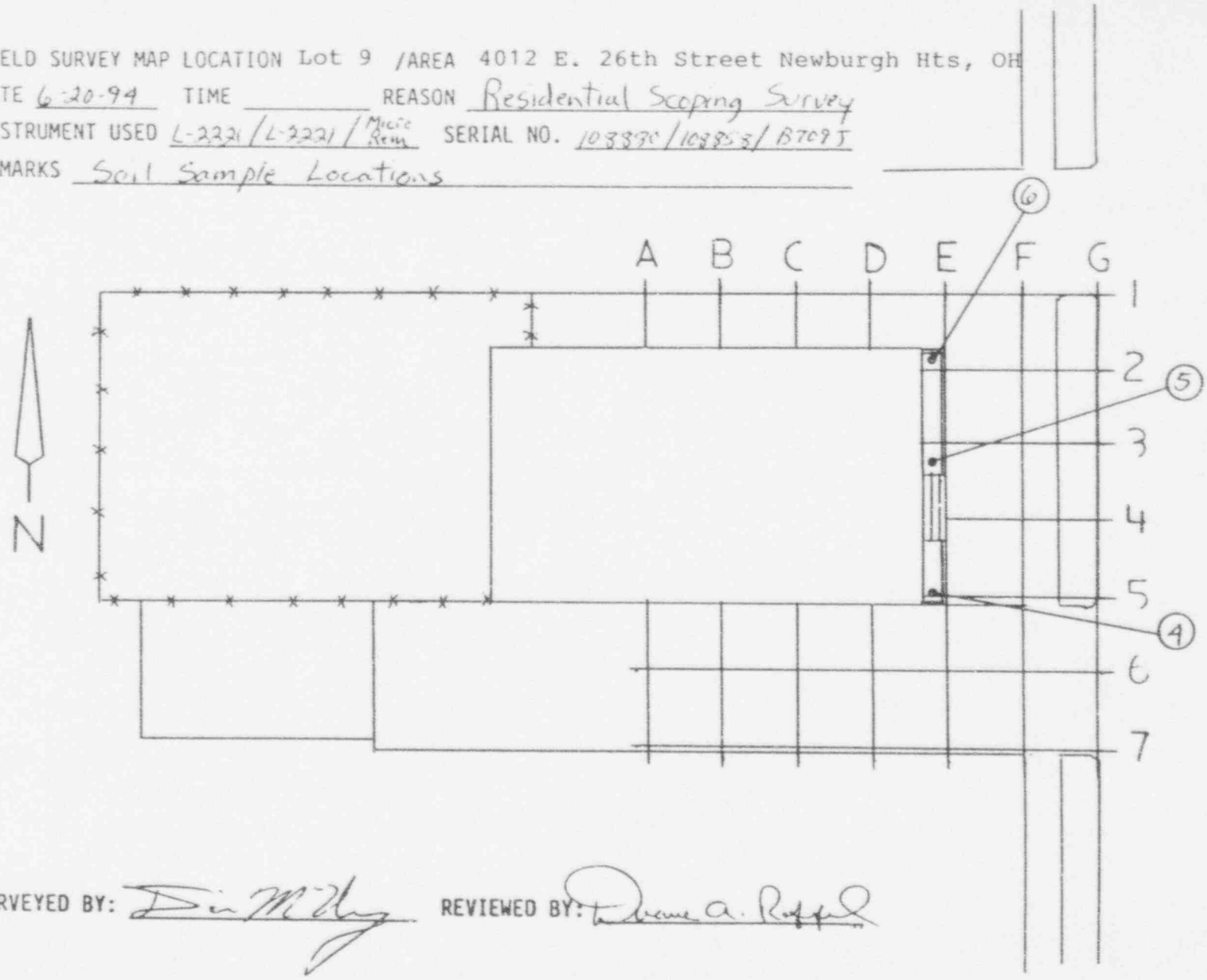
SURVEYED BY: Dan McClay REVIEWED BY: Duane A. Rathel

FIELD SURVEY MAP LOCATION Lot 9 /AREA 4012 E. 26th Street Newburgh Hts, OH

DATE 6-20-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221 / L-2221 / Micro Rem SERIAL NO. 103830 / 103853 / B709T

REMARKS Soil Sample Locations



SURVEYED BY: Dan Mabry REVIEWED BY: Duane A. Rafferty

SURVEY RECORD

DATE 6-20-94

LOCATION: Lot # 9 and Lot next to #120

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
1	Soil	<MDCR	<MDA	<MDCR	<MDA	7	1m	N/A	N/A
2						8			
3						6			
4						8			
5						6			
6						8			
			N/A						

DIRECT SURVEY INSTRUMENTS				SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221	α INST	N/A	β & γ INST	N/A
S.N.	109550	S.N.	105558	S.N.		S.N.	
CAL DUE	11-26-94	CAL DUE	11-20-94	CAL DUE		CAL DUE	
EFF	0.12	EFF	0.24	EFF		EFF	
BKG	0.3 cpm	BKG	43 cpm	BKG		BKG	
MDA	77 DPM/100cm²	MDA	917 DPM/100cm²	MDA		MDA	
MDCR	4.6 cpm	MDCR	71 cpm	MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B709J

CAL DUE 8-30-94

Surveyor (signature) Dan Miller Date 6-7-94

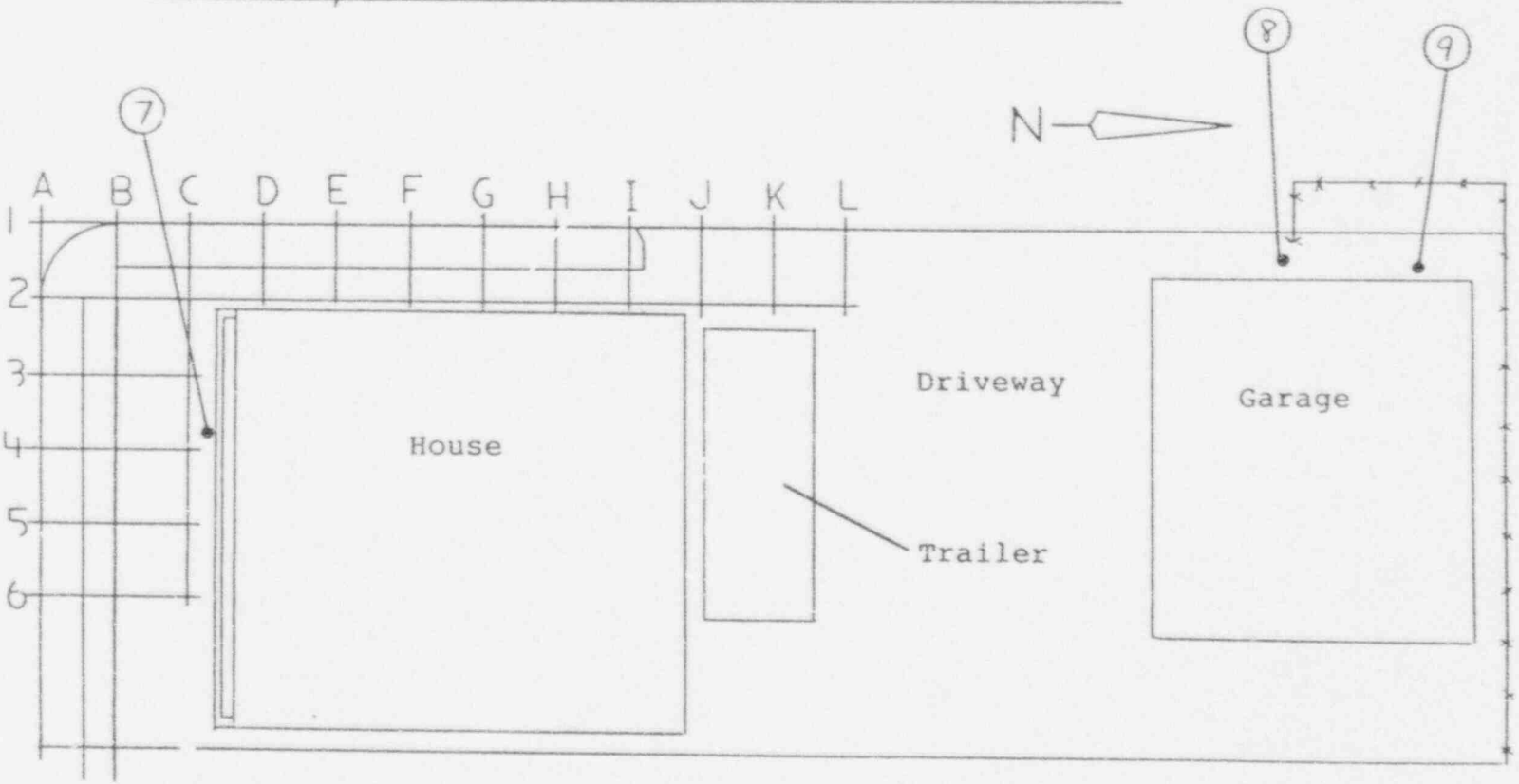
Reviewed by (signature) Duane A. Roffel Date 10/11/94

FIELD SURVEY MAP LOCATION Lot 262/AREA 2701 Ross Ave. Newburgh Hts., OH

DATE 6-21-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/Micro Rem SERIAL NO. 108890/108858/B709J

REMARKS Soil Sample Locations



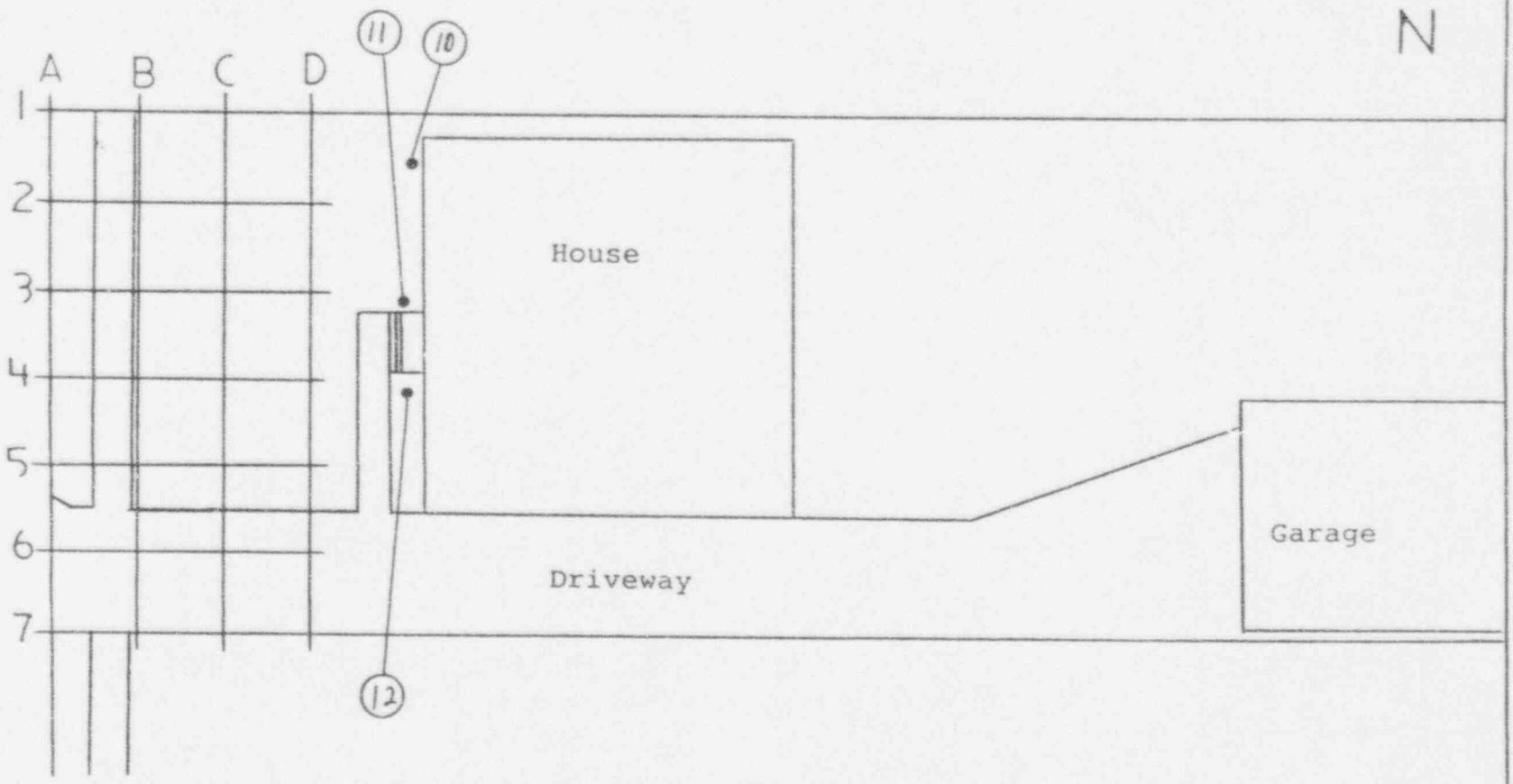
SURVEYED BY: Lee Morisa REVIEWED BY: Duane A. Rotter

FIELD SURVEY MAP LOCATION Lot 264/AREA 4013 E. 27th St. Newburgh Hts., OH

DATE 6-21-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2321/L-2221/Micro Rem SERIAL NO. 108850/108858/B7095

REMARKS Soil Sample Locations



SURVEYED BY: Lee Mojica

REVIEWED BY: Duane A. Rafferl

SURVEY RECORD

DATE 6-21-94

LOCATION: Lot #262 & 264

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
7	Soil	<MDCR	<MDA	<MDCR	<MDA	6	in	N/A	N/A
8						8			
9						7			
10						8			
11						7			
12	↓	↓	↓	↓	↓	6	↓	↓	↓
				N	A				

DIRECT SURVEY INSTRUMENTS		SMEARABLE CONTAMINATION INSTRUMENTS	
α INST L-2,221	β & γ INST L-2,221	α INST	β & γ INST
S.N. 108880	S.N. 108858	S.N.	S.N.
CAL DUE 11-26-94	CAL DUE 11-20-94	CAL DUE	CAL DUE
EFF 0.13	EFF 0.21	EFF N A	EFF N A
BKG 1.9 cpm	BKG 43 cpm	BKG	BKG
MDA 86 DPM/100cm²	MDA 917 DPM/100cm²	MDA	MDA
MDCR 75 cpm	MDCR 76 cpm	MDCR	MDCR

REMARKS:

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B709J

CAL DUE 8-30-94

Surveyor (signature) Lee Moiola Date 6-21-94

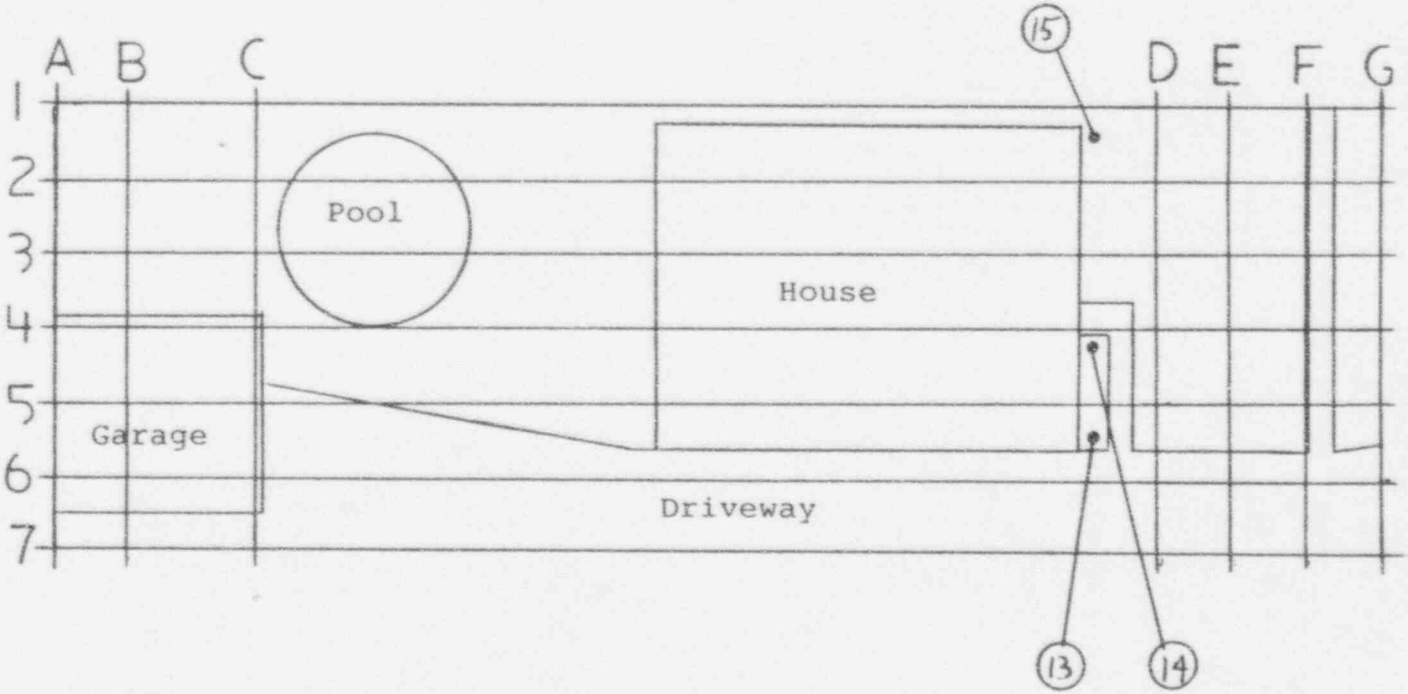
Reviewed by (signature) Donna A. Rotkel Date 10/11/94

FIELD SURVEY MAP LOCATION Lot 145 / AREA 4016 E. 27th Street Newburgh Hts., OH

DATE 6-22-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221 / L-2221 / Micro Rem SERIAL NO. 103880 / 103853 / B7095

REMARKS _____



SURVEYED BY: Lee Motjes

REVIEWED BY: Duane A. Ruffel

SURVEY RECORD

DATE 6-22-94

LOCATION: Lot # 145

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
13	Soil	<MDCR	<MDA	39	1053	4	1m	N/A	N/A
14	↓	↓	↓	49	1361	4	↓	↓	↓
15	↓	↓	↓	35	972	6	↓	↓	↓
			N		A				

DIRECT SURVEY INSTRUMENTS				SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221	α INST	N A	β & γ INST	
S.N.	108850	S.N.	108858	S.N.		S.N.	
CAL DUE	11-26-94	CAL DUE	11-20-94	CAL DUE		CAL DUE	
EFF	0.12	EFF	0.24	EFF	N A	EFF	N A
BKG	2.3 cpm	BKG	39 cpm	BKG		BKG	
MDA	130 DPM/100cm²	MDA	889 DPM/100cm²	MDA		MDA	
MDCR	10.1 cpm	MDCR	71 cpm	MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B709 J

CAL DUE 8-30-94

Surveyor (signature) Joe Moïra Date 6-22-94

Reviewed by (signature) Donna a. Ruff Date 6/11/94

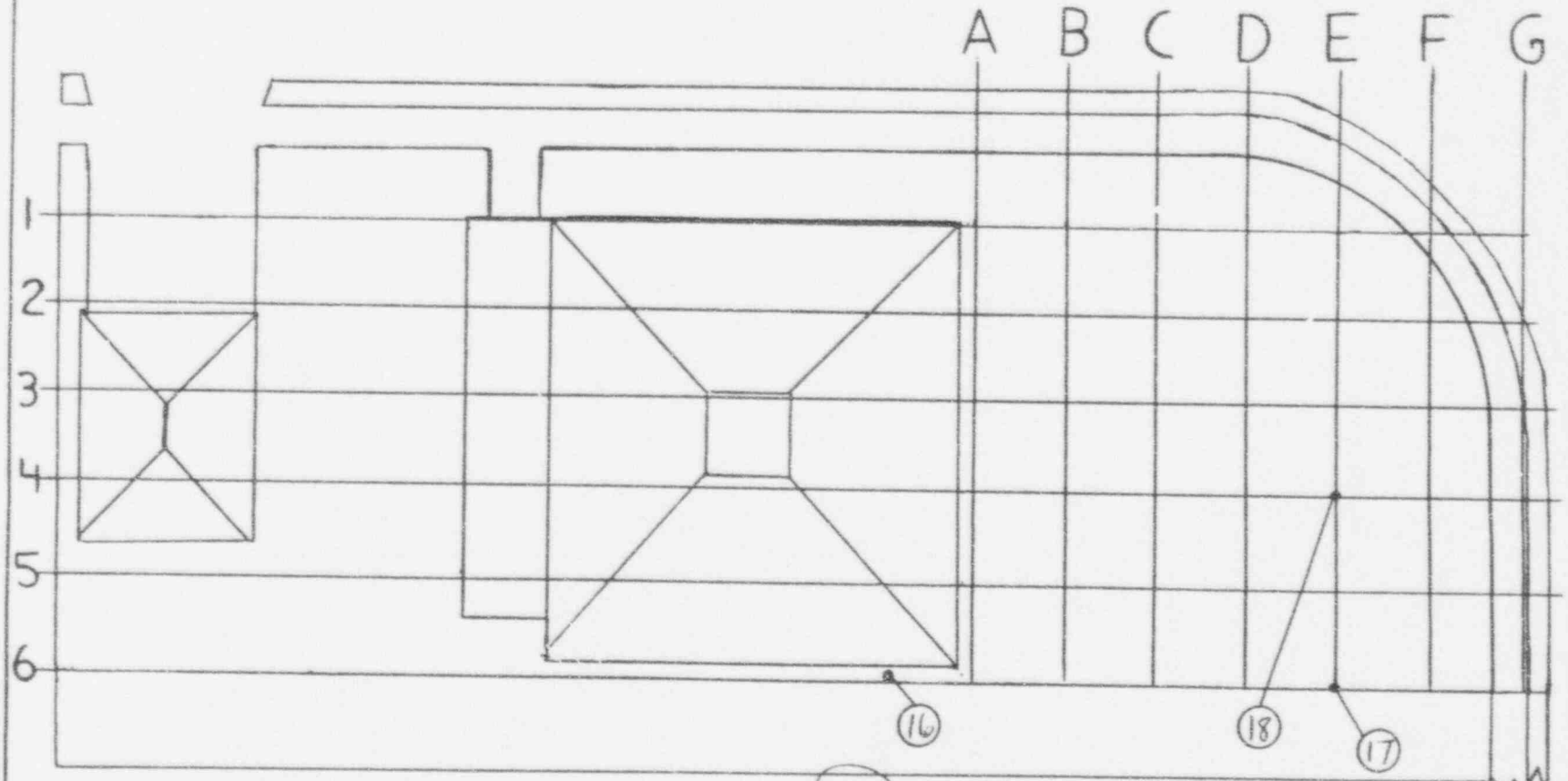
Newburgh Hts., OH

FIELD SURVEY MAP LOCATION Lot 317/AREA 2813 Hermit Ave.

DATE 6-23-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-7221/L-7221/Micro Rem SERIAL NO. 109880/108553/B707J

REMARKS Soil Sample Locations



SURVEYED BY: Dee Majica

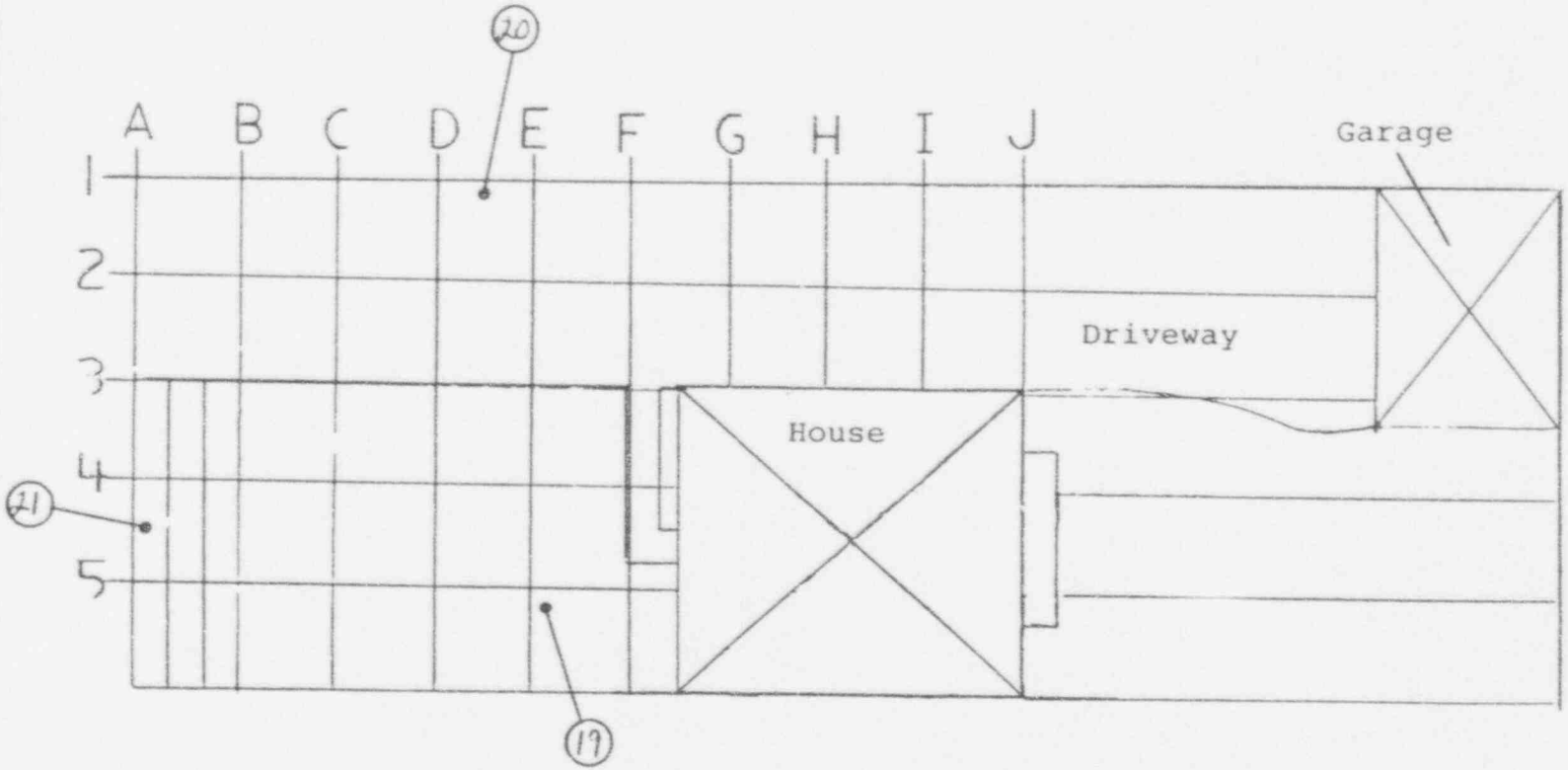
REVIEWED BY: Diane A. Rupp

FIELD SURVEY MAP LOCATION Lot 285/AREA 4013 E. 29th St. Newburgh Hts., OH

DATE 6-23-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-3221/Micro Rem SERIAL NO. 108880/108358/B709J

REMARKS Soil Sample Locations



SURVEYED BY: Lee Mojica REVIEWED BY: Duane A. Pottorf

SURVEY RECORD

DATE 6-23-94

LOCATION: Lot # 285 + 317

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	EXPOSURE RATE μR/hr	EXPOSURE DISTANCE meters	SMEARABLE CONTAMINATION α dpm/100cm²	β & γ dpm/100cm²
//	//////////////////////								
16	Soil	<MDCR	<MDA	<MDCR	<MDA	A	1m	N/A	N/A
17						1			
18						5			
19						7			
20				45	1,200	6			
21				45	1,200	6			

N A

DIRECT SURVEY INSTRUMENTS				SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221	α INST	N A	β & γ INST	N A
S.N.	108880	S.N.	108858	S.N.		S.N.	
CAL DUE	11-21-94	CAL DUE	11-30-94	CAL DUE		CAL DUE	
EFF	0.09	EFF	0.25	EFF		EFF	
BKG	0.7 cpm	BKG	47 cpm	BKG		BKG	
MDA	120 DPM/100cm²	MDA	933 DPM/100cm²	MDA		MDA	
MDCR	6.3 cpm	MDCR	82 cpm	MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B709J

CAL DUE 5-30-94

Surveyor (signature) Lee Moïsa Date 6-23-94

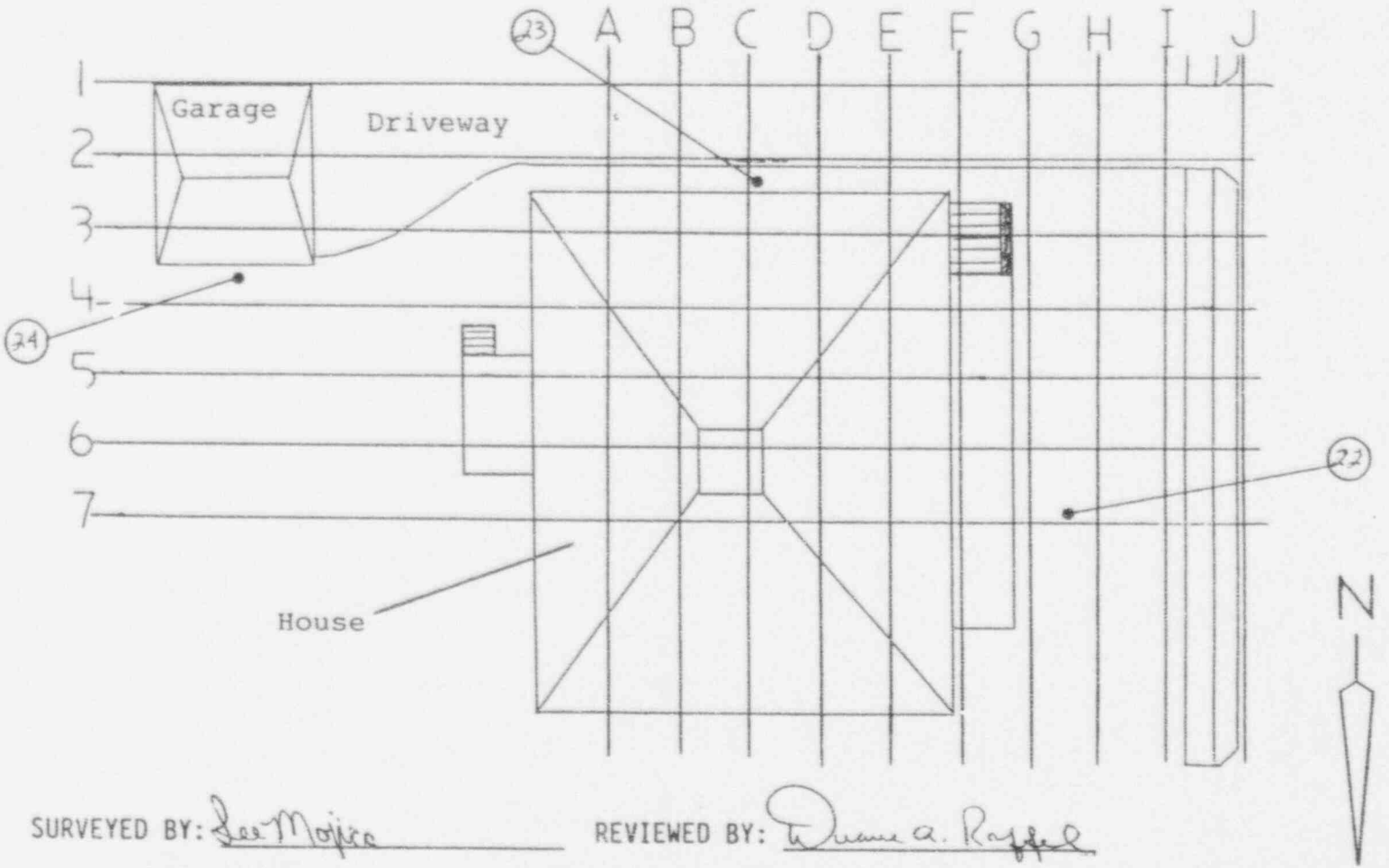
Reviewed by (signature) Duane A. Rafferd Date 10/11/94

FIELD SURVEY MAP LOCATION Lot 125/AREA 3999 E. 26th St. Newburgh Hts., OH

DATE 6-24-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/Micro Rem SERIAL NO. 108850/108858/B709J

REMARKS Soil Sample Locations



SURVEYED BY: Lee Mojica

REVIEWED BY: Duane A. Rafferl

SURVEY RECORD

DATE 6-24-94

LOCATION: Lot # 125

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
11	////////////////////								
22	Soil	< MDCR	< MDA	< MDCR	< MDA	5	1m	N/A	N/A
23	↓	↓	↓	↓	↓	6	↓	↓	↓
24	↓	↓	↓	↓	↓	5	↓	↓	↓
			N A						

DIRECT SURVEY INSTRUMENTS		SMEARABLE CONTAMINATION INSTRUMENTS	
α INST L-2221	β & γ INST L-2221	α INST	β & γ INST
S.N. 108880	S.N. 108858	S.N.	S.N.
CAL DUE 11-26-94	CAL DUE 11-20-94	CAL DUE	CAL DUE
EFF 0.13	EFF 0.24	EFF N A	EFF N A
BKG 1.7 cpm	BKG 42 cpm	BKG	BKG
MDA 135 DPM/100cm²	MDA 917 DPM/100cm²	MDA	MDA
MDCR 10.5 cpm	MDCR 75 cpm	MDCR	MDCR

REMARKS: Alpha readings were taken on 6-30-94 due to the fact that the 43-5 alpha probe was out for calibration and repair.

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B709J

CAL DUE 5-30-94

Surveyor (signature) Lee Mojica Date 6-30-94

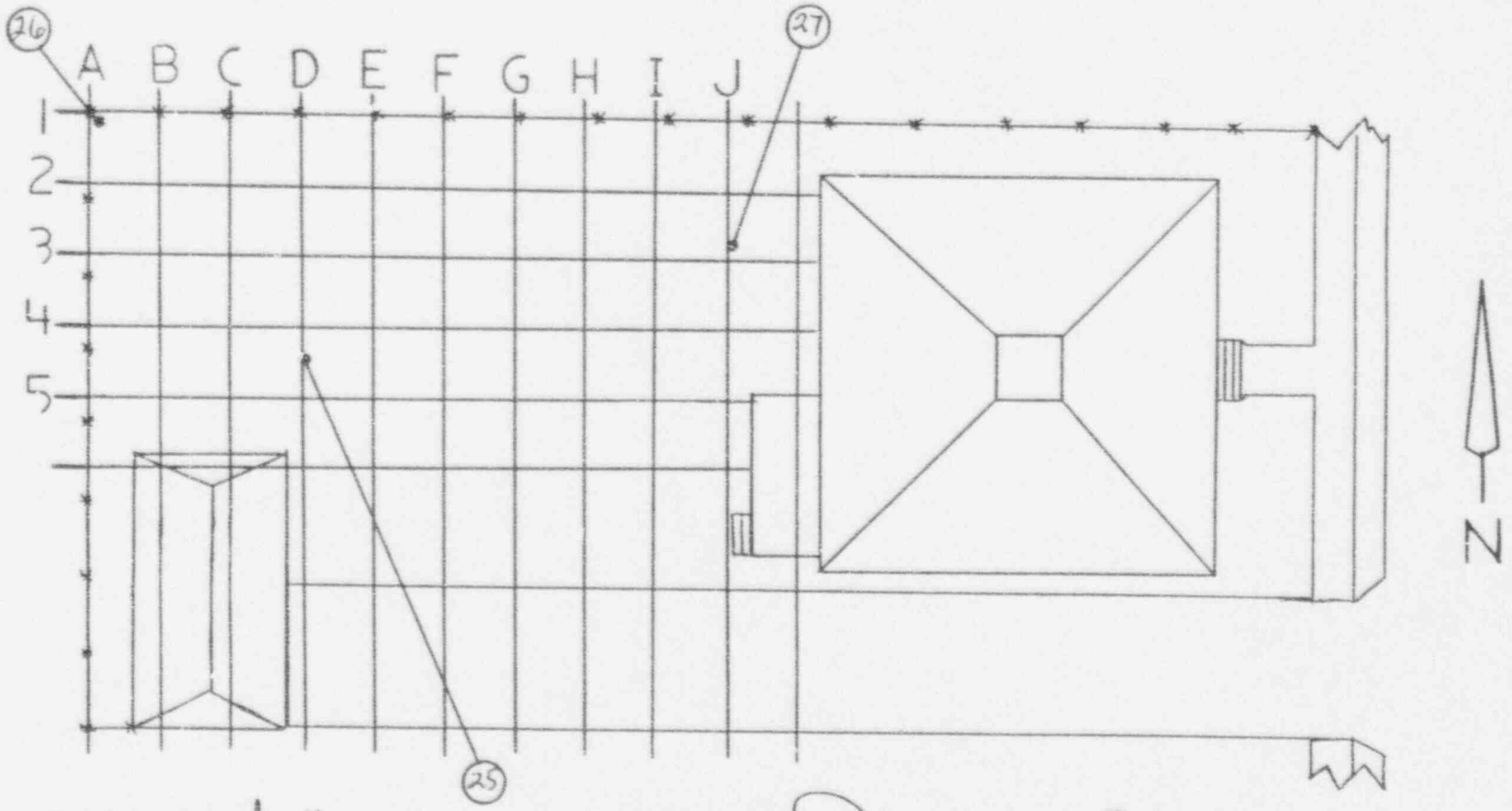
Reviewed by (signature) Duane A. Rath Date 10/1/94

FIELD SURVEY MAP LOCATION Lot 10 /AREA 4008 East 26th St.

DATE 6-25-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-7231/L-2221/Micro Rem SERIAL NO. 108830/108358/B709J

REMARKS Soil Sample Locations



SURVEYED BY: Lee Mojica REVIEWED BY: Duane A. Rath

SURVEY RECORD

DATE 6-25-94

LOCATION: Lot # 10

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
25	Soil	< MDCR	< MDA	< MDCR	< MDA	7	1m	N/A	N/A
26	↓	↓	↓	↓	↓	7	↓	↓	↓
27	↓	↓	↓	↓	↓	5	↓	↓	↓
			N	A					

DIRECT SURVEY INSTRUMENTS				SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221	α INST	N A	β & γ INST	N A
S.N.	108880	S.N.	108858	S.N.		S.N.	
CAL DUE	11-26-94	CAL DUE	11-20-94	CAL DUE		CAL DUE	
EFF	0.13	EFF	0.20	EFF		EFF	
BKG	1.7 cpm	BKG	57 cpm	BKG		BKG	
MDA	135 DPM/100cm²	MDA	1056 DPM/100cm²	MDA		MDA	
MDCR	10.5 cpm	MDCR	95 cpm	MDCR		MDCR	

REMARKS: Alpha readings were taken on 6-30-94 due to the fact that the 43-5 alpha probe was out for calibration and repair.

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B7095

CAL DUE 8-30-94

Surveyor (signature) Lee Mayes Date 6-30-94

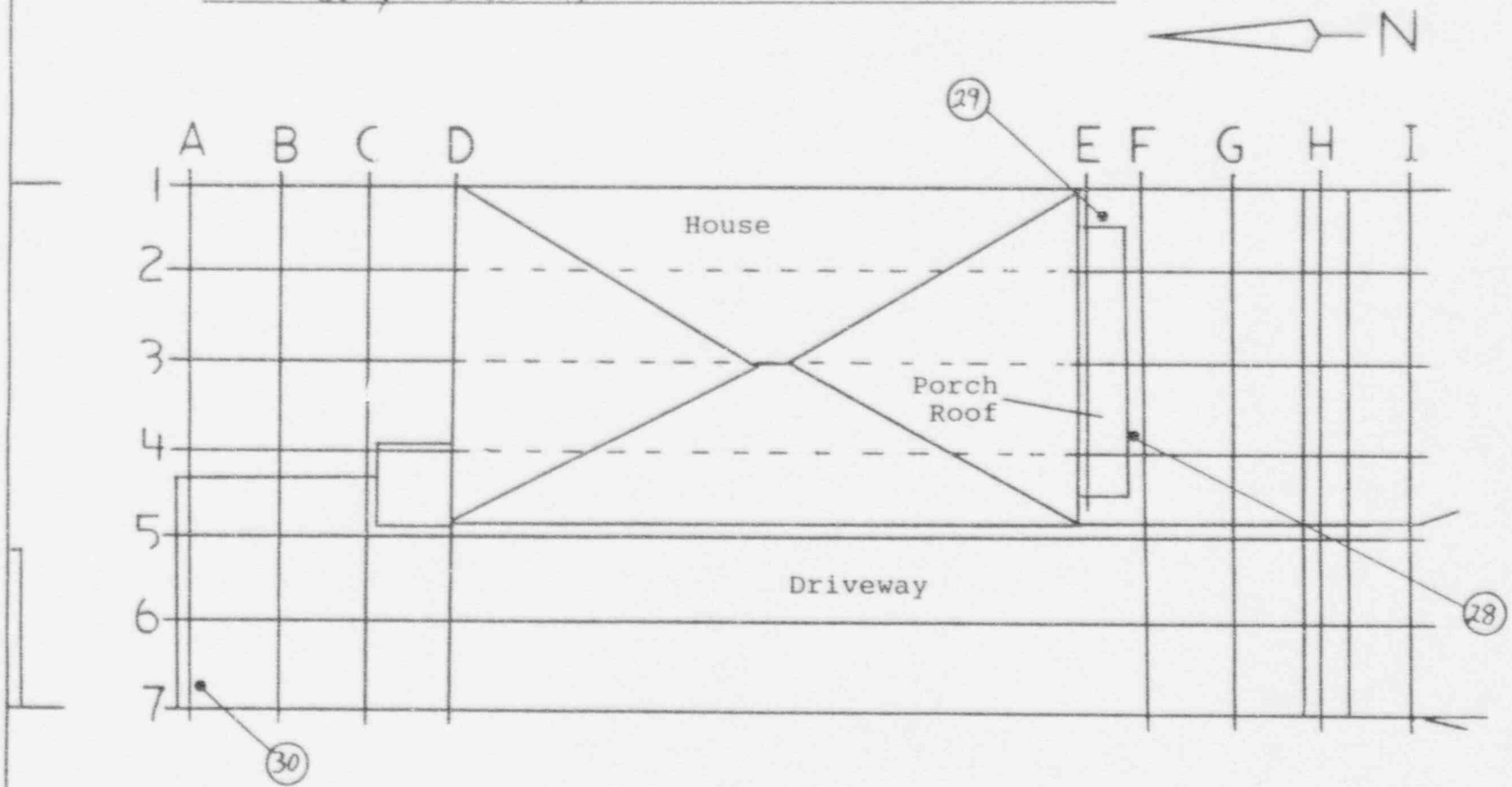
Reviewed by (signature) Duane A. Reffel Date 10/11/94

FIELD SURVEY MAP LOCATION Lot 308/AREA 2809 Ross Ave. Newburgh Hts., OH

DATE 7-1-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/Micro Rem SERIAL NO. 105880/108858/B709J

REMARKS Soil Sample Locations



SURVEYED BY: Jan Majka REVIEWED BY: Diane A. Reed

SURVEY RECORD

DATE 7-1-94

LOCATION: Lot # 305

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
28	Soil	< MDCR	< MDA	< MDCR	< MDA	4	1m	N/A	N/A
29	↓	↓	↓	↓	↓	5	↓	↓	↓
30	↓	↓	↓	↓	↓	5	↓	↓	↓
			N	A					

DIRECT SURVEY INSTRUMENTS				SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221	α INST		β & γ INST	
S.N.	108880	S.N.	108858	S.N.		S.N.	
CAL DUE	11-26-94	CAL DUE	11-20-94	CAL DUE		CAL DUE	
EFF	0.11	EFF	0.22	EFF	N A	EFF	N A
BKG	1.6 cpm	BKG	47 cpm	BKG		BKG	
MDA	109 DPM/100 m²	MDA	1061 DPM/100cm²	MDA		MDA	
MDCR	7.2 cpm	MDCR	93 cpm	MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT

γ INST Micro Rem

S.N. B7095

CAL DUE 6-30-94

Surveyor (signature) Lee Mojica Date 7-1-94

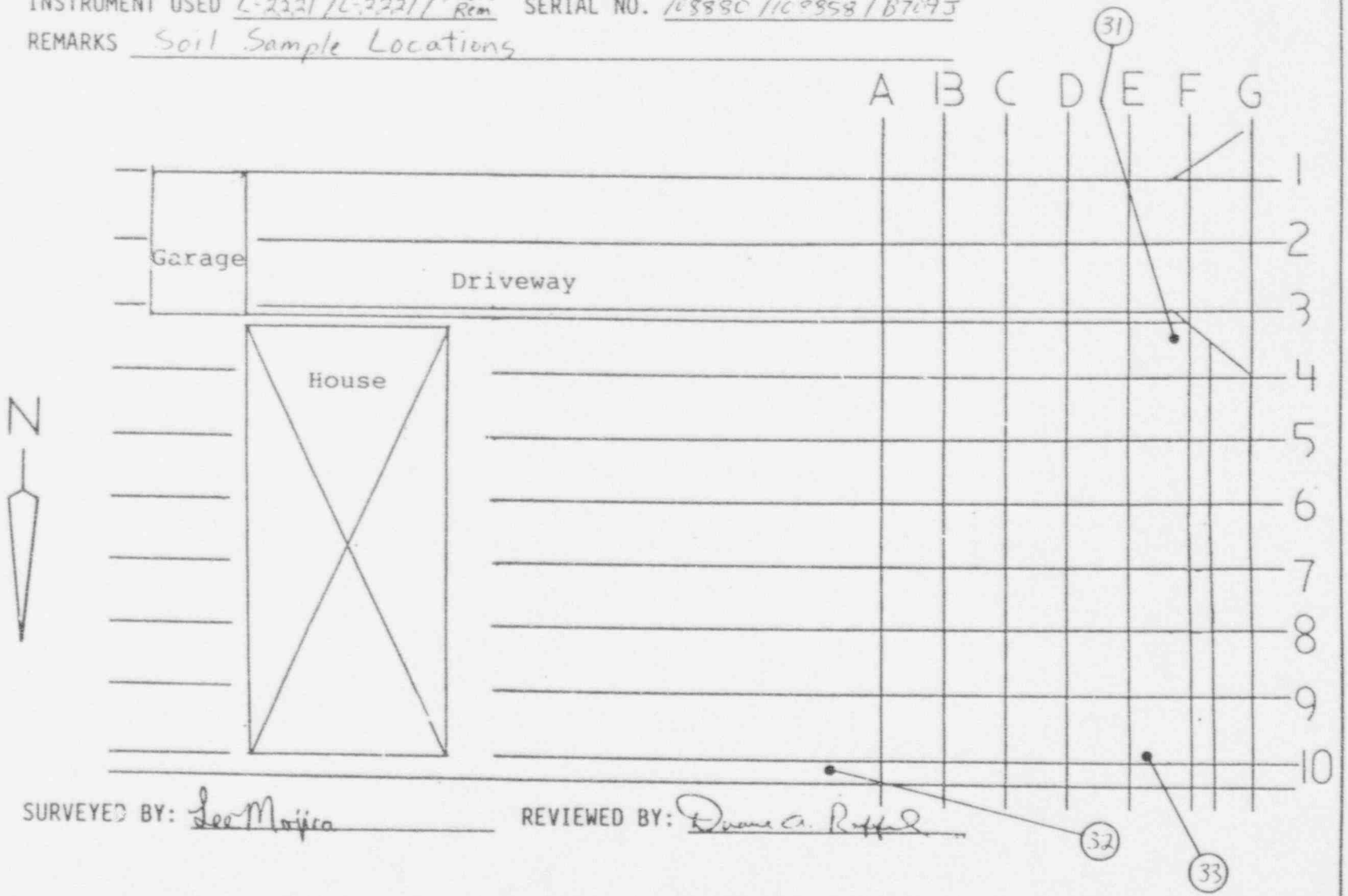
Reviewed by (signature) Dianne A Ruff Date 10/11/94

FIELD SURVEY MAP LOCATION Lot 294/AREA 3975 E. 29th St. Newburgh Hts., OH

DATE 7-5-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/Micro Rem SERIAL NO. 108880/109958/B709J

REMARKS Soil Sample Locations



SURVEYED BY: Lee Mojica REVIEWED BY: Diane A. Ruffo

SURVEY RECORD

DATE 7-5-94

LOCATION: Lot # 294

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
31	Soil	< MDCR	< MDA	< MDCR	< MDA	4	1m	N/A	N/A
32	↓	↓	↓	↓	↓	4	↓	↓	↓
33	↓	↓	↓	↓	↓	2	↓	↓	↓
			N		A				

DIRECT SURVEY INSTRUMENTS				SMEARABLE CONTAMINATION INSTRUMENTS			
α INST	L-2221	β & γ INST	L-2221	α INST		β & γ INST	
S.N.	108880	S.N.	109558	S.N.		S.N.	
CAL DUE	11-26-94	CAL DUE	11-20-94	CAL DUE		CAL DUE	
EFF	0.13	EFF	0.24	EFF	N A	EFF	N A
BKG	1.6 cpm	BKG	46 cpm	BKG		BKG	
MDA	108 DPM/100cm²	MDA	944 DPM/100cm²	MDA		MDA	
MDCR	5.7 cpm	MDCR	80 cpm	MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT	
γ INST	Micro Rem
S.N.	B709J
CAL DUE	9-30-94

Surveyor (signature) Lee Moïses Date 7-5-94

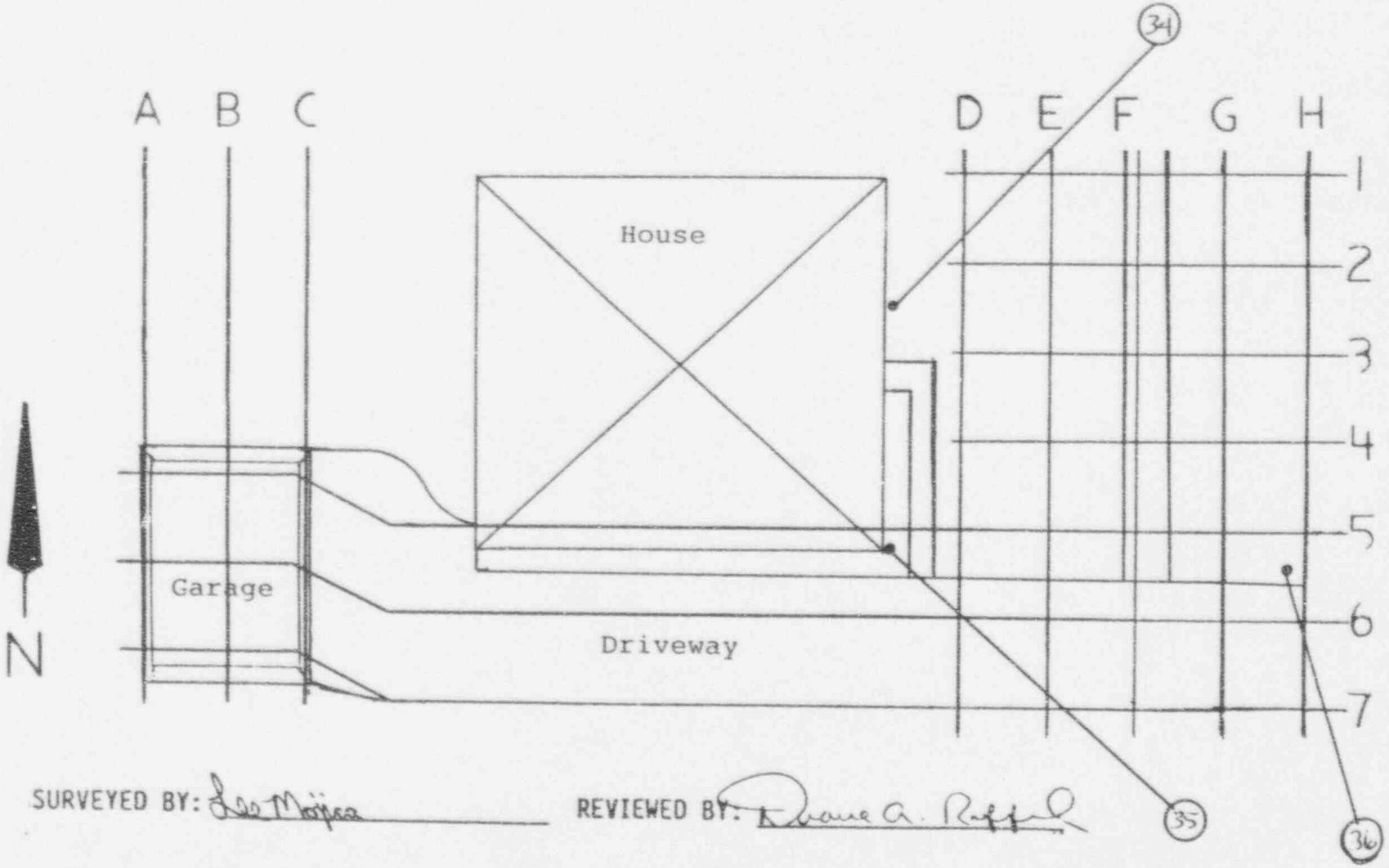
Reviewed by (signature) Duane A Rappel Date 10/1/94

FIELD SURVEY MAP LOCATION Lot 16/AREA 3982 E. 26th Street Newburgh Hts., OH

DATE 7-5-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-2221/L-2221/Micro Rem SERIAL NO. 108890/108858/B707J

REMARKS Soil sample locations



SURVEYED BY: Lee Mojica REVIEWED BY: Duane A. Ruffel

SURVEY RECORD

DATE 7-8-94

LOCATION: Lot # 16

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
34	Soil	<MDCR	<MDA	<MDCR	<MDA	6	1m	N/A	N/A
35	↓	6.2	113	↓	↓	5	↓	↓	↓
36	↓	<MDCR	<MDA	↓	↓	4	↓	↓	↓
			N		A				

DIRECT SURVEY INSTRUMENTS

α INST	L-2221	β & γ INST	L-2221
S.N.	105580	S.N.	105558
CAL DUE	11-26-94	CAL DUE	11-20-94
EFF	0.11	EFF	0.23
BKG	0.8 cpm	BKG	49 cpm
MDA	185 DPM/100cm²	MDA	1000 DPM/100cm²
MDCR	6.6 cpm	MDCR	84 cpm

SMEARABLE CONTAMINATION INSTRUMENTS

α INST		β & γ INST	
S.N.		S.N.	
CAL DUE		CAL DUE	
EFF	N A	EFF	N A
BKG		BKG	
MDA		MDA	
MDCR		MDCR	

REMARKS:

EXPOSURE RATE INSTRUMENT

γ INST	Micro Rem
S.N.	B709J
CAL DUE	8-30-94

Surveyor (signature) Leo Mojica Date 7-8-94

Reviewed by (signature) Duane A. Ruffin Date 10/1/94

APPENDIX C-2

RESIDENTIAL PROPERTY SOIL SAMPLE RESULTS

RSO, Inc. Analytical Report

Analysis For: B. Koh & Associates, Inc.
Sample From: McGean-Rohco, Inc.

Report Date: 29-Sep-94
Prepared By: James Dean Sr.
Project Manager

Independent Laboratory (Alpha Spec Analysis)

Sample Number	Date Collected	Matrix	Date Received	Date Analyzed	LLD	U234 pCi/g	Error +/- pCi/g	U235 pCi/g	Error +/- pCi/g	U238 pCi/g	Error +/- pCi/g	U234/U238 pCi/g	Total pCi/g	Error +/- pCi/g
RSA-4168-0001	06/17/94	Soil	07/15/94	08/11/94	0.4	5.00E-01	4.00E-01	-2.00E-01	2.00E-01	1.10E+00	5.00E-01	4.55E-01	1.40E+00	6.71E-01
RSA-4168-0002	06/17/94	Soil	07/15/94	08/11/94	0.4	5.00E-01	4.00E-01	0.00E+00	3.00E-01	9.00E-01	5.00E-01	5.56E-01	1.40E+00	7.07E-01
RSA-4168-0003	06/17/94	Soil	07/15/94	08/11/94	0.4	1.00E+00	5.00E-01	-1.00E-01	2.00E-01	1.20E+00	5.00E-01	8.33E-01	2.10E+00	7.35E-01
RSA-4168-0004	06/20/94	Soil	07/15/94	08/11/94	0.4	1.10E+00	5.00E-01	-2.00E-01	2.00E-01	2.00E+00	7.00E-01	5.50E-01	2.90E+00	8.83E-01
RSA-4168-0005	06/20/94	Soil	07/15/94	08/11/94	0.4	9.00E-01	5.00E-01	-2.00E-01	2.00E-01	2.60E+00	7.00E-01	3.46E-01	3.30E+00	8.83E-01
RSA-4168-0006	06/20/94	Soil	07/15/94	08/11/94	0.4	1.30E+00	6.00E-01	-1.00E-01	2.00E-01	2.00E+00	7.00E-01	6.50E-01	3.20E+00	8.90E-01
RSA-4168-0007	06/20/94	Soil	07/15/94	08/11/94	0.4	1.00E+00	5.00E-01	-2.00E-01	2.00E-01	1.40E+00	6.00E-01	7.14E-01	2.20E+00	6.50E-01
RSA-4168-0008	06/20/94	Soil	07/15/94	08/11/94	0.4	5.00E-01	4.00E-01	-1.00E-01	3.00E-01	9.00E-01	5.00E-01	5.56E-01	1.30E+00	7.07E-01
RSA-4168-0009	06/20/94	Soil	07/15/94	08/11/94	0.4	1.30E+00	6.00E-01	-2.00E-01	2.00E-01	1.90E+00	7.00E-01	6.84E-01	3.00E+00	9.43E-01
RSA-4168-0010	06/21/94	Soil	07/15/94	08/11/94	0.4	7.00E-01	5.00E-01	-2.00E-01	2.00E-01	1.60E+00	6.00E-01	4.38E-01	2.10E+00	8.06E-01
RSA-4168-0011	06/21/94	Soil	07/15/94	08/11/94	0.4	1.80E+00	6.00E-01	-1.00E-01	2.00E-01	6.00E+00	1.10E+00	3.00E-01	7.70E+00	1.27E+00
RSA-4168-0012	06/21/94	Soil	07/15/94	08/11/94	0.4	1.80E+00	6.00E-01	-1.00E-01	2.00E-01	5.20E+00	1.00E+00	3.46E-01	6.90E+00	1.18E+00
RSA-4168-0013	06/21/94	Soil	07/15/94	08/11/94	0.4	9.00E-01	5.00E-01	-1.00E-01	2.00E-01	3.90E+00	9.00E-01	2.31E-01	4.70E+00	1.05E+00
RSA-4168-0014	06/21/94	Soil	07/15/94	08/11/94	0.4	1.20E+00	6.00E-01	-1.00E-01	2.00E-01	2.40E+00	7.00E-01	5.00E-01	3.50E+00	9.43E-01
RSA-4168-0015	06/21/94	Soil	07/15/94	08/11/94	0.4	8.00E-01	5.00E-01	-1.00E-01	2.00E-01	1.40E+00	6.00E-01	5.71E-01	2.10E+00	8.06E-01
RSA-4168-0016	06/23/94	Soil	07/15/94	08/11/94	0.4	5.00E-01	4.00E-01	-2.00E-01	2.00E-01	1.10E+00	5.00E-01	4.55E-01	1.40E+00	6.71E-01
RSA-4168-0017	06/23/94	Soil	07/15/94	08/11/94	0.4	1.10E+00	5.00E-01	-1.00E-01	2.00E-01	3.70E+00	9.00E-01	2.97E-01	4.70E+00	1.05E+00
RSA-4168-0018	06/23/94	Soil	07/15/94	08/11/94	0.4	1.00E+00	5.00E-01	-2.00E-01	2.00E-01	5.00E-01	4.00E-01	2.00E+00	1.30E+00	6.71E-01
RSA-4168-0019	06/23/94	Soil	07/15/94	08/11/94	0.4	4.00E-01	4.00E-01	-1.00E-01	2.00E-01	1.60E+00	6.00E-01	2.50E-01	1.90E+00	7.48E-01
RSA-4168-0020	06/23/94	Soil	07/15/94	08/11/94	0.4	8.00E-01	5.00E-01	-2.00E-01	2.00E-01	2.30E+00	7.00E-01	3.48E-01	2.90E+00	8.83E-01
RSA-4168-0021	06/23/94	Soil	07/15/94	08/11/94	0.4	8.00E-01	5.00E-01	-2.00E-01	2.00E-01	1.50E+00	6.00E-01	5.33E-01	2.10E+00	8.06E-01
RSA-4168-0022	06/24/94	Soil	07/15/94	08/11/94	0.4	5.00E-01	4.00E-01	-1.00E-01	2.00E-01	1.00E+00	5.00E-01	5.00E-01	1.40E+00	6.71E-01
RSA-4168-0023	06/24/94	Soil	07/15/94	08/11/94	0.4	7.00E-01	4.00E-01	-2.00E-01	2.00E-01	1.10E+00	5.00E-01	6.36E-01	1.60E+00	6.71E-01
RSA-4168-0024	06/24/94	Soil	07/15/94	08/11/94	0.4	9.00E-01	5.00E-01	-1.00E-01	2.00E-01	1.70E+00	6.00E-01	5.29E-01	2.50E+00	8.06E-01
RSA-4168-0025	06/25/94	Soil	07/15/94	08/11/94	0.4	7.00E-01	5.00E-01	-2.00E-01	2.00E-01	1.40E+00	6.00E-01	5.00E-01	1.90E+00	8.06E-01
RSA-4168-0026	06/25/94	Soil	07/15/94	08/11/94	0.4	1.30E+00	5.00E-01	-2.00E-01	2.00E-01	1.70E+00	6.00E-01	7.65E-01	2.80E+00	8.06E-01
RSA-4168-0027	06/25/94	Soil	07/15/94	08/11/94	0.4	9.00E-01	5.00E-01	-1.00E-01	2.00E-01	1.30E+00	6.00E-01	6.92E-01	2.10E+00	8.06E-01
RSA-4168-0028	07/01/94	Soil	07/15/94	08/11/94	0.4	7.00E-01	4.00E-01	-1.00E-01	2.00E-01	1.30E+00	5.00E-01	5.38E-01	1.90E+00	6.71E-01
RSA-4168-0029	07/01/94	Soil	07/15/94	08/11/94	0.4	1.00E+00	5.00E-01	-1.00E-01	2.00E-01	1.10E+00	5.00E-01	9.09E-01	2.00E+00	7.35E-01

RSO, Inc. Analytical Report

Analysis For: B. Koh & Associates, Inc.
Sample From: McGean-Rohco, Inc.

Report Date: 29-Sep-94
Prepared By: James Dean Sr.
Project Manager

Independent Laboratory (Alpha Spec Analysis)

Sample Number	Date Collected	Matrix	Date Received	Date Analyzed	LLD	U234 pCi/g	Error +/- pCi/g	U235 pCi/g	Error +/- pCi/g	U238 pCi/g	Error +/- pCi/g	U234/U238 pCi/g	Total pCi/g	Error +/- pCi/g
RSA-4168-0030	07/01/94	Soil	07/15/94	08/11/94	0.4	9.00E-01	5.00E-01	-1.00E-01	2.00E-01	1.70E+00	6.00E-01	5.29E-01	2.50E+00	8.06E-01
RSA-4168-0031	07/05/94	Soil	07/15/94	08/11/94	0.4	7.00E-01	4.00E-01	-2.00E-01	2.00E-01	8.00E-01	5.00E-01	8.75E-01	1.30E+00	6.71E-01
RSA-4168-0032	07/05/94	Soil	07/15/94	08/11/94	0.4	8.00E-01	5.00E-01	-1.00E-01	2.00E-01	1.40E+00	6.00E-01	5.71E-01	2.10E+00	8.06E-01
RSA-4168-0033	07/05/94	Soil	07/15/94	08/11/94	0.4	1.10E+00	5.00E-01	-2.00E-01	2.00E-01	1.10E+00	5.00E-01	1.00E+00	2.00E+00	7.35E-01
RSA-4168-0034	07/07/94	Soil	07/15/94	08/11/94	0.4	8.00E-01	5.00E-01	-1.00E-01	2.00E-01	1.20E+00	5.00E-01	6.67E-01	1.90E+00	7.35E-01
RSA-4168-0035	07/07/94	Soil	07/15/94	08/11/94	0.4	9.00E-01	5.00E-01	-2.00E-01	2.00E-01	1.40E+00	6.00E-01	6.43E-01	2.10E+00	8.06E-01
RSA-4168-0036	07/07/94	Soil	07/15/94	08/11/94	0.4	9.00E-01	5.00E-01	-2.00E-01	2.00E-01	1.20E+00	5.00E-01	7.50E-01	1.90E+00	7.35E-01

Average Ratio U-234/U-238 = 0.506
"Total" Uranium Activity = 5.... pCi

APPENDIX C-3

PUBLIC PROPERTY SOIL SAMPLE RESULTS

APPENDIX C-3
PUBLIC PROPERTY SOIL SAMPLE RESULTS
(WASHINGTON PARK BOULEVARD)

Sample ID	U-238 pCi/g	Total U pCi/g
WPSS-4258-0034	5.73	8.60
WPSS-4258-0035	<1.94	<2.91
WPSS-4258-0036	<1.92	<2.88

EMPTY LOTS (#278 AND #279)

Sample ID	U-238 pCi/g	Total U pCi/g
RSA-4299-0226	5.12	7.68
RSA-4299-0227	<2.99	<4.49
RSA-4299-0228	3.25	4.88

APPENDIX C-4

ALCOA SOIL SAMPLE RESULTS

APPENDIX C-4

ALCOA SOIL SAMPLE ANALYSES

Sample ID #	U-234 pCi/g	U-235 pCi/g	U-238 pCi/g
AL-001-94	1.62 E+0	1.00 E-1	6.91 E+0
AL-002-94	8.39 E-1	3.98 E-2	1.91 E+0
AL-003-94	7.50 E-1	2.50 E-2	1.43 E+0
AL-004-94	8.82 E-1	3.34 E-2	1.88 E+0
AL-005-94	6.93 E-1	7.19 E-2	1.27 E+0
AL-006-94	1.03 E+0	2.28 E-2	2.03 E+0
AL-007-94	1.26 E+0	7.32 E-2	3.66 E+0
AL-008-94	1.47 E+0	5.46 E-2	5.80 E+0
AL-009-94	5.97 E-1	3.68 E-2	7.23 E-1

*Note location of soil sample given on Figure B-1A.

APPENDIX C-5

COMMERCIAL PROPERTY SOIL ANALYSES RESULTS

(Newburgh and South Shore Railroad, Ohio Crankshaft Division, McGean-Rohco, and CEI)

(Total U calculated by U-238 (pCi/g) x 1.5*)

*1.5 is the ratio of Total U to U-238 as determined by alpha spectroscopy

AFFECTED AREA
NEWBURGH AND SOUTH SHORE RAILROAD
(See Figure B-6A)

Grid	Sample #	Sample Location	U-238 (pCi/g)	Total U (pCi/g)
A-1	CP-045-1	A1-1	9.66	14.49
	CP-045-2	A1-2	6.51	9.77
	CP-045-3	A1-3	8.80	13.2
	CP-045-4	A1-4	28.5	42.75
B-1	CP-044-1	B1-1	<2.28	<3.42
	CP-044-2	B1-2	10.7	16.05
	CP-044-3	B1-3	9.4	14.1
	CP-044-4	B1-4	13.3	19.95
C-1	CP-043-1	C1-1	16.1	24.15
	CP-043-2	C1-2	17.7	26.55
	CP-043-3	C1-3	14.0	21.0
	CP-043-4	C1-4	22.4	33.6
D-1	CP-042-1	D1-1	10.8	16.2
	CP-042-2	D1-2	5.5	8.25
	CP-042-3	D1-3	8.73	13.10
	CP-042-4	D1-4	42.8	64.2
E-1	CP-041-1	E1-1	10.6	15.9
	CP-041-2	E1-2	32.7	49.05
	CP-041-3	E1-3	21.8	32.7
	CP-041-4	E1-4	14.1	21.15
F-1	CP-040-1	F1-1	30.3	45.45
	CP-040-2	F1-2	24.4	36.6
	CP-040-3	F1-3	45.1	67.65
	CP-040-4	F1-4	19.0	28.5
G-1	CP-039-1	G1-1	19.5	29.25
	CP-039-2	G1-2	12.9	19.35
	CP-039-3	G1-3	7.11	10.67
	CP-039-4	G1-4	34.3	51.45
H-1	CP-038-1	H1-1	17.0	25.5
	CP-038-2	H1-2	<3.62	<5.43
	CP-038-3	H1-3	<3.60	<5.4
	CP-038-4	H1-4	19.2	28.8
I-1	CP-037-1	I1-1	28.1	42.15
	CP-037-2	I1-2	<2.04	<3.06
	CP-037-3	I1-3	10.1	15.15
	CP-037-4	I1-4	11.4	17.1
J-1	CP-036-1	J1-1	11.6	17.4
	CP-036-2	J1-2	8.47	12.71
	CP-036-3	J1-3	5.16	7.74
	CP-036-4	J1-4	14.6	21.9
K-1	CP-035-1	K1-1	22.4	33.6
	CP-035-2	K1-2	<2.55	<3.83
	CP-035-3	K1-3	6.57	9.86
	CP-035-4	K1-4	26.6	39.9

AFFECTED AREA (continued)
NEWBURGH AND SOUTH SHORE RAILROAD
(See Figure B-6A)

Grid	Sample #	Sample Location	U-238 (pCi/g)	Total U (pCi/g)
L-1	CP-034-1	L1-1	<2.38	<3.57
	CP-034-2	L1-2	15.0	22.5
	CP-034-3	L1-3	9.85	14.78
	CP-034-4	L1-4	15.8	23.7
M-1	CP-033-1	M1-1	<2.40	<3.6
	CP-033-2	M1-2	4.46	6.69
	CP-033-3	M1-3	<3.44	<5.16
	CP-033-4	M1-4	4.34	6.51
N-1	CP-032-1	N1-1	25.1	37.65
	CP-032-2	N1-2	7.56	11.34
	CP-032-3	N1-3	11.2	11.8
	CP-032-4	N1-4	32.8	49.2
O-1	CP-031-1	O1-1	58.3	87.45
	CP-031-2	O1-2	<2.67	<4.01
	CP-031-3	O1-3	<2.67	<4.01
	CP-031-4	O1-4	32.8	49.2
P-1	CP-030-1	P1-1	26.4	39.6
	CP-030-2	P1-2	5.56	8.34
	CP-030-3	P1-3	5.04	7.56
	CP-030-4	P1-4	21.5	32.25
Q-1	CP-029-1	Q1-1	7.61	11.42
	CP-029-2	Q1-2	<2.84	<4.26
	CP-029-3	Q1-3	<2.60	<3.9
	CP-029-4	Q1-4	16.1	24.15
R-1	CP-028-1	R1-1	12.1	18.15
	CP-028-2	R1-2	<3.82	<5.73
	CP-028-3	R1-3	<1.24	<1.86
	CP-028-4	R1-4	9.97	14.86
S-1	CP-027-1	S1-1	15.5	23.25
	CP-027-2	S1-2	<2.02	<3.03
	CP-027-3	S1-3	<2.06	<3.09
	CP-027-4	S1-4	11.1	16.65
T-1	CP-026-1	T1-1	3.69	5.54
	CP-026-2	T1-2	<2.71	<4.07
	CP-026-3	T1-3	<2.82	<4.23
	CP-026-4	T1-4	4.60	6.9
U-1	CP-025-1	U1-1	<2.58	<3.87
	CP-025-2	U1-2	4.98	7.47
	CP-025-3	U1-3	<3.31	<4.97
	CP-025-4	U1-4	<2.28	<3.42
V-1	CP-024-1	V1-1	8.90	13.35
	CP-024-2	V1-2	<3.15	4.13
	CP-024-3	V1-3	<2.77	4.16
	CP-024-4	V1-4	35.8	53.7

AFFECTED AREA (continued)
NEWBURGH AND SOUTH SHORE RAILROAD
(See Figure B-6A)

Grid	Sample #	Sample Location	U-238 (pCi/g)	Total U (pCi/g)
W-1	CP-023-1	W1-1	11.8	17.7
	CP-023-2	W1-2	36.0	54.0
	CP-023-3	W1-3	7.95	11.93
	CP-023-4	W1-4	9.11	13.67

AFFECTED AREA (continued)
NEWBURGH AND SOUTH SHORE RAILROAD
(See Figure B-6A)

Grid	Sample #	Sample Location	U-238 (pCi/g)	Total U (pCi/g)
A-2	PSS-4263-0061	A2-1	13.5	20.25
	PSS-4263-0062	A2-2	<2.30	<3.45
	PSS-4263-0063	A2-3	11.8	17.7
	PSS-4263-0064	A2-4	11.7	17.6
B-2	PSS-4263-0065	B2-1	<1.83	<2.75
	PSS-4263-0066	B2-2	<2.77	<4.16
	PSS-4263-0067	B2-3	36.5	54.75
	PSS-4263-0068	B2-4	40.4	60.60
C-2	PSS-4263-0069	C2-1	10.0	15.0
	PSS-4263-0070	C2-2	10.6	15.9
	PSS-4263-0071	C2-3	65.9	98.9
	PSS-4263-0072	C2-4	24.4	36.6
D-2	PSS-4263-0073	D2-1	<1.53	<2.30
	PSS-4263-0074	D2-2	7.56	11.34
	PSS-4263-0075	D2-3	51.3	77.0
	PSS-4263-0076	D2-4	455	682.5
E-2	PSS-4263-0077	E2-1	10.9	16.35
	PSS-4263-0078	E2-2	<1.86	<2.79
	PSS-4263-0079	E2-3	74.8	112.2
	PSS-4263-0080	E2-4	53.8	80.7
F-2	PSS-4263-0081	F2-1	<2.65	<3.98
	PSS-4263-0082	F2-2	9.74	14.61
	PSS-4263-0083	F2-3	15.2	22.8
	PSS-4263-0084	F2-4	29.8	44.7
G-2	PSS-4263-0085	G2-1	13.8	20.7
	PSS-4263-0086	G2-2	9.03	13.55
	PSS-4263-0087	G2-3	60.9	91.35
	PSS-4263-0088	G2-4	36.5	54.8
H-2	PSS-4263-0089	H2-1	12.2	18.3
	PSS-4263-0090	H2-2	16.4	24.6
	PSS-4263-0091	H2-3	36.8	55.2
	PSS-4263-0092	H2-4	26.8	40.2
I-2	PSS-4263-0093	I2-1	28.7	43.05
	PSS-4263-0094	I2-2	<3.22	<4.83
	PSS-4263-0095	I2-3	27.1	40.65
	PSS-4263-0096	I2-4	43.6	65.40
J-2	PSS-4263-0097	J2-1	18.5	27.75
	PSS-4263-0098	J2-2	23.2	34.80
	PSS-4263-0099	J2-3	42.6	63.90
	PSS-4263-0100	J2-4	28.9	43.35
K-2	PSS-4263-0101	K2-1	30.4	45.6
	PSS-4263-0102	K2-2	<1.96	<2.94
	PSS-4263-0103	K2-3	18.2	28.80
	PSS-4263-0104	K2-4	24.5	36.75

AFFECTED AREA (continued)
NEWBURGH AND SOUTH SHORE RAILROAD
(See Figure B-6A)

Grid	Sample #	Sample Location	U-238 (pCi/g)	Total U (pCi/g)
L-2	PSS-4263-0105	L2-1	26.5	39.75
	PSS-4263-0106	L2-2	22.2	33.33
	PSS-4263-0107	L2-3	12.1	18.15
	PSS-4263-0108	L2-4	21.3	31.95
M-2	PSS-4263-0109	M2-1	15.4	23.1
	PSS-4263-0110	M2-2	<3.39	<5.09
	PSS-4263-0111	M2-3	18.2	27.30
	PSS-4263-0112	M2-4	<2.39	<3.59
N-2	PSS-4263-0113	N2-1	9.0	13.5
	PSS-4263-0114	N2-2	<3.11	4.67
	PSS-4263-0115	N2-3	26.5	39.75
	PSS-4263-0116	N2-4	38.8	58.20
O-2	PSS-4263-0117	O2-1	<3.04	<4.56
	PSS-4263-0118	O2-2	<2.96	<4.44
	PSS-4263-0119	O2-3	20.0	30
	PSS-4263-0120	O2-4	16.4	24.6
P-2	PSS-4264-0121	P2-1	23.2	34.80
	PSS-4264-0122	P2-2	5.8	8.7
	PSS-4264-0123	P2-3	16.4	24.6
	PSS-4264-0124	P2-4	7.4	11.1
Q-2	PSS-4264-0125	Q2-1	<3.43	<5.15
	PSS-4264-0126	Q2-2	<2.94	4.41
	PSS-4264-0127	Q2-3	10.7	16.05
	PSS-4264-0128	Q2-4	9.57	14.36
R-2	PSS-4264-0129	R2-1	<2.54	<3.81
	PSS-4264-0130	R2-2	11.3	17.0
	PSS-4264-0131	R2-3	12.0	18
	PSS-4264-0132	R2-4	7.43	11.15
S-2	PSS-4264-0133	S2-1	<2.45	<3.68
	PSS-4264-0134	S2-2	5.41	8.12
	PSS-4264-0135	S2-3	4.98	7.47
	PSS-4264-0136	S2-4	16.4	24.6
T-2	PSS-4264-0137	T2-1	<3.06	<4.59
	PSS-4264-0138	T2-2	<3.03	<4.55
	PSS-4264-0139	T2-3	20.4	30.60
	PSS-4264-0140	T2-4	11.7	17.55
U-2	PSS-4264-0141	U2-1	<3.01	<4.52
	PSS-4264-0142	U2-2	<2.15	<3.23
	PSS-4264-0143	U2-3	14.4	21.6
	PSS-4264-0144	U2-4	<2.55	<3.83
V-2	PSS-4264-0145	V2-1	<2.93	<4.40
	PSS-4264-0146	V2-2	8.84	13.26
	PSS-4264-0147	V2-3	18.8	28.2
	PSS-4264-0148	V2-4	15.1	22.65

AFFECTED AREA (continued)
NEWBURGH AND SOUTH SHORE RAILROAD
(See Figure B-6A)

Grid	Sample #	Sample Location	U-238 (pCi/g)	Total U (pCi/g)
W-2	PSS-4264-1049	W2-1	<3.20	<4.8
	PSS-4264-0150	W2-2	<2.76	<4.14
	PSS-4264-0151	W2-3	<3.73	<5.60
	PSS-4264-0152	W2-4	8.53	12.80

UNAFFECTED AREA
NEWBURGH AND SOUTH SHORE RAILROAD
(See Figure B-6A)

Grid	Sample #	Sample Location	U-238 (pCi/g)	Total U (pCi/g)
A-3	PSS-4265-0153	A3-1	13.7	20.55
A-3	PSS-4265-0154	A3-2	17.7	26.55
B-3	PSS-4265-0155	B3-1	43.1	64.65
B-3	PSS-4265-0156	B3-2	42.1	63.15
C-3	PSS-4265-0157	C3-1	23.0	34.5
C-3	PSS-4265-0158	C3-2	28.8	43.2
D-3	PSS-4265-0159	D3-1	38.9	58.35
D-3	PSS-4265-0160	D3-2	26.8	40.2
E-3	PSS-4265-0161	E3-1	22.9	34.35
E-3	PSS-4265-0162	E3-2	24.8	37.2
F-3	PSS-4265-0163	F3-1	27.9	41.85
F-3	PSS-4265-0164	F3-2	59.8	89.7
G-3	PSS-4265-0165	G3-1	21.5	32.25
G-3	PSS-4265-0166	G3-2	45.1	67.65
H-3	PSS-4265-0167	H3-1	21.7	32.55
H-3	PSS-4265-0168	H3-2	11.5	17.25
I-3	PSS-4265-0169	I3-1	19.2	28.8
I-3	PSS-4265-0170	I3-2	18.7	28.05
J-3	PSS-4265-0171	J3-1	19.0	28.5
J-3	PSS-4265-0172	J3-2	12.6	18.9
K-3	PSS-4265-0173	K3-1	20.6	30.9
L-3	PSS-4265-0174	L3-1	5.83	8.75
M-3	PSS-4265-0175	M3-1	25.9	38.85
N-3	PSS-4265-0176	N3-1	10.2	15.3
O-3	PSS-4265-0177	O3-1	8.77	13.16
P-3	PSS-4265-0178	P3-1	11.5	17.25
Q-3	PSS-4265-0179	Q3-1	13.8	20.7
R-3	PSS-4265-0180	R3-1	7.13	10.70
S-3	PSS-4265-0181	S3-1	4.76	7.14
T-3	PSS-4265-0182	T3-1	9.48	14.22
U-3	PSS-4265-0183	U3-1	7.22	10.83

AFFECTED AREA
OHIO CRANKSHAFT
(See Figure B-5)

Grid	Sample #	Sample Location	U-238 (pCi/g)	Total U (pCi/g)
A1	CP-001-1	A1-1	3.38	5.07
	CP-001-2	A1-2	<2.32	<3.48
	CP-001-3	A1-3	<1.87	<2.81
	CP-001-4	A1-4	<1.51	<2.27
B1	CP-002-1	B1-1	6.04	9.06
	CP-002-2	B1-2	<2.46	<3.69
	CP-002-3	B1-3	2.90	4.35
	CP-002-4	B1-4	<2.53	<3.80
C1	CP-003-1	C1-1	3.62	5.43
	CP-003-2	C1-2	5.26	7.89
	CP-003-3	C1-3	<2.26	<3.39
	CP-003-4	C1-4	3.49	5.24
D1	CP-004-1	D1-1	19.8	29.7
	CP-004-2	D1-2	4.88	7.32
	CP-004-3	D1-3	<2.31	<3.47
	CP-004-4	D1-4	<1.78	<2.67
E1	CP-005-1	E1-1	<2.11	<3.17
	CP-005-2	E1-2	6.27	9.41
	CP-005-3	E1-3	3.23	4.85
	CP-005-4	E1-4	3.74	5.61
F1	CP-006-1	F1-1	<1.79	<2.69
	CP-006-2	F1-2	<2.03	<3.05
	CP-006-3	F1-3	3.51	5.27
	CP-006-4	F1-4	4.42	6.63
G1	CP-007-1	G1-1	4.98	7.47
	CP-007-2	G1-2	<2.21	<3.32
	CP-007-3	G1-3	<1.81	<2.72
	CP-007-4	G1-4	5.25	7.88
H1	CP-008-1	H1-1	<2.14	<3.21
	CP-008-2	H1-2	3.00	4.5
	CP-008-3	H1-3	<1.66	<2.49
	CP-008-4	H1-4	4.52	6.78
I1	CP-009-1	I1-1	3.88	5.82
	CP-009-2	I1-2	<1.74	<2.61
	CP-009-3	I1-3	<1.75	<2.63
	CP-009-4	I1-4	5.3	7.95
J1	CP-010-1	J1-1	6.26	9.39
	CP-010-2	J1-2	4.54	6.81
	CP-010-3	J1-3	2.90	4.35
	CP-010-4	J1-4	5.36	8.04
K1	CP-011-1	K1-1	4.96	7.44
	CP-011-2	K1-2	4.13	6.20
	CP-011-3	K1-3	<2.05	<3.08
	CP-011-4	K1-4	<2.12	<3.18

AFFECTED AREA (continued)
OHIO CRANKSHAFT
(See Figure B-5)

Grid	Sample #	Sample Location	U-238 (pCi/g)	Total U (pCi/g)
L1	CP-012-1	L1-1	<2.21	<3.32
	CP-012-2	L1-2	<1.77	<2.66
	CP-012-3	L1-3	<2.18	<3.27
	CP-012-4	L1-4	3.52	5.28
M1	CP-013-1	M1-1	<2.44	<3.66
	CP-013-2	M1-2	<2.54	<3.81
	CP-013-3	M1-3	3.91	5.87
	CP-013-4	M1-4	17.5	26.25
N1	CP-014-1	N1-1	11.3	16.95
	CP-014-2	N1-2	<2.39	<3.59
	CP-014-3	N1-3	3.79	5.69
	CP-014-4	N1-4	6.59	9.89
O1	CP-015-1	O1-1	9.36	14.04
	CP-015-2	O1-2	3.53	5.30
	CP-015-3	O1-3	4.36	6.54
	CP-015-4	O1-4	9.88	14.82
P1	CP-016-1	P1-1	11.9	17.85
	CP-016-2	P1-2	4.90	7.35
	CP-016-3	P1-3	3.61	5.42
	CP-016-4	P1-4	12.0	18
Q1	CP-017-1	Q1-1	<2.11	<3.17
	CP-017-2	Q1-2	6.43	9.65
	CP 017-3	Q1-3	<1.86	<2.79
	CP-017-4	Q1-4	10.6	15.9
R1	CP-018-1	R1-1	4.69	7.04
	CP-018-2	R1-2	<2.23	<3.35
	CP-018-3	R1-3	10.1	15.15
	CP-018-4	R1-4	4.56	6.84
S1	CP-019-1	S1-1	7.61	11.42
	CP-019-2	S1-2	<1.62	<2.43
	CP-019-3	S1-3	8.20	12.3
	CP-019-4	S1-4	5.85	8.78
T1	CP-020-1	T1-1	25.1	37.65
	CP-020-2	T1-2	4.62	6.93
	CP-020-3	T1-3	4.66	6.99
	CP-020-4	T1-4	8.88	13.32
U1	CP-021-1	U1-1	6.51	9.77
	CP-021-2	U1-2	5.18	7.77

UNAFFECTED AREA
OHIO CRANKSHAFT
(See Figure B-5)

Grid	Sample #	Sample Location	U-238 (pCi/g)	Total U (pCi/g)
B2	CP-047-1	B2-1	<2.36	<3.54
H2	CP-050-1	H2-1	<1.71	<2.57
K2	CP-049-1	K2-1	<2.12	<3.18
L2	CP-052-1	L2-1	2.71	4.07
N2	CP-053-1	N2-1	3.4	5.1
O2	CP-048-1	O2-1	<1.99	<2.99
P2	CP-054-1	P2-1	4.60	6.9
R2	CP-055-1	R2-1	6.05	9.08
S2	CP-051-1	S2-1	<1.63	<2.45
T2	CP-056-1	T2-1	<2.22	<3.33

McGEAN-ROHCO NORTH PERIMETER
(See Figure B-4)

Grid	Sample #	Sample Location	U-238 (pCi/g)	Total U (pCi/g)
A1	CP-066-1	A1-1	12.5	18.75
C1	CP-065-1	C1-1	17.2	25.8
E1	CP-064-1	E1-1	13.1	19.65
G1	CP-063-1	G1-1	6.76	10.14
I1	CP-062-1	I1-1	<2.29	<3.44
K1	CP-061-1	K1-1	<2.19	<3.29
M1	CP-060-1	M1-1	<1.98	<2.97
O1	CP-059-1	O1-1	<1.97	<2.96
Q1	CP-058-1	Q1-1	<2.20	<3.3
S1	CP-057-1	S1-1	4.26	6.39

CEI ELECTRICAL SUBSTATION
(See Figure B-8)

Grid	Sample #	Sample Location	U-238 (pCi/g)	Total U (pCi/g)
D1	CEI-4258-0037	D1	<1.71	<2.57
E1	CEI-4258-0038	E1	<2.42	<3.63
F1	CEI-4258-0039	F1	6.40	9.6

APPENDIX C-6

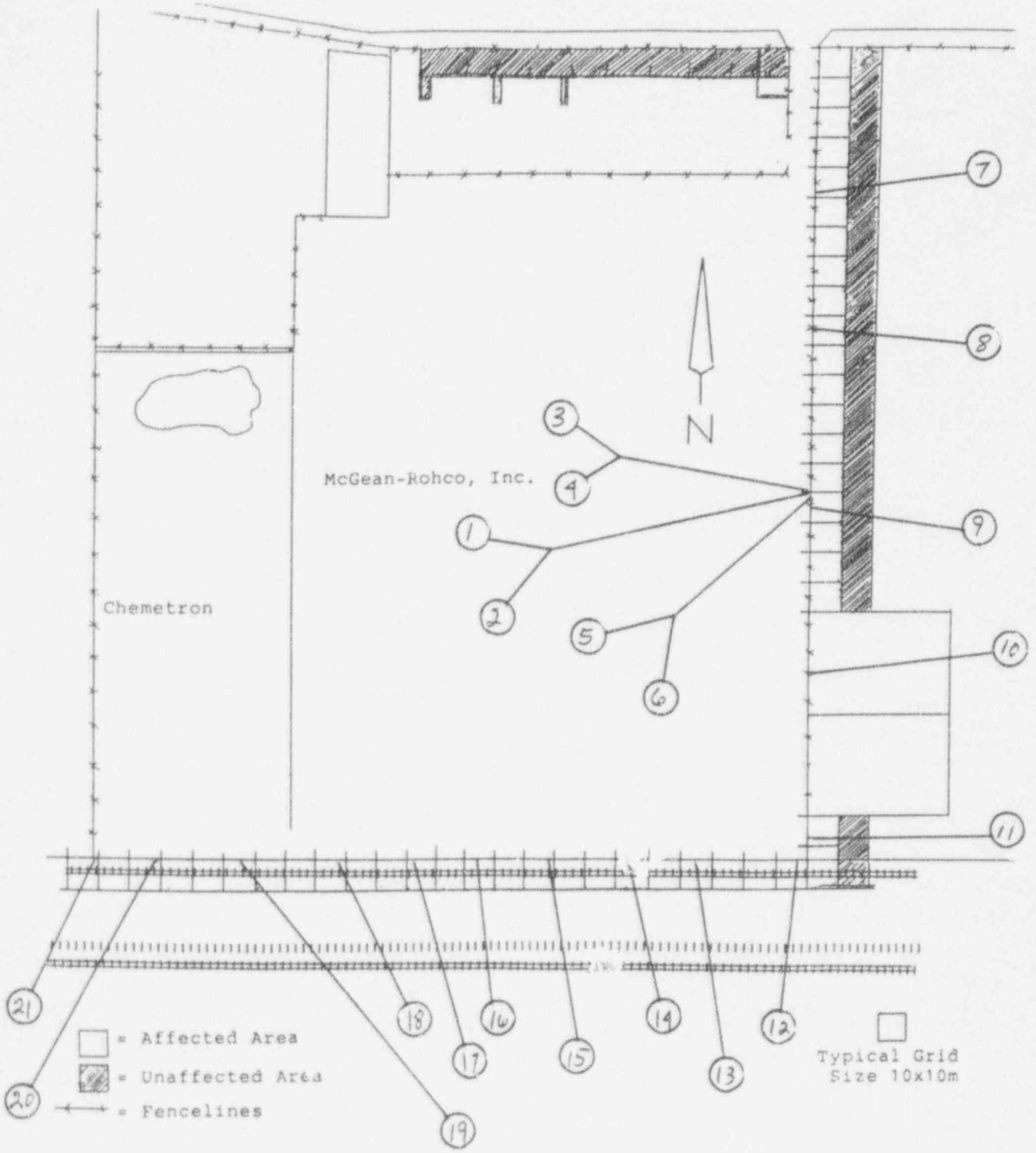
RANDOM SOIL SAMPLE LOCATIONS AND RESULTS

FIELD SURVEY MAP LOCATION McGean-Rohco /AREA East & South Perimeter

DATE 8-25-93 TIME _____ REASON Vicinity Scoping Survey

INSTRUMENT USED _____ SERIAL NO. _____

REMARKS Random Sample Locations



SURVEYED BY: _____ REVIEWED BY: _____

RANDOM SOIL SAMPLES
OHIO CRANKSHAFT, McGEAN-ROHCO AND NEWBURGH AND SOUTH SHORE RAILROAD

Sample #	Sample Location	U-238 (pCi/g)	Total U (pCi/g)
PSS-4258-0040	1	63.0	94.5
PSS-4258-0041	2	<1.7	<2.55
PSS-4258-0042	3	46.7	70.05
PSS-4258-0043	4	<2.29	<3.44
PSS-4258-0044	5	35.3	52.95
PSS-4258-0045	6	3.99	5.99
PSS-4258-0046	7	4.63	6.95
PSS-4258-0047	8	5.33	8.0
PSS-4258-0048	9	17.0	25.5
PSS-4258-0049	10	<2.25	<3.38
PSS-4258-0050	11	20.5	30.75
PSS-4258-0051	12	29.0	43.5
PSS-4258-0052	13	18.3	27.45
PSS-4258-0053	14	31.5	47.25
PSS-4258-0054	15	51.0	76.5
PSS-4258-0055	16	38.9	58.35
PSS-4258-0056	17	101	151.5
PSS-4258-0057	18	61.1	91.65
PSS-4258-0058	19	20.3	30.45
PSS-4258-0059	20	13.2	19.8
PSS-4258-0060	21	23.0	34.5

ADDENDUM

1.0 NRC REGION III SPECIAL INSPECTION AND CONFIRMATORY SURVEY

1.1 General

During the performance of the residential survey and sampling activities by Chemetron, NRC Region III personnel conducted a special inspection and confirmatory survey (June 23, 1994) and a review of related Chemetron survey and analytical data (July 29 through August 16, 1994). [NRC, 1994]

The purpose of the special inspection was to observe Chemetron personnel perform the surveys and sampling, as described in the approved Chemetron Survey and Sampling Plan. The purpose of the confirmatory survey and review of survey and analytical data was to verify Chemetron's survey and sampling results. The NRC Region III personnel conducted the confirmatory survey of several residential properties and the ALCOA property. The survey included direct surface surveys and collection of soil samples for gamma spectroscopy. A summary of the NRC confirmation survey and review of Chemetron survey and analytical data is presented in the subsequent sections. A discussion of the followup activities undertaken by Chemetron as a result of the NRC confirmatory survey and related review is also presented.

1.1.1 Confirmatory Survey Plan

The NRC Region III confirmatory survey conducted on June 23, 1994 consisted of surveying a minimum of 10 percent of the residential properties surveyed by Chemetron; 10 percent of the area outside of Chemetron's west fence line, on the ALCOA property, surveyed by Chemetron; and a 100 percent survey of the vacant lot on Bert Avenue. Walkover surveys were performed by scanning the areas with both a sodium-iodide (NaI) and a Geiger-Mueller (G-M) pancake detector. The survey included a collection of samples from any area with measurements two times background; and collection of samples at locations with elevated measurements identified by Chemetron.

1.1.2 Survey Results

The survey was performed using a Ludlum Model 12 portable survey meter, coupled to a G-M pancake detector to measure beta (β)/gamma (γ) activity or a NaI scintillation detector to detect γ activity. Background for the G-M pancake detector was 50 counts per minute (cpm) with an efficiency of 36 percent for depleted uranium (DU), using a strontium-90/yttrium-90 plated source. The background for the NaI detector was 8,000 cpm.

1.1.2.1 Residential Properties

The Bert Avenue vacant lot, next to Lot# 300 (Figure 1), was surveyed by walking over the entire lot while surface scanning the area with both the G-M pancake detector and the NaI detector. All measurements obtained were indistinguishable from background. Particular attention was given to the area previously identified with elevated measurements and partially remediated. All surface measurements in this area were also indistinguishable from background. Since all measurements were indistinguishable from background, soil samples were not collected from this lot.

Three residential properties were surveyed (Figure 1 and Table 1). These properties were in the neighborhood bounded by the Bert Avenue site on the north, Harvard Avenue on the south, residential properties on the west side of East 26th Street on the west, and residential properties on the east side of East 29th Street on the east. The survey was conducted by walking over the yards and driveways with both the G-M pancake detector and the NaI detector. All measurements of the residential properties were indistinguishable from background.

Since no elevated measurements were identified, one soil sample was collected from each of the properties for gamma spectroscopy analysis. One random soil sample was collected in the parkway from residential property Number 1. For residential properties Numbers 2 and 3, one soil sample from each property was collected along side the sample collected by Chemetron. Samples were collected within six inches of the surface.

Soil samples were prepared for analysis by drying, crushing and sieving. Samples were analyzed by gamma spectroscopy in the Region III laboratory. Background soil concentrations were determined from background soil samples collected by NRC Region III personnel during the May 1993 surveys of residential properties. Background soil concentration was 1.2 picocuries per gram (pCi/g) of total uranium. The total uranium concentration, for the background sampling assumed that uranium-238 and uranium-234 concentrations were in equilibrium.

The results of the gamma spectroscopy analysis, for the samples collected during this inspection, ranged from 8 to 43 pCi/g of soil for total DU. Since activity was identified in the residential soil samples significantly above background, the samples were sent to Oak Ridge Institute for Science and Education (ORISE) for isotopic uranium (U-234, U-235, U-238) analyses via alpha spectroscopy to determine total uranium concentration. Alpha spectroscopy was also used to determine whether the activity is from natural or depleted uranium by the U-234 to U-238 ratio. The results of the ORISE analyses ranged from 4 to 28 pCi for total uranium (see Table 2 for analysis data). The U-234 to U-238 ratio indicates the activity to be DU.

1.1.2.2 Commercial Properties

The affected and unaffected areas of the ALCOA property, as designated by Chemetron, were surveyed. The survey was conducted by walking over the area with both G-M and NaI detectors. Scans included any manholes or drains in the area. Four areas with activity in excess of background were identified on the ALCOA property, all but one was also identified by Chemetron (Figure 2 and Table 2). The activity identified ranged from 80 to 900 cpm. Soil samples from each of these areas were collected and analyzed by gamma spectroscopy in the Region III laboratory. The results of the analysis ranged from less than (<) 5 to 554 pCi/g of soil (Table 2). The U-234 to U-238 indicates the activity to be from DU.

The first location, approximately 6 inches wide and 15 feet long, is located between Chemetron's west fence line and an asphalt curb on ALCOA's property in grid T-1. The soil in this area appears to have been pushed up against the fence during the remediation and demolition of

Building 21. Two soil samples were collected in this area and the results were 143 pCi/g and 554 pCi/g of total DU.

The second location is along the western edge of grids A-1; B-1; and C-1. This was a composite sample and the analysis results indicated 18 pCi/g of total DU.

The third location is located on the west side of grid A-1 and is approximately four feet east of ALCOA's Building 65 concrete pad. The analysis results indicated 73 pCi/g of total DU. The fourth location is located in grid T-3, and the analysis results indicated <5 pCi/g of total DU.

1.1.3 Conclusions

In conclusion, the results of soil samples collected in the residential area indicated the presence of DU in excess of background levels, however the activity was less than NRC's unrestricted use criteria of 35 pCi/g. This criteria is found in NRC's Branch Technical Position "Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations," 46 FR 52061; October 23, 1981.

One residential sample indicated activity greater than 75 percent of the unrestricted use criteria, therefore NRC recommended that, as committed to in the Chemetron Survey and Sampling Plan, Chemetron should reclassify the residential area as affected and perform additional surveys as would be required in affected areas.

Two areas of the ALCOA property were identified with activity in excess of NRC's unrestricted use criteria. NRC recommended that these areas should be remediated and resurveyed. One area, by ALCOA's Building 65 pad, identified with activity in excess of the unrestricted use criteria. NRC commented that as stated in Chemetron's survey plan, this area should be reclassified as an affected area, gridded, and resurveyed to ensure there are no additional areas with activity in excess of the unrestricted use criteria.

2.0 CHEMETRON SURVEY/SAMPLING AND REMEDIATION

As a result of the NRC special inspection (NRC, 1994), Chemetron carried out additional survey/sampling of one residential property (4013 East 27th Street) and one commercial property (ALCOA).

2.1 Residential Property

As a result of the NRC's soil sample analyses being greater than 75% (28 pCi/g) of the unrestricted use criteria, Chemetron reclassified the front yard (4013 East 27th Street) as an affected area and the backyard as an unaffected area.

Surface scans were performed on 100% of the front yard and 10% of the backyard (Figure 1A). Beta-gamma and alpha direct measurements were also collected.

Four additional soil samples were collected from the front yard and 3 samples were collected from the backyard.

2.2 Commercial Property

As a result of the NRC special inspection (NRC, 1994), several areas of the ALCOA property were identified with activity in excess of the NRC's unrestricted use criteria (35 pCi/g). These areas (Figure 2) will be remediated and resurveyed. One area near the old Building 65 pad (Figure 2) was located in an area classified as unaffected. Consistent with Chemetron's Survey and Sampling Plan (B. Koh & Associates, July 1993), this area was reclassified as an affected area, gridded and resurveyed.

3.0 RESULTS AND DISCUSSION

3.1 Residential Property

Surface scans of the front and back yard showed no areas of elevated radiation. Direct measurements (<881 dpm/100 cm^2 beta-gamma and <86 dpm/100 cm^2 alpha) were all below the NRC's surface contamination release limits. Exposure rate measurements (5 to 9 μRem/hr) were comparable to background (6 to 12 μRem/hr). Soil sample analyses results are pending and will be reported under separate cover.

3.2 Commercial Property

Surface scans of the ALCOA properties east fenceline (Grids A-3, B-3 and C-3) showed areas of elevated radiation. Direct measurements (8,410 dpm/100 cm^2 beta-gamma maximum and <86 dpm/100 cm^2 alpha) were all below the NRC's surface contamination release limits. Exposure rate measurements (4 to 7 μRem/hr) were comparable to background. Soil sample analyses results are pending and will be reported under separate cover.

The contamination located on the McGean-Rohco, Inc. property (Grid T-1) will be remediated.

4.0 CONCLUSION

4.1 Residential Property

The results of the additional surveys indicated radiation levels comparable to background. The soil sample analyses are pending and will be reported under separate cover.

4.2 Commercial Property

The area west of grid A-1 that contained the 73 pCi/g (Total U) soil sample will be remediated.

The results of the additional surveys of the ALCOA property indicated the presence of radiation above background levels. Soil samples from these elevated areas were taken. The results of the analyses are pending and will be reported under separate cover.

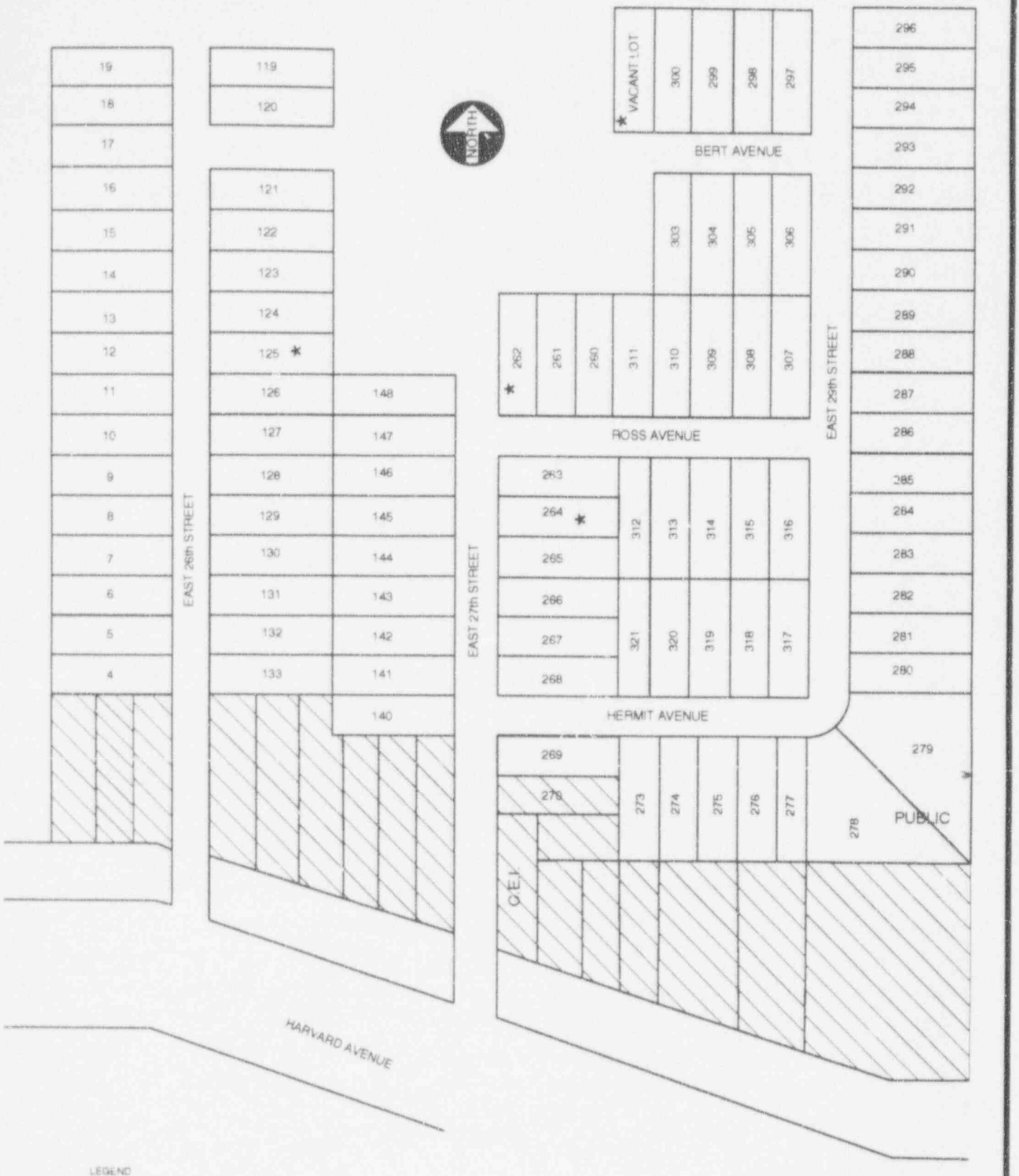
5.0 REFERENCES

B. Koh and Associates Inc., July 1993. Radiological Survey Plan For Residential, Public and Commercial Properties In the Vicinity of Harvard Avenue Chemetron Corporation, Newburgh Heights, Ohio.

US Nuclear Regulatory Commission. October 1981. Branch Technical Position 46 FR 52061. "Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations."

US Nuclear Regulatory Commission. October 4, 1994. Inspection Report No. 040-08724/94004 (DRSS) "Offsite Locations in the Vicinity of the Harvard Avenue Site, Newburgh Heights, Ohio."

FIGURES



LEGEND

* - NRC CONFIRMATORY SAMPLING SURVEY LOCATION

▨ - COMMERCIAL PROPERTY

NOTE: NOT ALL COMMERCIAL OR PUBLIC PROPERTIES ARE SHOWN

NOT TO SCALE

B. Koh & Associates, Inc.

FIGURE 1 (ADDENDUM)

NRC CONFIRMATORY SAMPLING AND SURVEY LOCATIONS

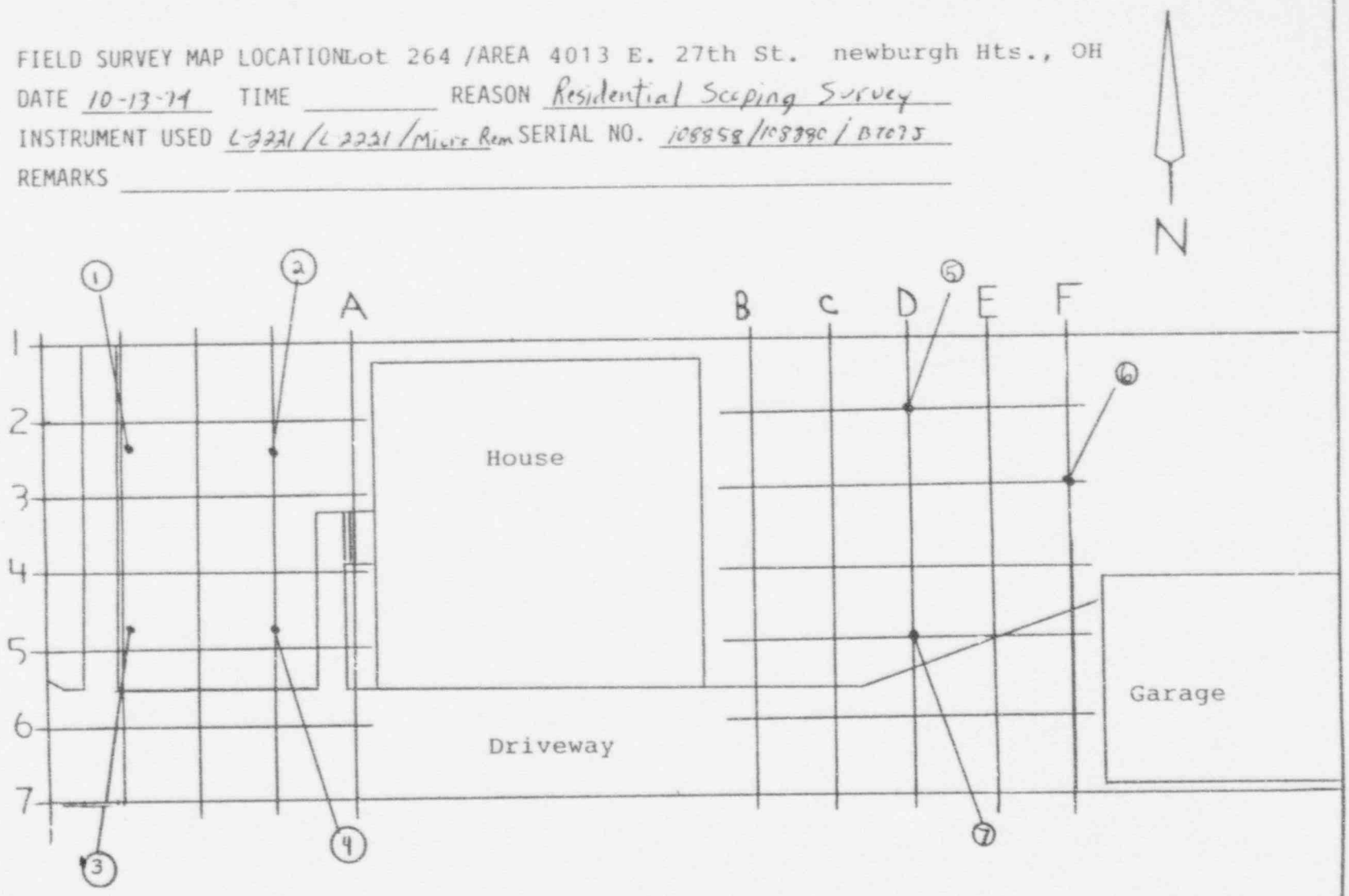
DATE: OCTOBER 7, 1994

FIELD SURVEY MAP LOCATION Lot 264 /AREA 4013 E. 27th St. newburgh Hts., OH

DATE 10-13-94 TIME _____ REASON Residential Scoping Survey

INSTRUMENT USED L-3231 / L 2231 / Micro Rem SERIAL NO. 108858 / 108880 / B1073

REMARKS _____



SURVEYED BY: Joe Mojica

REVIEWED BY: Dan Miller

FIGURE 1A (ADDENDUM)

SURVEY RECORD

DATE 10-13-94

LOCATION: Lot #264 / 4013 E. 27th St. Newburgh Hts. OH

TIME

REASON FOR SURVEY: Residential Scoping Survey

FIGURE # 1A Addendum

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A1	on ground	N/A	N/A	<mdcr	<mdA	8	1	N/A	N/A
A2						6			
A3						8			
A4						6			
A5						6			
A6						5			
A7						7			
B1						7			
B2						9			
B3						6			
B4						9			
B5						7			
B6						8			
B7						7			
C1						8			
C2						7			
C3						7			
C4						8			
C5						5			
C6						5			
C7						5			
D1		↓	↓			6			
D2		<mdcr	<mdA			7			
D3		N/A	N/A			7			
D4	↓	↓	↓	↓	↓	7	↓	↓	↓

DIRECT SURVEY INSTRUMENTS		SMEARABLE CONTAMINATION INSTRUMENTS	
α INST L-2221	β & γ INST L-2221	α INST	β & γ INST
S.N. 108858	S.N. 108880	S.N.	S.N.
CAL DUE 11-20-94	CAL DUE 11-26-94	CAL DUE	CAL DUE
EFF 0.10	EFF 0.28	EFF	EFF
BKG 0.2cpm	BKG 50cpm	BKG N/A	BKG N/A
MDA 86 dpm/100cm²	MDA 881 dpm/100cm²	MDA	MDA
MDCR 4.5 cpm	MDCR 86 cpm	MDCR	MDCR

REMARKS: Beta-Gamma readings taken 10-13-94.
Alpha readings taken 10-14-94.
Readings for soil samples 5,6,7 are recorded above on respected pts.

EXPOSURE RATE INSTRUMENT
γ INST Bircon Micro Rem
S.N. B729J
CAL DUE 1-23-95

Surveyor (signature) Don Minica Date 10-13-94

Reviewed by (signature) [signature] Date 10-21-94

SURVEY RECORD
CONTINUATION

DATE: 10-13-94

LOCATION: Lot #264 / 4013 E. 27th St. Newburgh Hts OH

TIME:

REASON FOR SURVEY: Residential Scoping Survey

FIGURE #: 1A Addendum

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
D5	on ground	<MDCR	<MDA	<MDCR	<MDA	5	1	N/A	N/A
D6		N/A	N/A			5			
D7						5			
E1						6			
E2						8			
E3						7			
E4						8			
E5						5			
E6						6			
E7						6			
F1						7			
F2						7			
F3		<MDCR	<MDA			7			
F4		N/A	N/A			6			
F5						6			
F6						5			
F7						5			
1		<MDCR	<MDA			7			
2						8			
3						6			
4						7			

N A

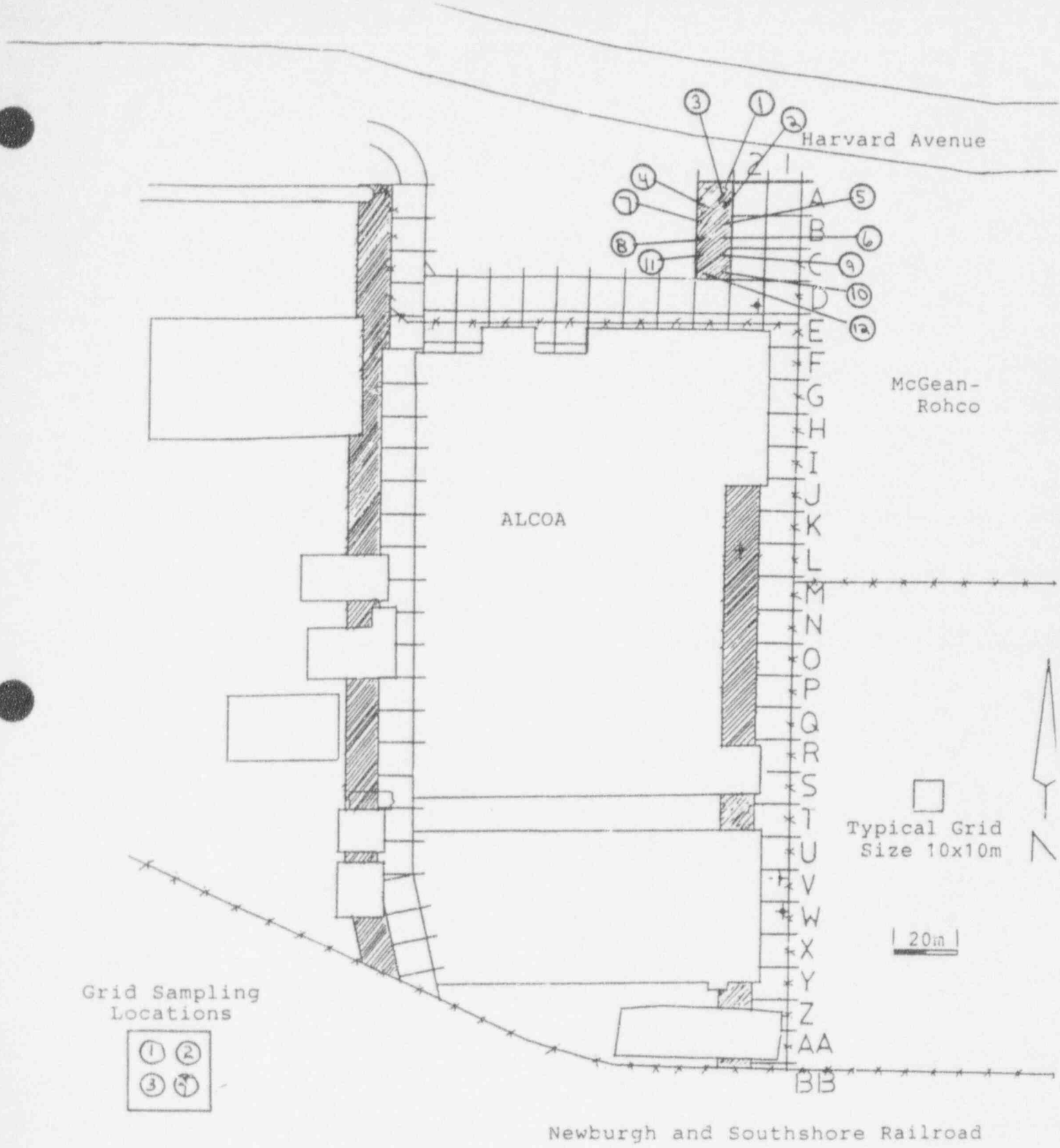


Figure 2
Addendum

ALCOA East Perimeter

SURVEY RECORD

DATE 10-13-94

TIME

FIGURE # 2 Addendum

LOCATION: ALCOA Property on NE Corner

REASON FOR SURVEY: Vicinity Scoping Survey

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
		α cpm probe	α dpm/100cm²	β & γ cpm probe	β & γ dpm/100cm²	μR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
A-1	On ground	<MDCR	<MDA	<MDCR	<MDA	5	1	N/A	N/A
A-2						4			
A-3						7			
A-4						6			
B-1						7			
B-2						6			
B-3						7			
B-4						6			
C-1						6			
C-2						4			
C-3						7			
C-4						5			

DIRECT SURVEY INSTRUMENTS		SMEARABLE CONTAMINATION INSTRUMENTS	
α INST L-2221	β & γ INST L-2221	α INST	β & γ INST
S.N. 103858	S.N. 99138	S.N.	S.N.
CAL DUE 11-30-94	CAL DUE 12-27-95	CAL DUE	CAL DUE
EFF 0.10	EFF 0.26	EFF	EFF
BKG 0.3 cpm	BKG 45	BKG	BKG
MDA 84 DPM/100cm²	MDA 873 DPM/100cm²	MDA	MDA
MDCR 4.5 cpm	MDCR 79 cpm	MDCR	MDCR

REMARKS: Beta-Gamma readings taken 10-13-94. Exposure readings 10-13-94. Alpha readings taken 10-14-94.

EXPOSURE RATE INSTRUMENT

γ INST Bicron

S.N. 8709J

CAL DUE 1-23-95

Surveyor (signature) Lee Mathis Date 10-13-94

Reviewed by (signature) Don Miller Date 10-21-94

SURVEY RECORD

DATE 10-13-94

LOCATION: ALCOA Property on NE Corner (Soil)

TIME

REASON FOR SURVEY: Vicinity Scoping Survey

FIGURE # 2 Addendum

NO.	ITEM	DIRECT SURVEY MEASUREMENTS				EXPOSURE RATE	EXPOSURE DISTANCE	SMEARABLE CONTAMINATION	
//	//////////////////////	α ccpm probe	α dpm/100cm²	β & γ ccpm probe	β & γ dpm/100cm²	uR/hr	meters	α dpm/100cm²	β & γ dpm/100cm²
1	on ground (soil)	N/A	N/A	<MDCR	<MDA	N/A	N/A	N/A	N/A
2		<MDCR	<MDA	↓	↓	↓	↓	↓	↓
3		N/A	N/A	333	8410	↓	↓	↓	↓
4		↓	↓	<MDCR	<MDA	N/A	N/A	↓	↓
5		↓	↓	↓	↓	↓	↓	↓	↓
6		↓	↓	↓	↓	↓	↓	↓	↓
7		↓	↓	↓	↓	↓	↓	↓	↓
8		<MDCR	<MDA	↓	↓	6	1	↓	↓
9		↓	↓	↓	↓	6	↓	↓	↓
10		N/A	N/A	↓	↓	N/A	N/A	↓	↓
11		↓	↓	↓	↓	↓	↓	↓	↓
12		<MDCR	<MDA	↓	↓	5	1	↓	↓

N/A

DIRECT SURVEY INSTRUMENTS		SMEARABLE CONTAMINATION INSTRUMENTS	
α INST L-2221	β & γ INST L-2221	α INST	β & γ INST
S.N. 109858	S.N. 99138	S.N.	S.N.
CAL DUE 11-22-94	CAL DUE 12-27-95	CAL DUE	CAL DUE
EFF 0.10	EFF 0.26	EFF	EFF
BKG 0.3cpm	BKG 45cpm	BKG	BKG
MDA 96 dpm/100cm²	MDA 873 dpm/100cm²	MDA	MDA
MDCR 4.5cpm	MDCR 79cpm	MDCR	MDCR

N/A

REMARKS: Beta-Gamma readings taken 10-13-94. Exposure readings taken 10-13-94. Alpha readings taken 10-14-94.

EXPOSURE RATE INSTRUMENT

γ INST Bicron

S.N. B7095

CAL DUE 1-23-95

Surveyor (signature) Joe Mattia Date 10-13-94

Reviewed by (signature) D. McKay Date 10-21-94

TABLES

ADDENDUM TABLE 1
LIST OF PROPERTIES SURVEYED

Residential Property 1	2071 Ross Avenue Newburgh Heights, Ohio
Residential Property 2	4013 East 27th Street Newburgh Heights, Ohio
Residential Property 3	3999 East 26th Street Newburgh Heights, Ohio

ADDENDUM TABLE 2
ANALYTICAL RESULTS

Location	Survey Results (cpm)	NRC Results	ORISE Results			
		U-Total*	U-234	U-235	U-238	U-Total
Residential Property 1	Background	23.6 ± 7.3	2.8 ± 0.3	0.3 ± 0.1	9.0 ± 0.5	12.0 ± 0.5
Residential Property 2	Background	43.2 ± 8.0	4.5 ± 0.3	0.5 ± 0.1	23.1 ± 0.8	28.1 ± 0.8
Residential Property 3	Background	8.0 ± 0.8	1.0 ± 0.2	0.1 ± 0.1	2.8 ± 0.3	3.9 ± 0.3
ALCOA Property Grid T,1	900	554.0 ± 22.0	NA	NA	NA	NA
ALCOA Property Grid T,1 South End	180	143.0 ± 11.0	NA	NA	NA	NA
ALCOA Property Building 65 Area, Composite along East Fence	80-120	18.0 ± 6.3	NA	NA	NA	NA
ALCOA Property Building 65 Area, Unaffected Area West of Grid A,1	280	73.0 ± 12.0	NA	NA	NA	NA
ALCOA Property Grid S,4	Background	<5.4	NA	NA	NA	NA

*NRC analyses assumes U-238 to U-234 ration of 2:1.

NA indicates Not Analyzed.