

Environmental Affairs

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VIACOM

Mr. Mark Roberts
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

**RE: Summary Document
Churchill Road Satellite Facility
Former Westinghouse Research Facility
Borough of Churchill, Pennsylvania**

Dear Mr. Roberts:


Per your verbal request on April 9, 2001 Viacom Inc. is submitting a summary of radiological characterization and remediation activities performed at the Churchill Road Satellite Facility. This facility is also known as the Edgewood Laboratory.

If you have any questions concerning this document please contact Mr. Kenneth Bird at (412) 642-3287.

Respectively submitted,



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cc: Roy Woods, PADEP
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CHURCHILL ROAD SATELLITE FACILITY

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**PROJECT NO. 94159.20/01
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CHURCHILL ROAD SATELLITE FACILITY

1.0 INTRODUCTION

This document summarizes radiological characterization and remediation activities that have occurred at the Churchill Road Satellite Facility. Also provided is a summary of the radiological licensing history.

1.1 LOCATION

The Churchill Road Satellite Facility, also known as the Edgewood Storage Site or Edgewood Laboratory, is a small unmanned facility most recently associated with the former Westinghouse Science and Technology Center (STC) in Churchill Borough, Allegheny County, Pennsylvania. The site consists of approximately 7.7 acres situated between Edgewood Country Club (ECC) and Wilkins School. Figure 1, Site Vicinity Map, in Appendix A shows site access and location with respect to other nearby significant features. The property is located on a hilltop and hillside within the Appalachian Plateaus Physiographic Province. Strata underlying the site consist of a relatively flat lying sequence of sandstones, shales, coals, and some limestones of Pennsylvanian Age. According to published mine maps, the Pittsburgh Coal Seam outcrop runs through the site. Property above the outcrop has been undermined to some extent.

1.2 SITE HISTORY

The earliest known site development was coal mining operations conducted prior to World War II. No specific information was obtained regarding this period of time, but inspection of available coal mine maps, coal outcrops by Earth Sciences Consultants (ESC), and a coal refuse pile on site supports this conclusion. According to Westinghouse archives, ECC was the previous site owner. ECC had leased the property to Catalyst Research Corporation (CRC) during World War II who reportedly used it for munitions manufacturing under a U.S. Government Contract. Westinghouse purchased the site from ECC on December 21, 1949. From 1950 to approximately 1966 the facility was used primarily as an adjunct laboratory to Westinghouse research activities. Records (1949) indicated the facilities were initially used as television laboratories. In the early

1950s the facility was associated with Westinghouse's Forest Hills Facility. Beginning in 1957, the facility became more associated with Westinghouse's STC and association with Forest Hills was phased out. Radiological licensed activities were terminated by 1964 at the property (Section 2.0). Beginning in the 1970s the site has mainly been used to store surplus equipment, and out-of-season grounds keeping equipment, with occasional usage as a laboratory facility. The property is currently leased to ECC for storage of equipment and owned by Viacom Inc. (Viacom), corporate successor to Westinghouse Electric Corporation.

1.3 SITE STRUCTURES

Figure 2 in Appendix A is a detailed site plan showing property line configuration and other site structures, including buildings, the coal refuse pile, and a stream channel. Site access is gained via a narrow paved roadway on a right-of-way between ECC and Wilkins School. There are five buildings near the center of the property. The two largest buildings (Buildings 201 and 202) were used in the past as laboratory buildings and are currently used for storage. They are single-story concrete block structures that were remodeled after Westinghouse purchased the site. Building 201 has electricity and municipal water. Building 202 has electricity but no water service. Building 202 was also expanded by Westinghouse in the 1960s. Based upon a 1959 map, two septic tanks were located approximately 135 feet east of Building 201. There is one small concrete building (Building 205) that was apparently constructed by CRC; this building has no utilities. Buildings 203 and 204 were used for storage of grounds keeping equipment and are one-story sheet metal structures. All that remains of Building 206 is the concrete floor. Several other buildings used by CRC were demolished by Westinghouse prior to 1966.

As shown on Figure 2 in Appendix A, a fill area exists south of the buildings in a small ravine. According to personnel interviews conducted by ESC, the fill area was constructed from the mid-1960s until the present. It consists mostly of demolition waste such as concrete and asphalt rubble from construction and remodeling activities at Westinghouse's STC. Fill has covered a portion of the ravine and may exceed 20 feet in thickness in places.

South and west of the fill area is a large coal refuse pile. This pile is an artifact of previous coal mining operations and suggests a mine entrance was located nearby. The pile is 20 to 30 feet high in the center and extends down a steep slope nearly to the southernmost property corner. The pile consists mainly of waste coal fragments, rock debris, and red dog which is a heavily oxidized mixture of coal, clay, and rock fragments. The refuse pile is densely forested by medium-sized trees and saplings, suggesting that it was formed at least 50 years ago.

A stream channel parallels the southwest property line. As shown in Appendix A, Figure 2, the upper portion of this stream channel has been riprapped to reduce erosion near buildings. Below the fill the stream channel steepens considerably and is not riprapped. There, the stream is deeply incised into coal refuse, soil, and rock with steep unstable banks in excess of 25 feet in height. The stream appears intermittent. This stream channel intersects another intermittent drainage immediately downstream of the property line; they drain into Chalfont Run approximately one-half mile from the property.

2.0 RADIOLOGICAL LICENSING SUMMARY

The Churchill Road Satellite Facility was not listed as the Primary Place of Use on any U.S. Atomic Energy Commission (AEC) issued license. It has been listed as an Additional Authorized Place of Use on licenses issued to Westinghouse's Forest Hills and STC facilities. The licensing documents reference several different names for the same facility as follows:

- **Forest Hills**
 - Ardmore Facility,
 - Engineering Center – East Pittsburgh,
 - Ardmore Boulevard – East Pittsburgh, and
 - Engineering Center Extension – East Pittsburgh.
- **Edgewood**
 - Edgewood Laboratory,
 - Edgewood Facility,
 - Edgewood Extension, and
 - Churchill Road.
- **Churchill**
 - Research Labs – Churchill,
 - Beulah Road, and
 - Central Laboratories – Churchill.

Beginning in 1956, it appears that the Churchill Road Satellite Facility was referenced as the Edgewood Facility on AEC issued licenses. Byproduct License No. 37-497-2, dated August 9, 1956, references the Forest Hills and Edgewood Facilities (Appendix B). The Edgewood Facility under this license was part of Westinghouse's Radiation and Nucleonics Laboratory. In August 1956 Westinghouse applied for a Source Material License and a Special Nuclear Material License. The application references Forest Hills and Edgewood. On October 29, 1956 AEC issued License Nos. C-3586 (Source Material) and SNM-47 (Special Nuclear Material). Edgewood is not listed on the Source Material License, but is listed on License No. SNM-47 (Appendix B).

In 1957, AEC issued License No. 37-497-6 to Westinghouse's Churchill Facility with Forest Hills and Edgewood named as Additional Authorized Places of Use. In December 1961 Westinghouse informed AEC that unsealed sources used under License No. 37-497-2

will no longer be used at the Edgewood Facility and requested the addition of the Churchill Facility as an Authorized Place of Use (Appendix B).

The AEC issued an inspection report dated November 21, 1958 (Appendix B) concerning an August 1958 visit to the Westinghouse Forest Hills and Edgewood facilities. Among other things, a wastewater issue was raised regarding the Edgewood facility. In a December 15, 1958 response letter, Westinghouse stated that the liquids were monitored prior to pumping over the embankment and the activity was below sanitary sewer system release criteria. As requested by the AEC letter, Westinghouse formally proposed discharge of liquids less than 1×10^{-7} micro curies/ml (Paragraph 20.103- Concentrations in Effluents to Unrestricted Area). The letters referenced above are contained in Appendix B. No other documents on this issue were located in Westinghouse files. To the extent liquids were discharged over the embankment historically, the affected area has been characterized through the survey and investigative work (including test pits) done to date (Section 3.0).

Amendment No. 6 to License No. 37-497-2 (January 18, 1962) adds the Churchill Facility to the license (Appendix B). In 1964 Westinghouse, in renewing License No. 37-497-6, requested the Edgewood Facility be removed as an Authorized Place of Use (Appendix B). In July 1964, Westinghouse requested deletion of the Edgewood Facility under License No. 37-497-2 (Appendix B). In Amendment No. 9 (License No. 37-497-2) the Edgewood Facility was removed as an Authorized Place of Use. On May 25, 1965, the U.S. Nuclear Regulatory Commission (NRC) modified License No. SNM-47 to list only the Forest Hills and Churchill Facilities. In a November 30, 1965 letter, Westinghouse requested License No. SNM-47 be transferred to STC (Churchill) because the Radiation and Nucleonics Laboratory was being moved to STC from Forest Hills.

3.0 CHARACTERIZATION AND SURVEY

3.1 1986 CHARACTERIZATION

Westinghouse's Health Physics Department performed several surveys at the property. The property-wide survey, using a Micro-R-Meter, indicated readings of 8 to 14 microrems per hour ($\mu\text{R}/\text{hour}$) at ground level. Two boreholes were drilled and the soil samples were analyzed using a multi-channel analyzer. A March 11, 1988 Westinghouse memo describes the findings (Appendix C).

3.2 1987 CHARACTERIZATION AND TANK REMOVAL

In 1987, ESC was retained by Westinghouse to investigate the fill area. During these activities, Westinghouse provided radiological support. This section summarizes the radiological findings.

3.2.1 Tank Removal

In 1998, a geophysical survey was conducted by ESC. The survey was concentrated around buildings, the parking area, the fill area, and over sites of possible previous disturbance. One traverse was completed on the hillside north of the buildings and another along the eastern edge of the coal refuse pile and up the stream channel from the southernmost property corner.

The survey indicated strong anomalies adjacent to Building 202 and at several locations in the parking and fill areas. Weaker anomalies excavated in the fill area generally revealed small metallic objects and steel-reinforced concrete rubble. Because of structural steel within walls, this survey could not be reliably interpreted within approximately ten feet of the buildings.

Trenches and test pits were excavated at 13 locations shown in Appendix C, based upon geophysical survey findings. Test pits were primarily concentrated around buildings and in the parking and fill areas. Depths ranging from 3 to 14 feet were limited by the nature of materials encountered or excavation depth of the backhoe. Test pits excavated in natural soils generally did not penetrate further than about six feet, while pits excavated in coal refuse and certain areas of the fill reached the depth limit of the backhoe. Pit atmosphere was monitored continuously during excavation with an organic vapor

analyzer and radioactivity measuring instruments, and additional readings were taken inside the test pit when foreign materials were uncovered.

Soil samples were collected at three locations and measured for gross alpha and gross beta. The results in pico curies per gram (pCi/g) are as follows:

Location	Gross Alpha	Gross Beta
TP-6	3	24
TP-10	4	4
TP-11	<9	<2

Debris and wastes encountered in the test pits did not have elevated radiological measurements except in one test pit.

Tank 1 was uncovered in Test Pit TP-3 near the edge of the parking area. Field measurements indicated no radiation or organic vapors above background levels. Representative liquid and solid waste samples from the interior of Tank 1 were collected. Gross alpha was <1 pCi/g and gross beta was 10 pCi/g. This tank is believed to be debris.

Excavation of Test Pit TP-6 adjacent to Building 202 uncovered Tank 2. The tank contained a blue-green granular material and was saturated with water from about two feet below ground surface to tank bottom. This water level corresponded with the elevation of the tank inlet supply pipe. After uncovering the sides of Tank 2, tank contents and exterior were scanned for radioactivity and organic vapors. Preliminary scanning indicated levels of radiological activity above background values. Westinghouse personnel inspected the tank and analyzed samples of liquid and solid waste.

Westinghouse directed ESC to remove both tanks. Tank 1 contents were removed using a backhoe and stockpiled on high-density polyethylene (HDPE) sheeting. The stockpile was covered and the excavation backfilled. After thorough scanning with a radiation detector by Westinghouse personnel, Tank 1 was cut into manageable pieces for disposal.

Special care was taken during handling of Tank 2 because of the possible presence of radioactive materials. Tank 2 was partially emptied of its contents onto a stockpile using

the backhoe. Each backhoe bucket was scanned using a radiation detector. After approximately 70 gallons of water were removed, the tank was lifted with the backhoe, set on blocks in the parking area adjacent to Building 202, and covered with HDPE sheeting. Tank photographs are included in Appendix C.

Scanning of Tank 2's exterior sides and bottom revealed that highest levels of radioactivity were within one inch of the tank bottom. Westinghouse personnel directed ESC to drill holes in the tank to drain and collect the liquids. Approximately 50 additional gallons of fluid were drained. Liquid and a small soil sample were collected. Westinghouse analyzed the solid sample and determined that a quantity of Cesium-137 existed at or near the tank bottom. A March 11, 1998 Westinghouse memo describes the results and the disposal of radioactive wastes (Appendix C).

Operations were continuously scanned with a radiation detector. In Tank 2, radioactivity levels increased within about three inches of the tank bottom where a brown muddy substance was encountered. ESC indicated that this substance may have been residue from previous laboratory operations which was not removed when tank use was discontinued. ESC packaged the radioactive material into plastic containers and cut the tank bottom from the tank. The rubber liner on the tank bottom was removed, cut into small pieces, and packaged with other radioactive material. After carefully scanning the tank bottom plate, radioactive portions were cut away from the bottom plate and similarly packaged. The remaining portion of the bottom plate and tank were cut into manageable pieces for disposal as scrap steel.

The inlet pipe to Tank 2 exhibited elevated levels of radioactivity when scanned with a radiation detector. ESC excavated five feet of pipe which were encased in concrete and passed underneath Building 202. The section of pipe through the building foundation and its concrete encasement were removed. The pipe was given to Westinghouse personnel for disposal along with the waste and other impacted portions of Tank 2. ESC conducted an electromagnetic survey to trace the pipe underneath Building 202.

In November 1987, Westinghouse removed the four-inch container pipe in the building. The pipe contained Cesium-137 and thorium. The typical readings in the 10-foot pipe were 5 to 7 millirems per hour (mR/hr). After pipe removal, the soil was surveyed with a

Ludlum micrometer with readings of 10 to 12 $\mu\text{R/hr}$. A memo describing this work is included in Appendix C.

3.2.2 Groundwater

ESC installed three temporary groundwater monitoring wells shown in Appendix C. Samples of the three temporary wells and a seep were analyzed for gross alpha and gross beta. The results, in pico curies per liter (pCi/l), are as follows.

Location	Gross Alpha	Gross Beta
Well 1	<1	6
Well 2	<1	14
Well 3	<1	<2
Seep	10	20

3.3 2000 SURVEY

In August 2000, ESC initiated surveys of the existing buildings/structures. Surveys that were performed included exterior and interior surfaces for fixed alpha and beta activity, fixed beta/gamma activity, gamma exposure rate, and removable alpha and beta activity using appropriate instrumentation. These surveys were performed to demonstrate compliance to criteria for unrestricted release under NUREG CR-5849 and REG Guide 1.86. A copy of the ESC report dated September 29, 2000 is in Appendix A. The findings presented in the report are as follows:

- The interior surfaces of the buildings show no indication of radiological contamination. Results of the surveys have been compared to, and were determined to meet site release criteria for unrestricted use.
- Surveys of the building exterior surfaces show no indication of radiological contamination. Results of the surveys have been compared to, and were determined to meet site release criteria for unrestricted use.
- No radiological contamination was detected by survey of the roof surfaces. Results of the surveys have been compared to, and were determined to meet site release criteria for unrestricted use.
- Fixed alpha activity measurements were consistently detected on the concrete surfaces of the on-site building docks, indicating that the radioactive material detected may be indigenous (naturally occurring)

to the concrete itself. Analytical results for concrete samples collected from the loading docks showed the presence of naturally occurring uranium and thorium at concentrations that are common to building materials such as light concrete and sand. Based on this laboratory information, the release criteria for naturally occurring uranium and thorium were applied to this survey unit and the survey results were determined to meet the criteria for unrestricted use.

- Gross gamma scans of drain lines and floor drains within the buildings show no indication of radiological contamination.

4.0 SUMMARY

Licensed radiological activities occurred at the Churchill Road Satellite Facility over a nine-year period (1956 through 1964). Surveys of building structures and surrounding property have been performed. Impacted structures have been remediated. The findings of the surveys have not identified other impacted areas or structures.

APPENDIX A

APPENDIX A

RADIOLOGICAL SURVEY – SITE BUILDINGS

Radiological Survey – Site Buildings

**Churchill Road Satellite Facility
Edgewood, Pennsylvania**

**Viacom Inc.
Pittsburgh, Pennsylvania**

**Project No. 5518A
September 29, 2000**



Earth Sciences Consultants, Inc.

Providing Environmental Consulting Services Since 1979

Radiological Survey – Site Buildings

**Churchill Road Satellite Facility
Edgewood, Pennsylvania**

**Viacom Inc.
Pittsburgh, Pennsylvania**

**Project No. 5518A
September 29, 2000**

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**Technical Report
Radiological Survey - Site Buildings
Viacom Inc.
Churchill Road Satellite Facility
Edgewood, Pennsylvania**

1.0 Introduction

Earth Sciences Consultants, Inc. has been retained by Viacom Inc. (Viacom) to provide technical assistance for the radiological survey of the buildings associated with the Churchill Road Satellite facility located in Edgewood, Pennsylvania (Figure 1). Viacom has completed the radiological survey in order to release the buildings for unrestricted use. This report has been prepared to demonstrate that residual radioactive material within the buildings at the Churchill Road Satellite facility satisfies the release criteria established by the Nuclear Regulatory Commission (NRC) for unrestricted use.

1.1 Summary of Radiological Survey Activities

Radiological survey activities were initiated in the summer of 2000 with a review and evaluation of existing data pertinent to the site. The first phase of the project consisted of the development of a work plan detailing proposed survey activities within the buildings and the development of a Health and Safety plan.

The second phase of decommissioning activities was initiated in August 2000 and focused on surveys of the existing buildings/structures. Specific decommissioning surveys that were performed included exterior and interior surfaces for fixed alpha and beta activity, fixed beta/gamma activity, gamma exposure rate, and removable alpha and beta activity using appropriate instrumentation. These surveys were performed to demonstrate compliance to criteria for unrestricted release under NUREG CR-5849 and REG Guide 1.86.

1.2 Report Structure

The remainder of this document provides a description of the subject site and a summary of facility operations (Chapter 2.0), a description of site facilities (Chapter 3.0), a presentation of the building radiological survey activities (Chapter 4.0), and a summary of final survey procedures and findings (Chapter 5.0). Chapter 6.0 presents a discussion of the quality assurance (QA) aspects for the survey efforts and a summary of the findings based upon an evaluation of the radiological survey data. Chapter 7.0 presents a summary of the radiological survey findings.

Building radiological survey documentation (summary tables and maps) is contained in Appendix A. Analytical data reports including chain-of-custody documentation for the building radiological surveys and miscellaneous characterization activities are contained in Appendix B.

2.0 Site Description and History of Operations

This chapter provides a general description of the Churchill Road Satellite facility and a summary of historical operations.

2.1 Site Description

The Churchill Road Satellite facility is located in Churchill Borough, Allegheny County, Pennsylvania approximately 1-1/4 miles east of the George Westinghouse Research Center (Figure 1). The site consists of approximately 7.7 acres situated between the Edgewood Country Club (ECC) and the Wilkins Jr. High School. Several single level buildings including office space and storage facilities are present at the site. Currently, the facility is unoccupied. The site buildings and surrounding areas are shown in Figure 2.

2.2 Summary of Facility Operations

The Churchill Road Satellite facility was originally part of a coal mining operation and was later leased to Catalyst Research Corporation (Catalyst) by the ECC. Catalyst was involved in munitions production by contract to the U.S. Government. Westinghouse Electric Corporation (Westinghouse) purchased the site from ECC in December 1949. Research and development activities supporting work being performed at the Forest Hills, and later the Churchill Science Center were performed until circa 1966. It is uncertain when building construction took place, but it is obvious building additions and demolition took place throughout the site history. Most of the activities performed by Westinghouse reportedly involved research of television, electro-optics, and laundry equipment. In more recent years, the facility was used as storage for surplus laboratory equipment and out-of-season grounds keeping equipment.

3.0 Summary of Site Facilities

This chapter provides a summary of the site facilities based upon a review of available information (files, maps, etc.) and documented interviews with past employees.

3.1 Buildings

Site buildings are identified numerically. The following sections provide a description of each site building and a summary of its historical use. Site building maps with room designations are provided in Appendix A.

3.1.1 Building 201

Building 201 is a single level, concrete block structure with steel supports and concrete ceiling slabs. Interior walls are constructed of concrete block or pressed wood panels on wood framing. The floor is poured concrete and is approximately 365 m² in area. The interior of the building is divided into five rooms that include an entryway and a bathroom. One laboratory was reportedly located in the north end of this building.

3.1.2 Building 202

Building 202 is a single level concrete block and brick structure with a concrete ceiling. Interior walls are constructed of concrete block or brick. The floor is poured concrete and is approximately 448 m² in area. The interior of the building is divided into four rooms that include two caged areas. Interviews documented a machine shop in this building. Reportedly, a laboratory existed in the west end of this building during the period of 1950 to 1966.

3.1.3 Building 203

Building 203 is a single level metal structure with a poured concrete floor approximately 44 m² in area. The interior of the building is one large room with a barn-style double door on the eastern side. This building was reportedly used only for equipment storage.

3.1.4 Building 204

Building 204 is a single level metal structure with a poured concrete floor approximately 56 m² in area. The interior of the building is one large room with a barn-style double door on the western side. This building was reportedly used only for equipment storage.

3.1.5 Building 205

Building 205 is a single level, concrete block structure with a wood plank floor approximately 12 m² in area. The interior of the building is one room with a double door on the north side.

3.1.6 Building 206

The remains of Building 206 are east of Building 202 and comprise a foundation and a poured concrete floor approximately 8 m² in area.

3.2 Drain Lines

Seven floor drains were identified in Buildings 201 and 202. A number of other drain lines associated with roof drains and sink/toilet fixtures were also found within the buildings.

4.0 Radiological Characterization Activities

This chapter provides a summary of the facility scoping surveys completed as part of the radiological clearance of the Churchill Road Satellite facility buildings. For clarification purposes, the term “radiological contamination” as used in this report implies that a material or surface exhibited radioactivity levels above the unrestricted release criteria established for the site.

4.1 Scoping Surveys

A preliminary assessment of the radiological conditions in the buildings was completed through the use of scoping surveys. The surveys were both randomly performed throughout the buildings and biased toward potentially contaminated areas. Scoping surveys were designed to be performed quickly and as such primarily utilized scanning methodologies in place of fixed point surveys.

4.1.1 Building Interiors

The scoping surveys performed within the buildings generally consisted of gamma floor scans. Scanning was performed using a 1-inch-by-1-inch Sodium Iodide (NaI) detector calibrated for gross gamma count rate passed approximately 1 centimeter (about one-half inch) above the scanned surface. The scanning rate was approximately 0.4 meter per second (about 18 inches) over the accessible floor surface. Audible clicks and needle deflection observations were utilized to identify potential areas of radiological contamination. Maximum and average scan rates, location, and approximate scan area percentages were recorded for each area surveyed.

4.1.2 Exterior Surfaces and Flat Building Roofs

Scoping surveys for exterior surfaces and flat building roofs were performed in conjunction with the final clearance surveys. These surveys consisted of scanning the surface with a 100 cm² gas proportional detector calibrated for alpha and beta activity approximately 1 centimeter from the surface (about one-half inch) at a rate of one probe width per second (about 10 centimeters or 4 inches). Average and maximum beta activity results were recorded on the final clearance survey forms and were utilized in choosing a fixed survey point for the final clearance survey.

4.1.3 Drain Lines

Accessible drain lines within the buildings were scanned using a 1-inch-by-1-inch Sodium Iodide (NaI) detector calibrated for gross gamma count rate. Drain lines where the internal surface was not accessible were scanned on the exterior using the NaI detector.

5.0 Radiological Survey Procedures and Findings

This chapter of the report provides a summary of the radiological surveys completed for the Churchill Road Satellite facility buildings. The purpose of the radiological surveys was to demonstrate that the radiological conditions within the buildings satisfy the NRC guidelines for release for unrestricted use. This section also establishes the key radionuclides of concern, release guidelines, and survey equipment and procedures used for the radiological surveys.

5.1 Identification of Key Radionuclides of Concern and Release Guidelines

A list of potential radionuclides of concern for the buildings was established using past operational knowledge, historical records, and former employee interviews performed by others in past years. These potential radionuclides of concern are defined in the following sections.

5.1.1 Potential Radionuclides of Concern

Reportedly, a laboratory sink located inside the western section of Building 202 was used for disposal of waste chemicals and radioactive material. This sink was located on the building's south side and drained into an underground storage tank (UST) (Tank 2) which was installed in the 1970s. Tank 2, located adjacent to Building 202, was a two-piece, rubber-lined rectangular unit bolted together in the middle. The sink, associated drain line and Tank 2 were determined to be radiologically contaminated and therefore were removed in 1987. Cesium-137 and thorium were identified as the primary radionuclides associated with the radioactive materials contained in the UST. While a specific thorium isotope was not mentioned within previous reports, it can be assumed to have been natural thorium, probably in support of the television tube research that was performed at the facility. Common progeny of these isotopes also presented a potential concern. Interviews with former employees conducted by others indicated the possibility of materials and equipment from the Forest Hills and Churchill facilities being transported to the Edgewood site. Therefore, the radionuclides of concern include uranium, thorium, fission products (cesium and cobalt), and radium.

5.1.2 Acceptable Surface Radiological Levels

Based upon the combination of the established radionuclides of concern, the acceptable surface radiological levels (unrestricted use) utilized for the site are presented in Table 1 and summarized below. Units are disintegrations per minute per 100 square centimeters or dpm/100 cm².

Acceptable Surface Radiological Levels	
<i>Total Surface Radiological Levels</i>	
• Alpha – 100 dpm/100 cm ² average value and 300 dpm/100 cm ² maximum value	
• Beta – 5,000 dpm/100 cm ² average value and 15,000 dpm/100 cm ² maximum value	
<i>Removable Surface Radiological Levels</i>	
• Alpha – 20 dpm/100 cm ²	
• Beta – 1,000 dpm/100 cm ²	

These criteria were based on the NRC document "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source or Special Nuclear Material," Policy and Guidance Directive FC 83-23 (August 1987).

5.1.3 Gamma Exposure Rate Level

The gamma exposure rate established for the site was 5 microroentgen per hour above natural background at 1 meter from the surface.

5.2 Survey Procedures

This section defines the procedures utilized to conduct the radiological surveys of the site buildings. A summary of the instrumentation used to complete the radiological surveys is also presented in this section.

5.2.1 Survey Classification

Each building was assigned a classification based upon the known or suspected historical use of radioactive material as defined within NUREG CR-5849. An affected area is an area where radioactive material was used in an unencapsulated form or where radioactive contamination was found. Unaffected areas are areas where no radioactive material was used or discovered during radiological surveys. Areas directly adjacent to affected areas are to be considered affected due to proximity and the potential for migration of contamination. Based upon these definitions, the western section of Building 202 was the only area classified as affected. A radiologically contaminated sink and drain line were located in this section of the building. The radiologically contaminated drain line, sink, and an associated UST located adjacent to the building were removed in 1987. Survey classifications are summarized in Table 2.

5.2.2 Building Surveys

Building surveys included interior and exterior surfaces of the site structures and followed a basic pattern of information collection, location identification, and survey procedure. Essentially, the progression of the survey process was as follows:

- (1) Established basic radiological history of each area of the site (i.e., was unencapsulated material ever used in an area).
- (2) Classified each area (affected/unaffected) as to the potential for contamination based upon the history of the area.
 - Classification of an area was based upon the descriptions in Section 5.2.1.
 - The classification of each area determined the number of survey points and the types of measurements.
- (3) Assigned the areas an identification number (i.e., section/unit/subunit) based upon location and classification.
- (4) Performed background surveys of materials similar to the known construction materials within a specified radius of the site.
- (5) Performed scoping surveys to quickly determine potential areas of concern.
- (6) Performed final surveys.

The basic set of measurements taken for a typical final survey (per defined grid square) were:

- Gamma radiation exposure rate at 1-meter height at each grid intersection (floor measurements only). Gamma radiation measurements were obtained using a gamma scintillation detector and rate meter calibrated to read in microRem per hour. Results of each measurement were logged in the survey record.
- Beta Scan around a 1-meter area of each grid intersection. The scan was conducted with a gas proportional detector. The active surface of the detector probe was passed over the area of the grid within approximately 1 centimeter of the surface at a rate of travel not exceeding 10 centimeters (approximately 4 inches) of linear motion per second (one probe width). The average and maximum count rates per minute were logged on the survey record.
- Alpha contact in total counts for 1 minute. Activity measurements were obtained for a period of 1 minute at each location using a gas proportional counter operated at the alpha voltage plateau. Results of each measurement were logged in the survey record. This was performed simultaneously with the beta contact readings.
- Beta contact in total counts for 1 minute. Activity measurements were obtained for a period of 1 minute at each location using a gas proportional counter operated at the beta voltage plateau. Results of each measurement were logged in the survey record. This was performed simultaneously with the alpha contact readings.
- Beta/Gamma count rate per minute. Activity measurements were obtained as an average result for a period of approximately 1 minute at each location using a pancake-type Geiger-Muller tube attached to a rate meter. Results of each measurement were logged in the survey record.

- Alpha and beta removable in disintegrations per minute per 100 cm² in each grid area. The sample smears were counted on-site in a manual counter on-site and select samples were analyzed by an off-site laboratory using an automatic counter.
- Media samples for laboratory analyses were collected as appropriate.

5.2.2.1 Identification of Survey Point Locations

Each survey point was assigned an identification number properly referencing where the survey was performed. A standard Cartesian grid system was implemented within each room to assure each point could be accurately located again if necessary.

5.2.2.2 Room Designations

The room designations were in the format of {Section}-{Unit}-{Subunit} based upon the following definitions.

- *Section*: The largest area identifier. The site buildings were assigned Section 1 due to the small size of the facility.
- *Unit*: A section that was subsequently divided into smaller areas based upon the potential for contamination. Units were uniform in that they comprised individual areas of the same survey classification (Section 5.2.1).
- *Subunit*: The smallest area identifier. A subunit was essentially a single room within an area.

Room designations are provided on the site building maps contained in Appendix A.

5.2.2.3 Survey Point Grid Designations

The grid designations for each survey point were based on a standard Cartesian grid (X,Y) system where the point of origin (0,0) was at the northern-most west corner of a room for floors and ceilings. This means survey points on floors and ceilings typically had positive X and negative Y numbers, but all positive/negative combinations were possible except for negative X and positive Y.

The point of origin (0,0) for walls was defined as the lowest left corner of the wall, with a wall being identified based on the compass point location (north, south, etc.). A room could have multiple walls to a compass point if they are physically divided by a separation from floor to ceiling or by another wall. In that case, the left-most wall becomes "*Compass point Wall 1*" (Ex: North Wall 1) and the next wall to the

right became "Compass point Wall 2" (Ex: North Wall 2) and so on until each wall on that compass point was identified. Each wall had a unique point of origin (0,0).

5.2.3 Instrumentation

Table 5.2.3 (below) summarizes the instrumentation used at the facility for the radiological surveys performed. The selection was based on using instruments that would provide an adequate response to demonstrate compliance with the acceptable release criteria. Other objectives in selecting instruments included special features such as digital displays and/or data logging capabilities that could eliminate or reduce the possibility of human error. MDA were calculated for each instrument type utilizing methods taken from NUREG CR-5849 and are provided in Table 3 for comparison purposes.

Table 5.2.3 Health Physics Instruments		
Instrument Manufacturer and Model	Detector Model/Type	Radiation Detected
Ludlum 2360	43-68 Gas proportional	Total Alpha and Total Beta
Ludlum 3	44-9 GM tube	Total Beta-gamma
Ludlum 2929	43-10 Scintillation	Removable Alpha and Removable Beta
Ludlum 19	Internal NaI Scintillation	Gamma Exposure
Ludlum 2350-1	Various	Probe dependent

Monitoring instruments were calibrated annually or when returned to a qualified facility for service. Calibrations were performed by an independent organization, which provided a current calibration certificate for each instrument. Maintenance of instruments was performed by an independent outside source certified by the instrument manufacturer. Periodic maintenance was performed as recommended by the manufacturer. Instruments were stored in a secure location away from radioactive contamination. Each day that an instrument was used, it was tested for proper functioning by the use of a check source or certified radioactivity source. An appropriate response to the source had to be obtained prior to the instrument being placed in service. An inappropriate response resulted in the instrument being taken out of service and sent for calibration or maintenance. The site health physics supervisor maintained instrument performance, calibration, and maintenance records.

5.3 Building Survey Results

A summary of the radiological survey results for each section and unit is provided below. Data summary tables (including statistical evaluations) and building maps (including room designations) are provided in

Appendix A. The number of lower survey and upper survey measurements are presented in the following report sections. The unit classifications have been presented previously in Section 5.2.1.

5.3.1.1 Unit 1 - Building 201

Unit 1 is comprised of five subunits (1-1-1 through 1-1-5) within Building 201. Concrete was identified as the primary building material associated with the construction of this unit. A total of 470 measurements were taken on lower and upper surfaces. Results of the surveys have been compared to, and were determined to meet the site release criteria for unrestricted use (Appendix A, Unit 1-1 Tables).

5.3.1.2 Unit 2 - Building 202 (Western Section)

Unit 2 consists of three subunits (1-2-1 through 1-2-3) in the western section of Building 202. Brick and concrete were identified as the primary building materials associated with the construction of this unit. A total of 518 measurements were taken on lower and upper surfaces. Results of the surveys have been compared to, and were determined to meet the site release criteria for unrestricted use (Appendix A, Unit 1-2 Tables).

5.3.1.3 Unit 3 - Building 202 (Eastern Section)

Unit 3 is comprised of one subunit (1-3-1) in the eastern section of Building 202. Brick and concrete were identified as the primary building materials associated with the construction of this unit. A total of 520 measurements were taken on lower and upper surfaces. Results of the surveys have been compared to, and were determined to meet the site release criteria for unrestricted use (Appendix A, Unit 1-3 Tables).

5.3.1.4 Unit 4 - Buildings 203, 204, 205

Unit 4 is comprised of Buildings 203, 204, and 205 with each building identified as one subunit. Metal and concrete were identified as the primary building materials associated with the construction in this unit. A total of 422 measurements were taken on lower and upper surfaces. Results of the surveys have been compared to, and were determined to meet the site release criteria for unrestricted use (Appendix A, Unit 1-4 Tables).

5.3.1.5 Unit 5 - Building Exterior Walls

This unit included the building exterior wall surfaces. Brick, metal, and concrete were identified as the primary building materials associated with the construction of the building exteriors. A total of 480 measurements were acquired from exterior building surfaces. Results of the surveys have been compared

to, and were determined to meet the site release criteria for unrestricted use (Appendix A, Unit 1-5 Tables).

5.3.1.6 Unit 6 - Building Flat Roofs

Unit 6 is comprised of the building flat roofs for Buildings 201 and 202. Concrete, stone, and brick were identified as the primary building materials associated with the construction. A total of 480 measurements were taken on lower surfaces. Results of the surveys have been compared to, and were determined to meet the site release criteria for unrestricted use (Appendix B, Unit 1-6 Tables).

5.3.1.7 Unit 7 - Exterior Building Docks

Unit 7 is comprised of three subunits attached to the exteriors of Buildings 201, 202, and 203. Concrete was identified as the primary building material associated with the construction. A total of 278 measurements were taken on lower surfaces. Fixed alpha measurement as high as 300 dpm/100 cm² were identified consistently on the concrete surfaces of this unit. A second survey of the unit confirmed these findings. Based on the original and confirmatory survey results, the elevated fixed alpha measurements appeared to be associated with the nature of the primary construction material of the unit (i.e., concrete). Therefore, samples of the concrete media were collected from each loading dock for radiochemical analysis by gamma spectrometry. Analytical results showed the presence of naturally occurring uranium and thorium at concentrations that are common to building materials such as light concrete and sand. Based on this laboratory information, the release criteria for naturally occurring uranium and thorium was applied to this survey unit and the survey results were determined to meet this criteria for unrestricted use (Appendix B, Unit 1-7 Tables).

5.3.1.8 Building Drain Lines

Gross gamma scans of the drain lines accessible in the buildings show no indication of elevated radioactivity levels.

6.0 QA/QC Program

This chapter presents an overview of the QA/quality control (QC) program followed during the radiological survey of the site buildings. The QA/QC program covered sample collection, analysis, data evaluation, and instrumentation.

6.1 Sample Collection and On-Site Analysis

This section applies to the collection of swipe samples for removable alpha and beta activity. A qualified Health Physics technician performed swipe sample collection. Prior to collecting a sample, the area to be sampled was scanned using an appropriate instrument for the anticipated potential contamination.

All swipe samples for removable alpha and beta activity were counted on-site and converted into standard units utilizing calibration values established by a third party calibration facility. The established QA/QC program for the calibration facility was accepted as meeting the intent of the project QA/QC program. To help eliminate errors, the Health Physics supervisor reviewed the conversion of the count results into standard units.

6.2 Swipe Sample QA/QC Results

Approximately 20 percent of the swipe samples were sent off-site for analysis on an automatic counter that provided data output in standard units based upon the current efficiency and background values. The results of this analysis were compared directly to the on-site count results for the particular sample. Using this method, an average difference was calculated for alpha and for beta removable activity. As calculated, the average difference in alpha removable activity was 0.3 dpm/100 cm² higher by the laboratory results with a maximum difference of 1.59 dpm/100 cm² higher by the laboratory results. The maximum result for alpha removable activity by either on-site or laboratory counting was 1.81 dpm/100 cm² which is well below the site release criteria of 20 dpm/100 cm². For beta removable activity, the average difference was 3.88 dpm/100 cm² higher by the laboratory results with a maximum difference of 10.73 dpm/100 cm² higher by the laboratory results. The maximum result for beta removable activity by either on-site or laboratory counting was 7.93 dpm/100 cm². Site release criteria for beta removable activity is 200 dpm/100 cm².

6.3 Instrumentation

Instrumentation was calibrated and repaired by a qualified calibration laboratory whose QA/QC procedures were accepted as meeting the intent of the project QA/QC program. Instrumentation was

calibrated annually or after any repairs. Prior to use, instruments were checked for a proper response to an appropriate check source. Any instrument that failed a response check was taken out of service or repaired and recertified for use. Gas proportional instruments were also checked upon return to storage for a proper response within the calibrated gas-decay duration (usually 4 hours). A gas proportional instrument failed its' return response check if a drop in efficiency greater than 10 percent for all detection channels was found upon return to storage. If a gas proportional instrument failed its' return response checks, the surveys performed during that time period were discarded and new surveys were completed with a properly operating instrument. The instrument which failed the return response check was then removed from service, repaired, or recertified for a shorter gas-decay duration as necessary.

6.4 Data Review

Final clearance survey data was analyzed using *Microsoft Excel 97* internal functions. Formulas created were reviewed by at least two individuals familiar with radioactive material surveys and spreadsheet functions. Selected results were also calculated manually and compared to the computer-generated results.

7.0 Radiological Survey Summary

This chapter provides a summary of the radiological survey completed for the Churchill Road Satellite facility buildings. The purpose of the radiological surveys was to demonstrate that the radiological conditions within the buildings satisfy the NRC guidelines for release for unrestricted use.

7.1 Building Interior Surfaces

The interior surfaces of the on-site buildings show no indication of radiological contamination. Results of the surveys have been compared to, and were determined to meet the site release criteria for unrestricted use.

7.2 Building Exterior Surfaces

Surveys of the building exterior surfaces show no indication of radiological contamination. Results of the surveys have been compared to, and were determined to meet the site release criteria for unrestricted use.

7.3 Building Flat Roofs

No radiological contamination was detected by surveys of the roof surfaces. Results of the surveys have been compared to, and were determined to meet the site release criteria for unrestricted use.

7.4 Building Docks

Fixed alpha activity measurements were consistently detected on the concrete surfaces of the on-site building docks indicating that the radioactive material detected may be indigenous (naturally occurring) to the concrete itself. Analytical results for concrete samples collected from the loading docks showed the presence of naturally occurring uranium and thorium at concentrations that are common to building materials such as light concrete and sand. Based on this laboratory information, the release criteria for naturally occurring uranium and thorium was applied to this survey unit and the survey results were determined to meet this criteria for unrestricted use.

7.5 Drain Lines

Gross gamma scans of drainlines and floor drains within the buildings show no indication of radiological contamination.

Tables

Table 1
Acceptable Surface Contamination Levels
Radiological Survey – Site Buildings
Viacom Inc.
Churchill Road Satellite Facility
Edgewood, Pennsylvania

Nuclide⁽¹⁾	Average^(2,3)	Maximum^(2,4)	Removable^(2,5)
U-nat, U235, U238, and associated decay products	5,000 dpm α /100 cm ²	15,000 dpm α /100 cm ²	1,000 dpm α /100 cm ²
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, AC-227, I-125, I-129	100 dpm/100 cm ²	300 dpm/100 cm ²	20 dpm/100 cm ²
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U232, I-126, I-131, I-133	1,000 dpm/100 cm ²	3,000 dpm/100 cm ²	200 dpm/100 cm ²
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5,000 dpm/100 cm ²	15,000 dpm/100 cm ²	1,000 dpm/100 cm ²

⁽¹⁾Where surface contamination by both alpha and beta-gamma emitting nuclides exist, the limits established for alpha and beta-gamma emitting nuclides should apply independently.

⁽²⁾As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

⁽³⁾Measurement of average contamination should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

⁽⁴⁾The maximum contamination level applies to an area of not more than 100 cm².

⁽⁵⁾The amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

Table 2
Survey Classifications
Radiological Survey – Site Buildings
Viacom Inc.
Churchill Road Satellite Facility
Edgewood, Pennsylvania

Building	Unit	Subunit	Classification
201	1-1	1-1-1 through 1-1-5	Unaffected
202 (Western Section)	1-2	1-2-1 through 1-2-3	Affected
202 (Eastern Section)	1-3	1-3-1	Unaffected
203	1-4	1-4-2	Unaffected
204	1-4	1-4-3	Unaffected
205	1-4	1-4-1	Unaffected
206	1-4	1-4-4	Unaffected
Exterior Building Walls	1-5	-	Unaffected
Building Flat Roofs	1-6	-	Unaffected
Exterior Building Docks	1-7	1-7-1 through 1-7-3	Unaffected

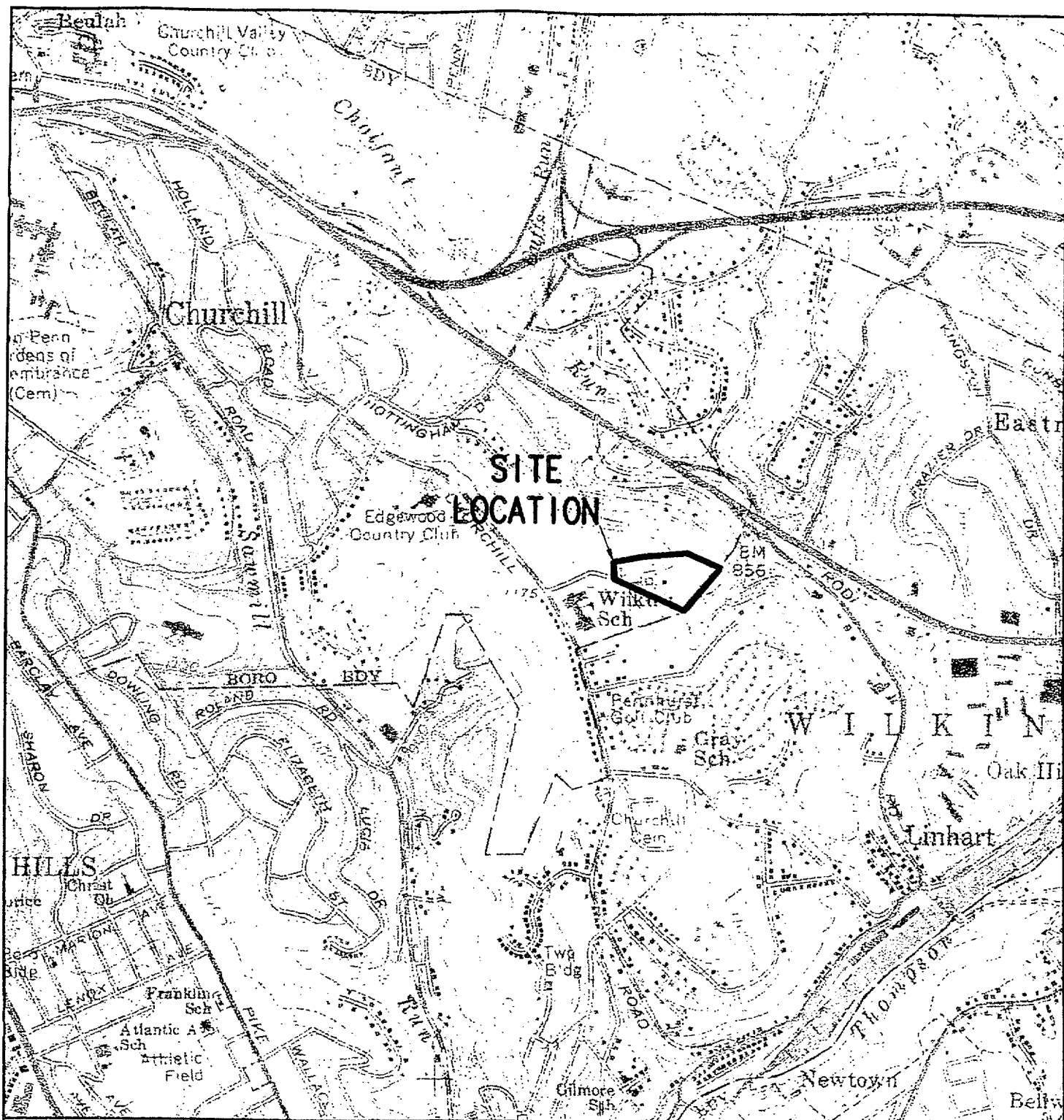
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Table 3
Health Physics Instruments
Radiological Survey – Site Buildings
Viacom Inc.
Churchill Road Satellite Facility
Edgewood, Pennsylvania

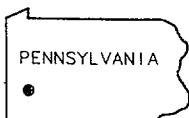
Instrument Manufacturer, Model, and Detector	Detector Model/ Type	Radiation Detected	Count Time	Typical Background Value	Typical Instrument Efficiency	Minimum Detectable Activity	Acceptance Criteria Value	MDA as % of Acceptance Criteria
Ludlum 2360	43-68 Gas proportional	Alpha	1 min.	8 (dpm/100 cm ²)	12.2%	60 (dpm/100 cm ²)	100 (dpm/100 cm ²)	60%
		Beta	1 min.	955 (dpm/100 cm ²)	20.0%	335 (dpm/100 cm ²)	5,000 (dpm/100 cm ²)	6.7%
Ludlum 3	44-9 GM tube	Beta-gamma	8 sec (Time constant)	2,381 (dpm/100 cm ²)	11.2%	3,390 (dpm/100 cm ²)	5,000 (dpm/100 cm ²)	67.8%
Ludlum 2929	43-10 Scintillation	Alpha	2 min.	1 (dpm/100 cm ²)	22.7%	12 (dpm/100 cm ²)	20 (dpm/100 cm ²)	62%
		Beta	2 min.	512 (dpm/100 cm ²)	12.1%	225 (dpm/100 cm ²)	1,000 (dpm/100 cm ²)	22.5%
Ludlum 19	Internal NaI Scintillation	Gamma	N/A	10 microR/hr	N/A	N/A	5 microR/hr above background	N/A
Ludlum 2221	44-10 NaI Scintillation	Gamma	N/A	N/A	N/A	N/A	N/A	N/A
Ludlum 2221	43-5 Scintillation	Alpha	1 min.	9 (dpm/100 cm ²)	10.9%	135 (dpm/100 cm ²)	100 (dpm/100 cm ²)	135%
Ludlum 2350-1	Various	Probe dependent	N/A	Probe dependent	Probe dependent	Probe dependent	N/A	N/A

The MDA for gamma exposure rate meters has not been calculated and is generally accepted to be equal to the measurable background rate.

Figures



SCALE - FEET
0 1000



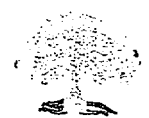
REFERENCE
USGS 7.5-MIN TOPOGRAPHIC QUADRANGLE
BRADDOCK, PA, DATED 1960
PHOTOREVISED 1979, SCALE 1:24000

**FIGURE 1
SITE LOCATION MAP**

**CHURCHILL ROAD SATELLITE FACILITY
EDGEWOOD, PENNSYLVANIA**

PREPARED FOR
VIACOM INC.
PITTSBURGH, PENNSYLVANIA

APPROVED	RED 9/80
CHECKED	ISS 9/80
DRAWN	
DRAWING NUMBER	5518001



Earth Sciences Consultants, Inc.

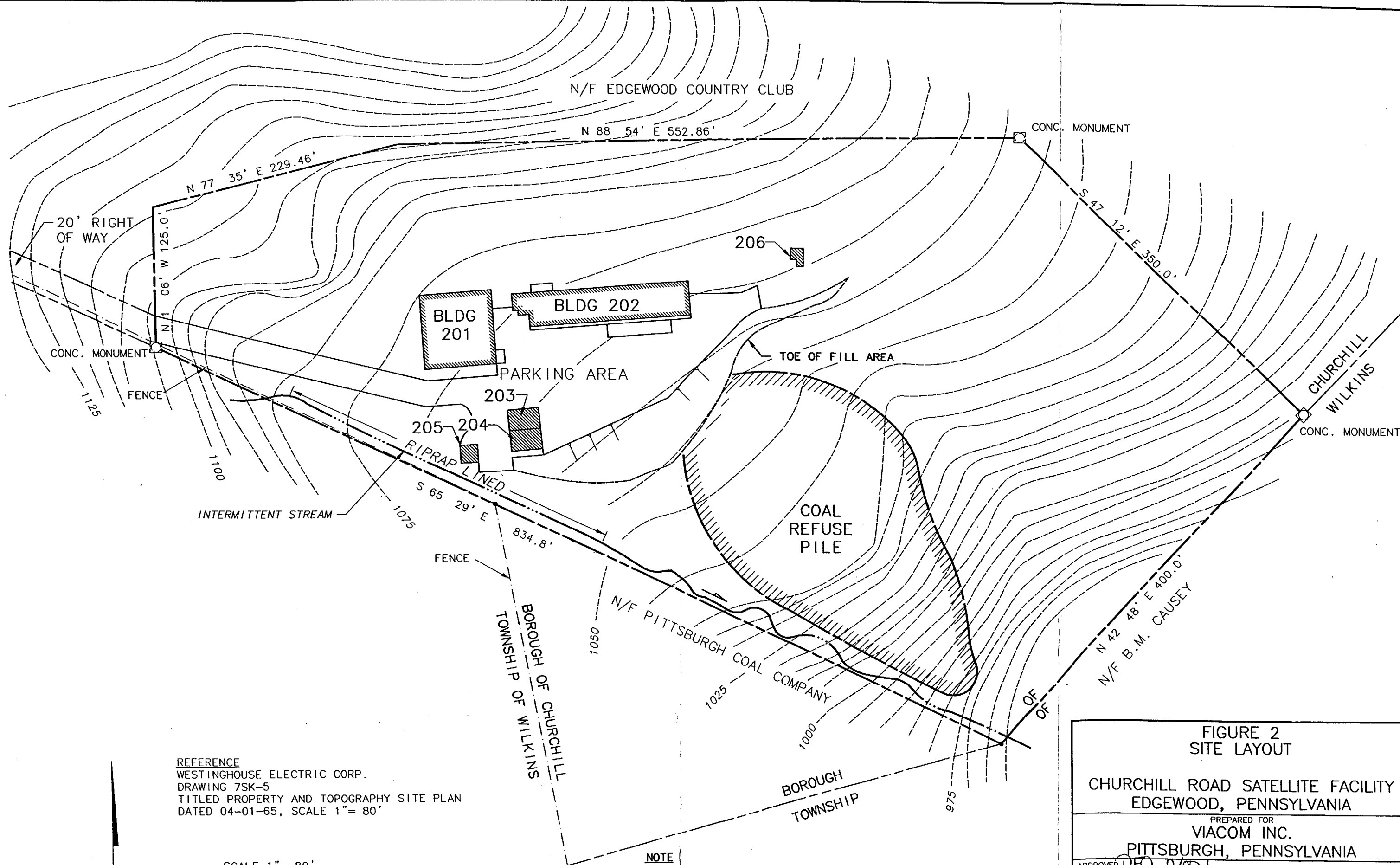


FIGURE 2
SITE LAYOUT

CHURCHILL ROAD SATELLITE FACILITY
EDGEWOOD, PENNSYLVANIA

PREPARED FOR
VIACOM INC.
PITTSBURGH, PENNSYLVANIA

APPROVED *RF 9/00*
CHECKED *BS 9/00*
DRAWN

DRAWING NUMBER

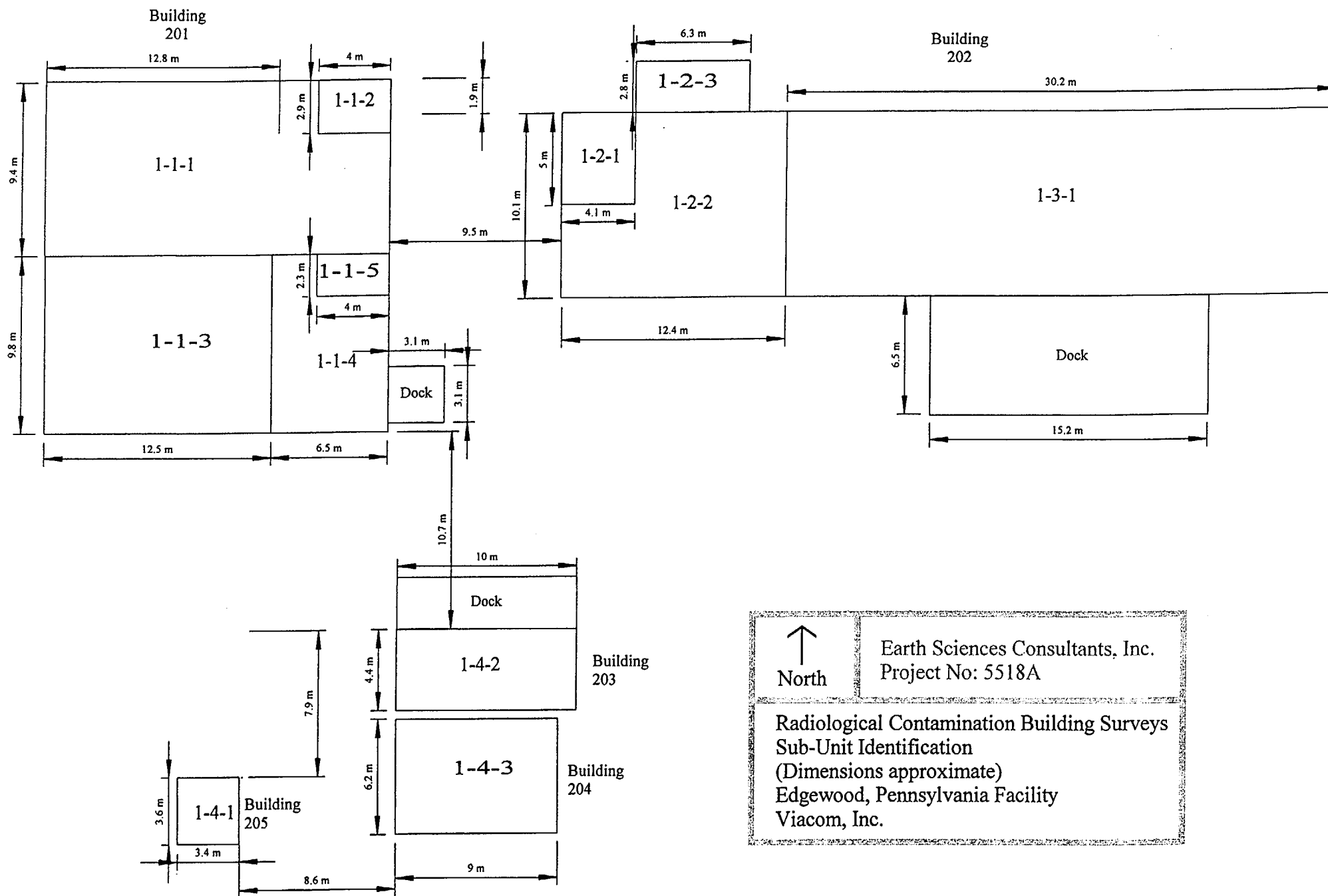
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Earth Sciences Consultants, Inc.

Appendix A

Building Radiological Survey Documentation



Earth Sciences Consultants, Inc.
Project No: 5518A

Radiological Contamination Building Surveys
Sub-Unit Identification
(Dimensions approximate)
Edgewood, Pennsylvania Facility
Viacom, Inc.

Survey Unit Code (Lower):	1-1L
Survey Unit Code (Upper):	1-1U
Survey Unit Code (Miscellaneous):	
Total number of measurements taken:	470

Unit Location and description:	Building 201
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Lower Surfaces							
	Alpha Fixed Activity (DPM/100cm ²)	Beta Fixed Activity (DPM/100cm ²)	Beta Scan Average Activity (DPM/100cm ²)	Beta Scan Maximum Activity (DPM/100cm ²)	Gamma Survey @ 1 meter (uR/hr)	Alpha Removable Activity (DPM/100cm ²)	Beta Removable Activity (DPM/100cm ²)
Standard Deviation of Data Set:	13.99	152.85	188.52	220.81	1.01	0.11	1.94
Mean of Data Set:	-4.54	126.25	180.05	422.21	-3.05	0.04	-0.62
Maximum value of data set:	37	658	658	959	-1	0.38	4.55
Calculated 95% confidence of Data Set:	-1.03	164.56	227.31	477.56	-2.70	0.07	-0.13
Guideline level:	100	5000	5000	5000	5	20	1000
Calculated C _x -X/S _x Value:	7.47	31.88	25.57	20.73	7.97	178.90	516.87
Total measurements collected:	45	45	45	45	24	44	44
Total measurements needed:	9	9	9	9	9	9	9
Measurements needed:	0	0	0	0	0	0	0
Current survey density meets 5849?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets quality criteria?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 guideline value?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 maximum value limit?	Yes	Yes	Yes	Yes	N/A	N/A	N/A

Upper Surfaces							
	Alpha Fixed Activity (DPM/100cm ²)	Beta Fixed Activity (DPM/100cm ²)	Beta Scan Average Activity (DPM/100cm ²)	Beta Scan Maximum Activity (DPM/100cm ²)	Gamma Survey @ 1 meter (uR/hr)	Alpha Removable Activity (DPM/100cm ²)	Beta Removable Activity (DPM/100cm ²)
Standard Deviation of Data Set:	22.23	183.49	227.26	264.13	N/A	0.18	1.89
Mean of Data Set:	16.16	5.90	40.15	359.28	N/A	0.04	-0.55
Maximum value of data set:	70	458	458	809	N/A	0.93	3.05
Calculated 95% confidence of Data Set:	23.05	62.81	110.64	441.21	N/A	0.10	0.05
Guideline level:	100	5000	5000	5000	N/A	20	1000
Calculated $C_x - X/S_x$ Value:	3.77	27.22	21.82	17.57	N/A	108.41	528.13
Total measurements collected:	30	30	30	30	N/A	29	29
Total measurements needed:	9	9	9	9	N/A	9	9
Measurements needed:	0	0	0	0	N/A	0	0
Current survey density meets 5849?	Yes	Yes	Yes	Yes	N/A	Yes	Yes
Meets quality criteria?	Yes	Yes	Yes	Yes	N/A	Yes	Yes
Meets CR-5849 guideline value?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 maximum value limit?	Yes	Yes	Yes	Yes	N/A	N/A	N/A

Unit 1-2

Survey Unit Code (Lower):	1-2L
Survey Unit Code (Upper):	1-2U
Survey Unit Code (Miscellaneous):	
Total number of measurements taken:	518

Unit Location and description:	Building 202 West section
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Lower Surfaces							
	Alpha Fixed Activity (DPM/100cm ²)	Beta Fixed Activity (DPM/100cm ²)	Beta Scan Average Activity (DPM/100cm ²)	Beta Scan Maximum Activity (DPM/100cm ²)	Gamma Survey @ 1 meter (uR/hr)	Alpha Removable Activity (DPM/100cm ²)	Beta Removable Activity (DPM/100cm ²)
Standard Deviation of Data Set:	18.21	245.47	313.02	341.96	4.99	0.33	2.45
Mean of Data Set:	2.31	304.62	427.69	737.04	-0.28	0.15	0.48
Maximum value of data set:	61	1074	1059	1460	4	1.54	5.55
Calculated 95% confidence of Data Set:	6.38	359.54	497.73	813.55	1.22	0.22	1.02
Guideline level:	100	5000	5000	5000	5	20	1000
Calculated C _x -X/S _x Value:	5.37	19.13	14.61	12.47	1.06	59.49	407.14
Total measurements collected:	56	56	56	56	32	56	56
Total measurements needed:	9	9	9	9	9	9	9
Measurements needed:	0	0	0	0	0	0	0
Current survey density meets 5849?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets quality criteria?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 guideline value?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 maximum value limit?	Yes	Yes	Yes	Yes	N/A	N/A	N/A

Upper Surfaces							
	Alpha Fixed Activity (DPM/100cm ²)	Beta Fixed Activity (DPM/100cm ²)	Beta Scan Average Activity (DPM/100cm ²)	Beta Scan Maximum Activity (DPM/100cm ²)	Gamma Survey @ 1 meter (uR/hr)	Alpha Removable Activity (DPM/100cm ²)	Beta Removable Activity (DPM/100cm ²)
Standard Deviation of Data Set:	19.51	409.83	451.02	493.52	N/A	0.21	1.73
Mean of Data Set:	6.64	170.34	277.41	692.45	N/A	0.07	0.25
Maximum value of data set:	70	1475	1561	2312	N/A	0.96	4.00
Calculated 95% confidence of Data Set:	13.32	310.58	431.75	861.33	N/A	0.14	0.85
Guideline level:	100	5000	5000	5000	N/A	20	1000
Calculated $C_p - X/S_x$ Value:	4.78	11.78	10.47	8.73	N/A	95.90	576.80
Total measurements collected:	25	25	25	25	N/A	25	25
Total measurements needed:	9	9	9	9	N/A	9	9
Measurements needed:	0	0	0	0	N/A	0	0
Current survey density meets 5849?	Yes	Yes	Yes	Yes	N/A	Yes	Yes
Meets quality criteria?	Yes	Yes	Yes	Yes	N/A	Yes	Yes
Meets CR-5849 guideline value?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 maximum value limit?	Yes	Yes	Yes	Yes	N/A	N/A	N/A

Survey Unit Code (Lower):	1-3L
Survey Unit Code (Upper):	1-3U
Survey Unit Code (Miscellaneous):	
Total number of measurements taken:	520

Unit Location and description:	Building 202 East section
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Lower Surfaces							
	Alpha Fixed Activity (DPM/100cm ²)	Beta Fixed Activity (DPM/100cm ²)	Beta Scan Average Activity (DPM/100cm ²)	Beta Scan Maximum Activity (DPM/100cm ²)	Gamma Survey @ 1 meter (uR/hr)	Alpha Removable Activity (DPM/100cm ²)	Beta Removable Activity (DPM/100cm ²)
Standard Deviation of Data Set:	11.29	170.34	235.18	221.31	1.27	0.21	2.00
Mean of Data Set:	-4.87	208.02	280.95	627.89	-2.77	0.07	-0.69
Maximum value of data set:	20	719	658	1059	0	0.98	4.62
Calculated 95% confidence of Data Set:	-2.22	248.03	336.19	679.88	-2.40	0.12	-0.22
Guideline level:	100	5000	5000	5000	5	20	1000
Calculated C _x -X/S _x Value:	9.29	28.13	20.07	19.76	6.11	93.51	500.44
Total measurements collected:	51	51	51	51	34	51	51
Total measurements needed:	9	9	9	9	9	9	9
Measurements needed:	0	0	0	0	0	0	0
Current survey density meets 5849?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets quality criteria?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 guideline value?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 maximum value limit?	Yes	Yes	Yes	Yes	N/A	N/A	N/A

Upper Surfaces							
	Alpha Fixed Activity (DPM/100cm ²)	Beta Fixed Activity (DPM/100cm ²)	Beta Scan Average Activity (DPM/100cm ²)	Beta Scan Maximum Activity (DPM/100cm ²)	Gamma Survey @ 1 meter (uR/hr)	Alpha Removable Activity (DPM/100cm ²)	Beta Removable Activity (DPM/100cm ²)
Standard Deviation of Data Set:	11.99	318.89	321.24	366.91	N/A	0.39	2.09
Mean of Data Set:	-2.48	-97.70	-101.87	329.20	N/A	0.14	0.63
Maximum value of data set:	25	638	658	1059	N/A	1.81	5.65
Calculated 95% confidence of Data Set:	1.23	1.22	-2.23	443.02	N/A	0.26	1.28
Guideline level:	100	5000	5000	5000	N/A	20	1000
Calculated C _x -X/S _x Value:	8.55	15.99	15.88	12.73	N/A	51.23	477.55
Total measurements collected:	30	30	30	30	N/A	30	30
Total measurements needed:	9	9	9	9	N/A	9	9
Measurements needed:	0	0	0	0	N/A	0	0
Current survey density meets 5849?	Yes	Yes	Yes	Yes	N/A	Yes	Yes
Meets quality criteria?	Yes	Yes	Yes	Yes	N/A	Yes	Yes
Meets CR-5849 guideline value?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 maximum value limit?	Yes	Yes	Yes	Yes	N/A	N/A	N/A

Survey Unit Code (Lower):	1-4L
Survey Unit Code (Upper):	1-4U
Survey Unit Code (Miscellaneous):	
Total number of measurements taken:	422

Unit Location and description:	Buildings 203, 204, 205
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Lower Surfaces							
	Alpha Fixed Activity (DPM/100cm ²)	Beta Fixed Activity (DPM/100cm ²)	Beta Scan Average Activity (DPM/100cm ²)	Beta Scan Maximum Activity (DPM/100cm ²)	Gamma Survey @ 1 meter (uR/hr)	Alpha Removable Activity (DPM/100cm ²)	Beta Removable Activity (DPM/100cm ²)
Standard Deviation of Data Set:	18.28	190.27	245.32	255.32	1.12	0.18	2.23
Mean of Data Set:	2.57	98.58	146.27	407.73	-3.40	0.05	-0.29
Maximum value of data set:	53	428	558	859	0	0.93	4.86
Calculated 95% confidence of Data Set:	7.65	151.42	214.40	478.64	-2.96	0.10	0.33
Guideline level:	100	5000	5000	5000	5	20	1000
Calculated C _g -X/S _x Value:	5.33	25.76	19.79	17.99	7.47	112.91	448.53
Total measurements collected:	37	37	37	37	20	37	37
Total measurements needed:	9	9	9	9	9	9	9
Measurements needed:	0	0	0	0	0	0	0
Current survey density meets 5849?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets quality criteria?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 guideline value?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 maximum value limit?	Yes	Yes	Yes	Yes	N/A	N/A	N/A

Upper Surfaces							
	Alpha Fixed Activity (DPM/100cm ²)	Beta Fixed Activity (DPM/100cm ²)	Beta Scan Average Activity (DPM/100cm ²)	Beta Scan Maximum Activity (DPM/100cm ²)	Gamma Survey @ 1 meter (uR/hr)	Alpha Removable Activity (DPM/100cm ²)	Beta Removable Activity (DPM/100cm ²)
Standard Deviation of Data Set:	8.80	133.94	174.57	148.88	N/A	0.22	2.55
Mean of Data Set:	1.20	-103.71	-106.89	140.40	N/A	0.10	-0.03
Maximum value of data set:	25	192	257	458	N/A	0.97	4.96
Calculated 95% confidence of Data Set:	3.93	-62.16	-52.74	186.58	N/A	0.17	0.76
Guideline level:	100	5000	5000	5000	N/A	20	1000
Calculated $C_p - X/S_x$ Value:	11.23	38.10	29.25	32.64	N/A	88.84	392.13
Total measurements collected:	30	30	30	30	N/A	30	30
Total measurements needed:	9	9	9	9	N/A	9	9
Measurements needed:	0	0	0	0	N/A	0	0
Current survey density meets 5849?	Yes	Yes	Yes	Yes	N/A	Yes	Yes
Meets quality criteria?	Yes	Yes	Yes	Yes	N/A	Yes	Yes
Meets CR-5849 guideline value?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 maximum value limit?	Yes	Yes	Yes	Yes	N/A	N/A	N/A

Exteriors

Survey Unit Code (Lower):	Ext
Survey Unit Code (Upper):	
Survey Unit Code (Miscellaneous):	
Total number of measurements taken:	#REF!
Unit Location and description:	Exteriors of all buildings, excluding roofs.

Lower Surfaces							
	Alpha Fixed Activity (DPM/100cm ²)	Beta Fixed Activity (DPM/100cm ²)	Beta Scan Average Activity (DPM/100cm ²)	Beta Scan Maximum Activity (DPM/100cm ²)	Gamma Survey @ 1 meter (uR/hr)	Alpha Removable Activity (DPM/100cm ²)	Beta Removable Activity (DPM/100cm ²)
Standard Deviation of Data Set:	17.13	329.27	325.09	336.06	N/A	0.18	2.03
Mean of Data Set:	6.26	136.68	215.38	459.11	N/A	0.03	-0.66
Maximum value of data set:	61	1155	1160	1460	0	1.07	5.10
Calculated 95% confidence of Data Set:	9.45	198.04	275.96	521.74	#VALUE!	0.07	-0.28
Guideline level:	100	5000	5000	5000	5	20	1000
Calculated C _p -X/S _x Value:	5.47	14.77	14.72	13.51	#VALUE!	113.38	493.76
Total measurements collected:	80	80	80	80	0	80	80
Total measurements needed:	9	9	9	9	#VALUE!	9	9
Measurements needed:	0	0	0	0	#VALUE!	0	0
Current survey density meets 5849?	Yes	Yes	Yes	Yes	#VALUE!	Yes	Yes
Meets quality criteria?	Yes	Yes	Yes	Yes	#VALUE!	Yes	Yes
Meets CR-5849 guideline value?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 maximum value limit?	Yes	Yes	Yes	Yes	N/A	N/A	N/A

Docks

Survey Unit Code (Lower):	Dock
Survey Unit Code (Upper):	
Survey Unit Code (Miscellaneous):	
Total number of measurements taken:	278
Unit Location and description:	Loading docks for Buildings 201 and 202. Alpha fixed and removable activity guideline level increased due to results indicating Th ^{nat} .

Lower Surfaces							
	Alpha Fixed Activity (DPM/100cm ²)	Beta Fixed Activity (DPM/100cm ²)	Beta Scan Average Activity (DPM/100cm ²)	Beta Scan Maximum Activity (DPM/100cm ²)	Gamma Survey @ 1 meter (uR/hr)	Alpha Removable Activity (DPM/100cm ²)	Beta Removable Activity (DPM/100cm ²)
Standard Deviation of Data Set:	75.25	160.65	178.47	217.55	0.50	0.38	3.02
Mean of Data Set:	111.51	501.22	650.84	846.33	-11.33	0.19	1.02
Maximum value of data set:	300	844	959	1260	-11	1.55	7.93
Calculated 95% confidence of Data Set:	131.56	544.03	698.40	904.30	-11.19	0.29	1.84
Guideline level:	1000	5000	5000	5000	5	200	1000
Calculated C _g -X/S _x Value:	11.81	28.00	24.37	19.09	32.69	532.41	330.81
Total measurements collected:	40	40	40	40	40	39	39
Total measurements needed:	9	9	9	9	9	9	9
Measurements needed:	0	0	0	0	0	0	0
Current survey density meets 5849?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets quality criteria?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 guideline value?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets CR-5849 maximum value limit?	Yes	Yes	Yes	Yes	N/A	N/A	N/A

Appendix B

**Analytical Data Reports
Building Decommissioning Surveys**



Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

August 16, 2000

Mr. Ronald Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. Commercial
CBS-Edgewood 5518A; Edgewood
Antech Ltd. Project No. 00-0616W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on August 10, 2000.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Emery J. Grohregin
Supervisor

EJG:rks

Enclosures

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 00-0616W

CLIENT: Purchase Order Number: Commercial

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0008-0104W	00-001-9	0008-0105W	00-001-13
0008-0106W	00-001-22	0008-0107W	00-001-24
0008-0108W	00-001-27	0008-0109W	00-001-33
0008-0110W	00-001-35	0008-0111W	00-001-39
0008-0112W	00-001-43	0008-0113W	00-001-48
0008-0114W	00-001-49	0008-0115W	00-001-50
0008-0116W	00-001-51	0008-0117W	00-001-55
0008-0118W	00-002-59	0008-0119W	00-002-65
0008-0120W	00-002-73	0008-0121W	00-002-76
0008-0122W	00-002-77	0008-0123W	00-002-78
0008-0124W	00-004-88	0008-0125W	00-004-89
0008-0126W	00-004-97	0008-0127W	00-004-119
0008-0128W	00-004-120	0008-0129W	00-004-122
0008-0130W	00-005-129	0008-0131W	00-005-140
0008-0132W	00-005-142	0008-0133W	00-007-157
0008-0134W	00-009-187	0008-0135W	00-009-191
0008-0136W	00-009-193	0008-0137W	00-009-202
0008-0138W	00-010-240	0008-0139W	00-011-252
0008-0140W	00-012-270	0008-0141W	00-012-281
0008-0142W	00-012-285	0008-0143W	00-013-290
0008-0144W	00-015-299	0008-0145W	00-016-6
0008-0146W	00-017-15	0008-0147W	00-017-16
0008-0148W	00-018-38	0008-0149W	00-019-50
0008-0150W	00-019-51	0008-0151W	00-019-52
0008-0152W	00-019-54	0008-0153W	00-020-69
0008-0154W	00-021-77	0008-0155W	00-021-78
0008-0156W	00-022-95	0008-0157W	00-022-97
0008-0158W	00-023-103	0008-0159W	00-023-108
0008-0160W	00-023-111	0008-0161W	00-025-132
0008-0162W	00-025-158	0008-0163W	00-026-169
0008-0164W	00-026-174	0008-0165W	00-028-193
0008-0166W	00-028-194	0008-0167W	00-028-195
0008-0168W	00-028-197	0008-0169W	00-029-209
0008-0170W	00-029-210	0008-0171W	00-029-211
0008-0172W	00-029-213	0008-0173W	00-029-214
0008-0174W	00-029-215	0008-0175W	00-029-216
0008-0176W	00-029-218	0008-0177W	00-029-219

ANTECH LTD.
CASE NARRATIVE

(Continued)

0008-0178W	00-029-220	0008-0179W	00-029-222
0008-0180W	00-029-223	0008-0181W	00-029-225
0008-0182W	00-029-226	0008-0183W	00-030-233
0008-0184W	00-030-234	0008-0185W	00-030-235
0008-0186W	00-030-236	0008-0187W	00-030-237

C: SHIPPING/RECEIVING COMMENTS:

Final report: 08/16/00.

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:

NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not
be interpreted as precision of the analytical procedure, but rather
as a result of reporting format.

Antech Ltd.

Gross Alpha/Gross Beta by Gas Flow Proportional Counting

Sample Results

Sample Matrix: Smear

Method: A-576

Client Name: Earth Sciences Consultants

Client Project Name: CBS Corporation; Edgewood Site

Client Project Number: 5518-A

Antech Proj. No.: 00-0616W

Client ID	Antech ID	Gross α (dpm)				Gross β (dpm)			
		Result	+/- 2 σ	MDA	Qualifier	Result	+/- 2 σ	MDA	Qualifier
00-001-9	0008-0104W	0.34	0.34	4.9973	U	4.17	1.58	4.0692	
00-001-13	0008-0105W	0.99	0.91	3.2129	U	4.63	1.53	3.5836	
00-001-22	0008-0106W	0.36	0.36	2.8403	U	1.59	1.05	3.2825	U
00-001-24	0008-0107W	0.000	0.00	4.1020	U	2.96	1.26	3.4238	U
00-001-27	0008-0108W	0.000	0.00	2.9429	U	4.27	1.44	3.4971	
00-001-33	0008-0109W	1.539	1.12	3.4773	U	2.26	1.21	3.3742	U
00-001-35	0008-0110W	0.000	0.00	3.1186	U	5.53	1.56	3.3064	
00-001-39	0008-0111W	0.000	0.00	2.7249	U	2.22	1.13	3.2687	U
00-001-43	0008-0112W	0.33	0.33	4.9927	U	5.55	1.72	4.0656	
00-001-48	0008-0113W	0.34	0.34	3.2095	U	4.78	1.52	3.5278	
00-001-49	0008-0114W	0.95	0.83	2.8372	U	2.48	1.22	3.3294	U
00-001-50	0008-0115W	1.071	1.07	4.0980	U	1.46	1.14	3.5677	U
00-001-51	0008-0116W	0.33	0.33	2.9398	U	3.06	1.32	3.5444	U
00-001-55	0008-0117W	0.00	0.00	3.4737	U	2.70	1.18	3.2197	U
00-002-59	0008-0118W	0.38	0.38	3.1152	U	1.90	1.12	3.3547	U
00-002-65	0008-0119W	0.000	0.00	2.7218	U	4.00	1.38	3.2658	
00-002-73	0008-0120W	0.96	0.96	4.9927	U	1.24	1.24	4.1037	U
00-002-76	0008-0121W	0.000	0.00	3.2095	U	0.82	0.82	3.4742	U
00-002-77	0008-0122W	0.36	0.36	2.8372	U	1.59	1.05	3.2796	U
00-002-78	0008-0123W	0.000	0.00	4.0981	U	2.11	1.17	3.4707	U
00-004-88	0008-0124W	0.93	0.84	2.9389	U	3.26	1.37	3.5937	U
00-004-89	0008-0125W	0.89	0.89	3.4737	U	3.43	1.34	3.3217	
00-004-97	0008-0126W	0.000	0.00	3.1153	U	2.74	1.21	3.3035	U
00-004-119	0008-0127W	1.810	1.12	2.7218	U	3.90	1.45	3.4241	
00-004-120	0008-0128W	0.34	0.34	4.9996	U	3.83	1.54	4.0711	U
00-004-122	0008-0129W	0.000	0.00	3.2146	U	5.65	1.60	3.4788	
00-005-129	0008-0130W	0.000	0.00	2.8418	U	2.09	1.10	3.2328	U
00-005-140	0008-0131W	0.000	0.00	4.1041	U	1.76	1.12	3.4754	U
00-005-142	0008-0132W	0.93	0.84	2.9445	U	1.52	1.13	3.5986	U
00-007-157	0008-0133W	0.000	0.00	3.4792	U	3.05	1.24	3.2240	U
00-009-187	0008-0134W	0.000	0.00	3.1203	U	3.10	1.26	3.3079	U
00-009-191	0008-0135W	0.52	0.52	2.7265	U	3.86	1.39	3.3243	

Footnotes:

MDA = Minimum Detectable Activity

U = Estimated Value below MDA

ND = Non detect at specified MDA

Antech Ltd.

Gross Alpha/Gross Beta by Gas Flow Proportional Counting

Sample Results

Sample Matrix: Smear

Method: A-576

Client Name: Earth Sciences Consultants

Client Project Name: CBS Corporation; Edgewood Site

Client Project Number: 5518-A

Antech Proj. No.: 00-0616W

Client ID	Antech ID	Gross α (dpm)				Gross β (dpm)			
		Result	+/- 2 σ	MDA	Qualifier	Result	+/- 2 σ	MDA	Qualifier
00-009-193	0008-0136W	0.96	0.96	4.9918	U	3.32	1.50	4.1030	U
00-009-202	0008-0137W	0.98	0.90	3.2089	U	4.62	1.53	3.5798	
00-010-240	0008-0138W	0.36	0.36	2.8366	U	0.90	0.90	3.2790	U
00-011-252	0008-0139W	0.000	0.00	4.0973	U	4.55	1.49	3.4702	
00-012-270	0008-0140W	0.33	0.33	2.9392	U	2.71	1.27	3.5438	U
00-012-281	0008-0141W	0.24	0.24	3.4731	U	3.57	1.33	3.2707	
00-012-285	0008-0142W	0.38	0.38	3.1146	U	1.55	1.06	3.3542	U
00-013-290	0008-0143W	0.000	0.00	2.7212	U	1.86	1.07	3.2653	U
00-015-299	0008-0144W	0.000	0.00	4.9988	U	0.99	0.99	3.9927	U
00-016-6	0008-0145W	0.36	0.36	3.2140	U	4.44	1.49	3.5330	
00-017-15	0008-0146W	0.000	0.00	2.8413	U	4.86	1.47	3.2324	
00-017-16	0008-0147W	0.000	0.00	4.1034	U	2.46	1.22	3.4749	U
00-018-38	0008-0148W	0.93	0.84	2.9440	U	3.97	1.46	3.5981	
00-019-50	0008-0149W	0.24	0.24	3.4785	U	3.24	1.29	3.2752	U
00-019-51	0008-0150W	0.39	0.39	3.1197	U	3.64	1.36	3.3588	
00-019-52	0008-0151W	0.52	0.52	2.7259	U	4.57	1.48	3.3238	
00-019-54	0008-0152W	0.97	0.97	4.9996	U	3.33	1.51	4.1092	U
00-020-69	0008-0153W	0.00	0.00	3.2146	U	4.96	1.52	3.4788	
00-021-77	0008-0154W	0.000	0.00	2.8418	U	2.78	1.20	3.2328	U
00-021-78	0008-0155W	0.45	0.45	4.1041	U	4.06	1.46	3.5245	
00-022-95	0008-0156W	0.34	0.34	2.9445	U	4.47	1.49	3.5491	
00-022-97	0008-0157W	0.000	0.00	3.4791	U	5.10	1.49	3.2240	
00-023-103	0008-0158W	0.000	0.00	3.1203	U	3.45	1.31	3.3079	
00-023-108	0008-0159W	0.000	0.00	2.7264	U	2.94	1.24	3.2702	U
00-023-111	0008-0160W	0.97	0.97	4.9964	U	1.24	1.24	4.1066	U
00-025-132	0008-0161W	0.000	0.00	3.2122	U	2.51	1.20	3.4766	U
00-025-158	0008-0162W	0.000	0.00	2.8397	U	4.16	1.39	3.2308	
00-026-169	0008-0163W	1.073	1.07	4.1013	U	1.81	1.19	3.5704	U
00-026-174	0008-0164W	0.000	0.00	2.9423	U	4.27	1.44	3.4965	
00-028-193	0008-0165W	1.538	1.12	3.4766	U	2.26	1.21	3.3736	U
00-028-194	0008-0166W	0.38	0.38	3.1179	U	2.60	1.22	3.3572	U
00-028-195	0008-0167W	0.000	0.00	2.7243	U	3.65	1.34	3.2682	

Footnotes:

MDA = Minimum Detectable Activity

U = Estimated Value below MDA

ND = Non detect at specified MDA

Antech Ltd.

Gross Alpha/Gross Beta by Gas Flow Proportional Counting

Sample Results

Sample Matrix: Smear
Method: A-576

Client Name: Earth Sciences Consultants
Client Project Name: CBS Corporation; Edgewood Site
Client Project Number: 5518-A

Antech Proj. No.: 00-0616W

Client ID	Antech ID	Gross α (dpm)				Gross β (dpm)			
		Result	+/- 2 σ	MDA	Qualifier	Result	+/- 2 σ	MDA	Qualifier
00-028-197	0008-0168W	0.000	0.00	4.9926	U	2.23	1.32	4.0271	U
00-029-209	0008-0169W	0.34	0.34	3.2094	U	2.70	1.27	3.5278	U
00-029-210	0008-0170W	1.546	1.02	2.8372	U	2.33	1.22	3.3783	U
00-029-211	0008-0171W	0.000	0.00	4.0980	U	5.25	1.57	3.4707	
00-029-213	0008-0172W	0.000	0.00	2.9398	U	2.87	1.26	3.4940	U
00-029-214	0008-0173W	0.000	0.00	3.4737	U	5.08	1.49	3.2197	
00-029-215	0008-0174W	0.000	0.00	3.1152	U	2.74	1.21	3.3035	U
00-029-216	0008-0175W	0.000	0.00	2.7218	U	3.64	1.33	3.2658	
00-029-218	0008-0176W	0.34	0.34	4.9997	U	4.18	1.58	4.0711	
00-029-219	0008-0177W	0.34	0.34	3.2147	U	7.93	1.85	3.5327	
00-029-220	0008-0178W	0.96	0.84	2.8419	U	3.53	1.36	3.3342	
00-029-222	0008-0179W	0.45	0.45	4.1042	U	1.96	1.18	3.5246	U
00-029-223	0008-0180W	0.34	0.34	2.9446	U	3.77	1.41	3.5492	
00-029-225	0008-0181W	0.000	0.00	3.4792	U	6.46	1.64	3.2241	
00-029-226	0008-0182W	0.39	0.39	3.1204	U	6.78	1.72	3.3594	
00-030-233	0008-0183W	0.000	0.00	2.7265	U	4.37	1.43	3.2703	
00-030-234	0008-0184W	0.000	0.00	4.9996	U	0.00	0.00	4.0324	U
00-030-235	0008-0185W	0.34	0.34	3.2146	U	1.31	1.06	3.5326	U
00-030-236	0008-0186W	0.000	0.00	2.8418	U	3.47	1.29	3.2328	
00-030-237	0008-0187W	1.075	1.08	4.1041	U	1.46	1.14	3.5727	U

Footnotes:

MDA = Minimum Detectable Activity

U = Estimated Value below MDA

ND = Non detect at specified MDA



Antech Ltd. Chain of Custody Record

SHIP 10:
Antech Ltd.
One Triangle Drive
Export, PA 15632
(724) 733-1161
FAX (724) 327-7793

Page 1 of 1

For Laboratory Use Only

Laboratory Project No.

00-066666

Project Name: CBS Edgewood Facility

Project No.: 5518A

Sampler: ERIC FRAMITTI
(Printed Name)

Eric D. Framitti
(Signature)

Relinquished By: (Signature and Printed Name)
Eric D. Framitti / ERIC D. FRAMITTI

Date 8/9/00 Time 3:25 PM

Received By: (Signature and Printed Name)
R.K. Scott / R.K. Scott

Date 10/00 Time 3:25
Date 8/9/00 Time 1:50

Relinquished By: (Signature and Printed Name)

Date

Received at Lab By: (Signature and Printed Name)

Date

Time

Antech Quote ID No.:

Antech Contact Name:

Client Purchase Order No.:

Method of Shipment:

Shipment ID:

Circle Bottle Size

Other (Please Specify)

Please Check when Monitoring
Samples are Collected:

- ☐ Residual Chlorine Present
☐ Residual Chlorine Not Present

Please Check when VOA Vials
are Collected:

- ☐ Free of Bubbles
☐ Bubbles Present 0008-

(Specify in Special Instructions/Comments)

Sneak

Sample ID Number	Sample Description		Grab	Composite	Specify in Special Instructions Column																				No. of Containers	For Lab Use Only Laboratory ID	
	Date	Time			Description	Chemistry	Nutrient	Total Metals	Dissolved Metals	Cyanide	Phenolics	TOC (12)	TOX (25)	Sulfide (5)	Oil & Grease	TPHC (1)	Bacteriological	VOA (40)	Organics	Radiochemical	VOA Septa Jar, Soil	Watershed Jar, Soil	VOA Sampling Device	VOA Methanol Vial			PCB Wipe Can
00-001-9	7-18-00		SWI 25 sample	✓																							0104W
00-001-13	7-18-00		SWI 25	✓																							0105W
00-001-22	7-18-00		SWI 25	✓																							0106W
00-001-24	7-18-00		SWI 25	✓																							0107W
00-001-27	7-18-00		SWI 25	✓																							0108W
00-001-33	7-18-00		SWI 25	✓																							0109W
00-001-35	7-18-00		SWI 25	✓																							0110W
00-001-39	7-19-00		SWI 25	✓																							0111W
00-001-43	7-19-00		SWI 25	✓																							0112W
00-001-48	7-19-00		SWI 25	✓																							0113W

Special Instructions/Comments:

gross alpha and beta

Sample Return/Disposal:

- ☒ Return to Client
☐ Disposal by Antech

Results To:

Client Name:

Company:

Address:

Ronald D. Dymant
EARTH SCIENCE Consultants
ONE TRIANGLE DRIVE
EXPORT PA 15632

For Laboratory Use Only:

Sample Condition Upon Receipt/Comments:

Was Temperature Vial Sent With Cooler? YES ☐ NO ☐ Cooler Temperature:

WHITE - Original COC File YELLOW - Return with Report PINK - Project File GOLD - Client Receipt

Invoice To:

Client Name:

Company:

Address:

SAME AS ABOVE



Antech Ltd. Chain of Custody Record

Antech Ltd.
One Triangle Drive
Export, PA 15632
(724) 733-1161
FAX (724) 327-7793

Page 1 of 1

For Laboratory Use Only
Laboratory Project No.: 00-00166

Project Name: CBS EDGEWOOD FACILITY Project No.: 5518A Sampler: ERIC FRAMITTI (Printed Name) Eric D. Framitti (Signature)

Relinquished By: (Signature and Printed Name) ERIC D. FRAMITTI / ERIC D. FRAMITTI Date 8/9/00 Time 3:25 PM Received By: (Signature and Printed Name) R.K. Scott / R.K. Scott Date 8/10/00 Time 1:50
Relinquished By: (Signature and Printed Name) _____ Date _____ Time _____ Received at Lab By: (Signature and Printed Name) _____ Date _____ Time _____

Antech Quote ID No.: _____				Grab	Composite	Circle Bottle Size																		Other (Please Specify)		Please Check when Monitoring Samples are Collected:			
Antech Contact Name: _____																										<input type="checkbox"/> Residual Chlorine Present			
Client Purchase Order No.: _____																										<input type="checkbox"/> Residual Chlorine Not Present			
Method of Shipment: _____																										Please Check when VOA Vials are Collected:			
Shipment ID: _____				<input type="checkbox"/> Free of Bubbles																									
																								<input type="checkbox"/> Bubbles Present		0008			
																								(Specify in Special Instructions/Comments)					
Sample ID Number	Date	Time	Description			Chemistry (500 ml, 1000 ml)	Nutrient (250 ml, 500 ml)	Total Metals (250 ml, 500 ml)	Dissolved Metals (250 ml, 500 ml)	Cyanide (1000 ml)	Phenolics (1000 ml)	TOC (125 ml)	TOX (250 ml)	Sulfide (500 ml)	Oil & Grease (1000 ml)	TPHC (1000 ml)	Bacteriological (125 ml)	VOA (40 ml)	Organics: PCP/PCB/Heptachlor (1 or 2 1/2 L)	Radiochemical (1000 ml)	VOA Septa Jar, Soil (125 ml)	Wide-mouth Jar, Soil (250 ml, 500 ml, 1000 ml)	VOA Sampling Device 5g	VOA Metabol Vial (5ml / 25 ml)	PCB Wipe Can (Hexane)			No. of Containers	For Lab Use Only Laboratory ID
0-001-49	7-19-00		SWIPE SAMPLE	✓																							1		0114W
0-001-50	7-19-00		SWIPE SAMPLE	✓																							1		0115W
0-001-51	7-19-00		SWIPE SAMPLE	✓																							1		0116W
0-001-55	7-19-00		SWIPE SAMPLE	✓																							1		0117W
0-002-59	7-19-00		SWIPE SAMPLE	✓																							1		0118W
0-002-65	7-19-00		SWIPE SAMPLE	✓																							1		0119W
0-002-73	7-19-00		SWIPE SAMPLE	✓																							1		0120W
0-002-76	7-19-00		SWIPE SAMPLE	✓																							1		0121W
0-002-77	7-19-00		SWIPE SAMPLE	✓																							1		0122W
0-002-78	7-19-00		SWIPE SAMPLE	✓																							1		0123W

Special Instructions/Comments: GROSS ALPHA + BETA

Sample Return/Disposal:
☒ Return to Client
☐ Disposal by Antech

Results To:
Client Name: RONALD DOUMONT
Company: EARTH SCIENCE CONSULTANTS
Address: ONE TRIANGLE LANE
EXPORT, PA 15632

For Laboratory Use Only:

Sample Condition Upon Receipt/Comments: _____
Was Temperature Vial Sent With Cooler? YES ☐ NO ☐ Cooler Temperature: _____
WHITE - Original COC File YELLOW - Return with Report PINK - Project File GOLD - Client Receipt

Invoice To:
Client Name: SAME AS ABOVE
Company: _____
Address: _____



Antech Ltd. Chain of Custody Record

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One Triangle Drive
Export, PA 15632
(724) 733-1161
FAX (724) 327-7793

Page 7 of 1

For Laboratory Use Only

Laboratory Project No. 00-06166

Project Name: Edgewood Facility Project No.: 5518A Sampler: ERIC FRAMITTO Eric D. Framitto
(Printed Name) (Signature)

Relinquished By: (Signature and Printed Name) ERIC D. FRAMITTO / ERIC D. FRAMITTO Date 8/9/00 Time 3:36 PM
Received By: (Signature and Printed Name) R.K. Scott / R.K. Scott Date 8/10/00 Time 1:50
Relinquished By: (Signature and Printed Name) Date Date Time

Sample ID Number	Sample Description		Grab	Composite	Circle Bottle Size															Other (Please Specify)	Please Check when Monitoring Samples are Collected:		No. of Containers	For Lab Use Only Laboratory ID								
	Date	Time			Description	Chemistry (500 ml, 1000 ml)	Nutrient (250 ml, 500 ml)	Total Metals (250 ml, 500 ml)	Dissolved Metals (250 ml, 500 ml)	Cyanide (1000 ml)	Phenolics (1000 ml)	TOC (125 ml)	TOX (250 ml)	Sulfide (500 ml)	Oil & Grease (1000 ml)	TPHC (1000 ml)	Bacteriological (125 ml)	VOA (40 ml)	Organics: PCP/CB/HeptSV (1 or 2 1/2 L)		Radiochemical (1000 ml)	VOA Septa Jar, Soil (125 ml)			Wetland Jar, Soil (250 ml, 500 ml, 1000 ml)	VOA Sampling Device 5g	VOA Methanol Vial (5ml / 25 ml)	PCB Wipe Can (Heptane)	<input type="checkbox"/> Residual Chlorine Present	<input type="checkbox"/> Residual Chlorine Not Present	<input type="checkbox"/> Free of Bubbles	<input type="checkbox"/> Bubbles Present
00-009-187	7-24-00		Swi	✓																												0134W
00-009-191	7-24-00		Swi	✓																												0135W
00-009-193	7-24-00		Swi	✓																												0136W
00-009-202	7-24-00		Swi	✓																												0137W
00-010-240	7-25-00		Swi	✓																												0138W
00-011-252	7-25-00		Swi	✓																												0139W
00-012-270	7-25-00		Swi	✓																												0140W
00-012-281	7-26-00		Swi	✓																												0141W
00-012-285	7-26-00		Swi	✓																												0142W
00-013-290	7-26-00		Swi	✓																												0143W

Special Instructions/Comments:

Gross alpha and beta

Sample Return/Disposal:

- ☒ Return to Client
☐ Disposal by Antech

Results To:

Client Name: Earth Sciences Consultant
Company: Robert Daimont
Address: One Triangle Lane
Export PA 15632

Invoice To:

Client Name: Same as Above
Company: _____
Address: _____

For Laboratory Use Only:

Sample Condition Upon Receipt/Comments:

Was Temperature Vial Sent With Cooler? YES _____ NO _____ Cooler Temperature: _____
WHITE - Original COC File YELLOW - Return with Report PINK - Project File GOLD - Client Receipt



Antech Ltd. Chain of Custody Record

Ship to:
Antech Ltd.
One Triangle Drive
Export, PA 15632
(724) 733-1161
FAX (724) 327-7793

Page 1 of 1

For Laboratory Use Only
Laboratory Project No. 00-0616W

Project Name: Edgewood Facility Project No.: 5518A Sampler: Eric D. Franti Eric D. Franti
(Printed Name) (Signature)

Relinquished By: (Signature and Printed Name) Eric D. Franti / Eric D. Franti Date 8/9/00 Time 3:38 PM
Received By: (Signature and Printed Name) R.K. Scott / R.K. Scott Date 8/10/00 Time 1:50
Relinquished By: (Signature and Printed Name) Date Date Time Time
Received at Lab By: (Signature and Printed Name) Date Time

Sample ID Number	Sample Description		Grab	Composite	Circle Bottle Size																		Other (Please Specify)	Please Check when Monitoring Samples are Collected:		For Lab Use Only Laboratory ID	
	Date	Time			Description	Chemistry (500 ml, 1000 ml)	Nutrient (250 ml, 500 ml)	Total Metals (250 ml, 500 ml)	Dissolved Metals (250 ml, 500 ml)	Cyanide (1000 ml)	Phenolics (1000 ml)	TOC (125 ml)	TOX (250 ml)	Sulfide (500 ml)	Oil & Grease (1000 ml)	TPHC (1000 ml)	Bacteriological (125 ml)	VOA (40 ml)	Organics: Res/PCB/HexaSV (1 or 2 1/2 L)	Radiochemical (1000 ml)	VOA Septa Jar, Soil (125 ml)	Widespread Jar, Soil (250 ml, 500 ml, 1000 ml)		VOA Sampling Device 5g	VOA Method Vial (5ml / 25 ml)		PCB Wipe Can (Hexane)
00-015-299	7-26-00		Smear Sample	✓																							0144W
00-016-6	7-26-00		Smear Sample	✓																							0145W
00-017-15	7-26-00		Smear Sample	✓																							0146W
00-017-16	7-26-00		Smear Sample	✓																							0147W
00-018-38	7-27-00		Smear Sample	✓																							0148W
00-019-50	7-28-00		Smear Sample	✓																							0149W
00-019-51	7-28-00		Smear Sample	✓																							0150W
00-019-52	7-28-00		Smear Sample	✓																							0151W
00-019-54	7-28-00		Smear Sample	✓																							0152W
00-020-69	7-28-00		Smear Sample	✓																							0153W

Special Instructions/Comments:
Gross Alpha and beta

Sample Return/Disposal:
☒ Return to Client
☐ Disposal by Antech

Results To:
Client Name: Earth Sciences Consultants
Company: Donald F. Diamond
Address: One Triangle Lane
Export PA 15632

For Laboratory Use Only:
Sample Condition Upon Receipt/Comments:
Was Temperature Vial Sent With Cooler? YES NO Cooler Temperature:
WHITE - Original COC File YELLOW - Return with Report PINK - Project File GOLD - Client Receipt

Invoice To:
Client Name: Same as above
Company:
Address:



Antech Ltd. Chain of Custody Record

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One Triangle Drive
Export, PA 15632
(724) 733-1161
FAX (724) 327-7793

Page 1 of 1

For Laboratory Use Only

Laboratory Project No.

00-06162

Project Name:

Edgewood Facility

Project No.:

S51KA

Sampler:

ERIC FRAMITTI

(Printed Name)

ERIC D. FRAMITTI

(Signature)

Relinquished By: (Signature and Printed Name)

ERIC D. FRAMITTI / ERIC D. FRAMITTI

Date

8/9/00

Time

3:41 PM

Received By: (Signature and Printed Name)

R.K. Scott / R.K. Scott

Date

8/10/00

Time

1:50

Relinquished By: (Signature and Printed Name)

Date

Time

Received at Lab By: (Signature and Printed Name)

Date

Time

Antech Quote ID No.:

Antech Contact Name:

Client Purchase Order No.:

Method of Shipment:

Shipment ID:

Circle Bottle Size

Other (Please Specify)

Please Check when Monitoring Samples are Collected:

☐ Residual Chlorine Present

☐ Residual Chlorine Not Present

Please Check when VOA Vials are Collected:

☐ Free of Bubbles

☐ Bubbles Present 0008

(Specify in Special Instructions/Comments)

Sample ID Number

Date

Time

Sample Description

Description

Grab Composite

Chemistry (500 ml, 1000 ml)

Nutrient (250 ml, 500 ml)

Total Metals (250 ml, 500 ml)

Dissolved Metals (250 ml, 500 ml)

Cyanide (1000 ml)

Phenolics (1000 ml)

TOC (125 ml)

TOX (250 ml)

Sulfide (500 ml)

Oil & Grease (1000 ml)

TPHC (1000 ml)

Bacteriological (125 ml)

VOA (40 ml)

Organics: Res/PCB/Hex/SV (1 or 2 1/2 L)

Radiochemical (1000 ml)

VOA Septa Jar, Soil (125 ml)

Wide-mouth Jar, Soil (250 ml, 500 ml, 1000 ml)

VOA Sampling Device 2g

VOA Methanol Vial (5ml / 25 ml)

PCB Wipe Can (Release)

Sneak

No. of Containers

For Lab Use Only Laboratory ID

00-021-77

7-28-00

SWIPE

✓

00-021-78

7-28-00

SWIPE

✓

00-022-95

7-31-00

SWIPE

✓

00-022-97

7-31-00

SWIPE

✓

00-023-103

7-31-00

SWIPE

✓

00-023-108

7-31-00

SWIPE

✓

00-023-111

7-31-00

SWIPE

✓

00-025-132

8-2-00

SWIPE

✓

00-025-158

8-2-00

SWIPE

✓

00-026-169

8-2-00

SWIPE

✓

Special Instructions/Comments:

glass alpha not beta

Sample Return/Disposal:

☒ Return to Client

☐ Disposal by Antech

Results To:

Client Name:

Company:

Address:

Small Downmont
Earth Sciences Laboratory
One Triangle Lane
Export, PA 15632

Invoice To:

Client Name:

Company:

Address:

SAMB AS ABOVE

For Laboratory Use Only:

Sample Condition Upon Receipt/Comments:

Was Temperature Vial Sent With Cooler? YES NO

Cooler Temperature

WHITE - Original COC File

YELLOW - Return with Report

PINK - Project File

GOLD - Client Receipt



Antech Ltd. Chain of Custody Record

One Triangle Drive
Export, PA 15632
(724) 733-1161
FAX (724) 327-7793

Page 1 of 1

For Laboratory Use Only

Laboratory Project No.

00-0616w

Project Name: Edgewood Facility Project No.: 5518A Sampler: ERIC FRANITTI Eric D. Frantti
(Printed Name) (Signature)

Relinquished By: (Signature and Printed Name) Eric D. Frantti / ERIC D. FRANTTI Date 8/9/00 Time 3:43 PM
Received By: (Signature and Printed Name) R.K. Scott / R.K. Scott Date 8-10-00 Time 1:50
Relinquished By: (Signature and Printed Name) Date Date Time
Received at Lab By: (Signature and Printed Name) Date Time

Antech Quote ID No.: _____				Grab	Composite	Circle Bottle Size																	Other (Please Specify)	Please Check when Monitoring Samples are Collected:	
Antech Contact Name: _____						<div>Chemistry (500 ml, 1000 ml)</div> <div>Nutrient (250 ml, 500 ml)</div> <div>Total Metals (250 ml, 500 ml)</div> <div>Dissolved Metals (250 ml, 500 ml)</div> <div>Cyanide (1000 ml)</div> <div>Phenolics (1000 ml)</div> <div>TOC (125 ml)</div> <div>TOX (250 ml)</div> <div>Sulfide (500 ml)</div> <div>Oil & Grease (1000 ml)</div> <div>TPHC (1000 ml)</div> <div>Bacteriological (125 ml)</div> <div>VOA (40 ml)</div> <div>Organics: PetriPCB/HerbSV (1 or 2 1/2 L)</div> <div>Radiological (1000 ml)</div> <div>VOA Septa Jar, Soil (125 ml)</div> <div>Widesmouth Jar, Soil (250 ml, 500 ml, 1000 ml)</div> <div>VOA Sampling Devices: Sg</div> <div>VOA Methanol Vial (5ml / 25 ml)</div> <div>PCB Wipe Can (Hexane)</div> <div>Smear</div>																		<input type="checkbox"/> Residual Chlorine Present	<input type="checkbox"/> Residual Chlorine Not Present
Client Purchase Order No.: _____																								Please Check when VOA Vials are Collected:	
Method of Shipment: _____						<input type="checkbox"/> Free of Bubbles		<input type="checkbox"/> Bubbles Present		0008															
Shipment ID: _____																		(Specify in Special Instructions/Comments)							
Sample ID Number	Date	Time	Sample Description															No. of Containers	For Lab Use Only Laboratory ID						
0-029-215	8-3-00		Swirl	✓														1	0174w						
0-029-216	8-3-00		Swirl	✓														1	0175w						
0-029-218	8-3-00		Swirl	✓														1	0176w						
0-029-219	8-3-00		Swirl	✓														1	0177w						
0-029-220	8-3-00		Swirl	✓														1	0178w						
0-029-222	8-3-00		Swirl	✓														1	0179w						
0-029-223	8-3-00		Swirl	✓														1	0180w						
0-029-225	8-3-00		Swirl	✓														1	0181w						
0-029-226	8-3-00		Swirl	✓														1	0182						
0-030-233	8-3-00		Swirl	✓														1	0183						



For Laboratory Use Only
Laboratory Project No. _____

Project No.: 5518A
CBS Equus Facility

Sampler: Eric Franti
(Printed Name)

Date 8/9/00 Time 3:44 PM

Received By: (Signature and Printed Name)
R.K. Scott / R.K. Scott

Received at Lab By: (Signature and Printed Name)

Shipment ID: _____

Sample ID Number	Sample Description	
	Date	Time
00-030-234	8-3-00	Swipe Sample
00-030-235	8-3-00	Swipe Sample
00-030-236	8-3-00	Swipe Sample
00-030-237	8-3-00	Swipe Sample
		Swipe Sample

[illegible]

Special instructions/Comments: add alpha and beta

☒ Return to Client

Disposal by Antech

Client Name:

Company: ~~_____~~

Address:

Sample Condition Upon Receipt/Comments:

Was Temperature Vial Sent With Cooler?

YES _____ NO _____

Cooler Temperature: _____

WHITE - Original COC File

YELLOW - Return with Report

PINK - Project File

GOLD - Client Receipt

Invoice To:

Client Name:

Company:

Address:

MAC.Antech-Admin.Antech-Chain of Custody
Rev: 02/16/98

Sample ID : 0008-0204W

Page : 1
Acquisition date : 14-AUG-2000 15:11:05

Antech Ltd. Waltz Mill Lab

14-AUG-2000 16:11:24.79

GAMMA Spectrometry Report

Client ID: EDG - 02 00-0622W

✓ Antech ID: 0008-0204W ✓

Archive: DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_00080204W_D_0500SSJSOIL_3159.CNF;1

Sample Quantity : 5.38060E+02 G
Sample Matrix : CONCRETE
Detector-Geometry: D-0500SSJ-SOIL
Data Entry : WTF

Sample Time : 10-AUG-2000 00:00
Decay Time : 4 15:11:05.67
Count Time : 0 01:00:00.00
% Dead Time : 0.0% Review: er

Library File : DKA100:[GAMMA.SCUSR.LIB]FHS.NLB;
Background File : DKA100:[GAMMA.SCUSR.ARCHIVE]BKG_LONGBKG_D_3150.CNF;1
Analysis File : DKA100:[GAMMA.SCUSR.ASF]Forest_Hills.asf

Tolerance *(FWHM): 0.60
Abundance limit : 60.0
Half life ratio : 12.0

Propagate errors? : Yes
Systematic Error : 1.00
Peak Sensitivity : 2.80

Brief Report

Nuclide	Activity pCi/G	2-Sigma Error
K-40	7.23	1.32
TL-208	0.148	6.330E-02
RA-226	0.322	8.313E-02
RA-228	0.639	0.209
TH-228	0.466	0.146

Total Activity : 8.81

Minimum Detectable Activity Report

Nuclide	Bckgnd Sum	Energy (keV)	MDA (pCi/G)
CO-60	5.	1332.50	6.6692E-02
CS-137	19.	661.66	7.7772E-02
EU-152	8.	1408.01	4.0431E-01
EU-154	3.	1274.44	1.5073E-01
TH-234	174.	63.20	1.7032E+00
U-235	70.	143.79	3.4833E-01
U-238C	10.	1001.00	1.0787E+01
AM-241	94.	59.54	1.4403E-01

Approved by: H. I. Lencich

Approval Date: 8 / 14 / 00

Reviewed by: [Signature]

Approval Date: 8 / 14 / 00

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/G
4	74.74*	90	0.78	298.88	295	20	28.9	5.25E-01		
4	77.13*	141	0.79	308.43	295	20	21.3			
0	92.60*	53	0.96	370.27	363	14	92.0			
0	238.63*	167	0.97	954.01	949	11	21.9		TH-228	0.466
0	295.26*	34	0.53	1180.36	1171	17	85.3		RA-226	0.255
0	352.00*	78	0.85	1407.19	1400	17	36.0		RA-226	0.350
0	583.28*	49	1.00	2331.81	2323	16	42.0		TL-208	0.148
0	609.40	55	0.43	2436.25	2425	18	38.2		RA-226	0.320
0	911.33*	50	1.17	3643.43	3634	20	31.6		RA-228	0.639
0	1461.17*	141	0.95	5842.18	5831	24	17.9		K-40	7.23

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
K-40	1460.83	10.67*	2.544E-01	7.233E+00	7.233E+00	18.27	OK

Final Mean for 1 Valid Peaks = 7.233E+00 +/- 1.322E+00 (18.27%)

Nuclide Type: desc Th-228

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
TL-208	277.28	6.80	1.025E+00	-----	Line Not Found	-----	Absent
	510.61	21.60	6.068E-01	-----	Line Not Found	-----	Absent
	583.02	86.00*	5.414E-01	1.470E-01	1.477E-01	42.85	OK
	763.06	1.64	4.322E-01	-----	Line Not Found	-----	Absent
	860.30	12.00	3.917E-01	-----	Line Not Found	-----	Absent
	1592.60	-- Double Escape--	-----	-----	Line Not Found	-----	Absent
	2614.35	99.79	1.468E-01	-----	Line Out Of Range	-----	Absent

Final Mean for 1 Valid Peaks = 1.477E-01 +/- 6.330E-02 (42.85%)

Nuclide Type: Ra-226 plus dtrs

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
RA-226	186.11	3.28	1.379E+00	-----	Line Not Found	-----	Absent
	241.92	7.46	1.143E+00	-----	Line Not Found	-----	Absent
	295.09	19.20	9.728E-01	2.546E-01	2.546E-01	85.91	OK
	351.87	37.10	8.377E-01	3.496E-01	3.496E-01	37.49	OK
	609.31	46.31*	5.216E-01	3.196E-01	3.196E-01	38.63	OK
	665.44	1.56	4.843E-01	-----	Line Not Found	-----	Absent
	768.35	4.88	4.297E-01	-----	Line Not Found	-----	Absent
	1120.27	15.00	3.163E-01	-----	Line Not Found	-----	Absent
	1238.11	5.92	2.916E-01	-----	Line Not Found	-----	Absent

Nuclide Type: Ra-226 plus dtrs

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
	1377.66	4.02	2.671E-01	-----	Line Not Found	-----	Absent
	1764.49	15.90	2.162E-01	-----	Line Not Found	-----	Absent
	2204.09	4.99	1.756E-01	-----	Line Out Of Range	-----	Absent

Final Mean for 3 Valid Peaks = 3.223E-01+/- 8.313E-02 (25.79%)

Nuclide Type: Ac-228

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
RA-228	89.96	3.40	1.687E+00	-----	Line Not Found	-----	Absent
	105.36	2.00	1.711E+00	-----	Line Not Found	-----	Absent
	129.03	2.90	1.650E+00	-----	Line Not Found	-----	Absent
	209.39	4.10	1.273E+00	-----	Line Not Found	-----	Absent
	270.26	3.80	1.046E+00	-----	Line Not Found	-----	Absent
	328.07	3.50	8.899E-01	-----	Line Not Found	-----	Absent
	338.42	12.40	8.665E-01	-----	Line Not Found	-----	Absent
	409.62	2.20	7.345E-01	-----	Line Not Found	-----	Absent
	463.10	4.60	6.602E-01	-----	Line Not Found	-----	Absent
	794.79	4.60	4.179E-01	-----	Line Not Found	-----	Absent
	835.60	1.71	4.011E-01	-----	Line Not Found	-----	Absent
	911.16	29.00*	3.738E-01	6.376E-01	6.386E-01	32.80	OK
	964.64	5.80	3.569E-01	-----	Line Not Found	-----	Absent
	968.97	17.40	3.556E-01	-----	Line Not Found	-----	Absent
	1588.23	3.60	2.370E-01	-----	Line Not Found	-----	Absent

Final Mean for 1 Valid Peaks = 6.386E-01+/- 2.095E-01 (32.80%)

Nuclide Type: th-228 plus dtrs

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
TH-228	131.50	0.13	1.640E+00	-----	Line Not Found	-----	Absent
	166.43	0.08	1.475E+00	-----	Line Not Found	-----	Absent
	215.75	0.28	1.246E+00	-----	Line Not Found	-----	Absent
	238.58	43.60*	1.155E+00	4.636E-01	4.657E-01	31.25	OK
	240.76	3.90	1.147E+00	-----	Line Not Found	-----	Absent
	300.03	3.34	9.598E-01	-----	Line Not Found	-----	Absent
	727.25	6.65	4.497E-01	-----	Line Not Found	-----	Absent
	785.51	1.11	4.220E-01	-----	Line Not Found	-----	Absent
	1620.66	1.51	2.329E-01	-----	Line Not Found	-----	Absent

Final Mean for 1 Valid Peaks = 4.657E-01+/- 1.455E-01 (31.25%)

Flag: "*" = Keyline

Sample ID : 0008-0205W

Acquisition date : 14-AUG-2000 15:15:28

Antech Ltd. Waltz Mill Lab

14-AUG-2000 15:45:46.41

GAMMA Spectrometry Report

Client ID: EDG - 03 00-0622W ✓ Antech ID: 0008-0205W ✓

Archive: DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_00080205W_C_0500SSJSOIL_3160.CNF;1

Sample Quantity : 5.62580E+02 G Sample Time : 10-AUG-2000 00:00
Sample Matrix : CONCRETE Decay Time : 4 15:15:28.81
Detector-Geometry: C-0500SSJ-SOIL Count Time : 0 00:30:00.00
Data Entry : WTF % Dead Time : 0.0% Review: in

Library File : DKA100:[GAMMA.SCUSR.LIB]FHS.NLB;
Background File : DKA100:[GAMMA.SCUSR.ARCHIVE]BKG_LONGBKG_C_3151.CNF;1
Analysis File : DKA100:[GAMMA.SCUSR.ASF]Forest_Hills.asf

Tolerance *(FWHM): 0.60

Propagate errors? : Yes

Abundance limit : 60.0

Systematic Error : 1.00

Half life ratio : 12.0

Peak Sensitivity : 2.80

Brief Report

Nuclide	Activity pCi/G	2-Sigma Error
BE-7	0.861	0.504
K-40	6.81	1.21
TL-208	0.197	6.028E-02
RA-226	0.575	0.108
TH-228	0.277	0.146

Total Activity : 8.72

Minimum Detectable Activity Report

Nuclide	Bckgnd Sum	Energy (keV)	MDA (pCi/G)
CO-60	11.	1332.50	7.3510E-02
CS-137	28.	661.66	8.6475E-02
EU-152	6.	1408.01	2.9120E-01
EU-154	11.	1274.44	2.0400E-01
RA-228	71.	911.16	4.7012E-01
TH-234	129.	63.20	5.1525E+00
U-235	106.	143.79	6.0914E-01
U-238C	28.	1001.00	1.4289E+01
AM-241	94.	59.54	5.6323E-01

Approved by: M. Y. French

Approval Date: 8 / 14 / 00

Reviewed by: WTF

Approval Date: 8 / 14 / 00

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/G
9	74.86	71	1.56	225.04	218	23	36.5	9.95E-01		
9	77.38	91	1.57	232.58	218	23	31.0			
0	238.63*	84	1.18	714.63	709	13	47.9		TH-228	0.277
0	295.21*	61	1.65	883.81	878	16	51.2		RA-226	0.512
0	351.72*	117	1.40	1052.80	1043	20	31.1		RA-226	0.570
0	477.71	38	1.67	1429.57	1423	17	58.0		BE-7	0.861
0	582.97*	87	0.69	1744.44	1733	23	28.4		TL-208	0.256
0	609.12*	108	1.85	1822.65	1814	20	24.8		RA-226	0.600
0	1460.78*	169	2.21	4371.92	4360	25	17.4		K-40	6.81
0	2613.86*	12	0.74	7828.47	7816	22	103.2		TL-208	9.643E-02

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
BE-7	477.61	10.39*	1.210E+00	8.100E-01	8.605E-01	58.52	OK

Final Mean for 1 Valid Peaks = 8.605E-01 +/- 5.036E-01 (58.52%)

Nuclide Type: natural

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
K-40	1460.83	10.67*	6.197E-01	6.811E+00	6.811E+00	17.79	OK

Final Mean for 1 Valid Peaks = 6.811E+00 +/- 1.212E+00 (17.79%)

Nuclide Type: desc Th-228

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
TL-208	277.28	6.80	1.716E+00	-----	Line Not Found	-----	Absent
	510.61	21.60	1.159E+00	-----	Line Not Found	-----	Absent
	583.02	86.00*	1.067E+00	2.544E-01	2.556E-01	29.61	OK
	763.06	1.64	9.101E-01	-----	Line Not Found	-----	Absent
	860.30	12.00	8.507E-01	-----	Line Not Found	-----	Absent
	1592.60	-- Double Escape--	-----	-----	Line Not Found	-----	Absent
	2614.35	99.79	3.390E-01	9.598E-02	9.643E-02	103.39	OK

Final Mean for 2 Valid Peaks = 1.974E-01 +/- 6.028E-02 (30.53%)

Nuclide Type: Ra-226 plus dtrs

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
RA-226	186.11	3.28	2.059E+00	-----	Line Not Found	-----	Absent
	241.92	7.46	1.851E+00	-----	Line Not Found	-----	Absent
	295.09	19.20	1.653E+00	5.120E-01	5.120E-01	52.03	OK
	351.87	37.10	1.478E+00	5.699E-01	5.699E-01	32.65	OK
	609.31	46.31*	1.039E+00	5.996E-01	5.996E-01	25.46	OK
	665.44	1.56	9.852E-01	-----	Line Not Found	-----	Absent
	768.35	4.88	9.066E-01	-----	Line Not Found	-----	Absent
	1120.27	15.00	7.329E-01	-----	Line Not Found	-----	Absent
	1238.11	5.92	6.905E-01	-----	Line Not Found	-----	Absent
	1377.66	4.02	6.450E-01	-----	Line Not Found	-----	Absent
	1764.49	15.90	5.347E-01	-----	Line Not Found	-----	Absent
	2204.09	4.99	4.265E-01	-----	Line Not Found	-----	Absent

Final Mean for 3 Valid Peaks = 5.752E-01 +/- 1.079E-01 (18.76%)

Nuclide Type: th-228 plus dtrs

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
TH-228	131.50	0.13	2.066E+00	-----	Line Not Found	-----	Absent
	166.43	0.08	2.105E+00	-----	Line Not Found	-----	Absent
	215.75	0.28	1.954E+00	-----	Line Not Found	-----	Absent
	238.58	43.60*	1.864E+00	2.757E-01	2.770E-01	52.68	OK
	240.76	3.90	1.856E+00	-----	Line Not Found	-----	Absent
	300.03	3.34	1.636E+00	-----	Line Not Found	-----	Absent
	727.25	6.65	9.355E-01	-----	Line Not Found	-----	Absent
	785.51	1.11	8.953E-01	-----	Line Not Found	-----	Absent
	1620.66	1.51	5.737E-01	-----	Line Not Found	-----	Absent

Final Mean for 1 Valid Peaks = 2.770E-01 +/- 1.459E-01 (52.68%)

Flag: "*" = Keyline

Sample ID : 0008-0206W

Page : 1
Acquisition date : 14-AUG-2000 15:31:49

Antech Ltd. Waltz Mill Lab

14-AUG-2000 16:17:10.33

GAMMA Spectrometry Report

Client ID: EDG - 04 00-0622W Antech ID: 0008-0206W

Archive: DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_00080206W_A_0500SSJSOIL_3161.CNF;1

Sample Quantity : 5.50190E+02 G Sample Time : 10-AUG-2000 00:00
Sample Matrix : CONCRETE Decay Time : 4 15:31:49.44
Detector-Geometry: A-0500SSJ-SOIL Count Time : 0 00:45:00.00
Data Entry : WTF % Dead Time : 0.1% Review: _____

Library File : DKA100:[GAMMA.SCUSR.LIB]FHS.NLB;
Background File : DKA100:[GAMMA.SCUSR.ARCHIVE]BKG_LONGBKG_A_3152.CNF;1
Analysis File : DKA100:[GAMMA.SCUSR.ASF]Forest_Hills.asf

Tolerance *(FWHM): 0.60 Propagate errors? : Yes
Abundance limit : 60.0 Systematic Error : 1.00
Half life ratio : 12.0 Peak Sensitivity : 2.80

Brief Report

Nuclide	Activity pCi/G	2-Sigma Error
K-40	7.49	1.15
TL-208	0.162	5.837E-02
RA-226	0.400	9.720E-02
RA-228	0.400	0.190
TH-228	0.492	0.167

Total Activity : 8.94

Minimum Detectable Activity Report

Nuclide	Bckgnd Sum	Energy (keV)	MDA (pCi/G)
CO-60	14.	1332.50	8.2406E-02
CS-137	24.	661.66	7.6890E-02
EU-152	8.	1408.01	3.1827E-01
EU-154	11.	1274.44	2.0317E-01
TH-234	134.	63.20	4.3716E+00
U-235	88.	143.79	4.6440E-01
U-238C	13.	1001.00	9.9315E+00
AM-241	132.	59.54	5.5386E-01

Approved by: M. J. Lencik

Approval Date: 8/14/00

Reviewed by: W. C.

Approval Date: 8/14/00

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/G
0	238.56*	173	0.93	476.70	473	10	26.1		TH-228	0.492
0	338.33	32	1.58	676.07	669	12100.7			RA-228	0.401
0	351.84*	97	1.56	703.07	696	14	33.6		RA-226	0.421
0	583.02*	59	1.96	1165.16	1161	9	34.9		TL-208	0.162
0	609.40*	71	1.38	1217.89	1210	16	37.7		RA-226	0.372
0	911.20*	36	1.41	1821.38	1813	17	53.1		RA-228	0.399
0	1460.82*	186	2.32	2921.05	2912	18	15.0		K-40	7.49
0	1764.33*	14	0.75	3528.65	3524	11	71.0		RA-226	0.437

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
K-40	1460.83	10.67*	4.237E-01	7.490E+00	7.490E+00	15.38	OK

Final Mean for 1 Valid Peaks = 7.490E+00 +/- 1.152E+00 (15.38%)

Nuclide Type: desc Th-228

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
TL-208	277.28	6.80	1.340E+00	-----	Line Not Found	-----	Absent
	510.61	21.60	8.517E-01	-----	Line Not Found	-----	Absent
	583.02	86.00*	7.734E-01	1.617E-01	1.624E-01	35.93	OK
	763.06	1.64	6.430E-01	-----	Line Not Found	-----	Absent
	860.30	12.00	5.949E-01	-----	Line Not Found	-----	Absent
	1592.60	-- Double Escape--	-----	-----	Line Not Found	-----	Absent
	2614.35	99.79	2.473E-01	-----	Line Out Of Range	-----	Absent

Final Mean for 1 Valid Peaks = 1.624E-01 +/- 5.837E-02 (35.93%)

Nuclide Type: Ra-226 plus dtrs

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
RA-226	186.11	3.28	1.661E+00	-----	Line Not Found	-----	Absent
	241.92	7.46	1.463E+00	-----	Line Not Found	-----	Absent
	295.09	19.20	1.284E+00	-----	Line Not Found	-----	Absent
	351.87	37.10	1.128E+00	4.211E-01	4.211E-01	35.02	OK
	609.31	46.31*	7.495E-01	3.719E-01	3.719E-01	38.21	OK
	665.44	1.56	7.050E-01	-----	Line Not Found	-----	Absent
	768.35	4.88	6.401E-01	-----	Line Not Found	-----	Absent
	1120.27	15.00	5.039E-01	-----	Line Not Found	-----	Absent
	1238.11	5.92	4.730E-01	-----	Line Not Found	-----	Absent
	1377.66	4.02	4.410E-01	-----	Line Not Found	-----	Absent
	1764.49	15.90	3.682E-01	4.372E-01	4.372E-01	71.15	OK

Nuclide Type: Ra-226 plus dtrs

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
	2204.09	4.99	3.008E-01	-----	Line Out Of Range	----	Absent

Final Mean for 3 Valid Peaks = 3.996E-01+/- 9.720E-02 (24.32%)

Nuclide Type: Ac-228

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
RA-228	89.96	3.40	1.272E+00	-----	Line Not Found	-----	Absent
	105.36	2.00	1.510E+00	-----	Line Not Found	-----	Absent
	129.03	2.90	1.691E+00	-----	Line Not Found	-----	Absent
	209.39	4.10	1.582E+00	-----	Line Not Found	-----	Absent
	270.26	3.80	1.364E+00	-----	Line Not Found	-----	Absent
	328.07	3.50	1.189E+00	-----	Line Not Found	-----	Absent
	338.42	12.40	1.162E+00	4.008E-01	4.014E-01	101.15	OK
	409.62	2.20	1.005E+00	-----	Line Not Found	-----	Absent
	463.10	4.60	9.161E-01	-----	Line Not Found	-----	Absent
	794.79	4.60	6.261E-01	-----	Line Not Found	-----	Absent
	835.60	1.71	6.061E-01	-----	Line Not Found	-----	Absent
	911.16	29.00*	5.736E-01	3.984E-01	3.990E-01	53.79	OK
	964.64	5.80	5.534E-01	-----	Line Not Found	-----	Absent
	968.97	17.40	5.519E-01	-----	Line Not Found	-----	Absent
	1588.23	3.60	3.992E-01	-----	Line Not Found	-----	Absent

Final Mean for 2 Valid Peaks = 3.996E-01+/- 1.898E-01 (47.49%)

Nuclide Type: th-228 plus dtrs

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/G	Decay Corr pCi/G	2-Sigma %Error	Status
TH-228	131.50	0.13	1.701E+00	-----	Line Not Found	-----	Absent
	166.43	0.08	1.711E+00	-----	Line Not Found	-----	Absent
	215.75	0.28	1.559E+00	-----	Line Not Found	-----	Absent
	238.58	43.60*	1.476E+00	4.895E-01	4.917E-01	34.06	OK
	240.76	3.90	1.468E+00	-----	Line Not Found	-----	Absent
	300.03	3.34	1.269E+00	-----	Line Not Found	-----	Absent
	727.25	6.65	6.638E-01	-----	Line Not Found	-----	Absent
	785.51	1.11	6.309E-01	-----	Line Not Found	-----	Absent
	1620.66	1.51	3.933E-01	-----	Line Not Found	-----	Absent

Final Mean for 1 Valid Peaks = 4.917E-01+/- 1.675E-01 (34.06%)

Flag: "*" = Keyline



Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

September 12, 2000

Mr. Ronald Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Soil Characterization; Purchase Order No. Commercial
CBS-Edgewood 5518A; Edgewood
Antech Ltd. Project No. 00-0622W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on August 14, 2000.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

A handwritten signature in cursive script, appearing to read "Emery J. Grohregin".

Emery J. Grohregin
Supervisor

EJG:rks

Enclosures

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 00-0622W

CLIENT: Purchase Order Number: Commercial

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0008-0204W	EDG-02	0008-0205W	EDG-03
0008-0206W	EDG-04		

C: SHIPPING/RECEIVING COMMENTS:

Final report: 09/12/00

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:

NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 00-0622W
Soil Characterization; CBS-Edgewood 5518A
Charge Order No. Commercial; Edgewood

Parameter	Analytical Method	Units	Sample Identification		
			0008-0204W	0008-0205W	0008-0206W
			EDG-02 (8/10/00)	EDG-03 (8/10/00)	EDG-04 (8/10/00)
Co-60	A-524	pCi/g	<6.7E-2	<7.4E-2	<8.2E-2
Cs-137	A-524	pCi/g	<7.8E-2	<8.6E-2	<7.7E-2
Ra-228 (Ac-228)	A-524	pCi/g	6.39E-1 ± 2.1E-1	5.75E-1 ± 1.1E-1	4.00E-1 ± 1.9E-1
Th-228 (GS)	A-524	pCi/g	4.66E-1 ± 1.5E-1	2.77E-1 ± 1.5E-1	4.92E-1 ± 1.7E-1
Th-230	A-544	pCi/g	4.60E-1 ± 1.6E-1	-(1)	-
Th-232 (AS)	A-544	pCi/g	3.31E-1 ± 1.3E-1	-	-
U-234	A-545	pCi/g	2.88E-1 ± 9.3E-2	-	-
U-235 (AS)	A-545	pCi/g	<2.6E-2	-	-
U-238 (AS)	A-545	pCi/g	3.14E-1 ± 9.7E-2	-	-

(1) Dash denotes not detected, not observed, or not analyzed, as applicable.

APPENDIX B

APPENDIX B

RADIOLOGICAL LICENSING DOCUMENTS

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE THIS COPY IS FOR YOUR FILES

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 30, Licensing of Byproduct Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee <i>Westinghouse Eng. Corp.</i>		3. License number 37-497-2
1. Name Westinghouse Engineering Center <i>Radiation & Nucleonics Lab.</i>	2. Address Ardmore Boulevard East Pittsburgh, Pennsylvania	4. Expiration date August 31, 1958
Attn: Dr. K. H. Sun Chairman, Isotopes Committee		5. Reference No. 37-497-1
6. Byproduct material (element and mass number) Any byproduct material from Atomic No. 3 to 83 inclusive (See Page 2)	7. Chemical and/or physical form Any (See Page 2)	8. Maximum amount of radioactivity which licensee may possess at any one time 500 millicuries of each byproduct material from Atomic No. 3 to 83 inclusive
9. Authorized use		

Research and Development as defined in Section 11 (q) of the Atomic Energy Act of 1954 and applications dated May 29, 1956, August 1, 1956, and related correspondence.

CONDITIONS

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above. Byproduct material may be used at Westinghouse Engineering Center, Radiation and Nucleonics Laboratory, Ardmore Blvd., East Pittsburgh, Pennsylvania, and Westinghouse Engineering Center, Radiation and Nucleonics Laboratory, Edgewood Facility, Edgewood, Pennsylvania.
11. Byproduct materials are to be used by, or under the supervision of, individuals designated by the radioisotopes committee.
12. THIS LICENSE SUPERSEDES LICENSE NUMBER 37-497-1 DATED MAY 23, 1956, and all previously issued authorizations.
13. Except as hereinafter provided the licensee shall comply with provisions of the Atomic Energy Commission's proposed standards for protection against radiation as published in the Federal Register, July 16, 1955 (10-CFR-20), until such time as said proposed regulations or revisions thereof become effective regulations of the Commission. Notwithstanding, Section 20.24(f) of said standards, labeling shall not be required for laboratory containers such as beakers, flasks and test tubes, used transiently in laboratory procedures during presence of the user.
(See Page 2)

For the U. S. Atomic Energy Commission

Date August 9, 1956

by Arthur R. Rogers
for: Director, Isotopes Extension
Division of Civilian Application
Oak Ridge, Tennessee

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSEPage 2 of 2 Pages

Supplementary Sheet

License Number 37-497-2

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
Strontium 90	Sealed Source equivalent to U.S. Radium Lab 353	1000 millicuries
Cobalt 60	Sealed Gamma Sources	1000 millicuries
Tritium	Any	17,000 millicuries

CONDITIONS

14. Total amount of Hydrogen 3 (Tritium) procured under this license is not to exceed 17 curies.
15. Licensee will report to the Commission within 48 hours any incident which has resulted or could result in an exposure to any individual in excess of a dose of 3 rem or any incident involving loss of the licensed material.
16. Byproduct material shall not be used in:
- (a) or on human beings.
 - (b) products distributed to the public.
 - (c) field or other uses where long term control of the radioactivity may be lost.
17. Byproduct material procured as sealed sources shall be used as such and these sources shall not be altered, opened, or combined.
18. Leak testing of sealed sources containing beta and/or gamma-emitting byproduct material except those containing Iridium 192, Tantalum 182, Gold 198, and plated Cobalt 60 in discrete metallic form shall be carried out at intervals of six months and records of the leak test results shall be furnished the Atomic Energy Commission upon request.

For the U. S. Atomic Energy Commission

Date August 9, 1956

by

for: Director, Isotopes Extension
Division of Civilian Application
Oak Ridge, Tennessee

UNITED STATES
ATOMIC ENERGY COMMISSION

IN REPLY REFER TO:

WASHINGTON 25, D. C.

CAL:JCD

SOURCE MATERIAL LICENSE

License No. C-3586

Dated: OCT 29 1956

Westinghouse Electric Corporation
Engineering Center, Ardmore Boulevard
East Pittsburgh, Pennsylvania

Attention: Dr. K. H. Sun, Advisory Engineer

Gentlemen:

Pursuant to the Atomic Energy Act of 1954 and Section 40.21 of the Code of Federal Regulations, Title 10 - Atomic Energy, Chapter 1, Part 40 - Control of Source Material, you are hereby licensed to receive possession of and title to the following refined source material during the term of this license for use in research and development:

- A. One hundred (100) pounds of thorium in the form of thorium metal and/or thorium compounds, and
- B. Fifty (50) pounds of uranium in the form of uranium metal and/or uranium compounds.

You are further licensed to transfer and deliver possession of and title to refined source material to any person licensed by the Atomic Energy Commission within the limits of his license.

As a condition of this license, you are required to maintain records of your inventories, receipts and transfers of refined source material.

This license is subject to all the provisions of the Atomic Energy Act of 1954 now or hereafter in effect and to all valid rules and regulations of the U. S. Atomic Energy Commission. Except as herein provided, it is subject also to the provisions of the Commission's proposed regulations, published in the Federal Register July 16, 1955, Title 10, Code of Federal Regulations, Part 20, entitled "Standards for Protection Against Radiation" until such time as said proposed regulations or revisions thereof shall become effective regulations of the Commission. Notwithstanding Section 20.24(f) of said standards, labeling shall not be required for laboratory containers such as beakers, flasks and test tubes, used transiently in laboratory procedures during presence of the user.

Neither this license nor any right under this license shall be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954.

This license shall expire October 1, 1958.

FOR THE ATOMIC ENERGY COMMISSION

*Letter to Johnson
10/27/58
for*

*revised
rec'd*

Lyall Johnson
Lyall Johnson
Chief, Licensing Branch
Division of Civilian Application

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

License No. SNM-47

L I C E N S E

Pursuant to the Atomic Energy Act of 1954 and Parts 30 and 70, Title 10, Chapter 1, Code of Federal Regulations, entitled, "Licensing of Byproduct Material" and "Special Nuclear Material Regulations," respectively, the Westinghouse Electric Corporation, Forest Hills and Edgewood Facilities, East Pittsburgh, Pennsylvania (hereinafter referred to as the "licensee") is hereby licensed to receive and possess the special nuclear and by-product material produced during the in-pile irradiation to a total neutron dose of 10^{18} thermal neutrons/cm² of fifty pounds of normal uranium and one hundred pounds of thorium for use in research and development studies related to slurry reactors as described in the licensee's application of July 31, and August 27, 1956.

This license is subject to all applicable provisions of the Atomic Energy Act of 1954 and to all applicable provisions, regulations and orders of the Commission. It is also subject to the provisions of the Commission's proposed regulations published in the Federal Register July 16, 1955, as proposed Part 20, 10 CFR, "Standards for Protection Against Radiation" until such time as said proposed regulations or revisions thereof shall become effective regulations of the Commission. Notwithstanding Section 20.24(f) of said standards, labeling shall not be required for laboratory containers such as beakers, flasks and test tubes, used transiently in laboratory procedures during presence of the user.

The provisions of Section 70.32(a) of Part 70, Title 10, Code of Federal Regulations, are incorporated herein by reference with the same force and effect as if fully set forth herein.

This license shall expire October 1, 1959.

FOR THE ATOMIC ENERGY COMMISSION

*Extended July 1958 -
Same expiration date*


Lyndal Johnson
Chief, Licensing Branch
Division of Civilian Application

Date of Issuance: OCT 20 1956

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 30, Licensee is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee

1. Name Westinghouse Electric Corporation
Westinghouse Research Laboratories
2. Address Reulah Road, Churchill Borough
Pittsburgh 35, Pennsylvania

3. License number

37-497-6

4. Expiration date

February 28, 1959

5. Reference No.

37-497-1, 37-497-3, 37-497-4, 37-497-5

6. Byproduct material
(element and mass number)
Any byproduct material
from Atomic No. 3 to 83,
inclusive.

7. Chemical and/or physical form

Any

Any

8. Maximum amount of radioactivity
which licensee may possess at
any one time 500 millicuries
of each byproduct material from
Atomic No. 3 to 83, inclusive.

* 20 curies

* Hydrogen 3 (tritium)

9. Authorized use

RESEARCH AND DEVELOPMENT as defined in Section 11(q) of the Atomic Energy Act of 1954.

CONDITIONS

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.
11. Byproduct material may also be used at Edgewood Extension of Research Laboratories, Edgewood, Pennsylvania; Engineering Center Extension of the Research Laboratories, East Pittsburgh, Pennsylvania.
12. Byproduct materials to be used by, or under the supervision of, individuals designated by the radioisotope committee; Chairman, G. S. Handler, Ph.D.
13. THIS LICENSE SUPERSEDES LICENSE NO. 37-497-1 (May 23, 1956), 37-497-3 (August 29, 1956), 37-497-4 (December 26, 1956), 37-497-5 (January 7, 1957) AND ALL PREVIOUS AUTHORIZATIONS ISSUED TO WESTINGHOUSE RESEARCH LABORATORIES, WESTINGHOUSE ELECTRIC CORPORATION, PITTSBURGH 35, PENNSYLVANIA.
14. Except as hereinafter provided the licensee shall comply with provisions of the Atomic Energy Commission's Standards for Protection Against Radiation as published in the Federal Register, January 29, 1957 (10-CFR-20).
- *15. Total amount of Hydrogen 3 (tritium) procured under this license shall not exceed 20 curies.

(See page 2)

For the U. S. Atomic Energy Commission

by



Director, Isotopes Extension
Division of Civilian Application
Oak Ridge, Tennessee

Date February 14, 1957

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE

Page 2 of 2 Pages

Supplementary Sheet

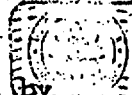
This copy is for your records.

License Number 37-197-6

continued

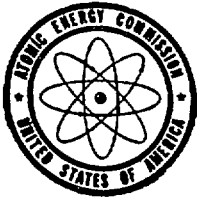
16. Byproduct material shall not be used in:
- (a) or on human beings
 - (b) products distributed to the public
 - (c) field applications.
17. Byproduct material procured as sealed sources shall be used as such and these sources shall not be altered, opened or combined.
18. Leak testing of sealed sources containing beta and/or gamma emitting byproduct material except those containing Iridium 192, Tantalum 182, Gold 198, and plated Cobalt 60 in discrete metallic form shall be carried out at intervals of six months and records of the leak test results shall be furnished the AEC upon request.
19. A curie of Iridium 192 is defined as that quantity of activity which presents a radiation intensity of 0.55 roentgens per hour at a distance of one meter.
20. Licensee shall report to the Commission immediately upon discovery thereof any incident which has resulted or could have resulted in an exposure to any individual in excess of a dose of 3 rem within a 24 hour period or any incident involving loss of the licensed material.

For the U. S. Atomic Energy Commission



Date February 14, 1957

Director, Isotopes Extension
Division of Civilian Application
Oak Ridge, Tennessee



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

IN REPLY REFER TO:
DLR:RGP

NOV 21 1958

Westinghouse Electric Corporation
Westinghouse Engineering Center
Radiation and Nucleonics Laboratory
Ardmore Boulevard
East Pittsburgh, Pennsylvania

Attention: Mr. S. L. Ruby, Chairman
Radiation Safety Committee

Gentlemen:

This refers to the inspection conducted on August 11, 1958, of your activities licensed under AEC Byproduct Material License No. 37-497-2.

It appears that certain of your activities were not conducted in full compliance with a condition of your license and the requirements of the AEC's "Standards for Protection Against Radiation," Part 20, Title 10, Code of Federal Regulations, in that:

1. The three Strontium 90 sources stored at the Ardmore Boulevard facility were not leak tested as required by License Condition No. 18, Leak testing of sealed sources.
2. The hot cell of the Ardmore Boulevard facility as well as the isotope laboratory and the isotope storage room of the Edgewood facility were not posted as required by Section 20.203(e)(1), Caution signs, labels and signals. Although these rooms were posted, the signs did not include the precautionary wording specified in this section of the regulation.
3. Numerous storage containers holding byproduct material located in the isotope laboratory and isotope storage room of the Edgewood facility as well as in the hot cell of the Ardmore

NOV 21 1958

Boulevard facility were not labeled as required by Section 20.203(f)(1) and (f)(4), Caution signs, labels and signals.

4. Byproduct material wastes were disposed at the Edgewood facility by dumping over an embankment. This constituted noncompliance with Section 20.301, General requirement for waste disposal.

Pursuant to the provisions of Section 2.201(a), Notice of violation, of the AEC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, you are requested to notify this office, within thirty days of your receipt of this notice, of the corrective steps taken or to be instituted to achieve correction of the above-described violations and the date when such correction has been or will be achieved.

With regard to the deficiency described in Item 4, your attention is directed to Section 20.302 which provides for Commission approval of disposal methods not authorized in Section 20.301. We will be pleased to consider an application from you proposing a disposal procedure not specified in Section 20.301. Such an application should contain a description of the wastes involved, including the quantities, kinds and levels of radioactivity. In addition, the application should present an analysis and evaluation of the topographical, geological and hydrological characteristics of the environment, including (1) the usage of ground and surface waters in the general disposal area; (2) the nature and location of other potentially affected facilities, and (3) procedures to be observed to minimize the risk of unexpected or hazardous exposures.

We have enclosed a sample sign containing the coloring, wording and symbol which meets the requirements of Section 20.203(e)(1) and (f)(1).

Very truly yours,



James R. Mason, Chief
Isotopes Branch
Division of Licensing & Regulation

Enclosures:

1. 10 CFR Part 20
2. 10 CFR Part 2
3. Sign "Caution - Radioactive Materials"

December 15, 1958

James R. Mason, Chief
Isotopes Branch
Division of Licensing & Regulation
United States Atomic Energy Commission
Washington 25, D.C.

Ref: DLR:RGP

Dear Mr. Mason:

This is in reply to your notice of November 21, 1958 addressed to Mr. Ruby regarding the results of the August 11, 1958 inspection pertaining to our By-Product Material License No. 37-497-2.

We have or will comply with the deficiencies cited as follows:

Deficiency #1

The three strontium 90 sources were leak tested on December 10 and found to be satisfactory. The method of test was as follows: a piece of filter paper, cut to fit a thin end window geiger counter, was used to wipe the source, and then counted.

This test will be repeated at six-month intervals as required.

Deficiency #2

An order has been placed for new signs bearing the precautionary wording specified. These will be posted as soon as received.

Deficiency #3

An order has been placed for labels bearing the precautionary wording specified. These will be affixed to all containers of by-product materials as soon as received.

Deficiency #4

The waste water from the Edgewood facility has always been monitored for gamma activity before disposal. Means for pumping this water through

December 15, 1958

a demineralizer are included in the installation, in order to bring the activity of the effluent down to an acceptable level. To the best of my knowledge, this demineralizer has never been used because the activity has never exceeded that specified in Para. 20.303, "Disposal by release into sanitary sewerage systems." This level of acceptance appears to have been set because of the mistaken idea that the Edgewood effluents went into a sanitary sewer. There has been only one such dumping since the August 11 inspection.

In order to comply with the requirements of Para. 20.301, I propose that we routinely circulate this effluent through the demineralizer until the activity is below that specified in Para. 20.103 (Concentrations in Effluents to Unrestricted Areas), namely less than 1×10^{-7} microcuries/ml. I hereby apply for permission to pump over the embankment at the Edgewood facility such decontaminated effluents. The spent demineralizer resin will be disposed of as solid waste which we presently transfer to Nuclear Engineering Company for burial at sea.

I hope we have remedied the deficiencies cited to your complete satisfaction. I presume we need written permission to proceed with the decontamination and dumping of our effluent as requested, and we shall not proceed with any such operation until we hear from you further.

Very truly yours,

L. M. Epstein
Radiation & Nucleonics Laboratory

Jb

December 5, 1961

Mr. James R. Mason
Chief, Isotopes Branch
Division of Licensing and Regulation
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Mason:

Our present by-product license 37-497-2 (H62) authorizes us to use by-product material at our Ardmore Blvd. facility and at our Edgewood facility. This is to advise you that we recently moved our warm laboratory facilities to our Ardmore Blvd. site, which was extended for this purpose, and no longer intend to use unsealed sources of by-product material at the Edgewood site.

Our group will soon occupy additional laboratory space at the new Westinghouse Central Laboratories buildings located at Churchill Boro., Beulah Road, Pittsburgh 35, Pa. We should like an amendment to extend our license to allow the use of by-product material in our new laboratory. We do not intend to use unsealed sources of by-product material at the new Central Laboratories, since we will not have a radiochemical laboratory there. Also, we now store all our radioactive materials at Ardmore Blvd. and will continue to do so.

Please let me know if there is any other information you require, or any special requirements we must meet to obtain this extension of our license. We expect to occupy the Central Laboratories space sometime this spring.

Very truly yours,

Lawrence M. Epstein

Lawrence M. Epstein
Radiation and Nucleonics Laboratory

/jb

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSEPage 1 of 2 Pages

Supplementary Sheet

License Number 37-497-2
(H62)

AMENDMENT NO. 6

This Copy is For Your Files

Westinghouse Electric Corporation
Radiation and Nucleonics Laboratory
Ardmore Boulevard
East Pittsburgh, Pennsylvania

Attention: K. H. Sun
S. L. Ruby

In accordance with letter from Lawrence M. Epstein dated December 5, 1961,
License No. 37-497-2 is amended as follows:

To revise Conditions No. 11 and 14 to read:

11. Byproduct material may also be used at the Radiation and Nucleonics Laboratory, Edgewood Facility, Edgewood, Pennsylvania. Byproduct material as sealed sources only may also be used at Westinghouse Central Laboratories, Churchill Boro., Beulah Road, Pittsburgh, Pennsylvania.
14. A. Each sealed source acquired from another person and containing byproduct material with a half-life greater than 30 days and in any form other than gas, shall be tested for contamination and/or leakage prior to use. In the absence of a certificate from a transferor indicating that a test has been made within 6 months prior to the transfer, the sealed source shall not be put into use until tested.
- B. Each sealed source fabricated by the licensee shall be tested for contamination and/or leakage immediately after fabrication. If the test reveals the presence of 0.005 microcuries or more of removable contamination, the licensee shall repair and/or decontaminate and retest the source. Sealed sources fabricated for distribution and containing byproduct material (with the exception of solid metallic Iridium 192, byproduct material with a half-life not exceeding thirty days, and byproduct material in the form of gas) shall, in addition to an initial test upon fabrication, be stored for a period of seven days and retested prior to being distributed.
- C. Each sealed source containing byproduct material with a half-life greater than 30 days and in any form other than gas, shall be tested for leakage and/or contamination at intervals not to exceed 6 months.
- D. The test shall be capable of detecting the presence of 0.005 microcuries of contamination on the test sample. The test sample shall be taken from the sealed source or from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently

(See page 2)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE

Page 2 of 2 Pages

Supplementary Sheet

License Number 37-497-2
(H62)

14. Continued:

AMENDMENT NO. 6

mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

- E. If the test required in A. or C. above reveals the presence of 0.005 microcuries or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five days of the test with the Director, Division of Licensing and Regulation, U. S. Atomic Energy Commission, Washington 25, D. C., describing the equipment involved, the test results, and the corrective action taken. A copy of such report shall be sent to the manager of the nearest AEC operations office listed in Appendix D of Title 10, Code of Federal Regulations, Part 20.

Date January 18, 1962

For the U. S. Atomic Energy Commission

by Chief, Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.



Westinghouse Electric Corporation

Research & Development Center

Pittsburgh 35, Pa.

Telephone: 242-1500

DIRECT DIAL CODE - 412

January 28, 1964

U. S. Atomic Energy Commission
* Division of Licensing and Regulation
Washington 25, D. C.

Attention: Mr. Robert W. Lowenstein, Director

Subject: Renewal of Byproduct License 37-497-6,
Amendment #5

Gentlemen:

Westinghouse Electric Corporation hereby applies for renewal of Byproduct License #37-497-6. It is requested that the provisions covering the Westinghouse Research Laboratory Extensions at the locations of Edgewood, Highland Avenue, and Cheswick, as designated in amendments 2 and 4, be deleted from the license as byproduct materials have been removed from these locations and they are no longer under the management of the Research Laboratory.

It is requested that the license include any byproduct material rather than isotope 3-83 as previously requested. This renewal application requests an upper limit of 10 curies total be established with a maximum of 500 mc per isotope.

The license and any associated correspondence are to be sent to Mr. E. J. Fregin, Research and Development Center, 1310 Beulah Road, Pittsburgh, Pa. 15235. If you have any questions, please wire or phone collect 412-242-1500.

Very truly yours,


E. J. Fregin

Assistant to Vice President
and General Manager

Attachments



Westinghouse Electric Corporation

3 Gateway Center
Box 1278, Pittsburgh, Pa. 15230

July 30, 1964

* U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C., 20545

Attention: Mr. Lyall Johnson, Acting Director

Subject: Renewal of Byproduct License 37-497-2 (H64)
Amendment #9

Gentlemen:

Westinghouse Electric Corporation hereby applies for renewal of Byproduct License #37-497-2. Three copies of the license renewal form and attachments are transmitted herewith.

Byproduct materials as sealed sources will be used under license #37-497-6 at the Westinghouse Research Laboratories, Beulah Road, Churchill Borough, Pittsburgh, Pa., so the extension of license #37-497-2 to cover sealed sources at the Research Laboratories will no longer be necessary as stated in Amendment #6, Condition 11, dated January 18, 1962. It is also requested that the extension of the license given in Amendment #6 to cover the Edgewood Facility, Edgewood, Pa., be deleted.

It is requested that this license include any byproduct material rather than the isotopes 1-84 as previously requested. The possession limits will remain the same.

U. S. ATOMIC ENERGY COMMISSION

Page 1 of 3 Pages

THIS COPY IS FOR YOUR FILES

BYPRODUCT MATERIAL LICENSE No. 37-497-2 Amendment No. 9

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations (H66) Chapter 1, Part 30, concerning Byproduct Material, and in reliance on statements and representations previously made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 30.4(k) of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee		
1 Name	Westinghouse Electric Corporation Radiation and Nucleonics Laboratory	3. License number
2 Address	3 Gateway Center Pittsburgh, Pennsylvania 15230	4 Expiration date
		5. Reference No.

In accordance with application dated July 30, 1964, 37-497-2 is amended in its entirety to read as follows:
August 31, 1966

6 Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
A. Any byproduct material	A. Any	A. 100 curies of any byproduct material; total not to exceed 500 curies

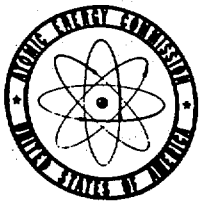
9 Authorized use

Research and Development as defined in Section 30.4(k), Title 10, Code of Federal Regulations, Part 30.

CONDITIONS

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.
11. Byproduct material shall only be used at Radiation and Nucleonics Laboratory, Avenue A and West Street, Forest Hills Borough, Pittsburgh, Pennsylvania.
12. The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards for Protection Against Radiation."
13. Byproduct material shall be used by, or under the supervision of, individuals designated by the local Isotope Committee, K. H. Sun, Chairman.
14. A. Each sealed source acquired from another person and containing byproduct material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for contamination and/or leakage prior to use. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be put into use until tested.

(See Page 2)



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

IN REPLY REFER TO:

DML:RLL

70-48

SNM-47, Amendment No. 2

MAY 25 1965

RECEIVED

MAY 26 1965

WESTINGHOUSE
E.C.B. - C.P.S.

Westinghouse Electric Corporation
3 Gateway Center
Box 2278
Pittsburgh, Pennsylvania 15230

Attention: Mr. C. P. Skillern
License Administrator

Gentlemen:

Pursuant to Title 10, Code of Federal Regulations, Part 70, Items 7, 8 and 10 of Special Nuclear Material License No. SNM-47, dated December 20, 1962, are hereby amended to read as follows:

- "7. Eighty grams of plutonium encapsulated as a Pu-Be neutron source and 250 grams U-235.
- "8. For use in accordance with the procedures described in the licensee's application dated August 21, 1962 and supplements dated October 19, and November 27, 1962, and May 14, 1965.
- "10. Authorized Place of Use: The licensee's Radiation and Nucleonics Laboratories at the Engineering Center, Forest Hills, Pennsylvania, and Buildings 401 and 501 at the Research and Development Center, Churchill Borough, Pennsylvania."

All other conditions of this license shall remain the same.

FOR THE ATOMIC ENERGY COMMISSION

Donald A. Nussbaumer

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch
Division of Materials Licensing



Westinghouse Electric Corporation

3 Gateway Center
Box 2278, Pittsburgh, Pa. 15230

November 30, 1965

*
U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C., 20545

Attention: Mr. Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch

Subject: Renewal and Amendment of
License SNM-47, Docket 70-48

Gentlemen:

Westinghouse Electric Corporation hereby applies for renewal of the subject license and amendment of it in accordance with the attached application dated 11/30/65. It will be noted that the Radiation and Nucleonics Laboratory is being moved from the Forest Hills Site to the R & D Center. This application provides for use of SNM by this laboratory at the R&D Center and a request for amendment of their Byproduct Material License will be transmitted separately.

The license amendment should be sent to me at the above address.

If you have any questions, please write to me at the above address, or telephone collect, 412-391-2800, Extension 3449.

Very truly yours,

Karl R. Schendel

Karl R. Schendel
License Administrator

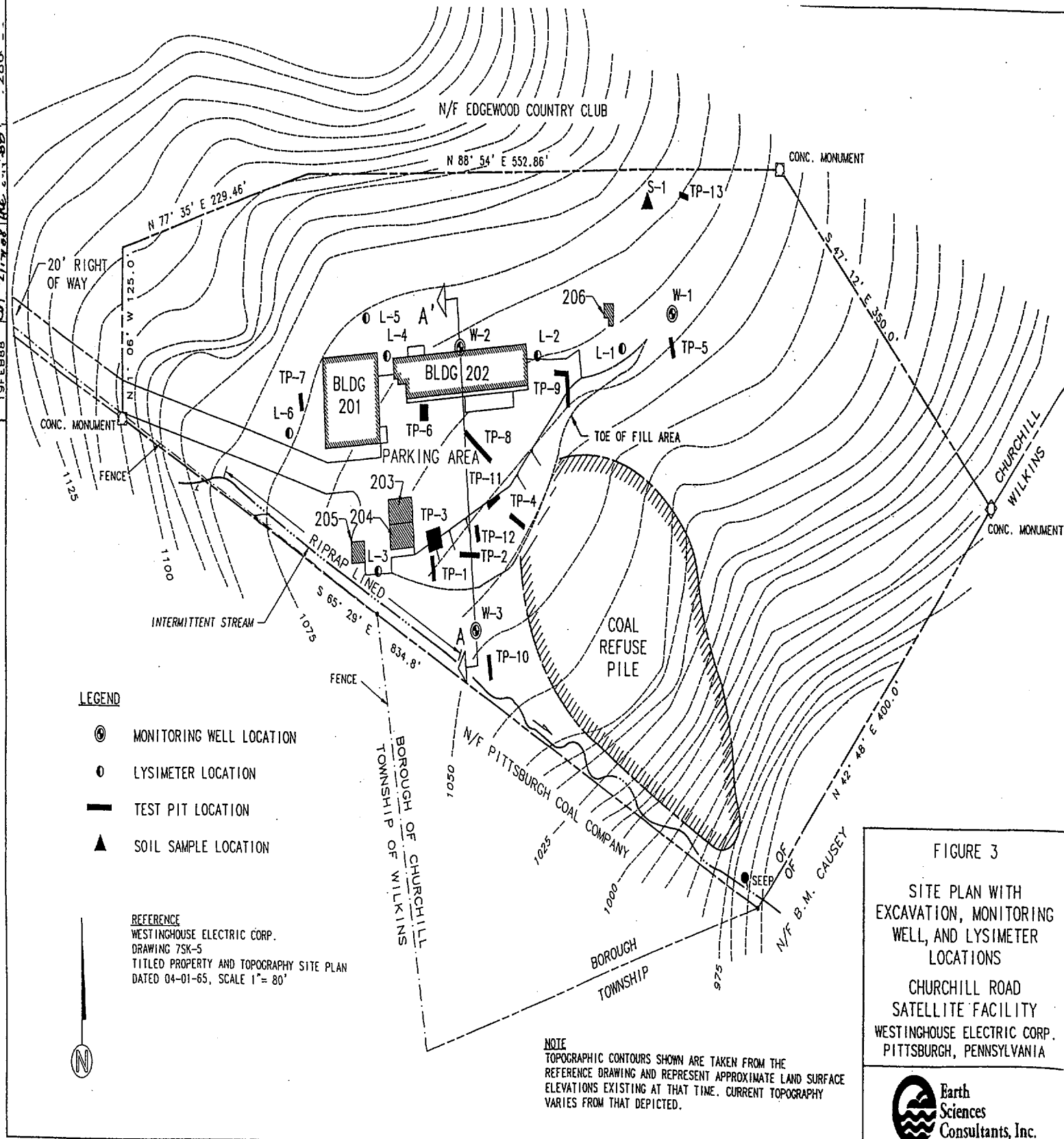
Attachment: License Amendment

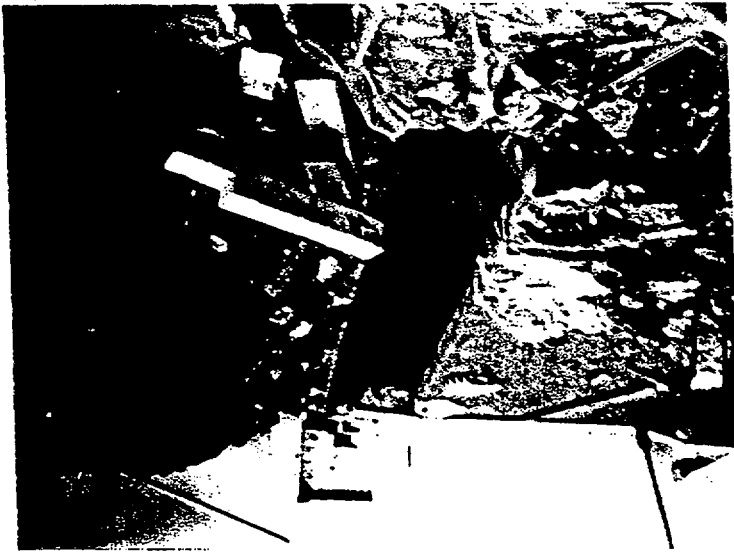
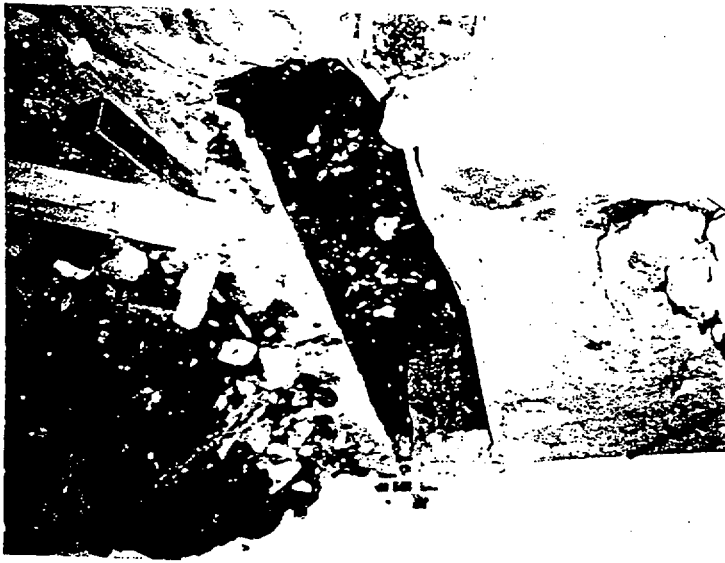
6 copies transmitted

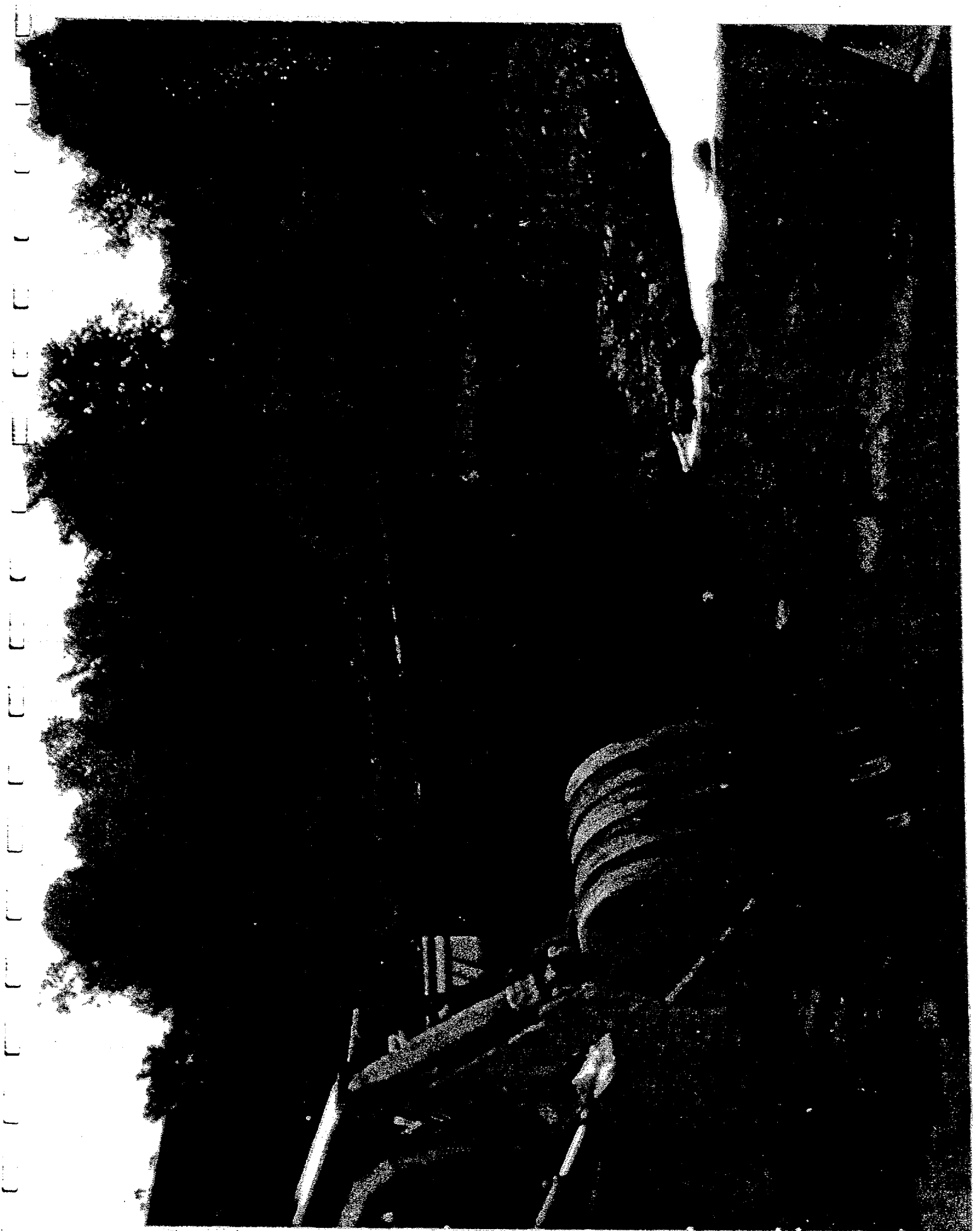
APPENDIX C

APPENDIX C

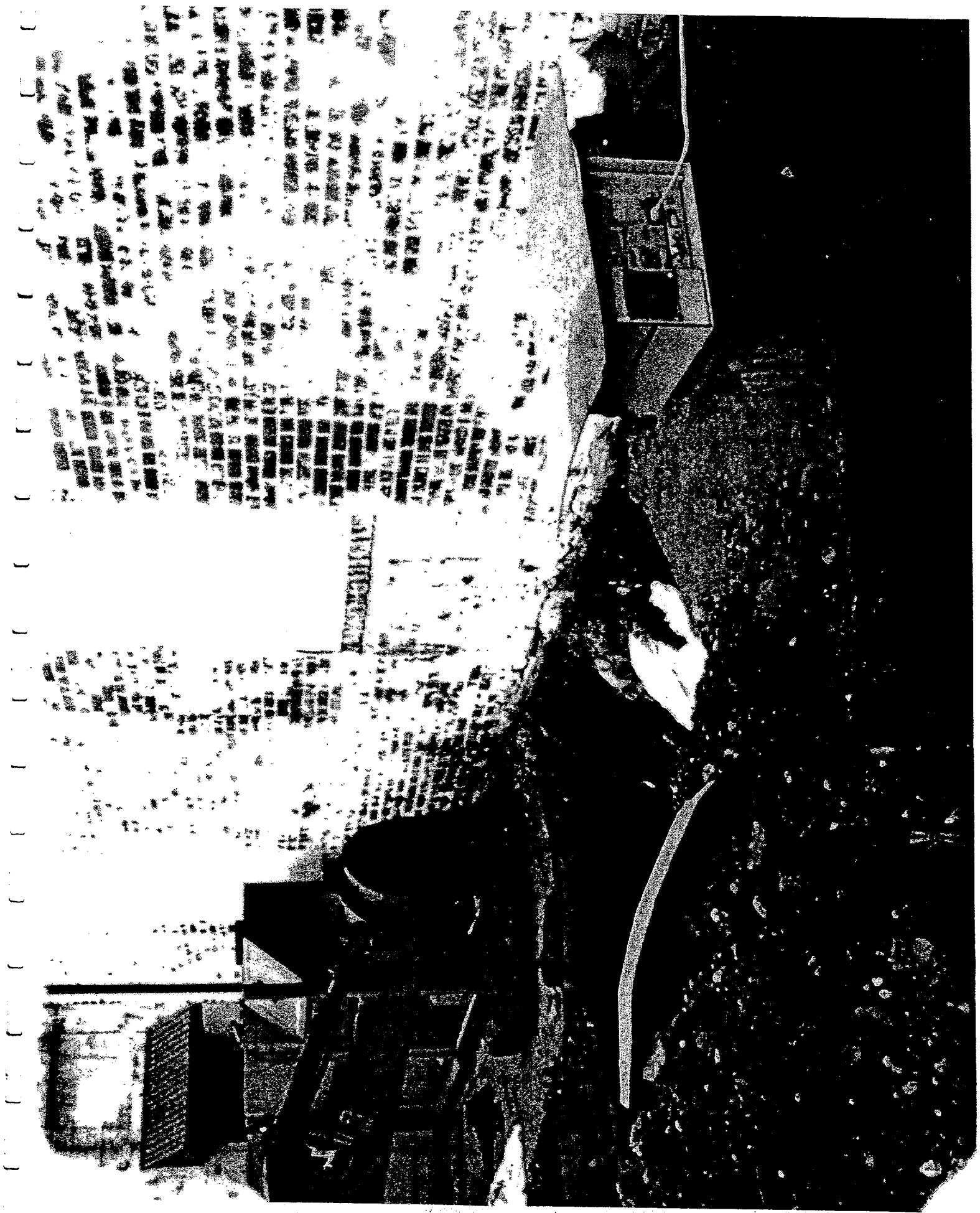
**1986 THROUGH 1987 SURVEYS AND
TANK REMOVAL**





















From : RESEARCH AND DEVELOPMENT CENTER
WIN : 236-1044
Date : December 2, 1987
Subject: Edgewood Site Cleanup

To : RESEARCH AND DEVELOPMENT CENTER

B. Churma

After the removal of the 750 gallon tank from excavation in front of Bldg. 202 by Earth Sciences at the Edgewood site, they traced out a 4" cast iron pipe leading into the center of the building. The analysis of the pipe by R&D indicated it was contaminated with ^{137}Cs and thorium activity. Typical readings of 5-7 MR/HR were measured.* The pipe, approximately 10 ft. in length, was removed by Babich & Stotler on November 11, 1987. The removal was done by digging up the floor and removing the pipe by sections and placing each section into a plastic bag. The sections were then taken back to the R&D Center and placed into the radioactive waste system. The ground area around the pipe and the tank area was surveyed with a Ludlum μR meter*** with typical readings of 10-12 $\mu\text{R}/\text{HR}$ were observed.

P. E. Felice
Radiation Safety Officer

jp

*Eberline E-120 - S/N 2146

***Ludlum Model 19 - S/N 36538



From: R&D Center - Bldg. 302-202
WIN: 236-1044
Date: March 11, 1988
Subject: EDGEWOOD SITE SURVEYS

To: R&D Facility Department
Earth Science Consultants, Inc.
Ed Bober - Chairman Radiation Safety Committee

During the process of investigating the environmental condition of the Edgewood Site for possible chemical and radioactive activity, several surveys were conducted by the Health Physics section.

First, a general overall radiation field survey was performed on 10/23/86 using a Ludlum micro-R meter (Model 19 S/N 36538). A grid network was laid out and readings were taken at ground level. Typical readings of 8 to 14 $\mu\text{R}/\text{HR}$ were obtained.

Next two boreholes were drilled by Tera Testing Inc. on 10/23/86, one hole drilled in front of 202 Building and the other hole about 100 ft. south of hole number one. Core samples were taken every foot down to about 13.5 ft. depth. The dirt samples were placed into a Marnelli beaker and counted on a Ge.(L1.) detector using a Nuclear Data Multichannel Analyzer. The results indicate a typical energy spectrum associated with Uranium and Thorium ore along with a small peak for ^{137}Cs . The concentration of the soil averaged 0.12 picocuries/gm.

After the removal of the 500 gallon tank located in front of 202 Building, by Earth Sciences, water and dirt samples were taken from the contents and analyzed at the R&D Center. The only indication of any radioactivity was noted on the sludge located at the bottom of the tank. Concentration of the sludge was 0.32 picocuries/gm. The sludge was collected into two containers and taken to the R&D Center for waste disposal. The water from the tank was drained into 55 gallon drums and are being stored at the Edgewood site. Analyzes of the sludge and water again indicates energy peaks for Uranium and Thorium and ^{137}Cs with concentration of 3.2 picocuries/cc obtained for the water sample.


P. E. Felice
Radiation Safety Officer

10/23/86

WORK SHEET
WESTINGHOUSE FORM 8295 E

Section I

Ref

Area survey

Using model 14
Cable meter & meter
See # 36538

ALL readings in M/H/A

Distance from
Building 202

Building 202

10 meters 20 30 40 50 60 70 80 90 100 110

5 meters	13-14	11-12	14-15	9-10	9-10	7-8	8-9	7-8	7-8	7-8	7-8		
15	13-14	12-13	12-13	10-11	8-9	10-11	9-10	8-9	7-8	7-8	7-8		
35	11-12	12-13	14-15	12-13	11-12	11-12	8-9	8-9	8-9	9-10	7-8		
45	11-12	11-12	11-12	11-12	11-12	11-12	7-8	7-8	9-10	11-12	12-13		
50	12-13	10-11	9-10	9-10	12-13	11-12	8-9	9-10	11-12	11-12	11-12		
60	8-9	6-7	9-10	8-9	9-10	11-12	12-13	11-12	11-12	11-12	11-12		
70	8-9	7-8	8-9	11-12	12-13	12-13	11-12	12-13	11-12	10-11	11-12		
80	11-12	11-12	11-12	11-12	11-12	11-12	10-11	10-11	10-11	}			
90	11-12	11-12	13-14	11-12	12-13	12-13							
Rev 202	10-11	8-9	10-11	10-11	10-11	10-11	9-10	10-11	10-11	1			

Building 30
11-12

Building 30
11 MOSTLY
NEAR OFFSET
30

BUNKER
BUILDING
11-12

BUILD
10 FT
END LINE
OFF
11-12

11-25-25

1 letter from
Wald

11-01	11-01	6-8	11-01	11-01	11-11	11-01	11-11	6-8	11-11	11-11	8-6	6-8	11-01	11-01
		13	12	11	10	9	8	7	6	5	4	3	2	1

Section III - Criminal gate way

8-6	8-7	6-8	11-21	6-8	6-8	wood working firm
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