

Enclosure

**OAK RIDGE ASSOCIATED UNIVERSITIES:
SITE STATUS REPORT FOR THE FORMER ANSONIA ELECTRIC COMPANY AT
63 MAIN STREET IN ANSONIA, CONNECTICUT**

JUNE 28, 2018

ADAMS ACCESSION NO: ML18151A461

EXECUTIVE SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) requested that Oak Ridge Associated Universities (ORAU) perform a radiation survey of the former Ansonia Electric Company property, which is now a parking lot, at 63 Main Street in Ansonia, Connecticut. A 1922 article listed Ansonia Electric Company as manufacturing radium luminous front door bell pushes (*Electrical Merchandising* 1922). The building was subsequently removed; however, the soil at the site may be contaminated with radium. The primary objective of this survey was to locate possible discrete sources of radium, if any, that would be associated with former Ansonia Electric Company operations.

ORAU performed the radiation surveys in accessible areas of the parking lot on May 10, 2018. Surveys did not identify elevated levels of radiation that could be attributed to discrete sources of radium. Because no elevated levels of radiation were identified, ORAU concludes that discrete sources of radium are not present in surface soils. Based on these results, it is recommended that the NRC not pursue additional action at the 63 Main Street property.

SITE STATUS REPORT

Property: Former Ansonia Electric Company
63 Main Street
Ansonia, CT 06418

Docket Number: 03038936

Current Property Name(s): Public Parting Lot P1

Current Property Owner(s): The City of Ansonia

Inspection Dates: May 10, 2018

Inspector(s): Mark Roberts/ U.S. Nuclear Regulatory Commission (NRC), supported by David King/Oak Ridge Associated Universities (ORAU)

1.0 INTRODUCTION

The Energy Policy Act of 2005 amended section 11e.(3) of the Atomic Energy Act of 1954 to place discrete sources of radium-226 (Ra-226) under NRC regulatory authority as byproduct material. The property at 63 Main Street in Ansonia, Connecticut (CT) was identified as the site of the former Ansonia Electric Company that manufactured luminous front door bell pushes containing radium (*Electrical Merchandising* 1922). The objectives of the survey were to determine if discrete sources of Ra-226 and/or distributed Ra-226 contamination are present, to identify the areas of highest contamination, to determine if there are any current health and safety concerns, and to determine if a scoping survey is needed.

Data collected during the survey are used to either eliminate the property from future NRC consideration or to plan future actions that may be needed to reduce Ra-226 exposure to current or future site occupants to levels that do not exceed the applicable regulatory requirement. It is important to note that destructive testing is not generally performed as described within NRC's procedures, Temporary Instruction (TI) 2800/043, Revision 2, *Inspection of Facilities Potentially Contaminated with Discrete Radium-226 Sources* (NRC 2018) (Agencywide Documents Access and Management System [ADAMS] Accession number ML17297B921).

2.0 PROPERTY DESCRIPTION AND INITIAL SITE VISIT CONSIDERATIONS

2.1 Property Description and History

The approximately 4,200 m² parking lot is identified as the site of the former Ansonia Electric Company. Figure 1 is taken from a 1900 fire insurance map that shows the location of the former Ansonia Electrical Company (Library of Congress 2018), and a 1921 Ansonia directory has the address listed as 63 Main Street (World Maps Online 2014). Figure 2 shows the location of the properties at 31 and 91 Main Street—Public Parking Lot P1 falls between these structures. It is presumed that the luminous bell pushes, listed in the 1922 article, were

manufactured at the former 63 Main Street facility (*Electrical Merchandising* 1922). The original building was removed and an asphalt-covered parking lot currently occupies the area, as shown in Figure 2. The remaining soil under the parking lot could be potentially contaminated by radium (ORNL 2017). As of 2013, the city of Ansonia owns the property and has the intention of developing the area into retail space with overhead apartments (*Valley Independent Sentinel* 2013).

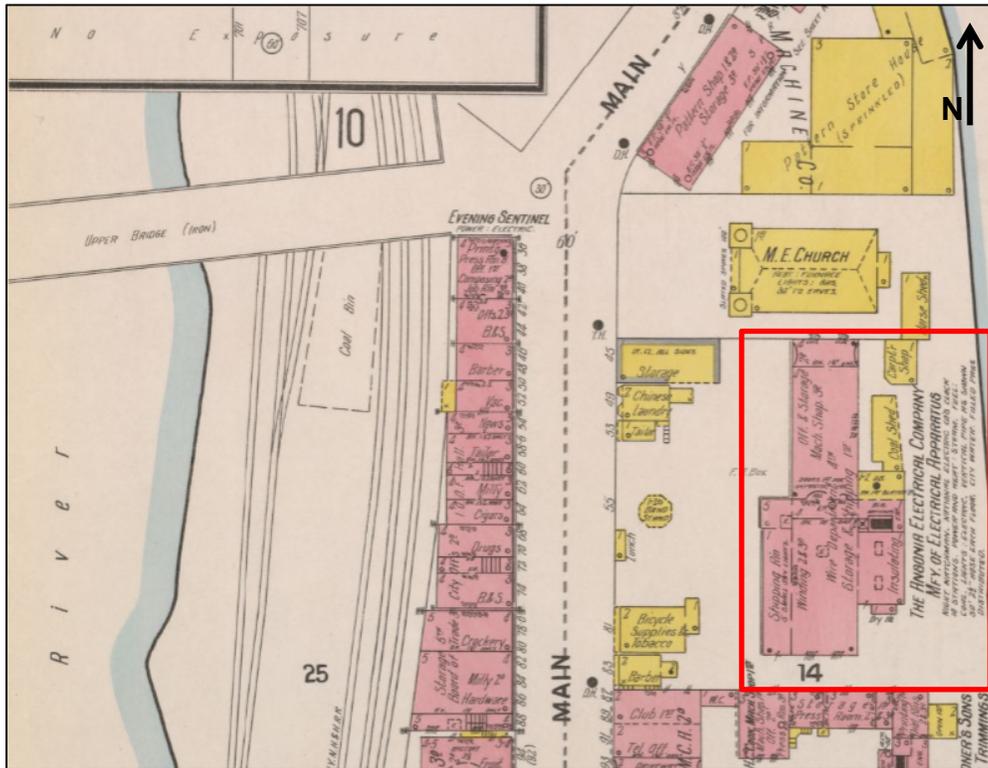


Figure 1. Former Ansonia Electric Company Property (Library of Congress 2018)



Figure 2. Former Ansonia Electric Company Property (Parking Lot) (Google Earth 2017)

2.2 Initial Site Visit Considerations

Prior to commencing survey activities, the general property layout was examined for consistency with historical information and to identify impediments to conducting the survey and/or health and safety considerations. No health or safety issues were noted.

3.0 SITE OBSERVATIONS AND FINDINGS

3.1 Summary of Activities

The inspection team conducted a survey at the 63 Main Street property on May 10, 2018. The inspection team consisted of Mark Roberts (NRC) and David King (ORAU). Representatives from the City of Ansonia were also present at different stages of the survey: Sheila O’Malley, Economic Development Director/Grants Administrator, and Michael Eheman, Buildings/Refuse/Maintenance Foreman. The inspection team informed city representatives of the intention to perform general area radiation surveys around the property prior to the onset of field activities.

Radiological surveys performed by the inspection team consisted of gamma radiation scans within the land area using a Ludlum model 44-10 2-inch by 2-inch (2×2) sodium iodide detector connected to a Ludlum model 2221 ratemeter/scale and radiation exposure rate measurements using a Ludlum model 192 sodium iodide-based µR ratemeter¹. A hand-held identiFINDER R300-Z was available to confirm, if possible, the presence of Ra-226 if elevated radiation levels were encountered. Table 1 presents the specific instruments used during the site visit.

Radiation Type (units)	Detector Type	Detector Model (Number)	Ratemeter (Number)
Gross gamma (cpm)	Sodium Iodide	44-10 (1152) Calibrated 11/03/2017	2221 (1144) Calibrated 04/06/2018
Gross gamma (µR/h)	Exposure Meter	192 (1128) Calibrated 06/02/2017	N/A
Gamma Spectrum Analyzer (identiFINDER)	Cesium Iodide	R300-Z (CG0343) Calibrated 03/22/2018	N/A

N/A = not applicable
 Number = ORAU equipment barcode
 cpm = counts per minute
 µR/h = microRoentgen per hour

¹Roentgen is a unit of exposure (energy absorbed in air), whereas a rem is a unit of dose delivered to a person (resulting from the radiation energy absorbed in that person). While Roentgen and rem are related, these are different units. Because they are similar for gamma ray energies from Ra-226, NRC makes the simplifying assumption in this case that these units are equivalent (1 Roentgen = 1 rem).

Surveys were conducted using a 2×2 sodium iodide detector connected to global positioning system (GPS) equipment, and a model 192 ratemeter for exposure rates to acquire gamma radiation data. Approximately 50 percent of the total property was surveyed. The identiFINDER was available if Ra-226 contamination was suspected, but none was identified at the 63 Main Street property, so the identiFINDER was not used.

3.2 Summary of Results

Photographs taken during the initial site visit are presented in Appendix A. Survey maps and tabulated data are presented in Appendix B. Figure B-1 shows the 2×2 sodium iodide detector measurements for the gamma walkover survey. Areas with relatively elevated radiation levels (shown in red on Figure B-1) were identified adjacent to the high stone wall (Figure A-1) that runs the length of the eastern property boundary. Due to the uniform 2×2 sodium iodide detector responses along the length of the wall, the inspection team concluded that the relatively elevated responses were due to naturally occurring radioactive material (NORM). Figure B-2 shows the location of the exposure rate measurements for the parking lot, and Table B-1 provides the exposure rate measurements associated with each location. As with gamma walkover survey data, relatively high exposure rates were collected along the eastern wall and are associated with NORM. Table B-2 presents summary statistics for the gamma walkover and exposure rate data collected during the initial site visit.

3.3 Summary of Dose Assessment Results

A historical site-specific dose assessment associated with the former Ansonia Electric Company property has not been identified. Because no elevated radiation levels associated with discrete sources of Ra-226 were identified during the May 2018 site visit, a dose assessment was not necessary.

4.0 OBSERVATIONS AND RECOMMENDATIONS

Based on the data collected, the former Ansonia Electric Company property does not contain discrete sources of Ra-226 in excess of regulatory requirements, as determined by the following observations:

- Gamma radiation levels across the site were generally consistent with background (including NORM materials); the absence of gamma radiation anomalies suggests there are no discrete sources of Ra-226.
- Risk of potential contamination on the site is low and, if present, would most likely be found at a significant depth in the subsurface soil.

Based on the above observations, it is recommended that the NRC not perform a more detailed scoping survey. The rationale behind this recommendation is that the initial site visit generated a robust dataset that already meets the scoping survey purpose. Furthermore, it is also recommended that the NRC staff should not pursue additional action at the former Ansonia Electric Company property given that no elevated radiation levels (relative to background) were identified at the surface.

5.0 REFERENCES

Electrical Merchandising 1922. "Sell Luminous Specialties—Cash In on the Popular Interest in Radium," Vol. 27, No. 1, p. 106, January.

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ORNL 2017. *Ansonia Electrical Company: Site Summary*, Oak Ridge National Laboratory, Oak Ridge, Tennessee, April 18. (ADAMS Accession No. ML17244A036).

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http://memory.loc.gov/cgi-bin/ampage?collId=gmd&action=browse&fileName=/gmsanborn/010/01096/01096_004/ct_browse.db&displayType=3&maxCols=3&recNum=0&title2=Ansonia,%20CT%201900

Valley Independent Sentinel 2013. "Farrel Properties in Ansonia Sold for \$1.9 Million," Ansonia, Connecticut, January 24.

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World Maps Online 2014. *Historic Map – Ansonia, CT 1921*, World Maps Online, Seattle, Washington, accessed on 05/17/2018. <https://www.worldmapsonline.com/historicalmaps/1W-CT-AN-1921.htm>.

APPENDIX A
PHOTOS FROM THE FORMER ANSONIA ELECTRIC COMPANY SURVEY



Figure A-1. Stone Wall Along Eastern Edge of Parking Lot



Figure A-2. Parking Lot Looking Northwest



Figure A-3. Parking Lot Looking Southwest



Figure A-4. Parking Lot Looking East

APPENDIX B
SURVEY RESULTS FROM THE FORMER ANSONIA ELECTRIC COMPANY SURVEY

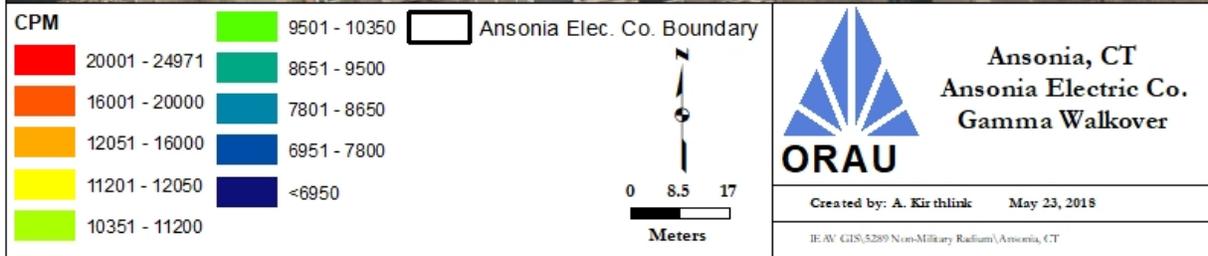
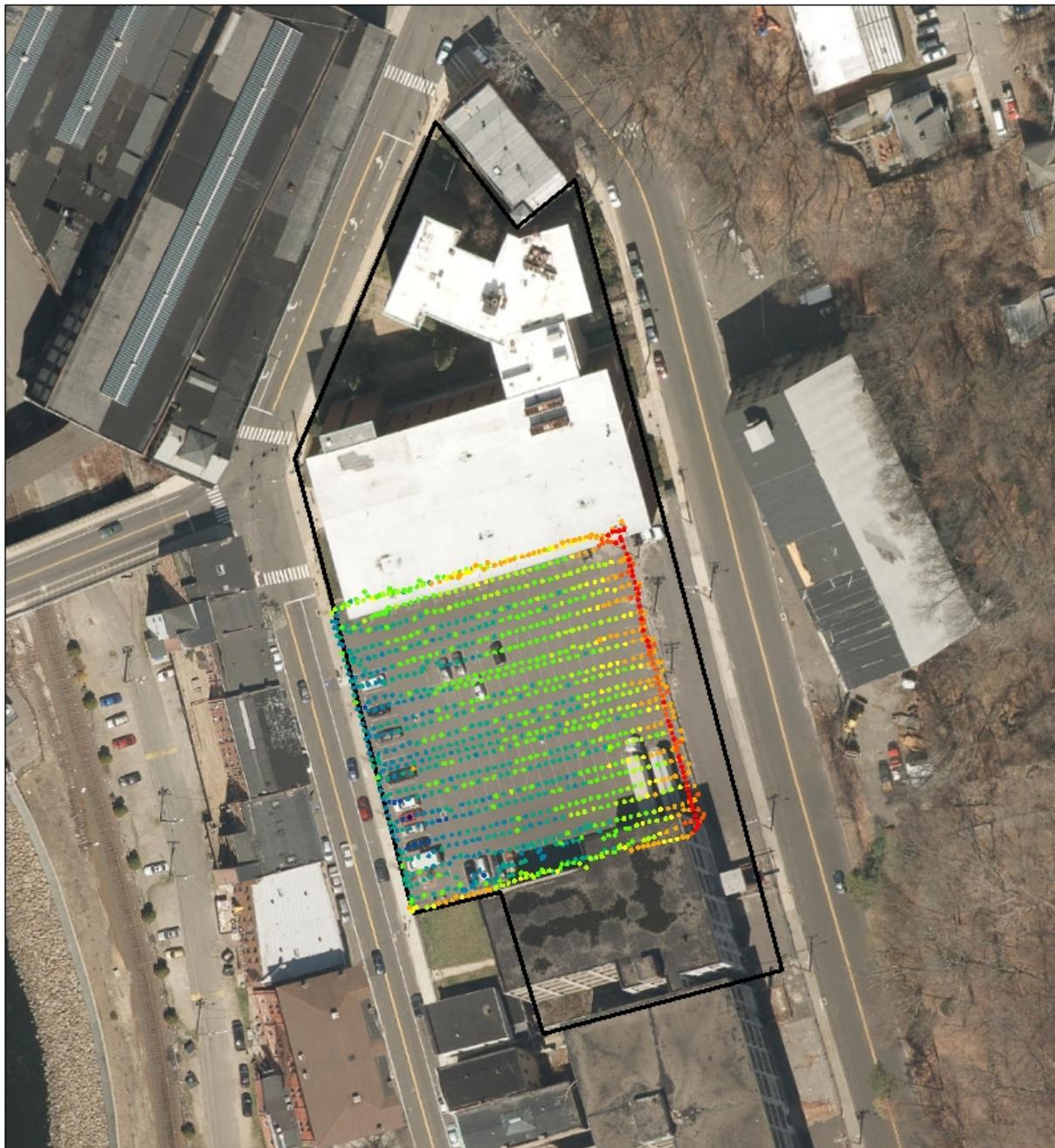


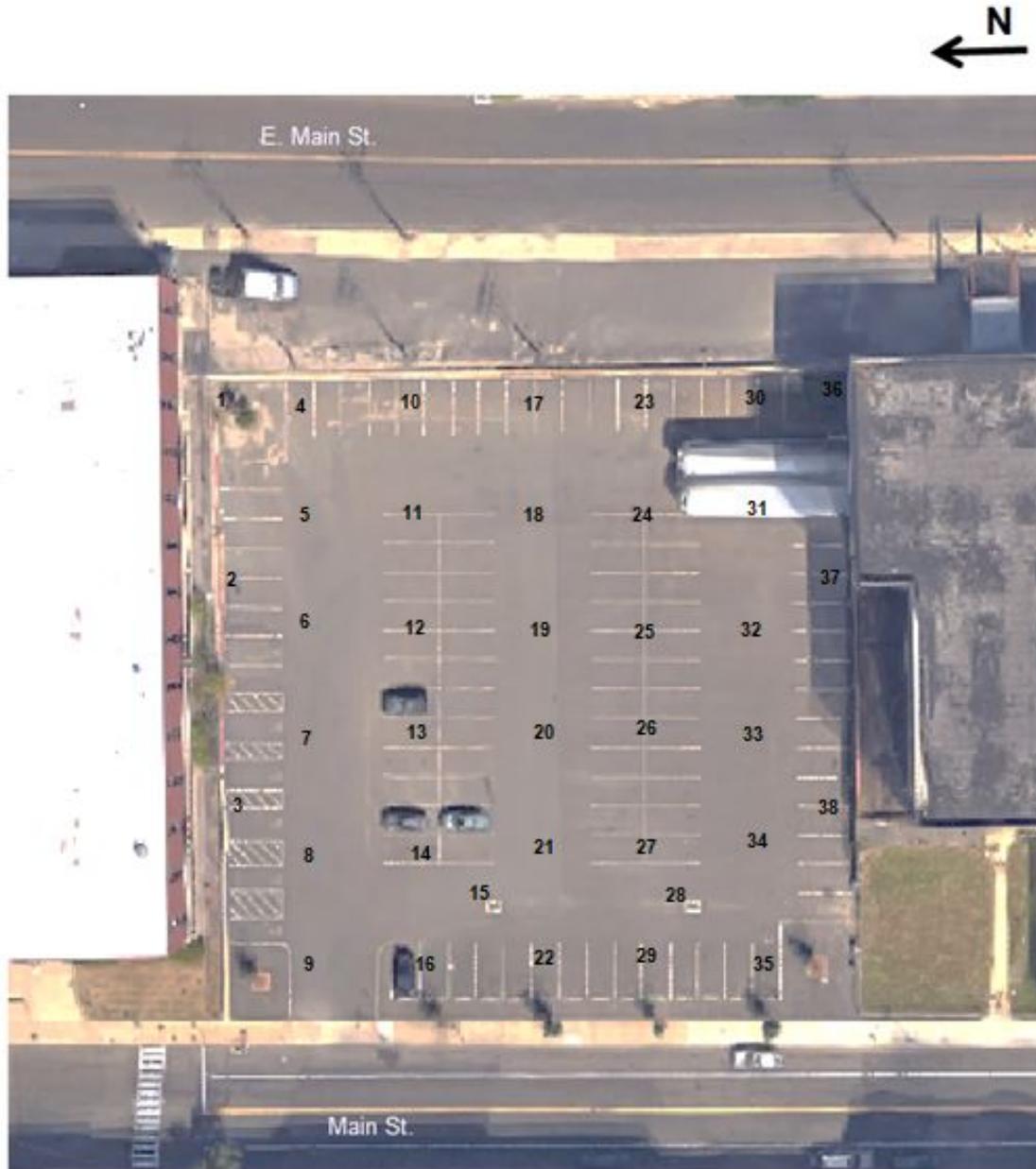
Figure B-1. Gamma Walkover Survey Map

Table B-1. Ansonia Electric – Parking Lot		
Location No.	Gamma	Comments
	μR/h at 1 meter	
1	27	
2	13	
3	11	
4	23	
5	10	
6	10	
7	9.5	
8	9.5	
9	9	
10	20	
11	10	
12	9	
13	8.5	
14	8	
15	5	Contact with Drain
16	7	
17	19.5	
18	9.5	
19	9	
20	8.5	
21	8.5	
22	7	
23	20	
24	9	
25	8	
26	8.5	
27	8	
28	6	Contact with Drain
29	6.5	
30	22	
31	10	
32	8	
33	8.5	
34	7	
35	8.5	
36	25	
37	12	
38	11.5	

Site: Ansonia Electric	Area: Parking Lot	Date(s): 05/10/18	Time: 1100
Surveyor(s): DAK		Purpose: Site Visit	

Radiation Type	Instrument	Detector	Background
Gamma	2221 No. 1144	44-10 No. 1152	8.5 kcpm ^a
Gamma	192 No. 1128	NA	8-20 μ R/h ^a

^aBackground varied depending on naturally occurring radioactive material in the area.



= Measurements provided in Table B-1.

Figure B-2. Location of Exposure Rate Measurements

Table B-2. Statistical Summary for Radiation Measurements during the Ansonia Site Visit

Parameter	Units	No.	Min. Value	Max. Value	Mean	Median	Standard Deviation
Count rate	cpm	1,254	6,858	24,971	10,799	9,847	2,991
Exposure rate	μ R/h at 1 m	38	5	27	11	9.0	5.7