

**REMOVAL PROGRAM
PRELIMINARY ASSESSMENT/
SITE INVESTIGATION REPORT
FOR THE
FORMER WATERBURY CLOCK FACTORY
WATERBURY, NEW HAVEN COUNTY, CONNECTICUT
8 JULY 2019, 4 SEPTEMBER 2019, AND
21 THROUGH 24 OCTOBER 2019**

Prepared For:

U.S. Environmental Protection Agency
Region I
Emergency Planning and Response Branch
5 Post Office Square, Suite 100
Boston, Massachusetts 02109-3912

CONTRACT NO. EP-S3-15-01

TO/TDD NO.: TO1-01-19-06-0002

TASK NO.: 0317

DC NO.: R-00761

Submitted By:

Weston Solutions, Inc.
Region I
Superfund Technical Assessment and Response Team
101 Billerica Avenue, Building 5, Suite 103
North Billerica, Massachusetts 01862

December 2019

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I. Preliminary Assessment/Site Investigation Forms

REMOVAL PRELIMINARY ASSESSMENT

Potential Responsible Parties

Owner: New Opportunities Economic Development Corporation; Property Owner Representative: James H. Gatling. **Telephone:** (203) 575-4211
Address: 232 North Elm Street, Waterbury CT 06702
Operator: **Telephone:**
Address:

Site Access

Authorizing Person: James H. Gatling, New Opportunities Economic Development Corporation
Date: 25 June 2019 **Obtained** **Verbal**
Telephone: (203) 575-9799 **Not Obtained** **Written**

Historical Preservation

Site is Historically Significant or Eligible for Historic Preservation

Contacts Identified

1) State Historical Preservation Officer (SHPO)
Name: Mary Dunne **Telephone:** 860-500-2356
2) Tribal Historical Preservation Officer (THPO)
Name: **Telephone:**

Comments:

Physical Site Characterization

Background Information: The Former Waterbury Clock Factory Site (the Site) is located in a mixed industrial, commercial, and residential area in Waterbury, Connecticut (CT). The buildings of interest at the site include those at 215 Cherry Street (Buildings 3/R and 4/T), 177 Cherry Street (Buildings 6/K and 7/L), and 39 Cherry Street (Building 1/G). These are 5- and 6-story buildings (including basements/sub-basements) that were constructed of brick and wood in the late 1890s/early 1900s, and that are in various (sometime severe) states of disrepair. Most of the buildings of concern have deteriorated roofs, with some collapsed floor areas. There are other buildings adjacent and/or connected to the buildings of interest that are part of the Former Waterbury Clock Factory Complex that have been remediated and rehabilitated and are occupied by businesses, residents, and non-profit groups.

REMOVAL PRELIMINARY ASSESSMENT

The 2005 Phase I ESA prepared in March 2005 by Berkshire Environmental Services & Technology, LLC, identified the following historical uses of the subject property: clock manufacturing between approximately 1890 and the 1940s; offices, a bakery, a furnace company, clothing manufacturers, and tool and metal product production between the 1940s and the 1970s; clothing, handbag and belt manufacturing between the 1970s and 2004; and vacant between 2004 to present. Numerous investigations of the Site buildings have occurred, and remediation activities have been conducted in other buildings within the former factory complex. The following is a summary of the status and condition of the site buildings of concern:

39 Cherry Avenue/Building 1 (or G)

Access: Access possible on all floors except the basement, and all floors in the northern ~2/3 of building towards K and L. Deteriorated or collapsed sections of floor and ceiling on all floors. Wind and weather restrictions per a licensed CT Professional Structural Engineer.

Radium: Basement and 6th floor not affected <30 microRoentgens per hour ($\mu\text{R/hr}$); 2nd floor (machine shop) and 3rd floor store room, hallway, and Liba room) multiple areas with elevated $\mu\text{R/hr}$ readings; 4th floor (store room) and 5th floor (rental area) with elevated levels.

Asbestos: Chrysotile asbestos-containing material (ACM) in roofing and flashing; ACM vapor barrier (brown) throughout buildings; 6th, 5th, 3rd, 1st floor pipe insulation including 1st floor boiler room; 5th, 3rd, 2nd, 1st floor ACM floor or ceiling tiles.

Lead: Negative except for wood posts, wood window units, and small amounts of brick wall primarily in stairwells; 98% of samples negative for lead (< 1 milligram/square centimeter). Total Characteristic Leaching Procedure (TCLP) 0.50 milligrams per Liter (mg/L).

Other: Possible drums/small containers 1st floor; three thermostats with mercury 3rd floor; numerous light ballasts on all floors.

215 Cherry Street/Buildings 3 (or R) and 4 (or T)

Access: Access is possible on all floors. Deteriorated or collapsed sections of floor and ceiling on all floors. Wind and weather restrictions per a licensed CT Professional Structural Engineer.

Radium: Building 3/R on 2nd, 3rd, 4th, 5th, 6th floors (not basement); Building 4/T on 5th and 6th floor, possibly 3rd floor.

Asbestos: Chrysotile ACM in roofing and flashing; ACM vapor barrier (brown) throughout buildings; elevator house exterior and interior wall board, caulking; 5th floor pipe insulation and wall board.

Lead: Negative except for wood posts, wood window units, and small amounts of brick wall primarily in stairwells; all ceilings, beams and floors and 98% of brick wall samples were negative for lead. TCLP 0.50 mg/L.

Other: Possible drums/small containers 2nd and 5th floors; numerous light ballasts all floors. Volatile Organic Compounds (VOCs): 7,380 parts per billion (ppb) trichloroethylene (TCE) and 1,830 ppb tetrachloroethylene (PCE) in soils, and 7.7 ppb vinyl chloride (VC) in groundwater well MW-4 west of buildings at 215 Cherry Street and north of Building G.

REMOVAL PRELIMINARY ASSESSMENT

177 Cherry Street/Buildings 6 (or K) and 7 (or L)

Access: No access to any areas of buildings. Internal structural failures. Wind and weather restrictions along the exterior perimeter of the building per a licensed CT Professional Structural Engineer.

Radium: Some elevated areas in both buildings but lesser contamination, < 50 μ R/hr.

Asbestos: Chrysotile ACM in roofing and flashing; ACM vapor barrier (brown) throughout buildings; 1st floor tile; window and door caulking; interior fiber board

Lead: Negative except for any paint remaining around windows; buildings were gutted and sandblasted in the 1990s except for floors.

Other: VOCs: TCE in soils detected at 6,749 ppb north of Building 7.

Description of Substances Possibly Present, Known or Alleged: ACM, Radium 226 (Ra-226), VOCs (PCE and TCE)

Existing Analytical Data

() Real-Time Monitoring Data:

(X) Sampling Data: Sampling conducted as part of the Hazardous Building Materials Assessment conducted by Loureiro Engineering Associates, Inc. (LEA) in 2010. Soil and groundwater samples collected by Leggette, Brashears & Graham, Inc. in 2011 for the Phase II Investigation Report.

Potential Threat

Description of potential hazards to environment and/or population-identify any of the criteria for a Removal Action (from NCP) that may be met by the site under 40 CFR 300.415 [b] [2].

- i. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants.
- ii. Actual or potential contamination of drinking water supplies or sensitive ecosystems.
- iii. Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release.
- iv. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate.
- v. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.
- vi. Threat of fire or explosion.

REMOVAL PRELIMINARY ASSESSMENT

- vii. The availability of other appropriate federal or state response mechanisms to respond to the release.
- viii. Other situations or factors that may pose threats to public health or welfare or the environment.

Prior Response Activities

PRP **STATE** **FEDERAL** **OTHER**

Brief Description: In 2011, New Opportunities for Waterbury (NOW) was awarded three Brownfields cleanup grants from US EPA Region 1 for 39 Cherry Avenue, 177 Cherry Street and 215 Cherry Street. Some remediation was conducted but reportedly not all areas were remediated. Available records on the investigation and remediation of radium contamination are limited.

Priority for Site Investigation

High **Medium** **Low** **None**

Comments:

Report Generation

Originator: Bonnie Mace **Date:** 6 November 2019
Affiliation: Weston Solutions, Inc. (START) **Telephone:** (978) 552-2131
TDD No.: TO1-01-19-06-0002 **Task No.:** 0317



**EPA REGION I
REMOVAL SITE INVESTIGATION**

Inspection Information

Site Name: Former Waterbury
Clock Factory

Address: 39 Cherry Avenue,
177 & 215 Cherry Street

Town: Waterbury

County: New Haven

State: Connecticut (CT)

Date of Inspection: 8 July 2019

Time of Inspection: 1000 hours

Weather Conditions: Partly cloudy, low to mid-70 degrees Fahrenheit (°F), light winds.

Date of Inspection: 4 September 2019

Time of Inspection: 1000 hours

Weather Conditions: Sunny, high 70 °F to low 80 °F, light winds.

Date of Inspection: 21 October 2019

Time of Inspection: 1100 hours

Weather Conditions: Mostly sunny, mid-60s °F, light winds.

Date of Inspection: 22 October 2019

Time of Inspection: 0700 hours

Weather Conditions: Mostly cloudy, high 50 °F to low 60 °F, light winds.

Date of Inspection: 23 October 2019

Time of Inspection: 0700 hours

Weather Conditions: Partly cloudy, mid- to- high 60s °F, moderate winds.

Date of Inspection: 24 October 2019

Time of Inspection: 0700 hours

Weather Conditions: Sunny, mid-60s °F, light winds.

Site Status at Time of Inspection:

ACTIVE

INACTIVE

Comments: The site is a former clock factory that used Radium (Ra-226) radioluminescent paint so the dials/faces would be self-illuminated.

REMOVAL SITE INVESTIGATION

Agencies/Personnel Performing Inspection

	<u>Names</u>	<u>Program</u>
(X) EPA:	Sherry Banks Mike Cofsky	U.S. Environmental Protection Agency (EPA) Region I, Superfund and Emergency Management Division (SEMD), Emergency Planning and Response Branch (EPRB), On-Scene Coordinator (OSC).
	Tony Honnellio	EPA, SEMD, EPRB Radiation Program Manager/H&S Coordinator.
	Mandy Liao	EPA, SEMD, Remediation Branch, Site Assessment Manager (SAM).
	Darriel Swatts	EPA, SEMD, Community Involvement Coordinator (CIC).
	Madeline Isenberg	EPA, SEMD, Health And Safety Specialist Intern.
	Mike Messer Scott Faller	US EPA Radiation Field Operations Radiological Emergency Response Team (NCRFO/RERT).
(X) EPA Contractor:	Eric Ackerman John Kelly Paul Callahan Bonnie Mace	Weston Solutions, Inc. (WESTON), Superfund Technical Assessment and Response Team IV (START).
(X) State:	Sheila Gleason	Connecticut Department of Energy and Environmental Protection (CT DEEP).
	Mike Firsick	CTDEEP/Radiation.
	Stuart Torf	CTDEEP/Radiation.
	Shannon Perry	CTDEEP/Radiation.
	Lilly Quetschke	CTDEEP/Radiation.
	Meg Harvey	Connecticut Department of Public Health (CT DPH).
(X) Other:	Kevin Ulrichsen Lucien Lafreniere Michael Terenzio Brad Rudman David Lucas Michael Brooks	City of Waterbury Fire Department (WFD).
	James Silva, PE	Agency for Toxic Substances and Disease Registry (ATSDR). Silva Engineering, Professional Structural Engineer.

Current Owner Based on Field Interview: New Opportunities (for Waterbury) Economic Development Corporation (NOW).

REMOVAL SITE INVESTIGATION

Physical Site Characteristics

<u>Parameter</u>	<u>Quantities/Extent</u>
<input type="checkbox"/> Cylinders:	
<input checked="" type="checkbox"/> Drums:	Previous investigations inside the current buildings indicate the possible presence of drums/small containers in the following locations: <u>39 Cherry Avenue/Building 1/G</u> : Possible drums/small containers on 1st floor. <u>215 Cherry Street/Buildings 3/R and 4/T</u> : Possible drums/small containers on 2nd and 5th floors.
<input type="checkbox"/> Lagoons:	
<input checked="" type="checkbox"/> Tanks:	<input checked="" type="checkbox"/> Above: Aboveground Storage Tanks (ASTs) have previously been noted on the site, but START did not observe any during the exterior reconnaissance of the site on 4 September 2019. <input checked="" type="checkbox"/> Below: Underground Storage Tanks (USTs) have previously been noted on the site, but START did not observe any during the exterior reconnaissance of the site on 4 September 2019.
<input checked="" type="checkbox"/> Asbestos:	Previous investigation data indicate the presence of asbestos-containing material (ACM) in the following areas: <u>39 Cherry Avenue/Building 1/G</u> : Chrysotile ACM in roofing and flashing; ACM vapor barrier (brown) throughout buildings; 6th, 5th, 3rd, 1st floors, pipe insulation including 1st floor boiler room; 5th, 3rd, 2nd, 1st floor, ACM floor or ceiling tiles. <u>215 Cherry Street/Buildings 3/R and 4/T</u> : Chrysotile ACM in roofing and flashing; ACM vapor barrier (brown) throughout buildings; elevator house exterior and interior wall board, caulking; 5th floor pipe insulation and wall board. <u>177 Cherry Street/Buildings 6/K and 7/L</u> : Chrysotile ACM in roofing and flashing; ACM vapor barrier (brown) throughout buildings; 1st floor tile; window and door caulking; interior fiber board.
<input checked="" type="checkbox"/> Piles:	Several construction debris piles were noted during the 4 September 2019 reconnaissance. These piles contained soil fill material, bricks, wood, metal, etc.
<input type="checkbox"/> Stained Soil:	
<input type="checkbox"/> Sheens:	
<input type="checkbox"/> Stressed Vegetation:	
<input type="checkbox"/> Landfill:	
<input checked="" type="checkbox"/> Population in Vicinity:	There are approximately 2,397 people residing within a 0.25-mile radius of the site.

REMOVAL SITE INVESTIGATION

<u>Parameter</u>	<u>Quantities/Extent</u>
(X) Wells: () Drinking: (X) Monitoring:	Six monitoring wells (including one dry well) were previously installed on the site, but START was unable to locate/observe any of the monitoring wells. START observed that five of the wells were potentially destroyed or buried under debris, and the sixth well appeared to have been covered by a concrete pad following the demolition of Building 2 on the 39 Cherry Avenue property.
(X) Other:	Radiation levels within the on-site buildings: Radium 226 (Ra-226) radioluminescent paint was used on site, and multiple areas with elevated $\mu\text{R/hr}$ readings have previously been noted. Radiation levels were observed up to 400-450 microRoentgens per hour ($\mu\text{R/hr}$) during the on-site reconnaissance and up to 1,500-2,000 $\mu\text{R/hr}$ during previous investigations of the site. Although access to the building is restricted, illegal access to the building by vagrants is likely to be occurring.

Physical Site Observations

Comments:

The Former Waterbury Clock Factory Site (the Site) is located in a mixed industrial, commercial, and residential area in Waterbury, CT. The buildings of interest at the Site include those at 215 Cherry Street (Buildings 3/R and 4/T), 177 Cherry Street (Buildings 6/K and 7/L), and 39 Cherry Avenue (Building 1/G). These 4- to 6-story buildings were constructed of brick and wood in the late 1890s/early 1900s and are in various (sometime severe) states of disrepair. Most of the buildings of concern have deteriorated roofs, with some collapsed floor areas. There are other buildings adjacent and/or connected to the buildings of interest that are part of the former Waterbury Clock Factory complex that have been remediated and rehabilitated and are occupied by businesses, residents, and non-profit groups.

Previous investigations have indicated ACM, VOC, and radiation contamination throughout portions of the site.

The nearest residence is located immediately adjacent to the site within the apartment building at 13 Cherry Avenue. The apartment building has been “repurposed” from one of the former Waterbury Clock buildings and abuts the site. This off-site building appears to share a common wall with the on-site 39 Cherry Avenue Building 1/G. The New Opportunities Child Care Service operates a Child Care Center at 232 North Elm Street on the abutting property to the west. Several other day-care facilities are located within 0.25 miles of the site.

On 8 July 2019, Weston Solutions, Inc. Superfund Technical Assessment and Response Team (START) mobilized to the Site with a Professional Structural Engineer (PE) licensed in the state of Connecticut. James Silva, of Silva Engineering, conducted a structural assessment of the buildings at 215 Cherry Street, 177 Cherry Street, and 39 Cherry Avenue. Results from the assessment can be reviewed in the document, entitled *Structural Assessment Report for the Former*

REMOVAL SITE INVESTIGATION

Waterbury Clock Factory, Cherry Street, Waterbury, Connecticut, August 1, 2019. A summary of the results included wind advisories for working in and around all of the Site buildings, with more attention paid to the exterior of 177 Cherry Street (Buildings L and K), which showed significant deterioration of the brick façade. All other building were inspected. It was recommended by the engineer that precautions be made with regard to traversing the building; lumber should be placed across all of the spans between the beams to reduce the chance of breaching the floor due to deterioration caused by moisture that has entered the building via open windows and breaches in the ceiling. It was also recommended that the number of personnel in the building be limited to teams of two during all entries.

Field Sampling and Analysis

Matrix	Field Instrumentation Readings				Notes/Instrument
	CGI/O₂ (%)	RAD (μR/hr)	PID (ppm)	FID (ppm)	
Background:	0.0%/20.9%	3-5 μ R/hr	0.0	--	Ludlum 77-6
Background:	0.0%/20.9%	40-70 CPM	0.0	--	Ludlum 2241 w/ 44-9
Background:	0.0%/20.9%	10-12 μ R/hr	0.0	--	Ludlum 192
Background:	0.0%/20.9%	10-12 μ R/hr	0.0	--	Ludlum 19A
Background:	0.0%/20.9%	3,500 CPM	0.0	--	Ludlum 44-10 w/2241

Matrix	Field Radiation Readings	
	RAD	Instrument
Exterior parking area, Former Building 2:	15-20 μ R/hr	Ludlum 19A
Interior of Building G, 1st Floor Stairwell:	14 kCPM	Ludlum 2241 w/ 44-9
Interior of Building G, 1st Floor:	2.5-4 kCPM	Ludlum 2241 w/ 44-9
Interior of Building G, 2nd Stairwell Railing:	600 CPM	Ludlum 2241 w/ 44-9
Interior of Building G, 2nd Floor:	2.5-3 kCPM	Ludlum 2241 w/ 44-9
Interior of Building G, 3rd Floor:	3-4 kCPM	Ludlum 2241 w/ 44-9
Interior of Building G, 3rd Floor Column:	13.5 kCPM	Ludlum 2241 w/ 44-9
Interior of Building G, 3rd Floor Column:	8.5 kCPM	Ludlum 2241 w/ 44-9
Interior of Building G, 4th Floor Columns:	2.5-4 kCPM	Ludlum 2241 w/ 44-9
Interior of Building G, 4th Floor Stairwell:	3-4 kCPM	Ludlum 2241 w/ 44-9
Interior of Building T, 1st Floor, just inside door:	>40 μ R/hr	Ludlum 19A
Interior of Building T, 1st Floor Column:	11.5-13.8 kCPM	Ludlum 2241 w/ 44-9
Interior of Building T, 2nd Floor, just inside door:	2.5-4 kCPM	Ludlum 2241 w/ 44-9
Interior of Building T, 3rd Floor, just inside door:	2.5-3.5 kCPM	Ludlum 2241 w/ 44-9
Interior of Building T, 4th Floor, just inside door:	2.5-3.5 kCPM	Ludlum 2241 w/ 44-9
Exterior of Building R:	20-25 μ R/hr	Ludlum 19A
Exterior of Building R, Outside Loading Dock:	40-45 μ R/hr	Ludlum 19A
Interior of Building R, Inside Loading Dock:	350 μ R/hr	Ludlum 19A
Interior of Building R, 1st Floor, just inside door:	100 μ R/hr	Ludlum 19A
Interior of Building R, 1st Floor, near wall:	500 μ R/hr	Ludlum 19A
Interior of Building R, 1st Floor, on wall:	81 kCPM	Ludlum 2241 w/ 44-9

REMOVAL SITE INVESTIGATION

Matrix	Field Radiation Readings	
	RAD	Instrument
Interior of Building R, 1st Floor, on wall:	193 kCPM	Ludlum 2241 w/ 44-9
Interior of Building R, 2nd Floor, inside stairwell:	5.5 kCPM	Ludlum 2241 w/ 44-9
Interior of Building R, 2nd Floor:	2.5-4.5 kCPM	Ludlum 2241 w/ 44-9
Interior of Building R, 3rd Floor:	3-4 kCPM	Ludlum 2241 w/ 44-9
Interior of Building R, 4th Floor, inside stairwell:	3-4 kCPM	Ludlum 2241 w/ 44-9

CGI/O₂ (%) = Combustible Gas Indicator/Oxygen
 PID = PhotoIonization Detector (parts per million)
 CPM = counts per minute

RAD (μR/hr) = Radiation (microRoentgens per hour)
 FID (ppm) = Flame Ionization Detector (parts per million)
 kCPM = kilocounts per minute

Field Quality Control Procedures

(X) SOP Followed

() Deviation from SOP

Comments:

Sampling was conducted according to the site Sampling and Analysis Plan (SAP), prepared as a separate document, entitled *Sampling and Analysis Plan for the Former Waterbury Clock Factory Site, Waterbury, New Haven County, Connecticut*, dated September 2019.

Description of Sampling Conducted

From 21 through 24 October 2019, START personnel collected 13 smear samples (SM-01 through SM-13) for Ra-226 field screening by CT DEEP Radiation Division personnel using a Ludlum Model 3030 Dual Alpha/Beta Counter. In addition, eight surface soil samples and one catch basin soil sample (SS-01 through SS-08 and CB-01) were collected for Ra-226 analysis by the CT DPH laboratory, and six bulk asbestos samples (ACM-01 through ACM-06) were collected for asbestos analysis by US EPA Office of Environmental Measurement and Evaluation (OEME).

Analyses

Analytical Parameter	Media	Laboratory
<input type="checkbox"/> VOC	<input type="checkbox"/> AIR	<input checked="" type="checkbox"/> NERL
<input type="checkbox"/> PCB	<input type="checkbox"/> WATER	<input type="checkbox"/> CLP
<input type="checkbox"/> PESTICIDE	<input checked="" type="checkbox"/> SOIL	<input type="checkbox"/> PRIVATE
<input type="checkbox"/> METALS	<input checked="" type="checkbox"/> SOURCE	<input type="checkbox"/> DAS
<input type="checkbox"/> CYANIDE	<input type="checkbox"/> SEDIMENT	<input type="checkbox"/> SOW
<input type="checkbox"/> SVOC	<input type="checkbox"/> SOIL GAS	<input checked="" type="checkbox"/> CT DPH
<input type="checkbox"/> TOXICITY	<input checked="" type="checkbox"/> SMEAR	<input checked="" type="checkbox"/> FIELD (CT DEEP)
<input type="checkbox"/> DIOXIN		
<input checked="" type="checkbox"/> ASBESTOS		
<input checked="" type="checkbox"/> OTHER: Radium (Ra-226)		

REMOVAL SITE INVESTIGATION

Receptors

	<u>Comments</u>
<input type="checkbox"/> Drinking Water: <input type="checkbox"/> Private: <input type="checkbox"/> Municipal:	
<input checked="" type="checkbox"/> Groundwater:	Elevated levels of VOCs have been detected in groundwater off site, in the vicinity of the site.
<input checked="" type="checkbox"/> Unrestricted Access:	Pedestrian access is partially restricted by fencing of selected areas and boarding of entrance ways to the vacant buildings. However, according to WFD personnel and site observations, people continue to access the site and buildings. In addition, exterior portions of the western portion of 0 and 39 Cherry Avenue property appear to be used by workers and tenants of the adjacent buildings (13 Cherry Avenue and 232 North Main Street properties). Vehicle access is generally unrestricted along the western portion of 0 and 39 Cherry Avenue property as it is used for accessing the rear (eastern) portions of the 13 Cherry Avenue and 232 North Elm Street properties. START personnel observed three delivery vehicles labeled as "New Opportunities, Inc., Meals on Wheels" and "Meals in Motion" parked on 39 Cherry Avenue Property, where Building 2 had been demolished.
<input checked="" type="checkbox"/> Population in Proximity:	There are approximately 2,397 and 25,883 people residing within a 0.25-mile radius and a 1-mile radius of the site, respectively. An estimated 138,175 people reside within 4-radial miles of the site.
<input checked="" type="checkbox"/> Sensitive Ecosystem:	Sensitive environments (including wetlands) are located along the Naugatuck River, which is located approximately 1 mile downstream of the site. No sensitive environments are known to occur along the Great Brook underground diversion channel.
<input type="checkbox"/> Other:	

Additional Procedures for Site Determination

Biological Evaluation **ATSDR** **None**

To be determined by the On-Scene Coordinator (OSC).

REMOVAL SITE INVESTIGATION

Site Determination

Depending on further information, criteria that may be met by the site include 40 CFR 300.415 [b] [2], parts:

- i. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants.
- ii. Actual or potential contamination of drinking water supplies or sensitive ecosystems.
- iii. Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release.
- iv. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate.
- v. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.
- vi. Threat of fire or explosion.
- vii. The availability of other appropriate federal or state response mechanisms to respond to the release.
- viii. Other situations or factors that may pose threats to public health or welfare or the environment.

Report Generation

Originator: Bonnie Mace
Affiliation: Weston Solutions, Inc. (START)
TDD No.: TO1-01-19-06-0002

Date: 6 November 2019
Telephone: (978) 552-2131
Task No.: 0317

II. Narrative Chronology

Narrative Chronology

SITE DESCRIPTION

The Former Waterbury Clock Factory Site (the Site) is located in a mixed industrial, commercial, and residential area in Waterbury, Connecticut (CT) (see Appendix A, Figure 1) [1]. The buildings of interest at the site include those at 215 Cherry Street (Buildings 3/R and 4/T), 177 Cherry Street (Buildings 6/K and 7/L), and 39 Cherry Street (Building 1/G) (Figure 2) [7]. These 4- to 6-story buildings were constructed of brick and wood during the late 1880s/early 1900s, and are in various (sometime severe) states of disrepair. Most of the buildings of concern have deteriorated roofs, with some collapsed floor areas. There are other buildings adjacent and/or connected to the buildings of interest that are part of the Former Waterbury Clock Factory complex that have been remediated and rehabilitated and are occupied by businesses, residents, and non-profit groups.

SITE BACKGROUND

The 2005 Phase I Environmental Site Assessment (ESA) prepared in March 2005 by Berkshire Environmental Services & Technology, LLC, identified the following historical uses of the subject property: clock manufacturing between approximately 1890 and the 1940s; offices, a bakery, a furnace company, clothing manufacturers, and tool and metal product production between the 1940s and the 1970s; clothing, handbag, and belt manufacturing between the 1970s and 2004; and vacant from 2004 until present. Numerous investigations of the Site buildings have occurred, and remediation activities have been conducted in other buildings within the former factory complex. The following paragraphs are a summary of the status and condition of the site buildings of concern [2, 3, 4, 5, 6, 7].

39 Cherry Avenue/Building 1 (or G)

Access: Access possible on all floors except the basement, and all floors in the northern ~2/3 of building toward K and L. Deteriorated or collapsed sections of floor and ceiling on all floors. Wind and weather restrictions per a licensed CT Professional Structural Engineer.

Radium: Basement and 6th floor not affected, <30 microRoentgens per hour ($\mu\text{R/hr}$); 2nd floor (machine shop) and 3rd floor (store room, hallway, and Liba room), multiple areas with elevated $\mu\text{R/hr}$ readings; 4th floor (store room) and 5th floor (rental area) with elevated levels.

Asbestos: Chrysotile asbestos-containing material (ACM) in roofing and flashing; ACM vapor barrier (brown) throughout buildings; 6th, 5th, 3rd, 1st floor, pipe insulation including 1st floor boiler room; 5th, 3rd, 2nd, 1st floor, ACM floor or ceiling tiles.

Lead: Negative except for wood posts, wood window units, and small amounts of brick wall primarily in stairwells; 98% of samples negative for lead (< 1 milligram/square centimeter). Total Characteristic Leaching Procedure (TCLP) 0.50 milligrams per Liter (mg/L).

Other: Possible drums/small containers 1st floor; three thermostats with mercury on 3rd floor; numerous light ballasts on all floors.

215 Cherry Street/Buildings 3 (or R) and 4 (or T)

Access: Access is possible on all floors. Deteriorated or collapsed sections of floor and ceiling on all floors. Wind and weather restrictions per a licensed CT Professional Structural Engineer.

Radium: Building 3/R on 2nd, 3rd, 4th, 5th, 6th floors (not basement); Building 4/T on 5th and 6th floor, possibly 3rd floor.

Asbestos: Chrysotile ACM in roofing and flashing; ACM vapor barrier (brown) throughout buildings; elevator house exterior and interior wall board, caulking; 5th floor pipe insulation and wall board.

Lead: Negative except for wood posts, wood window units, and small amounts of brick wall primarily in stairwells; all ceilings, beams, and floors, and 98% of brick wall samples were negative for lead. TCLP 0.50 mg/L.

Other: Possible drums/small containers 2nd and 5th floors; numerous light ballasts all floors. Volatile Organic Compounds (VOCs): 7,380 parts per billion (ppb) trichloroethylene (TCE) and 1,830 ppb tetrachloroethylene (PCE) in soils, and 7.7 ppb vinyl chloride (VC) in groundwater well MW-4 west of buildings at 215 Cherry Street and north of Building G.

177 Cherry Street/Buildings 6 (or K) and 7 (or L)

Access: No access to any areas of buildings. Internal structural failures. Wind and weather restrictions along the exterior perimeter of the building per a licensed CT Professional Structural Engineer.

Radium: Some elevated areas in both buildings but lesser contamination, < 50 μ R/hr.

Asbestos: Chrysotile ACM in roofing and flashing; ACM vapor barrier (brown) throughout buildings; 1st floor tile; window and door caulking; interior fiber board.

Lead: Negative except for any paint remaining around windows; buildings were gutted and sandblasted in the 1990s except for floors.

Other: VOCs: TCE in soils detected at 6,749 ppb north of Building 7.

SITE ACTIVITIES

Structural Assessment

On 8 July 2019, Weston Solutions, Inc. Superfund Technical Assessment and Response Team IV (START) member Eric Ackerman and START-subcontracted Professional Structural Engineer James Silva mobilized to the site to conduct a structural assessment of the Site buildings to provide general guidance during environmental investigation operations. A report detailing the inspection, entitled *Structural Assessment Report for the Former Waterbury Clock Factory, Cherry Street, Waterbury, Connecticut, August 1, 2019*, outlined the current conditions of the building along with

special considerations for vibration, inclement weather (rain/snow), and wind during environmental remediation operations [8].

Site Reconnaissance

On 4 September 2019, EPA On-Scene Coordinators (OSCs) Sherry Banks and Mike Cofsky; EPA Site Assessment Manager (SAM) Mandy Liao; EPA Radiation Program Manager/H&S Coordinator Tony Honnellio; EPA Community Involvement Coordinator (CIC) Darriel Swatts; EPA Health And Safety Specialist Intern Madeline Isenberg; EPA National Center for Radiation Field Operations/Radiological Emergency Response Team (NCRFO/RERT) members Mike Messer (Environmental Protection Specialist) and Scott Faller (Physical Scientist); Connecticut Department of Energy and Environmental Protection (CT DEEP) members Sheila Gleason (Project Manager) and Mike Firsick (Radiation Safety Officer); CT Department of Public Health (CT DPH) member Meg Harvey (Environmental & Occupational Health Assessment Program); members of the Waterbury Fire Department (WFD); and START members Ackerman and John Kelly mobilized to the Site to conduct a site reconnaissance.

START members initiated warm-up procedures for EPA radiation equipment and a photoionization detector (PID) in the parking lot of Home Depot located at 575 Bank Street, Waterbury, CT. START personnel bump tested air monitoring instruments, including a US Environmental (USE) MultiRAE Plus [with carbon monoxide (CO), hydrogen sulfide (H₂S), VOC, oxygen (O₂), and lower explosive limit (LEL) sensors], a USE Ludlum 19A Radiation meter, and an EPA Warehouse Ludlum 19A Radiation meter and a Ludlum Model 2241-2 w/44-9 Probe, and noted that background levels at the Home Depot parking lot, within the southern portion of the City, away from the site, were as follows: CO = 0 parts per million (ppm), H₂S = 0 ppm, VOC = 0 units, O₂ = 20.9%, LEL = 0 ppm; and radiation levels were USE Ludlum 19A = 8-10 µR/hr, EPA Ludlum 19A = 10-12 µR/hr, and Ludlum Model 2241-2 with a 44-9 Probe = 35 to 60 counts per minute (CPM) [8-9].

START member Ackerman handed out EPA warehouse electronic dosimeters (Siemens Mk2 Personal Dosimeters) to EPA, CT DEEP, and CT DPH personnel. Background levels on the EPA Ludlum 19A were 15-20 µR/hr on the 39 Cherry Avenue lot in the area of the former Building 2.

START members Kelly and Ackerman donned Weston START Thermo Scientific Electronic Personal Dosimeters and Landauer Luxel+ optically stimulated luminescence (OSL) dosimeter badges.

OSC Banks, START member Ackerman, and EPA Radiation Program Manager Honnellio conducted a tailgate health and safety meeting and discussed site history, site lay-out (which parcels/addresses make up the site), building configuration/numbering, and details of the Site-Specific Health and Safety Plan (HASP), including radiological, physical, chemical, and biological hazards associated with the property, personal protective equipment (PPE) requirements (including hard hats at all times on site), emergency contacts (local Police/Fire), and directions to the nearest hospital. Emphasis and details were noted regarding the radiation levels noted during previous reconnaissance activities, awareness of surroundings, staying with the group, volatile organic compounds (VOCs) detected in soil and groundwater during previous investigations, and the findings of the 1 August 2019 Structural Assessment Report, including the conditions and

structural integrity of the various buildings on site, and the exterior fall zones and hazards noted in the report. The site HASP was prepared as a separate document, entitled *Weston Solutions, Inc., Region I START IV Site Health and Safety Plan (HASP) for the Former Waterbury Clock Factory Preliminary Assessment/Site Investigation, Waterbury, Connecticut [10]*.

OSC Banks provided a general overview of the plan for the reconnaissance and logistics.

START members Ackerman and Kelly signed the Site-Specific HASP and tailgate attendance sheet.

All personnel conducted a reconnaissance of the exterior of the various site buildings, noting their various states of disrepair.

START member Kelly and EPA SAM Liao followed START member Ackerman and EPA personnel into the interior of Building 3/R to observe one of the locations of previously detected high radiation levels. Entrance to the building was through an enclosed wooden walkway along the southern side of the building. START member Kelly noted that floors and walls at various locations were partially structurally compromised.

START member Kelly noted a high level of 350 $\mu\text{R/hr}$ on the EPA Ludlum 19A in the vicinity of the interior side of the loading dock (eastern wall) near the location where elevated radiation level measurements had been noted outside the building. EPA NCRFO/RERT member Faller noted that he obtained a reading of 400-450 $\mu\text{R/hr}$ on his radiation unit. START member Kelly noted that Faller had scanned a large area of the wall and floor within this area and obtained the higher result near the base of the wall at floor level. EPA Faller also noted that he had also obtained elevated readings, up to 250 $\mu\text{R/hr}$ on his radiation unit, along an interior hallway wall within the interior of Building 3/R, west of the loading dock area. No PID readings were noted above background within the areas of Building 3/R entered by START.

EPA and START staff exited the building and were frisked for residual radiation on their hands, clothing, and boots. No elevated radiation readings were noted above background levels using the Ludlum Model 2241-2 with a 44-9 Probe (Pancake probe).

Group discussions were held regarding sampling strategies due to the poor structural integrity of the building and potential fall hazards. START members Kelly and Ackerman proceeded to conduct photodocumentation prior to departing the site.

Sampling Activities

On 21 October 2019, EPA OSC Banks, Agency for Toxic Substances and Disease Registry (ATSDR) representative Michael Brooks, CT DEEP members Firsick and Stuart Torf, members of the WFD, and START members Ackerman, Kelly, Paul Callahan, and Bonnie Mace mobilized to the site to conduct sampling activities.

START member Callahan conducted a tailgate health and safety meeting and discussed site history, site lay-out (which parcels/addresses make up the site), building configuration/numbering, and details of the Site-Specific HASP. Emphasis and details were noted regarding the radiation

levels noted during previous reconnaissance activities, awareness of surroundings, staying with the group, and the finding of the 1 August 2019 Structural Assessment Report, including the conditions and structural integrity of the various buildings on site, and the exterior fall zones and hazards noted in the Structural Assessment Report.

START personnel reviewed and signed the Site-Specific HASP and tailgate attendance sheet.

All personnel conducted a walk-through of the site buildings, noting the areas of disrepair and radiation levels. START personnel would conduct a full evaluation of the building conditions, radiation levels, and collect radiation smear samples and ACM samples the following day.

Following the walk-through, all personnel departed the site.

On 22 October 2019, EPA OSC Banks, ATSDR representative Brooks, CT DEEP members Firsick, Torf, Shannon Perry, and Lilly Quetschke, members of the WFD, and START members Ackerman, Kelly, Callahan, and Mace mobilized to the site to initiate sampling activities.

START member Callahan conducted a tailgate health and safety meeting, and START member Ackerman discussed the day's operations, before all personnel signed the tailgate attendance sheet.

EPA and CT DEEP personnel screened and collected eight surface soil samples and one catch basin soil sample (SS-01 through SS-08 and CB-01) from locations surrounding the buildings (see Appendix A, Figure 3) [11]. The soil samples were submitted to the CT DPH laboratory for Radium (Ra-226) analysis. Sampling activities were performed in accordance with the site Sampling and Analysis Plan (SAP), which has been prepared as a separate document, entitled *Sampling and Analysis Plan for the Former Waterbury Clock Factory Site, Waterbury, Connecticut* [12].

START personnel conducted a full assessment of each building's floors, including recording radiation levels (see Appendix A, Figures 4 through 6C).

The buildings were surveyed using a Ludlum Model 19A MicroR meter (Model 19A), a Ludlum Model 192 MicroR meter (Model 192), a Ludlum Model 2241 with a 44-9 pancake probe (Model 2241), Ludlum Model 44-10 with a 2-inch x 2-inch sodium iodide (NaI) probe (Model 44-10), and a Ludlum Model 77-6 with a Stretch Scope (1.25-inch NaI probe) (Model 77-6).

Background readings were as follows: Model 19A (10-12 $\mu\text{R}/\text{Hr}$), Model 192 (10-12 $\mu\text{R}/\text{Hr}$), Model 2241 (40-70 CPM), Model 44-10 (3,500 CPM), and Model 77-6 (3-5 $\mu\text{R}/\text{Hr}$).

In addition, START personnel collected 13 smear samples (SM-01 through SM-13) and six bulk asbestos samples (ACM-01 through ACM-06) from areas inside the buildings [13].

Following surveying and sampling activities, all personnel departed the site.

On 23 October 2019, EPA OSC Banks, ATSDR representative Brooks, CT DEEP members Firsick, Torf, Perry, and Quetschke, members of the WFD, and START members Ackerman, Kelly, Callahan, and Mace mobilized to the site to complete sampling activities.

START member Callahan conducted a tailgate health and safety meeting, and START member Ackerman discussed the day's operations, before all personnel signed the tailgate attendance sheet. EPA and START personnel continued to complete the building assessments. START member Ackerman used an extension ladder to access the third and fourth floors of Buildings K and L from the exterior due to the building's dilapidated interior condition. START member Ackerman scanned the window sills and interior walls below the window sills with the Model 2241 with 44-10 pancake probe, and used the Model 77-6 with the 8-foot Stretch scope to scan the floors and ceilings of Buildings K and L. The readings from the window sills on Buildings K and L were all below background levels. The readings from window sills, floors, and ceilings along Building K were also all below background levels. On the western portion of Building L, on the southern side at the fifth window from the southwest corner, there was an elevated reading of 45 $\mu\text{R/hr}$ on the floor. All other readings were below background levels. In addition, at the second and third windows of Building K, there was an elevated reading of 90-100 $\mu\text{R/Hr}$ on the floor, approximately 5 feet from the window. All other readings for Building K were below background (see Appendix A, Figure 7).

CT DEEP personnel ran the smear samples on the Ludlum 3030. A summary of Ludlum 3030 sample counting results for smear samples is found in Appendix B, Table 1.

START member Mace labelled and packaged the soil and bulk asbestos samples. The soil samples were relinquished to CT DEEP member Firsick for delivery to the CT DPH laboratory in Rocky Hill, CT for Ra-226 analysis. The bulk asbestos samples were submitted to EPA Laboratory Services and Applied Sciences Division (LSASD) New England Regional Laboratory (NERL) in North Chelmsford, Massachusetts for asbestos analysis. Samples were documented on the chain-of-custody record (see Appendix D). Sample locations are shown on Figures in Appendix A.

START personnel photodocumented building conditions and sample locations (see Appendix C, Photodocumentation Log). All surface soil sample locations were documented using a Trimble™ Global Positioning System (GPS) [14].

On 5 November 2019, START received the analytical data results from LSASD [15]. On 19 November 2019, START received the analytical data results from CT DPH [16]. These data are summarized in Appendix B, and complete analytical results are included in Appendix D.

Analytical Data Summaries

Smear Samples

Field analytical results with background subtraction and correction factors applied for alpha (α) and beta (β) in both counts per minute (CPM) and disintegrations per minute (DPM) ranged from 0 CPM and 0 DPM α and β (in T4SM-01), to 2,911 CPM and 14,555 DPM α and 5,902 CPM and 23,608 DPM β (in R1SM-11). Smear sample T4SM-01 was collected from Building T, Floor 4, and smear sample R1SM-11 was collected from Building R, Floor 1 (see Appendix B, Table 1, and Appendix D, Analytical Data).

Asbestos Samples

Six bulk asbestos samples were collected and delivered to NERL. The samples were analyzed for bulk asbestos using EPA Region 1 SOP EIASOP-IGNASBD2.

Analytical results of the bulk asbestos samples indicated that one of the six asbestos minerals was detected above the laboratory reporting limit (RL) in three of the six samples: chrysotile (at a maximum concentration of 50% in RT2-3 ACM-03). Actinolite, amosite, anthophyllite, crocidolite, and tremolite were not detected above the laboratory RLs in any of the samples submitted for bulk asbestos analysis (see Appendix B, Table 2, and Appendix D, Analytical Data) [15].

Soil Samples

Concentrations of Ra-226 in the soil samples ranged from 0.048 +/- 0.44 picocuries per gram (pCi/g) (in SS-3) to 0.98 +/-0.35 pCi/g (in CB-1). All of the soil sample results were below the concentration criteria for soil of 5 pCi/g (see Appendix B, Table 3, and Appendix D, Analytical Data) [16].

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- [10] Weston Solutions, Inc. 2019. *Removal Program Site Health And Safety Plan for the Former Waterbury Clock Factory Site, Preliminary Assessment/Site Investigation, Waterbury, Connecticut. June.*
- [11] Weston Solutions, Inc. 2015. *Standard Operating Procedure for Surface and Subsurface Soil Sampling, SOP No. WSI/S4-001*, Superfund Technical Assessment and Response Team IV (START), North Billerica, MA. September.
- [12] Weston Solutions, Inc. 2018. *Sampling & Analysis Plan for the Former Waterbury Clock Factory Site, Waterbury, New Haven County, Connecticut. September.*
- [13] Weston Solutions, Inc. 2015. *Standard Operating Procedure for Asbestos Sampling, SOP No. WSI/S4-019*, Superfund Technical Assessment and Response Team IV (START), North Billerica, MA. September.
- [14] Weston Solutions, Inc. 2015. *Standard Operating Procedure for Trimble™ GeoXT GeoExplorer® 2008 Series Global Positioning System (GPS), SOP No. WSI/S4-020*,

Superfund Technical Assessment and Response Team IV (START), North Billerica, MA. September.

- [15] U.S. EPA (Environmental Protection Agency), New England Regional Laboratory, Office of Environmental Measurement and Evaluation. 2019. Laboratory Report, Project Number 19100036, Waterbury Clock Factory, Bulk Asbestos Analysis by PLM. 4 November.
- [16] Connecticut Department of Public Health (CT DPH). 2019. Lab Test Report, Re: Work Order 886516, Work ID Waterbury Clock 20191022 SO S. 19 November.

III. Appendices

Appendix A

Figures

- Figure 1 - Site Location Map
- Figure 2 - Site Map
- Figure 3 - Surface Soil Sample Location Map
- Figure 4 - Building G - First Floor Radiation Readings and Building Conditions
- Figure 4A - Building G - Second Floor Radiation Readings and Building Conditions
- Figure 4B - Building G - Third Floor Radiation Readings and Building Conditions
- Figure 4C - Building G - Fourth Floor Radiation Readings and Building Conditions
- Figure 5 - Building T - First Floor Radiation Readings and Building Conditions
- Figure 5A - Building T - Second Floor Radiation Readings and Building Conditions
- Figure 5B - Building T - Third Floor Radiation Readings and Building Conditions
- Figure 5C - Building T - Fourth Floor Radiation Readings and Building Conditions
- Figure 6 - Building R - First Floor Radiation Readings and Building Conditions
- Figure 6A - Building R - Second Floor Radiation Readings and Building Conditions
- Figure 6B - Building R - Third Floor Radiation Readings and Building Conditions
- Figure 6C - Building R - Fourth Floor Radiation Readings and Building Conditions
- Figure 7 - Building K and L Radiation Readings

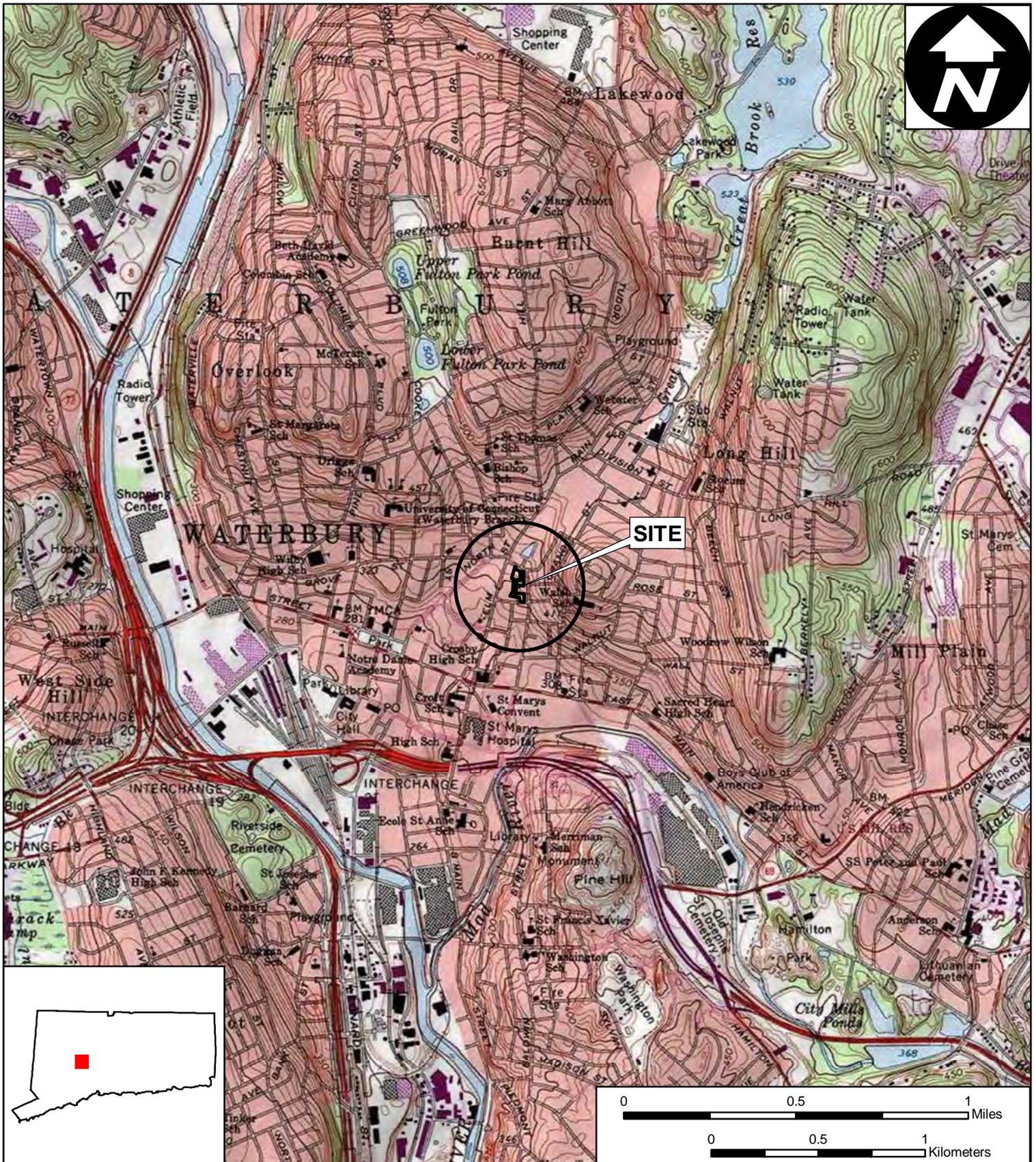


Figure 1

Site Location Map

**Former Waterbury Clock Factory
39 Cherry Avenue,
177 & 215 Cherry Street
Waterbury, Connecticut**

**EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01**

TDD Number: TO1-01-19-06-0002
Created by: B. Mace
Created on: 9 September 2019
Modified by: B. Mace
Modified on: 5 November 2019

Data Sources:

Topos: MicroPath/USGS/USA Topo Maps
Quadrangle Name: Waterbury, CT
All other data: START



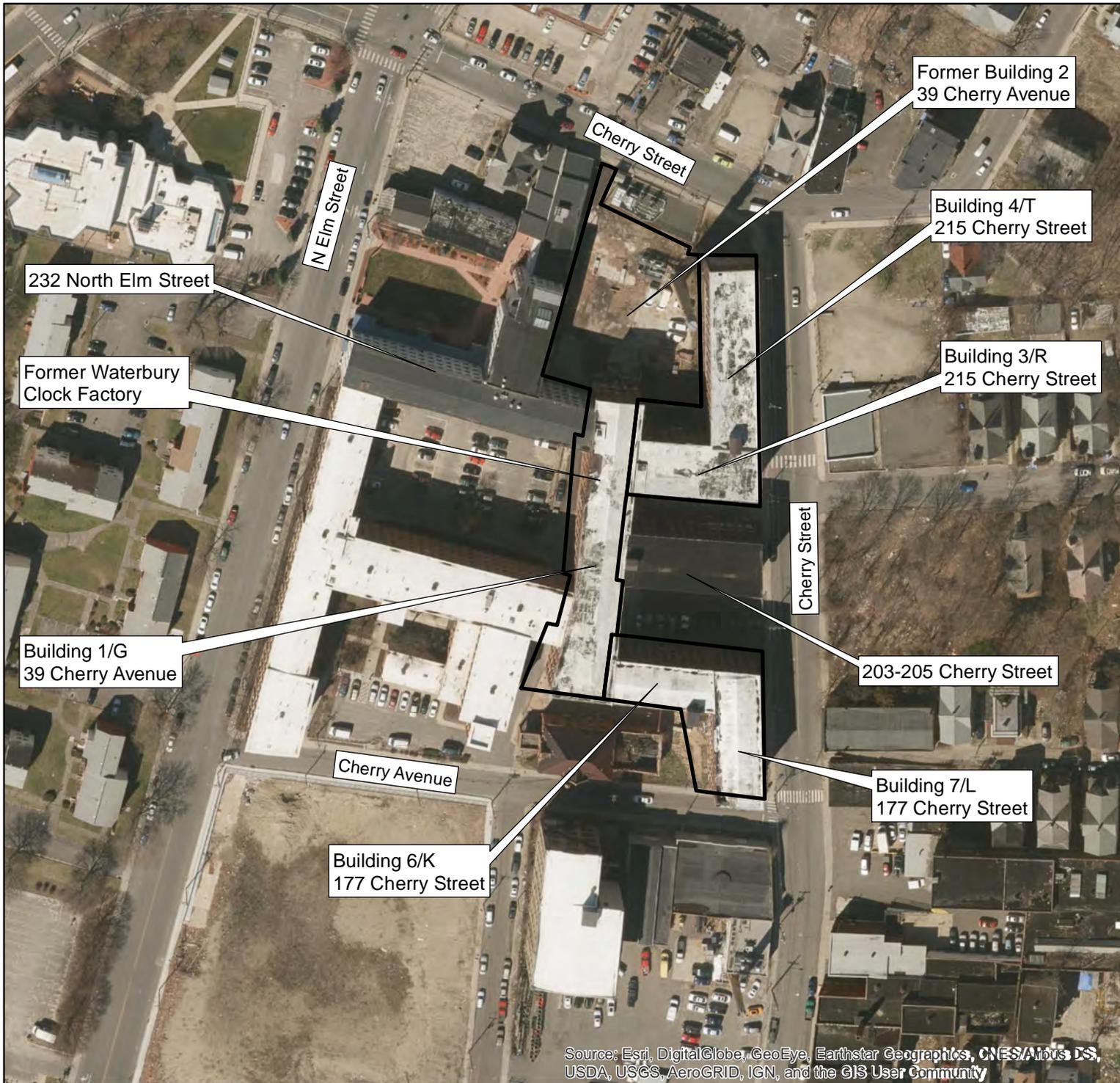


Figure 2
Site Map
Former Waterbury Clock Factory
39 Cherry Avenue,
177 & 215 Cherry Street
Waterbury, Connecticut

EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01
TDD Number: TO1-01-19-06-0002
Created by: B. Mace
Created on: 9 September 2019
Modified by: B. Mace
Modified on: 5 November 2019

LEGEND

 Site Boundary

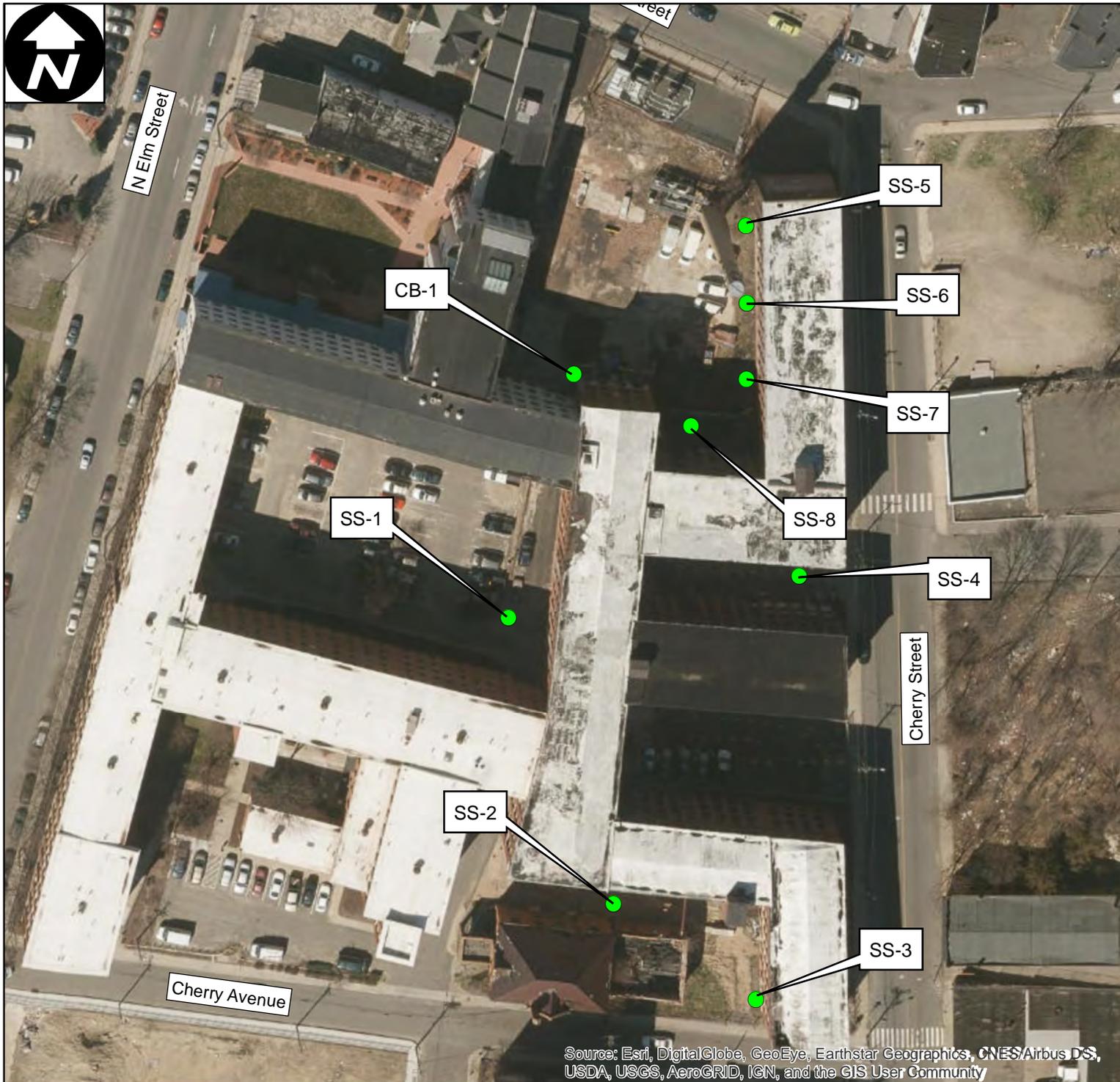



 0 100 200
 Feet

Data Sources:
 Imagery: ESRI, i-cubed, USDA FSA, USGS
 AEX, GeoEye, Getmapping, Aerogrid, IGP
 Topos: MicroPath
 All other data: START



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 3
Surface Soil
Sample Location Map
Former Waterbury Clock Factory
177 & 215 Cherry Street
Waterbury, Connecticut

EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01
TDD Number: TO1-01-19-06-0002
Created by: B. Mace
Created on: 9 September 2019
Modified by: B. Mace
Modified on: 12 November 2019

LEGEND

● Surface Soil Sample Location

Data Sources:
 Imagery: ESRI, i-cubed, USDA FSA, USGS AEX, GeoEye, Getmapping, Aerogrid, IGP
 Topos: MicroPath
 All other data: START



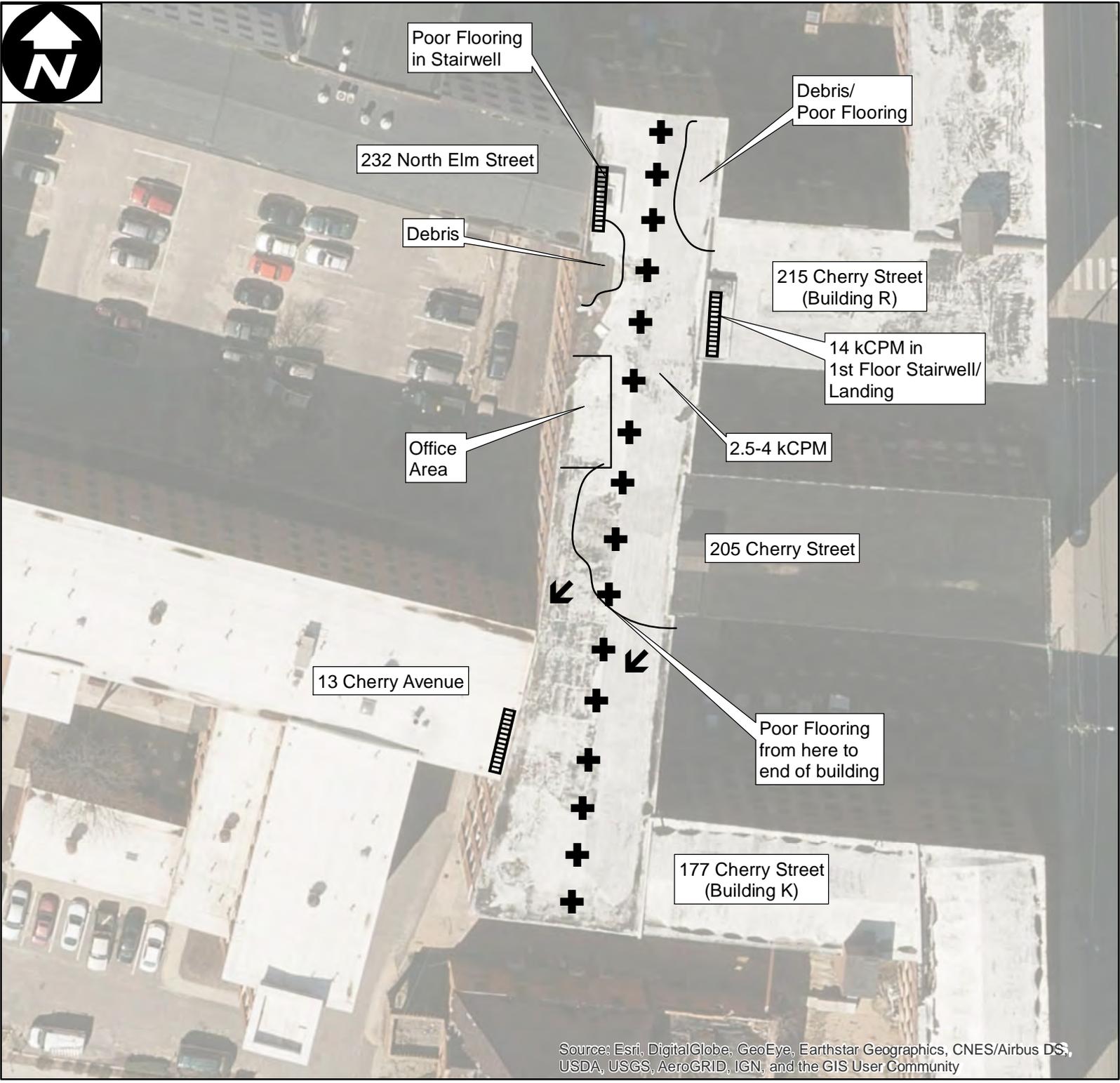


Figure 4
Building G - First Floor
Radiation Readings
and Building Conditions

Former Waterbury Clock Factory
39 Cherry Avenue
Waterbury, Connecticut

EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01
TDD Number: TO1-01-19-06-0002
Created by: B. Mace
Created on: 9 September 2019
Modified by: B. Mace
Modified on: 12 November 2019

LEGEND

+ Approx Location of Support Columns

 Stairwell

kCPM = Kilo Counts per Minute

Radiation readings taken using Ludlum Model 2241 with 44-9 probe.

0 40 80



Feet

Data Sources:
 Imagery: ESRI, i-cubed, USDA FSA, USGS AEX, GeoEye, Getmapping, Aerogrid, IGP
 Topos: MicroPath
 All other data: START



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

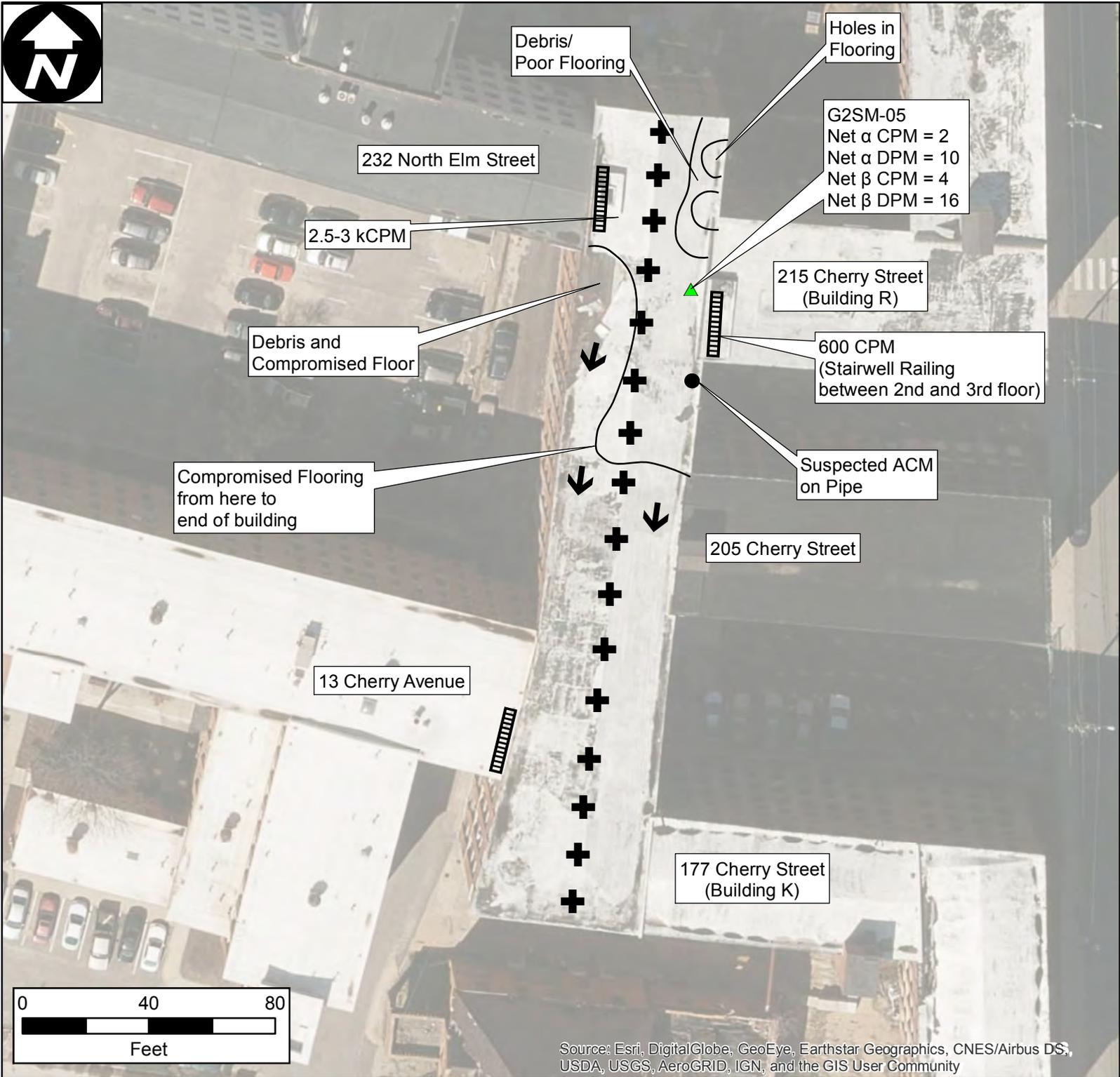


Figure 4A
Building G - Second Floor
Radiation Readings
and Building Conditions

Former Waterbury Clock Factory
39 Cherry Avenue
Waterbury, Connecticut

EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01
TDD Number: TO1-01-19-06-0002
Created by: B. Mace
Created on: 9 September 2019
Modified by: B. Mace
Modified on: 12 December 2019

LEGEND

-  Smear Sample Locations
-  Approx Location of Support Columns
-  Stairwell

kCPM = Kilo Counts per Minute
 CPM = Counts per Minute
 Radiation readings taken using
 Ludlum Model 2241 with 44-9 probe.
 ACM = Asbestos-containing material
 Net α CPM = Net Alpha Counts per minute
 Net α DPM = Net Alpha Disintegrations
 per minute
 Net β CPM = Net Beta Counts per minute
 Net β DPM = Net Beta Disintegrations
 per minute

Data Sources:
 Imagery: ESRI, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
 USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Topos: MicroPath
 All other data: START



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
 USDA, USGS, AeroGRID, IGN, and the GIS User Community

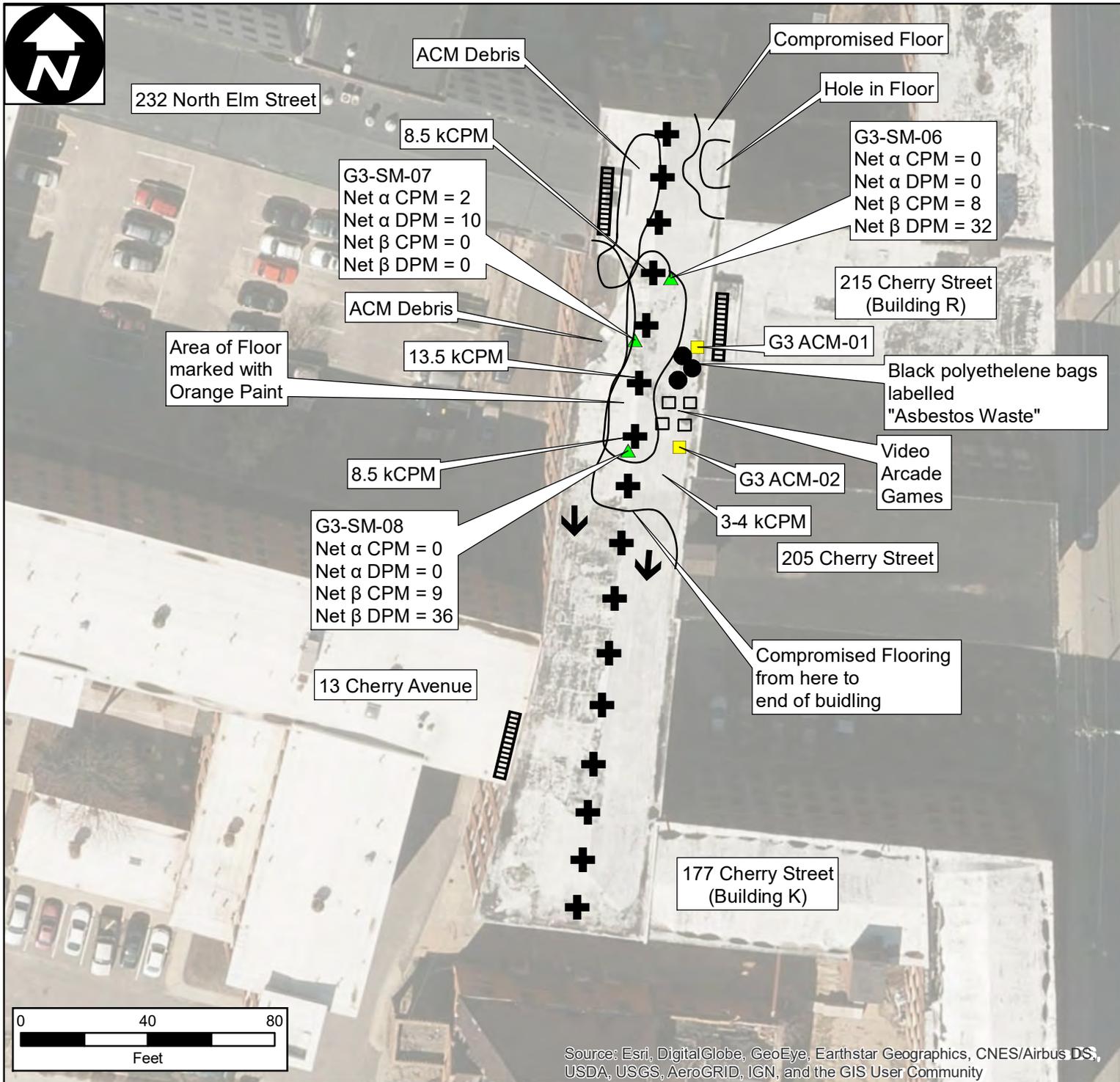


Figure 4B
Building G - Third Floor
Radiation Readings
and Building Conditions

Former Waterbury Clock Factory
39 Cherry Avenue
Waterbury, Connecticut

EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01
TDD Number: TO1-01-19-06-0002
Created by: B. Mace
Created on: 9 September 2019
Modified by: B. Mace
Modified on: 12 December 2019

LEGEND

- ACM Samples
- ▲ Smear Sample Locations
- +** Approx Location of Support Columns
- Stairwell

kCPM = Kilo Counts per Minute
Radiation readings taken using Ludlum Model 2241 with 44-9 probe.
ACM = Asbestos-containing material
Net α CPM = Net Alpha Counts per minute
Net α DPM = Net Alpha Disintegrations per minute
Net β CPM = Net Beta Counts per minute
Net β DPM = Net Beta Disintegrations per minute

Data Sources:

Imagery: ESRI, i-cubed, USDA FSA, USGS AEX, GeoEye, Getmapping, Aerogrid, IGP
Topos: MicroPath
All other data: START



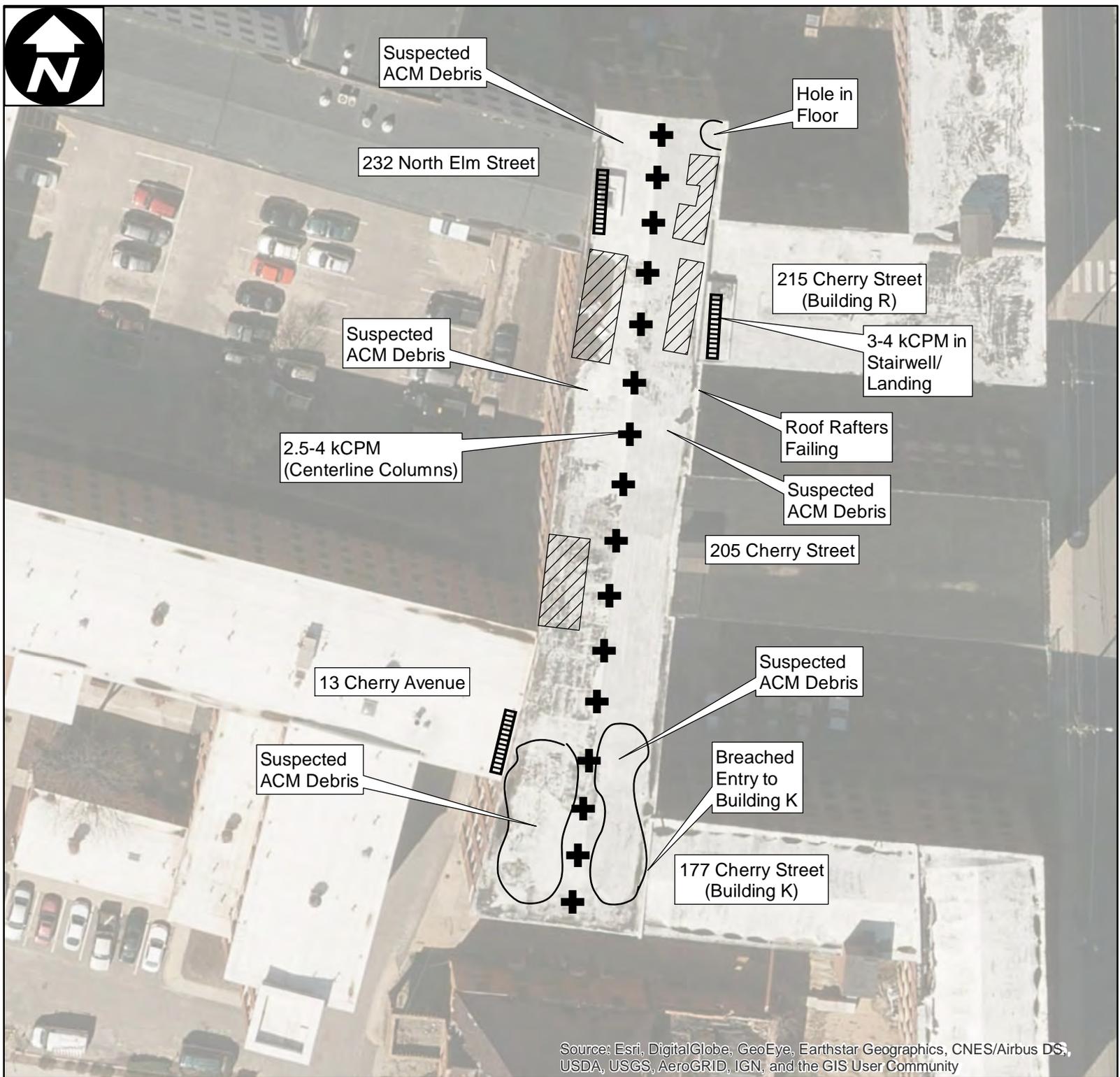


Figure 4C

**Building G - Fourth Floor
Radiation Readings
and Building Conditions**

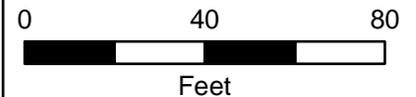
**Former Waterbury Clock Factory
39 Cherry Avenue
Waterbury, Connecticut**

**EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01
TDD Number: TO1-01-19-06-0002
Created by: B. Mace
Created on: 9 September 2019
Modified by: B. Mace
Modified on: 12 November 2019**

LEGEND

-  Approx Location of Support Columns
-  Stairwell
-  Area of Floor Remediated (Removed)

kCPM = Kilo Counts per Minute
Radiation readings taken using
Ludlum Model 2241 with 44-9 probe.
ACM = Asbestos-containing material



Data Sources:

Imagery: ESRI, i-cubed, USDA FSA, USGS
AEX, GeoEye, Getmapping, Aerogrid, IGP
Topos: MicroPath
All other data: START



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



15-20 μ R/Hr
Parking Area,
Former Building 2
(Ludlum Model 19A)

Office
Area

> 40 μ R/Hr
Just inside Door
(Ludlum Model 19A)

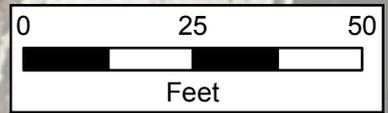
215 Cherry Street
(Building R)

Poor
Collapsing
Floor

Very Poor Wet
Collapsing
Floor

T1SM-04
Net α CPM = 1
Net α DPM = 5
Net β CPM = 2
Net β DPM = 8

11.5 kCPM
13.8 kCPM



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 5 Building T - First Floor Radiation Readings and Building Conditions

Former Waterbury Clock Factory
215 Cherry Street
Waterbury, Connecticut

EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01
TDD Number: TO1-01-19-06-0002
Created by: B. Mace
Created on: 9 September 2019
Modified by: B. Mace
Modified on: 17 December 2019

Legend

- Smear Sample Locations
- Approx Location of Support Columns
- Stairwell

kCPM = Kilo Counts per Minute
Radiation readings taken using
Ludlum Model 2241 with 44-9 probe.
> = Greater than
 μ R/Hr = microRoentgens per hour
Net α CPM = Net Alpha Counts per minute
Net α DPM = Net Alpha Disintegrations
per minute
Net β CPM = Net Beta Counts per minute
Net β DPM = Net Beta Disintegrations
per minute

Data Sources:
Imagery: ESRI, i-cubed, USDA FSA, USGS
AEX, GeoEye, Getmapping, Aerogrid, IGP
Topos: MicroPath
All other data: START



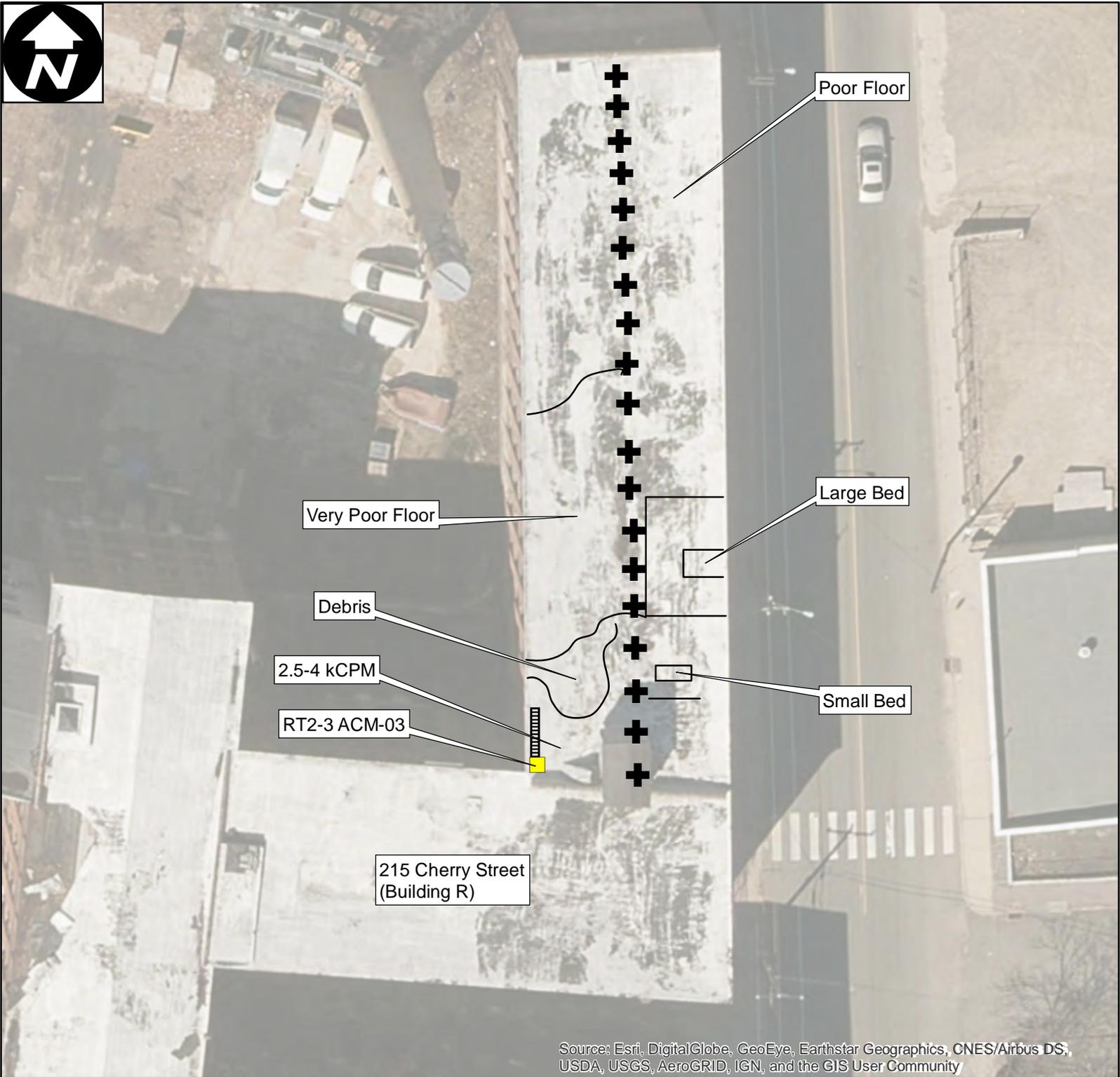


Figure 5A
Building T - Second Floor
Radiation Readings
and Building Conditions
 Former Waterbury Clock Factory
 215 Cherry Street
 Waterbury, Connecticut

EPA Region I
 Superfund Technical Assessment and
 Response Team (START) IV
 Contract No. EP-S3-15-01
 TDD Number: TO1-01-19-06-0002
 Created by: B. Mace
 Created on: 9 September 2019
 Modified by: B. Mace
 Modified on: 22 November 2019

Legend

- ACM Samples
- + Approx Location of Support Columns
- Stairwell

kCPM = Kilo Counts per Minute
 Radiation readings taken using
 Ludlum Model 2241 with 44-9 probe.

0 25 50
 ───────────────────┬──────────────────┬──────────────────
 Feet

Data Sources:
 Imagery: ESRI, i-cubed, USDA FSA, USGS
 AEX, GeoEye, Getmapping, Aerogrid, IGP
 Topos: MicroPath
 All other data: START



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, ONES/Airbus DS,
 USDA, USGS, AeroGRID, IGN, and the GIS User Community

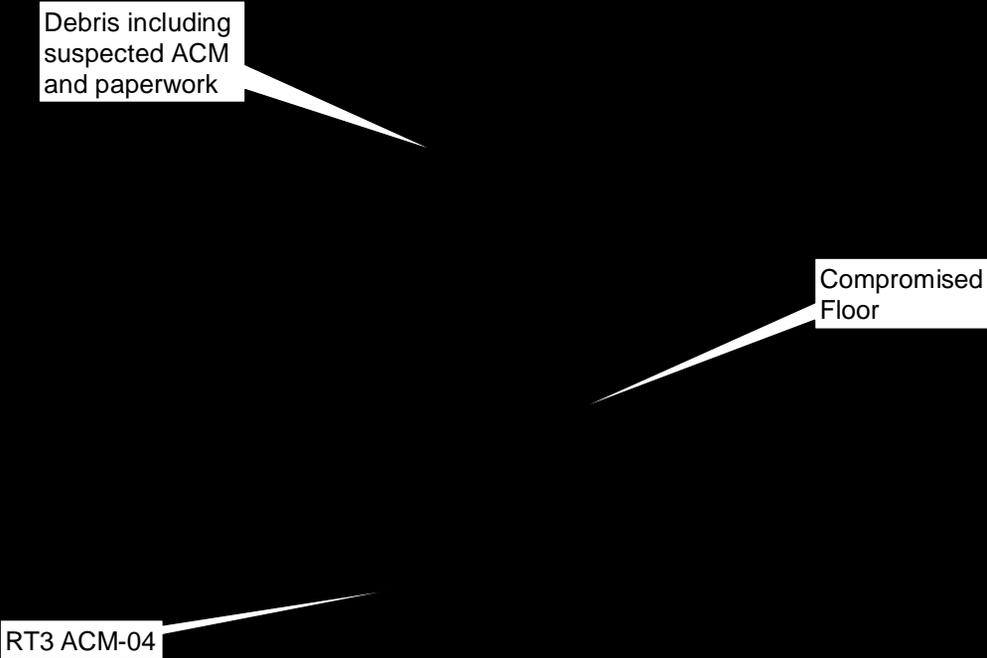


Figure 5B
Building T - Third Floor
Radiation Readings
and Building Conditions

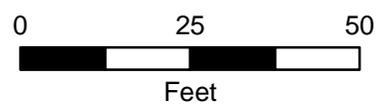
Former Waterbury Clock Factory
215 Cherry Street
Waterbury, Connecticut

EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01
TDD Number: TO1-01-19-06-0002
Created by: B. Mace
Created on: 9 September 2019
Modified by: B. Mace
Modified on: 12 November 2019

Legend

-  ACM Samples
-  Approx Location of Support Columns
-  Stairwell

kCPM = Kilo Counts per Minute
Radiation readings taken using
Ludlum Model 2241 with 44-9 probe.



Data Sources:
Imagery: ESRI, i-cubed, USDA FSA, USGS
AEX, GeoEye, Getmapping, Aerogrid, IGP
Topos: MicroPath
All other data: START

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community





Fiber Drums

Clear Plastic
Floor Questionable

Orange Paint
on Column

T4SM-01
Net α CPM = 0
Net α DPM = 0
Net β CPM = 0
Net β DPM = 0

Figure 5C
Building T - Fourth Floor
Radiation Readings
and Building Conditions

Former Waterbury Clock Factory
215 Cherry Street
Waterbury, Connecticut

EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01

TDD Number: TO1-01-19-06-0002

Created by: B. Mace

Created on: 9 September 2019

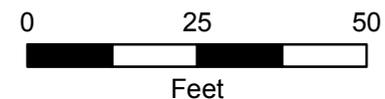
Modified by: B. Mace

Modified on: 12 December 2019

Legend

-  Smear Sample Locations
-  Approx Location of Support Columns
-  Stairwell

kCPM = Kilo Counts per Minute
Radiation readings taken using
Ludlum Model 2241 with 44-9 probe.
Net α CPM = Net Alpha Counts per minute
Net α DPM = Net Alpha Disintegrations
per minute
Net β CPM = Net Beta Counts per minute
Net β DPM = Net Beta Disintegrations
per minute



Data Sources:

Imagery: ESRI, i-cubed, USDA FSA, USGS
AEX, GeoEye, Getmapping, Aerogrid, IGP
Topos: MicroPath
All other data: START



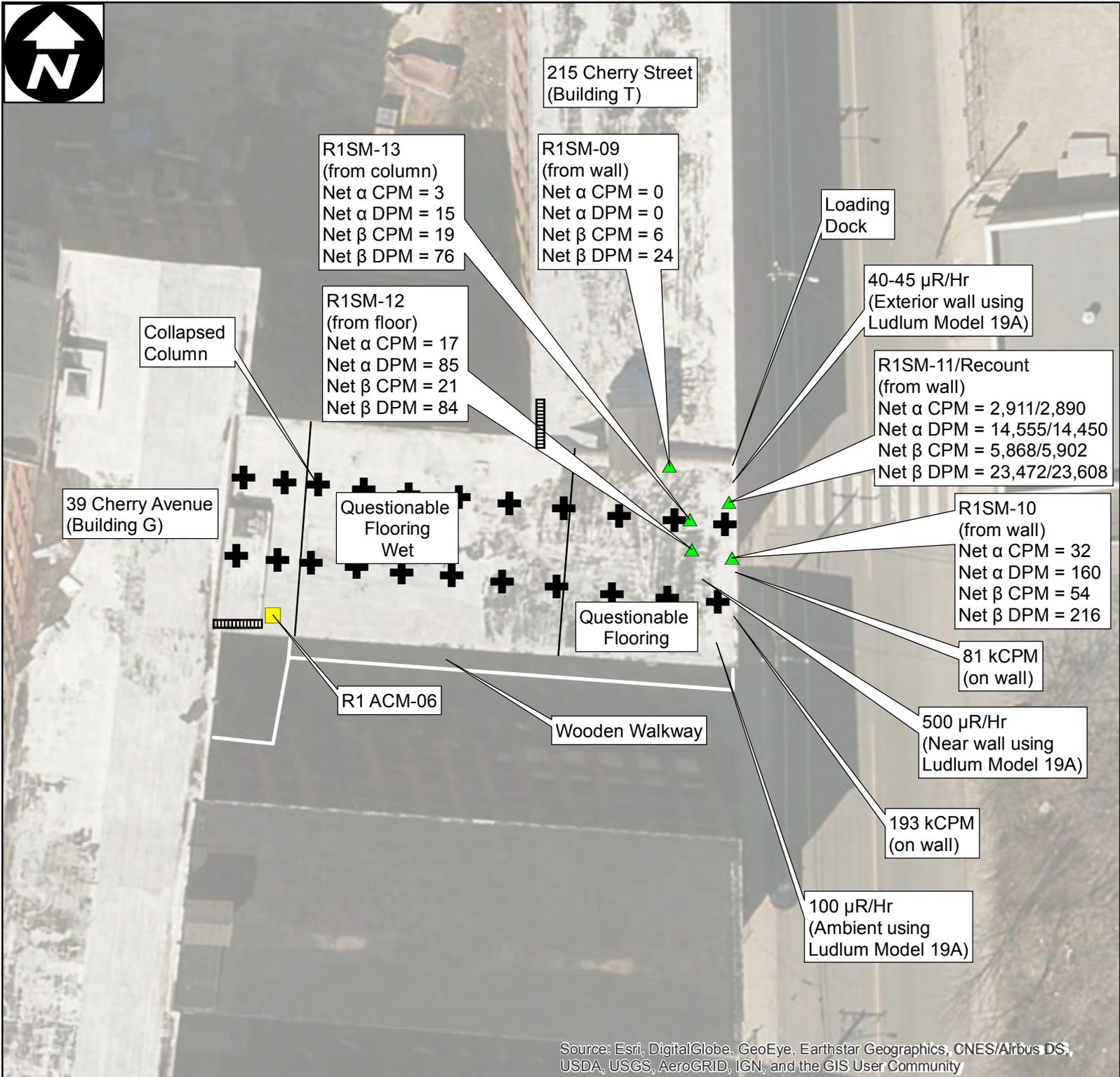


Figure 6
Building R - First Floor
Radiation Readings
and Building Conditions
Former Waterbury Clock Factory
215 Cherry Street
Waterbury, Connecticut

EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01
TDD Number: TO1-01-19-06-0002
Created by: B. Mace
Created on: 9 September 2019
Modified by: B. Mace
Modified on: 17 December 2019

Legend

- ▲ Smear Sample Locations
- ACM Samples
- +** Approx Location of Support Columns
- Stairwell

kCPM = Kilo Counts per Minute
 Radiation readings taken using Ludlum Model 2241 with 44-9 probe.
 µR/Hr = microRoentgens per hour
 Net α CPM = Net Alpha Counts per minute
 Net α DPM = Net Alpha Disintegrations per minute
 Net β CPM = Net Beta Counts per minute
 Net β DPM = Net Beta Disintegrations per minute

0 25 50
 ───────────────────┬──────────────────┬──────────────────
 Feet

Data Sources:
 Imagery: ESRI, i-cubed, USDA FSA, USGS AEX, GeoEye, Getmapping, Aerogrid, IGP
 Topos: MicroPath
 All other data: START



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Figure 6A
Building R - Second Floor
Radiation Readings
and Building Conditions
Former Waterbury Clock Factory
215 Cherry Street
Waterbury, Connecticut

EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01
TDD Number: TO1-01-19-06-0002
Created by: B. Mace
Created on: 9 September 2019
Modified by: B. Mace
Modified on: 12 December 2019

Legend

- Smear Sample Locations
- Approx Location of Support Columns
- Stairwell

kCPM = Kilo Counts per Minute
 Radiation readings taken using
 Ludlum Model 2241 with 44-9 probe.
 Net α CPM = Net Alpha Counts per minute
 Net α DPM = Net Alpha Disintegrations
 per minute
 Net β CPM = Net Beta Counts per minute
 Net β DPM = Net Beta Disintegrations
 per minute

0 25 50

 Feet

Data Sources:
 Imagery: ESRI, i-cubed, USDA FSA, USGS
 AEX, GeoEye, Getmapping, Aerogrid, IGP
 Topos: MicroPath
 All other data: START



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
 USDA, USGS, AeroGRID, IGN, and the GIS User Community



Figure 6B
Building R - Third Floor
Radiation Readings
and Building Conditions
Former Waterbury Clock Factory
215 Cherry Street
Waterbury, Connecticut

EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01
TDD Number: TO1-01-19-06-0002
Created by: B. Mace
Created on: 9 September 2019
Modified by: B. Mace
Modified on: 12 November 2019

Legend

- Approx Location of Support Columns
- Stairwell
- Video Arcade Games

kCPM = Kilo Counts per Minute
 Radiation readings taken using
 Ludlum Model 2241 with 44-9 probe.

0 25 50

 Feet

Data Sources:
 Imagery: ESRI, i-cubed, USDA FSA, USGS
 AEX, GeoEye, Getmapping, Aerogrid, IGP
 Topos: MicroPath
 All other data: START



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
 USDA, USGS, AeroGRID, IGN, and the GIS User Community

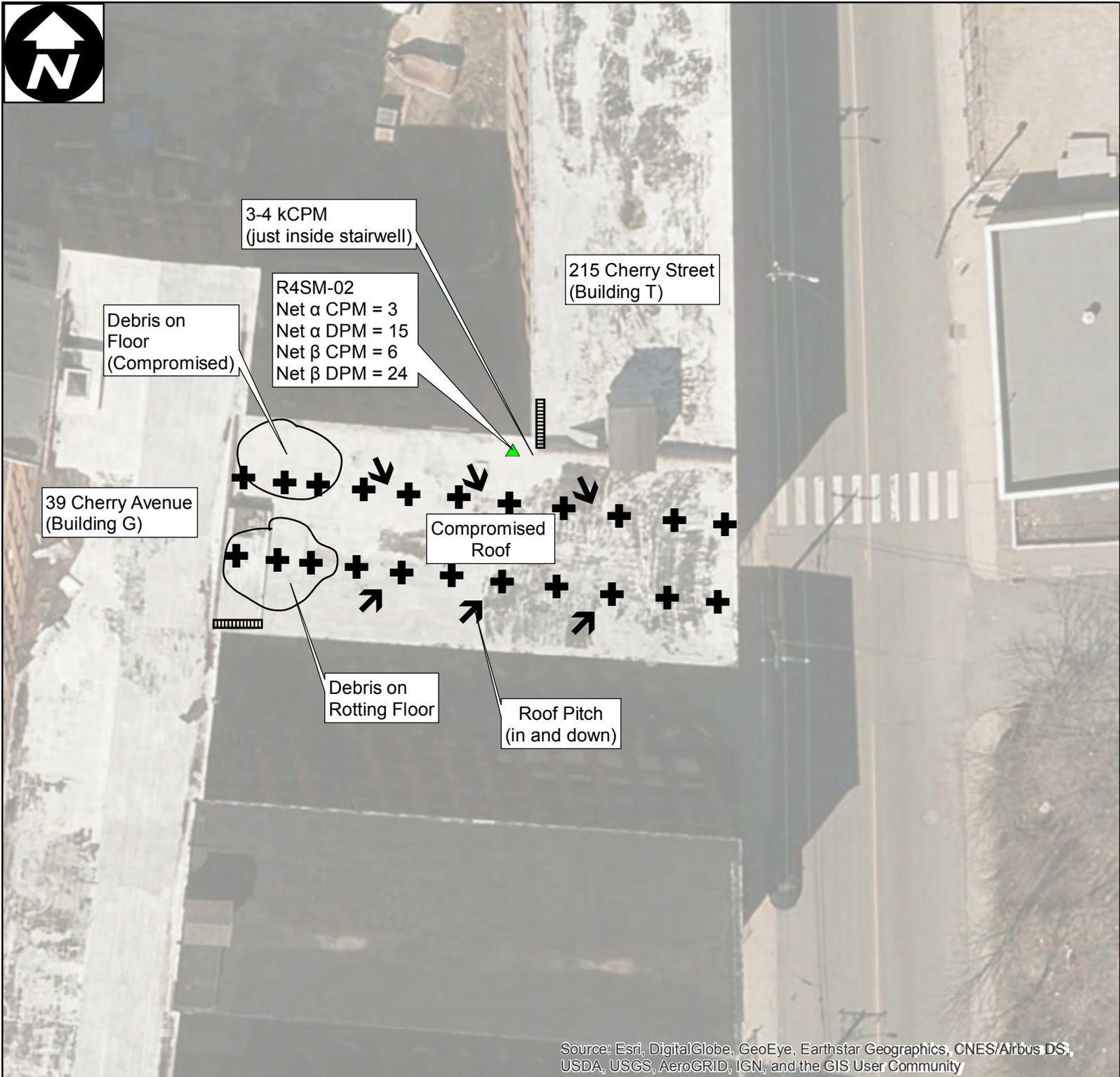


Figure 6C
Building R - Fourth Floor
Radiation Readings
and Building Conditions
Former Waterbury Clock Factory
215 Cherry Street
Waterbury, Connecticut

EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01
TDD Number: TO1-01-19-06-0002
Created by: B. Mace
Created on: 9 September 2019
Modified by: B. Mace
Modified on: 12 December 2019

Legend

- Smear Sample Locations
- Approx Location of Support Columns
- Stairwell

kCPM = Kilo Counts per Minute
 Radiation readings taken using
 Ludlum Model 2241 with 44-9 probe.
 Net α CPM = Net Alpha Counts per minute
 Net α DPM = Net Alpha Disintegrations
 per minute
 Net β CPM = Net Beta Counts per minute
 Net β DPM = Net Beta Disintegrations
 per minute

0 25 50

 Feet

Data Sources:
 Imagery: ESRI, i-cubed, USDA FSA, USGS
 AEX, GeoEye, Getmapping, Aerogrid, IGP
 Topos: MicroPath
 All other data: START



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
 USDA, USGS, AeroGRID, IGN, and the GIS User Community



Figure 7
Building K & L
Exterior Radiation Readings
Former Waterbury Clock Factory
177 & 215 Cherry Street
Waterbury, Connecticut

EPA Region I
Superfund Technical Assessment and
Response Team (START) IV
Contract No. EP-S3-15-01
TDD Number: TO1-01-19-06-0002
Created by: B. Mace
Created on: 9 September 2019
Modified by: B. Mace
Modified on: 12 December 2019

LEGEND

Radiation readings taken using
 Ludlum Model 77-6 with
 the 8-foot Stretch scope
 µR/Hr = microRoentgens per hour
 Background readings = 3-5 µR/Hr

0 25 50
 Feet

Data Sources:
 Imagery: ESRI, i-cubed, USDA FSA, USGS
 AEX, GeoEye, Getmapping, Aerogrid, IGP
 Topos: MicroPath
 All other data: START



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
 USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix B

Tables

- Table 1 - Ludlum Model 3030 Sample Counting Results Summary
- Table 2 - Summary of Bulk Asbestos Sample Results
- Table 3 - Summary of Radium-226 Soil Sample Results

TABLE 1

**LUDLUM MODEL 3030 SAMPLE COUNTING RESULTS SUMMARY
FORMER WATERBURY CLOCK FACTORY SITE
WATERBURY, CONNECTICUT**

Sample Number	Sample Location	Date Collected	Net Alpha CPM	Alpha DPM	Net Beta CPM	Beta DPM	Sample Type/ Comments
0317-0010	T4SM-01	10/23/2019	0	0	0	0	Smear
0317-0011	R4SM-02	10/23/2019	3	15	6	24	Smear
0317-0012	R2SM-03	10/23/2019	1	5	6	24	Smear
0317-0013	T1SM-04	10/23/2019	1	5	2	8	Smear
0317-0014	G2SM-05	10/23/2019	2	10	4	16	Smear
0317-0015	G3SM-06	10/23/2019	0	0	8	32	Smear
0317-0016	G3SM-07	10/23/2019	2	10	0	0	Smear
0317-0017	G3SM-08	10/23/2019	0	0	9	36	Smear
0317-0018	R1SM-09	10/23/2019	0	0	6	24	Smear
0317-0019	R1SM-10	10/23/2019	32	160	54	216	Smear
0317-0020	R1SM-11	10/23/2019	2,911	14,555	5,868	23,472	Smear
0317-0021	R1SM-12	10/23/2019	17	85	21	84	Smear
0317-0022	R1SM-13	10/23/2019	3	15	19	76	Smear
0317-0020	R1SM-11	10/23/2019	2,890	14,450	5,902	23,608	Smear/Recount

NOTES

- 1) Samples counted on a Ludlum Model 3030 with a 1-minute count time.
- 2) Counting efficiency: 26.7% for alpha, 20.5% for beta.
- 3) Background levels: 0 counts per minute (cpm) alpha, 31.0 cpm beta.
- 4) Results reported with background subtract activated.
- 5) CPM = Counts per minute.
- 6) DPM = Disintegrations per minute.
- 7) Minimum detectable amount (MDA) is 3 DPM alpha.
- 8) MDA is 108 DPM beta.

Check Source Values Using CT DEEP DEP008 (α) and DEP003 (β):

α - Th₂₃₀ (Activity of 19,200 DPM) = 3,928.8 CPM.

β - Cs₁₃₇ (activity of 1.1 e⁶ DPM) = 266,717.4 CPM.

TABLE 2

**SUMMARY OF BULK ASBESTOS SAMPLE RESULTS
FORMER WATERBURY CLOCK FACTORY SITE
WATERBURY, CONNECTICUT**

SAMPLE LOCATION	G3 ACM-01	G3 ACM-02	RT2-3 ACM-03	RT3 ACM-04	R3 ACM-05	R1 ACM-06
SAMPLE NUMBER	0317-0023	0317-0024	0317-0025	0317-0026	0317-0027	0317-0028
LABORATORY NUMBER	AB83258	AB83259	AB83260	AB83261	AB83262	AB83263
DATE SAMPLED	10/23/2019	10/23/2019	10/23/2019	10/23/2019	10/23/2019	10/23/2019
COMPOUND						
Actinolite	ND	ND	ND	ND	ND	ND
Amosite	ND	ND	ND	ND	ND	ND
Anthophyllite	ND	ND	ND	ND	ND	ND
Chrysotile	ND	40	50	ND	40	ND
Crocidolite	ND	ND	ND	ND	ND	ND
Tremolite	ND	ND	ND	ND	ND	ND

NOTES:

- 1) Samples were analyzed by U.S. EPA Laboratory Services and Applied Sciences Division (LSASD) New England Regional Laboratory (NERL) EPA Region I SOP, EIASOP-INGASBSED2, Bulk Asbestos Analysis by PLM (Polarized Light Microscope).
- 2) All quantities are estimated volume percent.
- 3) ND = Not Detected
- 4) % = Percent

TABLE 3

**SUMMARY OF RADIUM-226 SOIL SAMPLE RESULTS
FORMER WATERBURY CLOCK FACTORY SITE
WATERBURY, CONNECTICUT**

SAMPLE LOCATION	CB-1	SS-1	SS-2	SS-3	SS-4	SS-5	Concentration Criteria for Soil (pCi/g)
SAMPLE NUMBER	0317-0001	0317-0002	0317-0003	0317-0004	0317-0005	0317-0006	
LABORATORY ID NUMBER	886516001	886516002	886516003	886516004	886516005	886516006	
SAMPLE DEPTH (INCHES)	0-3	0-3	0-3	0-3	0-3	0-3	
RADIONUCLIDE							
RADIUM-226	0.98 +/- 0.35	0.88 +/- 0.44	0.83 +/- 0.32	0.48 +/- 0.44	1.9 +/- 0.49	1.2 +/- 0.39	5
DATE SAMPLED	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	

SAMPLE LOCATION	SS-6	SS-7	SS-8				Concentration Criteria for Soil (pCi/g)
SAMPLE NUMBER	317-0007	0317-0008	0317-0009				
LABORATORY ID NUMBER	886516007	886516008	886516009				
SAMPLE DEPTH (INCHES)	0-3	0-3	0-3				
RADIONUCLIDE							
RADIUM-226	0.69 +/- 0.41	0.67 +/- 0.41	1.6 +/- 0.51				5
DATE SAMPLED	22-Oct-19	22-Oct-19	22-Oct-19				

NOTES:

- 1) Samples collected by Weston Solutions, Inc., Superfund Technical Assessment and Response Team (START).
- 2) Samples analyzed by State of Connecticut Department of Public Health (CTDPH) Laboratory, 395 West Street, Rocky Hill, Connecticut using Analytical Method EPA 901.1, Gamma Emitting Radionuclides in Drinking Water, modified for Soil Sample Analysis, and CTDPH approved methodology.
- 3) Results are reported in picocuries per gram (pCi/g).
- 4) Concentration Criteria for soil from Subpart B of 40 CFR Part 192.
- 5) Concentrations bolded and highlighted in yellow exceed the concentration criteria for soil per Subpart B of 40 CFR Part 192.

Appendix C

Photodocumentation Log

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of 215 Cherry Street Building 3/R (right) and the enclosed wooden walkway entrance, 39 Cherry Avenue Building 1/G (ahead – loading dock), and 203-205 Cherry Street Building O (left – not part of site). Photograph taken facing west.

DATE: 4 September 2019
PHOTOGRAPHER: J. Kelly

TIME: 1047 hours
CAMERA: Apple iPhone 8



SCENE: View of courtyard area with maintenance equipment on 39 Cherry Avenue, former Building 2 area, with 215 Cherry Street Building 4/T (left), Masonry Smoke Stack, Building 3/R (center) and 39 Cherry Avenue Building 1/G (right) in background. Photograph taken facing southeast.

DATE: 4 September 2019
PHOTOGRAPHER: J. Kelly

TIME: 1303 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of courtyard area and former Building 2 area, with 215 Cherry 3/R (left), 39 Cherry Avenue Building 1/G (center), and 232 North Elm Street Cherry Street Buildings I and J (cream colored buildings) in background. Photograph taken facing south.

DATE: 4 September 2019
PHOTOGRAPHER: J. Kelly

TIME: 1303 hours
CAMERA: Apple iPhone 8



SCENE: View of area of location of elevated radiation reading on brick wall surface, adjacent to loading dock for 215 Cherry Building 3/R. Photograph taken facing north-northwest.

DATE: 4 September 2019
PHOTOGRAPHER: J. Kelly

TIME: 1306 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of 215 Cherry Street Building 3/R enclosed wooden walkway entrance. Photograph taken facing northwest.

DATE: 4 September 2019
PHOTOGRAPHER: J. Kelly

TIME: 1306 hours
CAMERA: Apple iPhone 8



SCENE: View of 39 Cherry Avenue Building 1/G (left), and 203-205 Cherry Street Building O (on right). Photograph taken facing west.

DATE: 4 September 2019
PHOTOGRAPHER: J. Kelly

TIME: 1309 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of 177 Cherry Street Building 6/K (left), 39 Cherry Avenue Building 1/G (ahead – loading dock), and 203-205 Cherry Street Building O (right – not part of site). Photograph taken facing west.

DATE: 4 September 2019

TIME: 1309 hours

PHOTOGRAPHER: J. Kelly

CAMERA: Apple iPhone 8



SCENE: View of yellow fire-brick pavement and vegetation adjacent to 177 Cherry Street Building 7/L (right) and Building 6/K (ahead). Photograph taken facing north.

DATE: 4 September 2019

TIME: 1311 hours

PHOTOGRAPHER: J. Kelly

CAMERA: Apple iPhone 8

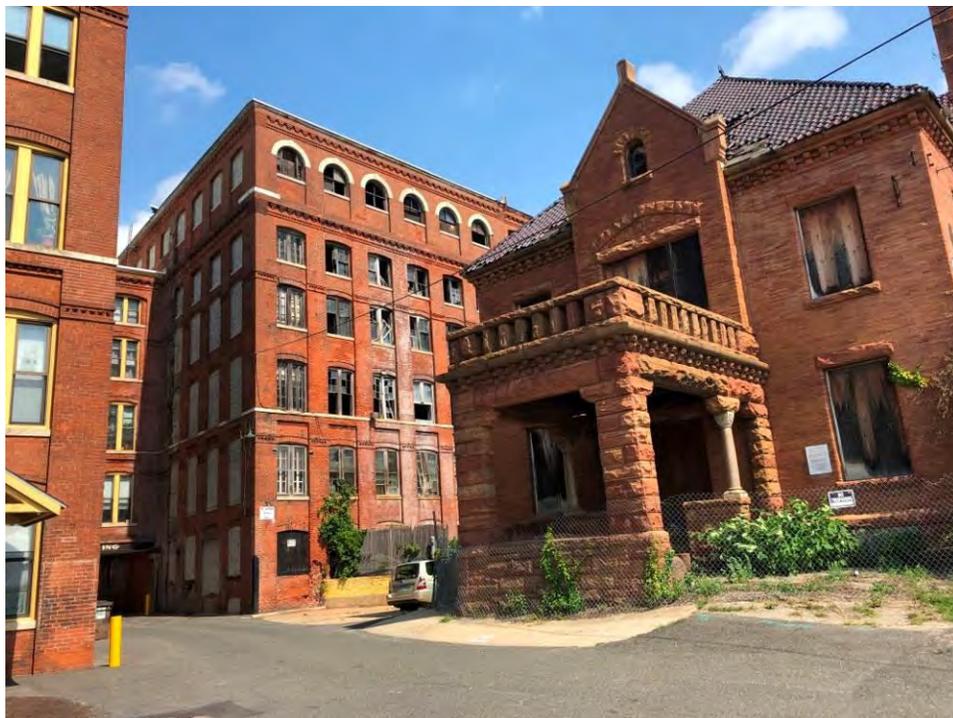
PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of 177 Cherry Street Building 7/L, with Cherry Avenue to right. Photograph taken facing east.

DATE: 4 September 2019
PHOTOGRAPHER: J. Kelly

TIME: 1312 hours
CAMERA: Apple iPhone 8



SCENE: View of the 0 Cherry Avenue Building 5/7 (right) and 39 Cherry Avenue Building 1/G (center), with 13 Cherry Avenue, Building B (left). Photograph taken facing northeast.

DATE: 4 September 2019
PHOTOGRAPHER: J. Kelly

TIME: 1313 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building G, Floor 4 with portions of the flooring removed (arrow) that contained elevated Radium-226 (Ra-226). Photograph taken facing west.

DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1056 hours

CAMERA: Apple iPhone 8



SCENE: View of Building G, Floor 4 with portions of the flooring removed (arrow) that contained elevated Radium-226. Photograph taken facing west.

DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1313 hours

CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building G, Floor 4 with portions of the flooring removed (arrows) that contained elevated Ra-226.
Photograph taken facing north.

DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1059 hours

CAMERA: Apple iPhone 8



SCENE: View of Building G, Floor 4 with portions of the flooring removed (arrow) that contained elevated Ra-226.
Photograph taken facing south.

DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1101 hours

CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building R, Floor 4 with debris and plastic sheeting covering rotting floor. Photograph taken facing east.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1107 hours
CAMERA: Apple iPhone 8



SCENE: View of Building R, Floor 4 with debris and plastic sheeting covering rotting floor. Photograph taken facing north.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1107 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building R, Floor 3 with video arcade game carcasses and other debris. Photograph taken facing northeast.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1111 hours
CAMERA: Apple iPhone 8

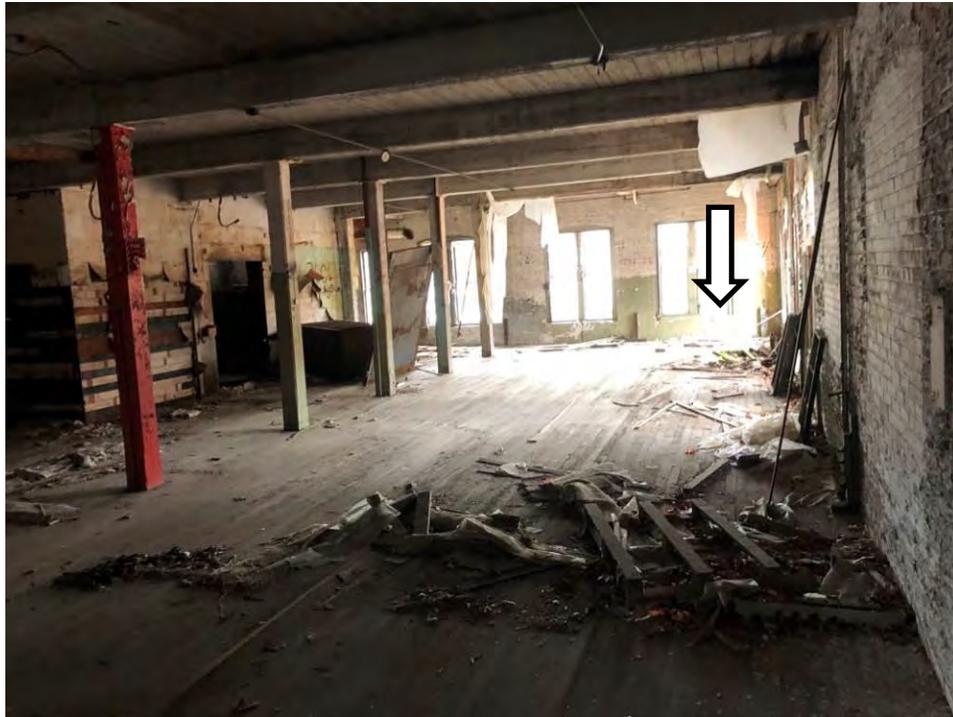


SCENE: View of rotting floorboards of Building R, Floor 4 (looking up from Floor 3).

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1111 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building G, Floor 3 with debris and hole in floor (arrow). Photograph taken facing north.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1115 hours
CAMERA: Apple iPhone 8

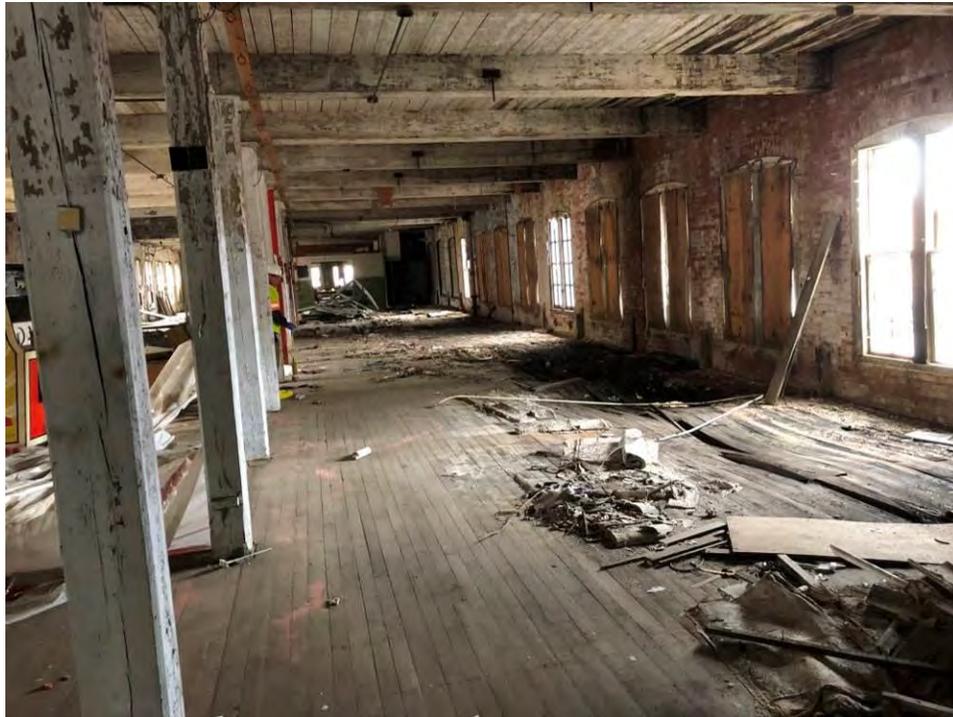


SCENE: View of Building G, Floor 3 with video arcade game carcasses and black “asbestos” waste bags. Photograph taken facing south.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1117 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building G, Floor 3 with areas of orange paint denoting elevated Ra-226 along the floor near the columns and the warped, structurally compromised flooring. Photograph taken facing southwest.

DATE: 22 October 2019

TIME: 1118 hours

PHOTOGRAPHER: J. Kelly

CAMERA: Apple iPhone 8



SCENE: Close-up view of orange paint denoting elevated Ra-226 and suspected asbestos-containing material (ACM) pipe wrap on the 3rd Floor of Building G. Photograph taken facing west.

DATE: 22 October 2019

TIME: 1120 hours

PHOTOGRAPHER: J. Kelly

CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building R, Floor 2 with hole in floor above and debris on floor. Photograph taken facing east.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1131 hours
CAMERA: Apple iPhone 8



SCENE: View of Building R, Floor 2 with vegetation growing on the floor. Photograph taken facing east.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1131 hours
CAMERA: Apple iPhone 8

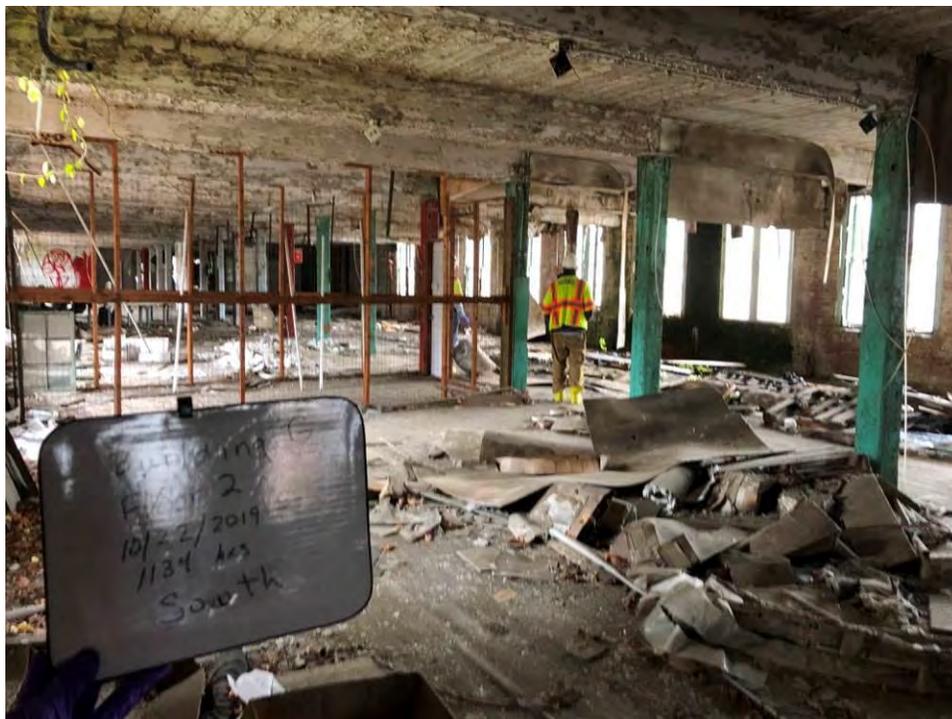
PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building G, Floor 2 with debris and holes in floor. Photograph taken facing north.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1133 hours
CAMERA: Apple iPhone 8



SCENE: View of Building G, Floor 2 with debris and compromised floor. Photograph taken facing south.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1134 hours
CAMERA: Apple iPhone 8

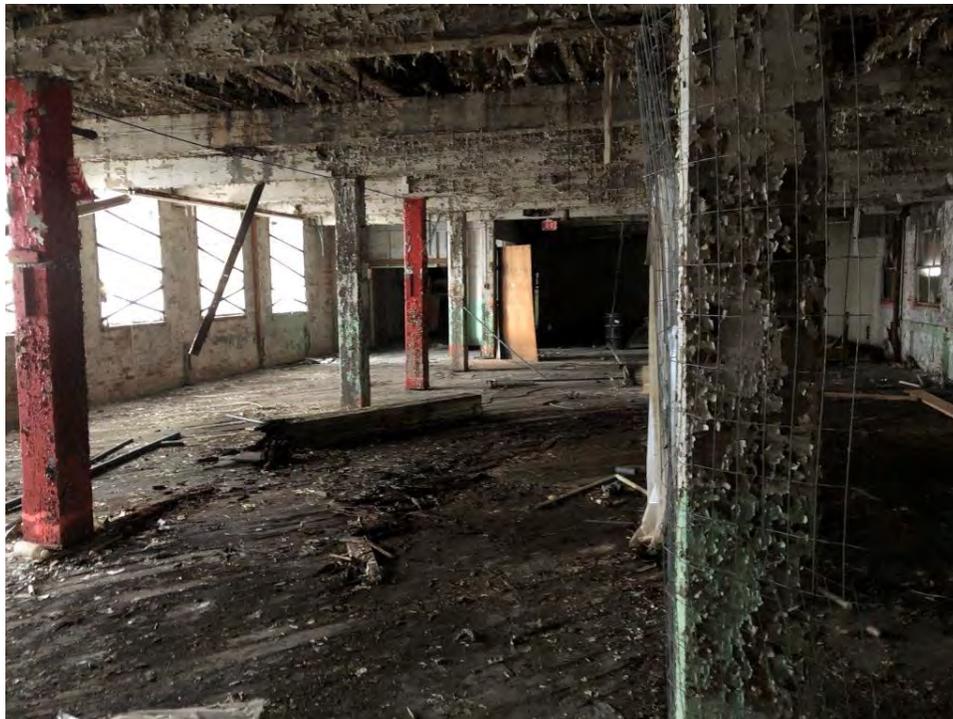
PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building G, Floor 2 with debris and compromised floor. Photograph taken facing west.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1135 hours
CAMERA: Apple iPhone 8

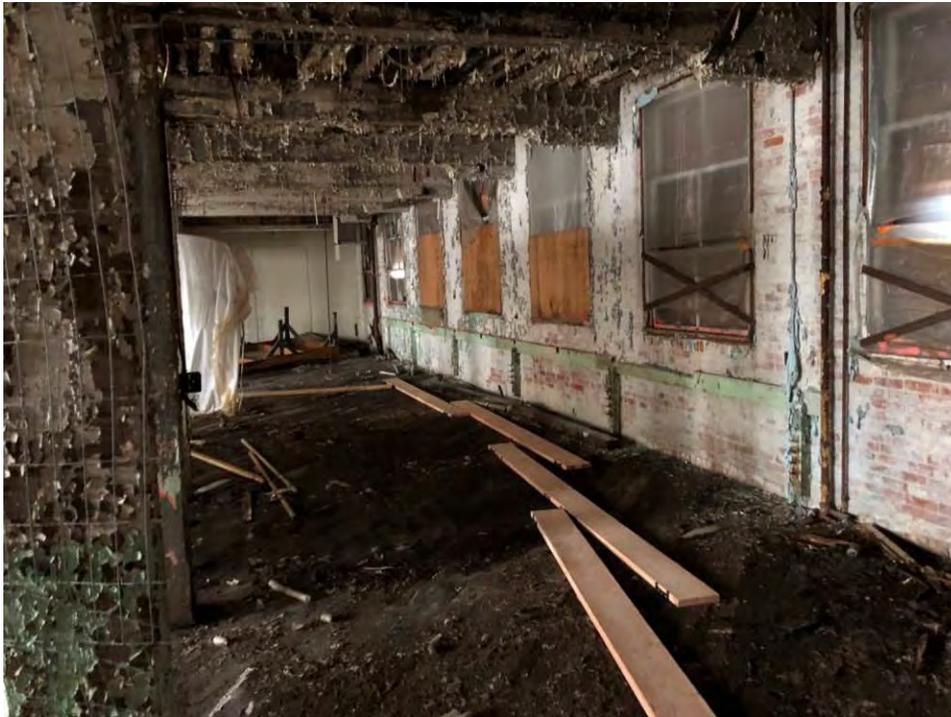


SCENE: View of Building R, Floor 1; note the collapsed column on the left. Photograph taken facing east.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1149 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building R, Floor 1 with wooden planking used to span beams and cross the compromised floor. Photograph taken facing southeast.

DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1149 hours

CAMERA: Apple iPhone 8



SCENE: View of Building G, Floor 1 with debris and hole in ceiling. Photograph taken facing north.

DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1153 hours

CAMERA: Apple iPhone 8

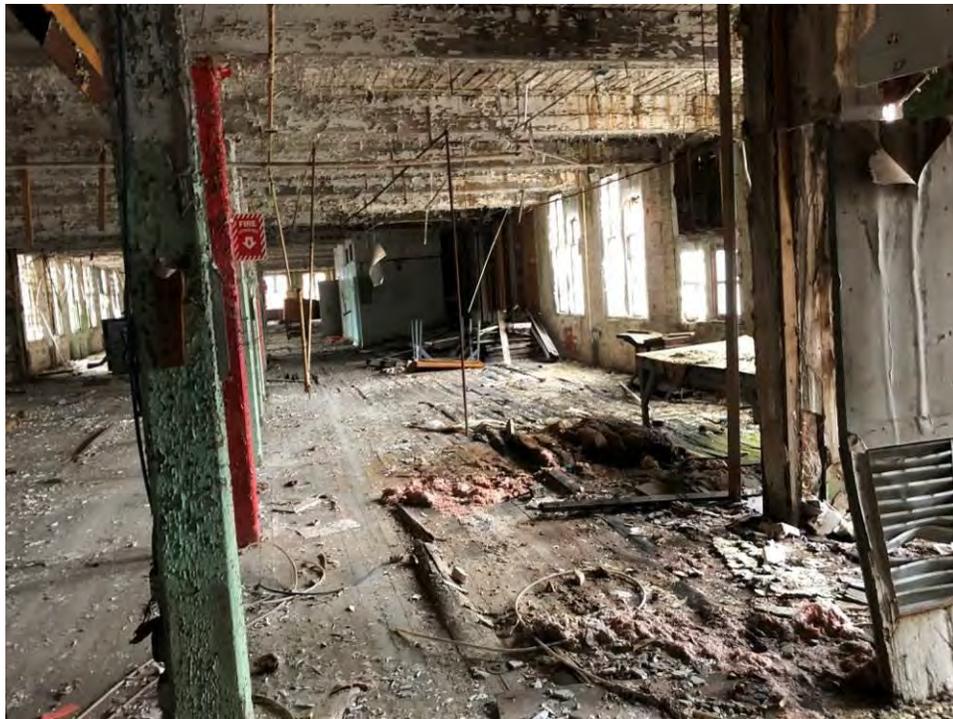
PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building G, Floor 1. Photograph taken facing south.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1159 hours
CAMERA: Apple iPhone 8



SCENE: View of Building G, Floor 1 with compromised floor. Photograph taken facing south.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1159 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut

TOP



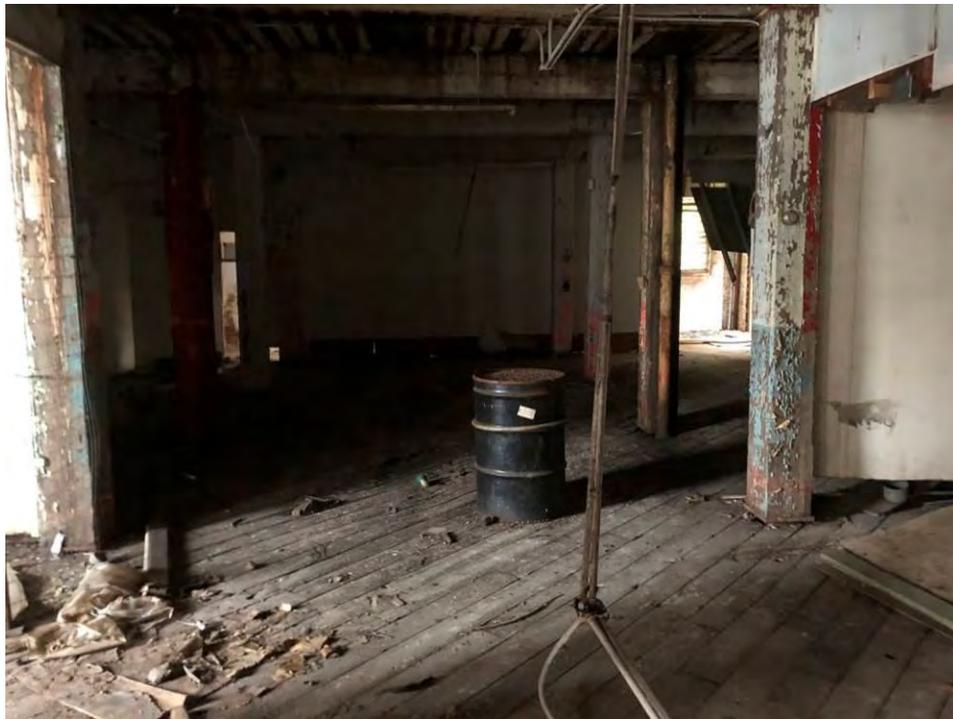
SCENE: View of stairwell between Floor 2 and 3 and between Buildings R and G with orange paint on the handrail denoting elevated Ra-226. Photograph taken facing south.

DATE: 22 October 2019

TIME: 1203 hours

PHOTOGRAPHER: J. Kelly

CAMERA: Apple iPhone 8



SCENE: View of Building R, Floor 1. Photograph taken facing east.

DATE: 22 October 2019

TIME: 1207 hours

PHOTOGRAPHER: J. Kelly

CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



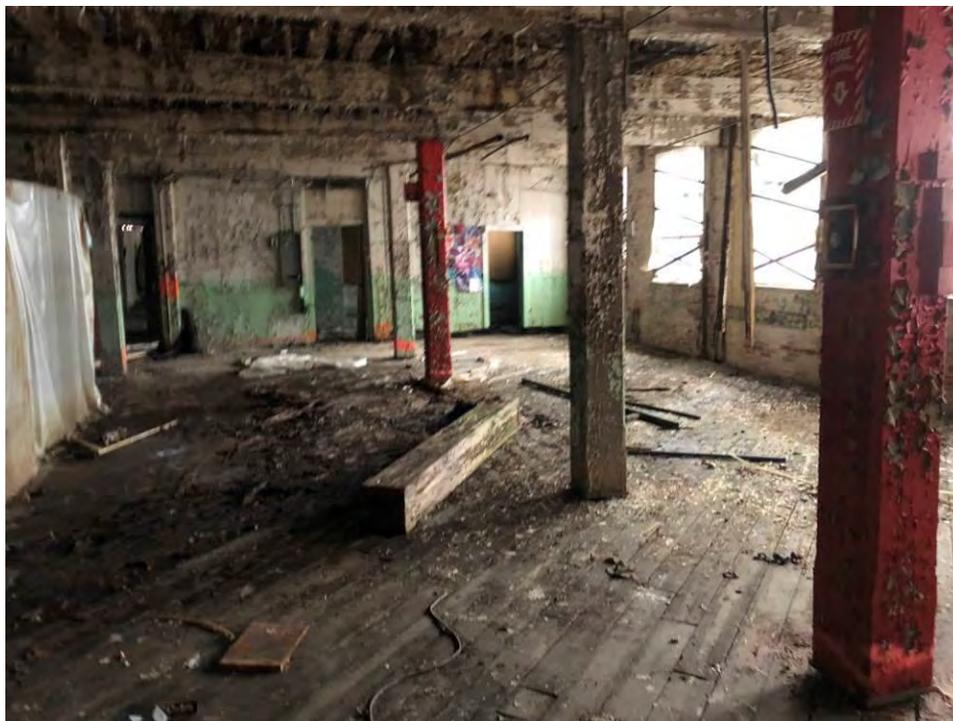
SCENE: View of Building R, Floor 1 with orange paint on columns and windowsills denoting elevated Ra-226. Photograph taken facing southeast.

DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1207 hours

CAMERA: Apple iPhone 8



SCENE: View of Building R, Floor 1 with collapsed column. Photograph taken facing northwest.

DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1208 hours

CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building R, Floor 1, northern wall and approximate location of smear sample R1-SM-09. Photograph taken facing west.

DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1209 hours

CAMERA: Apple iPhone 8



SCENE: View of Building R, Floor 1, eastern wall and approximate location of smear samples R1-SM-10 and R1-RM-11. Photograph taken facing north.

DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1209 hours

CAMERA: Apple iPhone 8

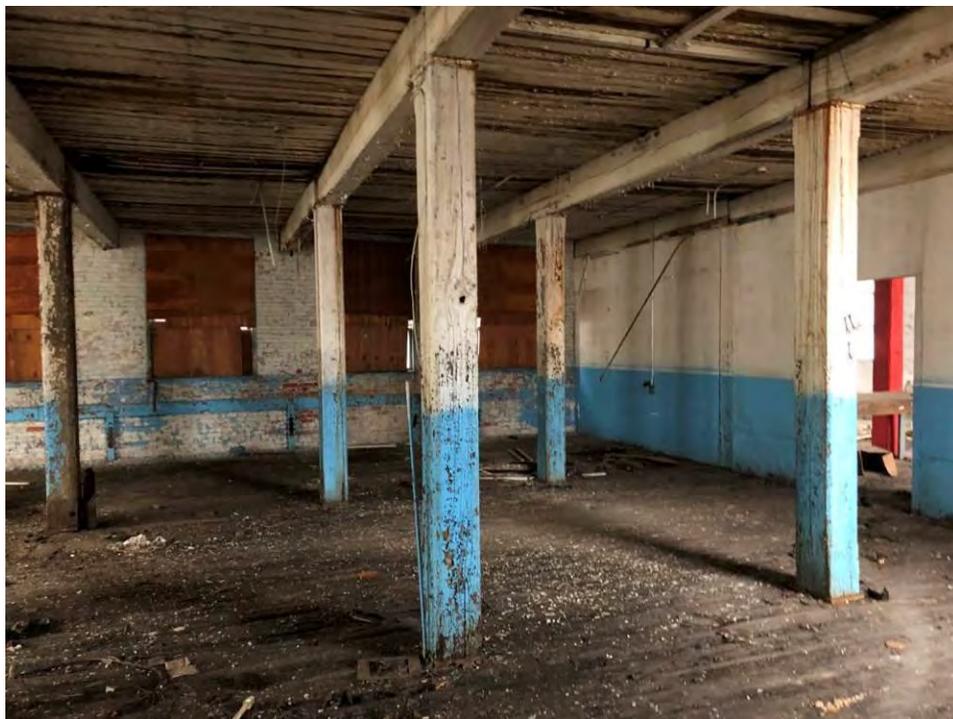
PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of the interior of the wooden walkway leading to the entrance to Building R. Photograph taken facing east.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1210 hours
CAMERA: Apple iPhone 8

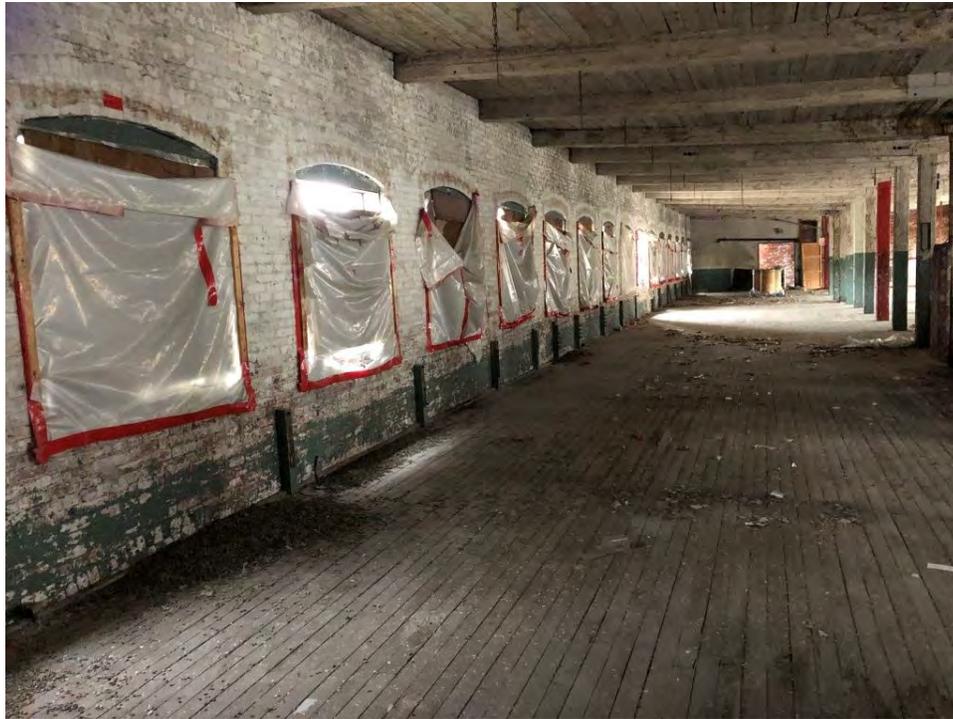


SCENE: View of Building R, Floor 2, eastern room. Photograph taken facing southeast.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1401 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building T, Floor 4 with fiber drums at the far northern end. Photograph taken facing north.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1409 hours
CAMERA: Apple iPhone 8



SCENE: View of Building T, Floor 4 with debris (tables/cardboard) in southeastern portion. Photograph taken facing east.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1410 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building T, Floor 4 with orange paint on column, approximate location of smear sample T4-SM-01. Photograph taken facing northeast.

DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1411 hours

CAMERA: Apple iPhone 8



SCENE: View of Building R, Floor 3 with pallet of books in eastern end. Photograph taken facing southeast.

DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1426 hours

CAMERA: Apple iPhone 8

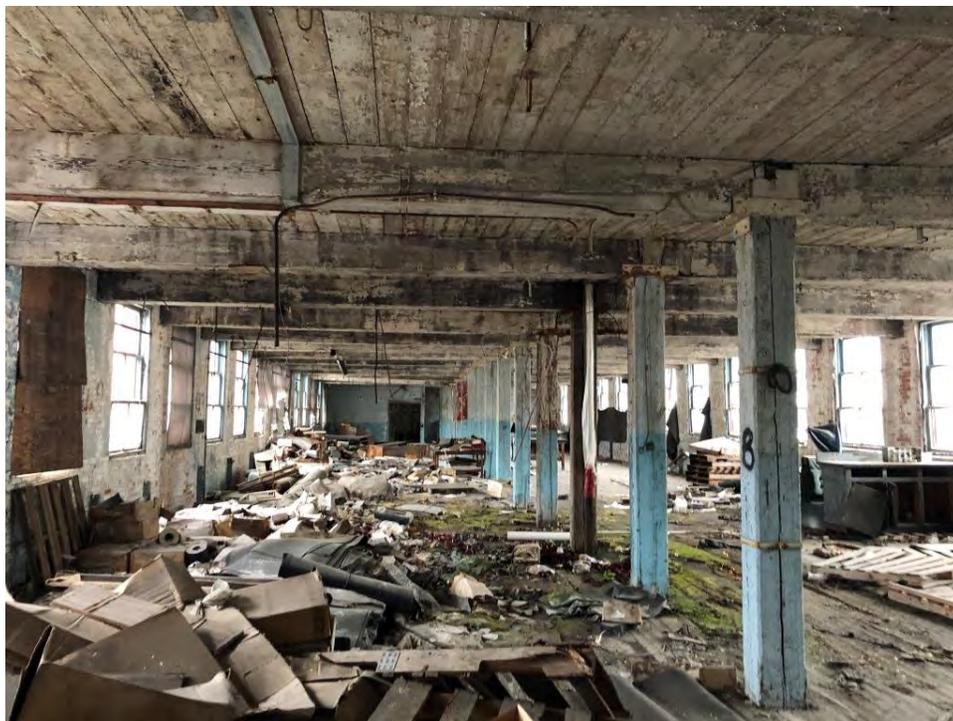
PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building R, Floor 3 with video game carcasses. Photograph taken facing south.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1426 hours
CAMERA: Apple iPhone 8

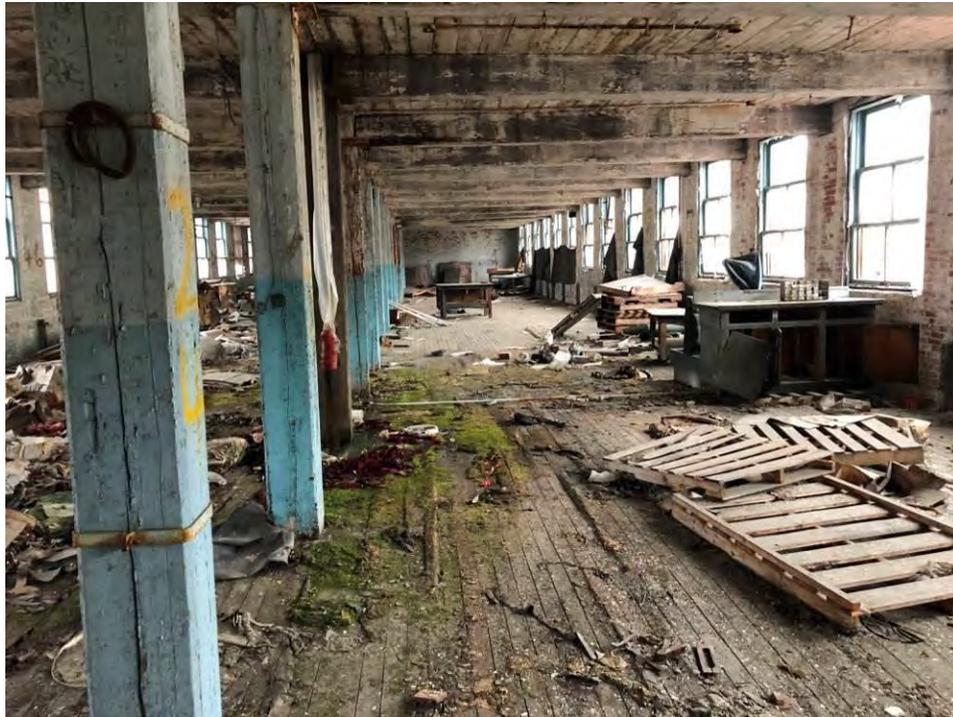


SCENE: View of Building T, Floor 3 with debris including suspected ACM, cardboard and paperwork along with vegetation on the floor indicating how wet it is. Photograph taken facing north.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1429 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building T, Floor 3 with debris including suspected ACM, cardboard and paperwork along with vegetation on the floor. Photograph taken facing north.

DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1430 hours

CAMERA: Apple iPhone 8



SCENE: View of stairwell with suspected ACM pipe wrap. Photograph taken facing south.

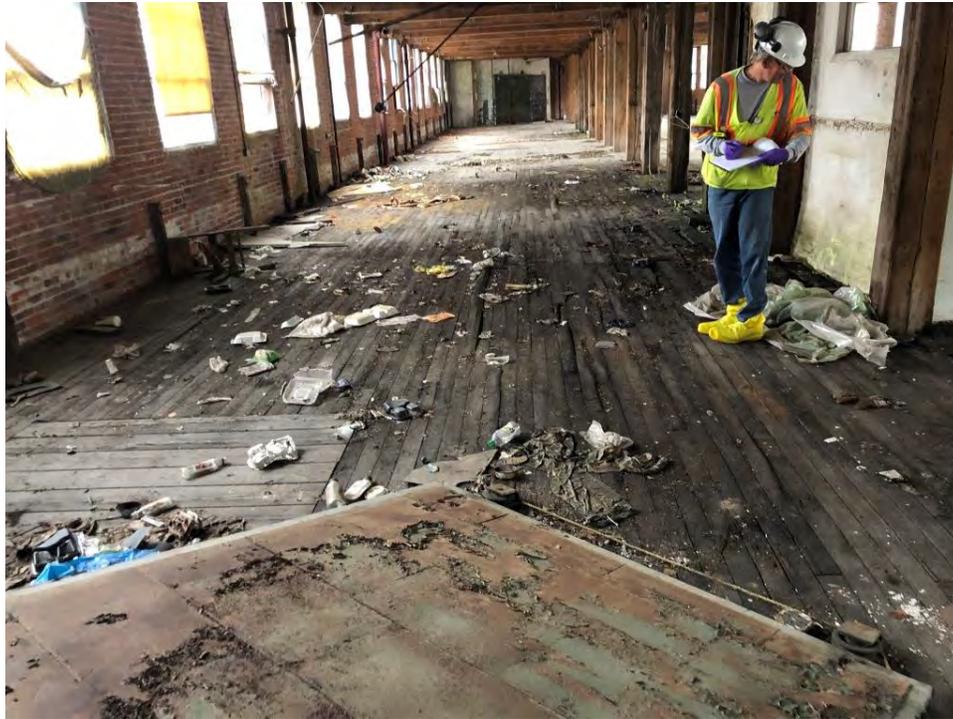
DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1432 hours

CAMERA: Apple iPhone 8

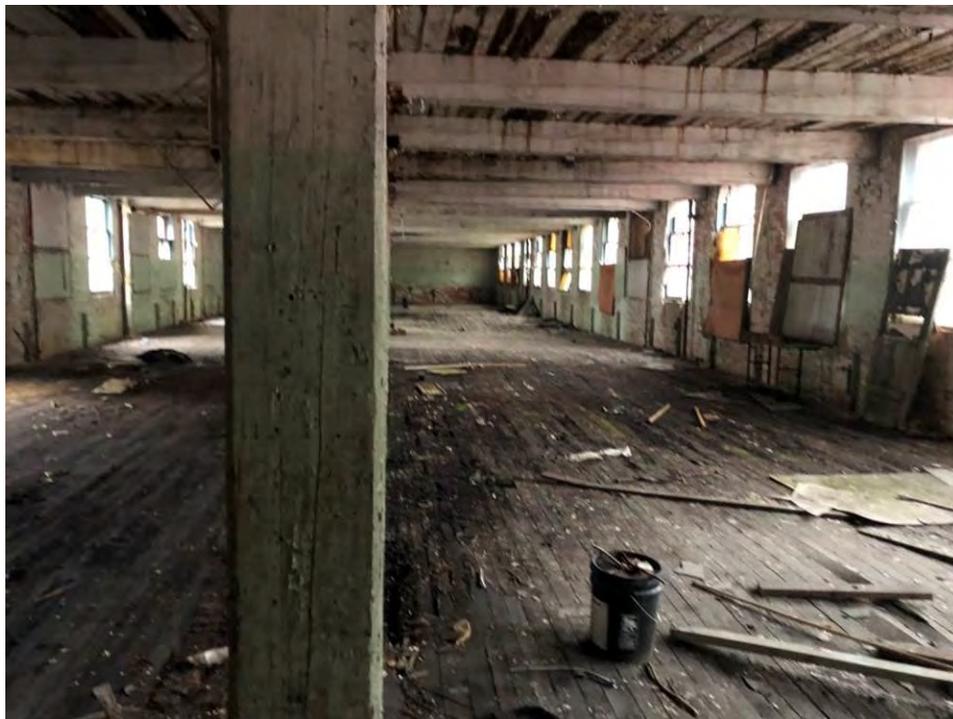
PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building T, Floor 2 with compromised floor. Photograph taken facing north.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1434 hours
CAMERA: Apple iPhone 8



SCENE: View of Building T, Floor 1 with wet, compromised floor. Photograph taken facing north.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1454 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building T, Floor 1 with wet, compromised floor. Photograph taken facing north.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1454 hours
CAMERA: Apple iPhone 8



SCENE: View of the split column in the Building T Basement. Photograph taken facing east.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1502 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of damaged beam in the Building T basement. Photograph taken facing east.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1505 hours
CAMERA: Apple iPhone 8



SCENE: View of damaged shed between Buildings R and T. Photograph taken facing west.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1507 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of Building R, Basement with damaged ceiling/floor from above. Photograph taken facing south.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1509 hours
CAMERA: Apple iPhone 8



SCENE: View of Building R, Basement with debris. Photograph taken facing south.

DATE: 22 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1510 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of hypodermic needles on a shopping cart on the wooden walkway leading to the entrance to Building R.
Photograph taken facing north.

DATE: 22 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1521 hours

CAMERA: Apple iPhone 8

TOP



SCENE: View of bulk asbestos sample location G3-ACM-02, collected from pipe wrap on the floor of Building G, Floor 3.
Photograph taken facing south.

DATE: 23 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1024 hours

CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut

TOP



SCENE: View of bulk asbestos sample location G3-ACM-01, collected from the black “asbestos” waste bags of Building G, Floor 3. Photograph taken facing east.

DATE: 23 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1026 hours

CAMERA: Apple iPhone 8



SCENE: View of bulk asbestos sample location RT2-3-ACM-03, collected from pipe wrap in the stairwell between Buildings R and T, between Floors 2 and 3. Photograph taken facing north.

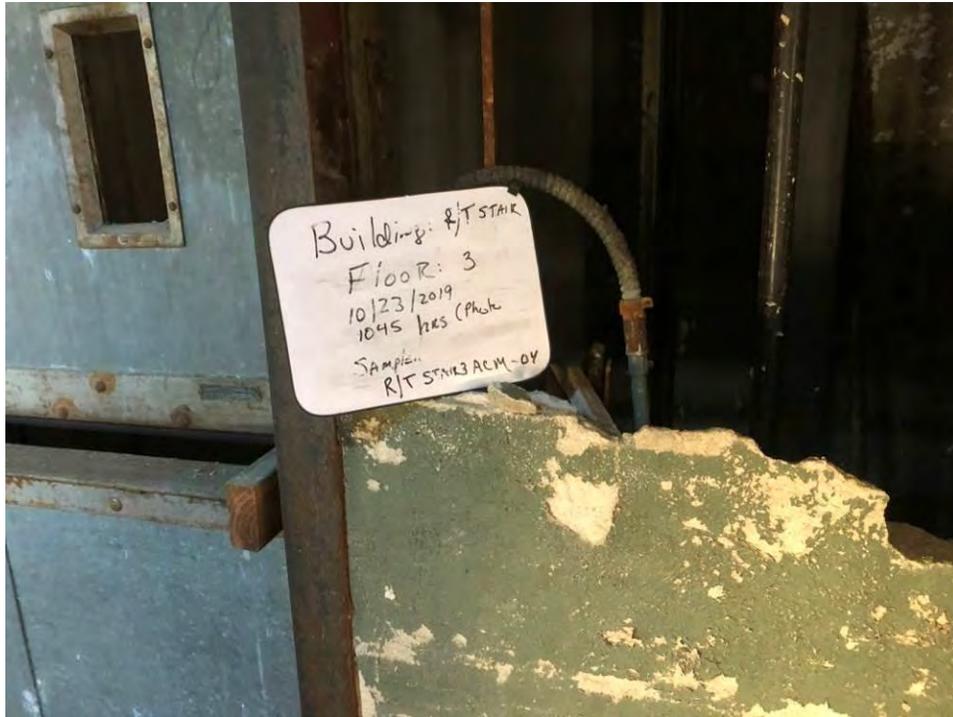
DATE: 23 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1041 hours

CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of bulk asbestos sample location RT3-ACM-04, collected from wall between the elevator shaft between Buildings R and T, Floor 3. Photograph taken facing east.

DATE: 23 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1046 hours

CAMERA: Apple iPhone 8



SCENE: View of bulk asbestos sample location R3-ACM-05, collected from pipe wrap on the floor of Building T, Floor 3. Photograph taken facing east.

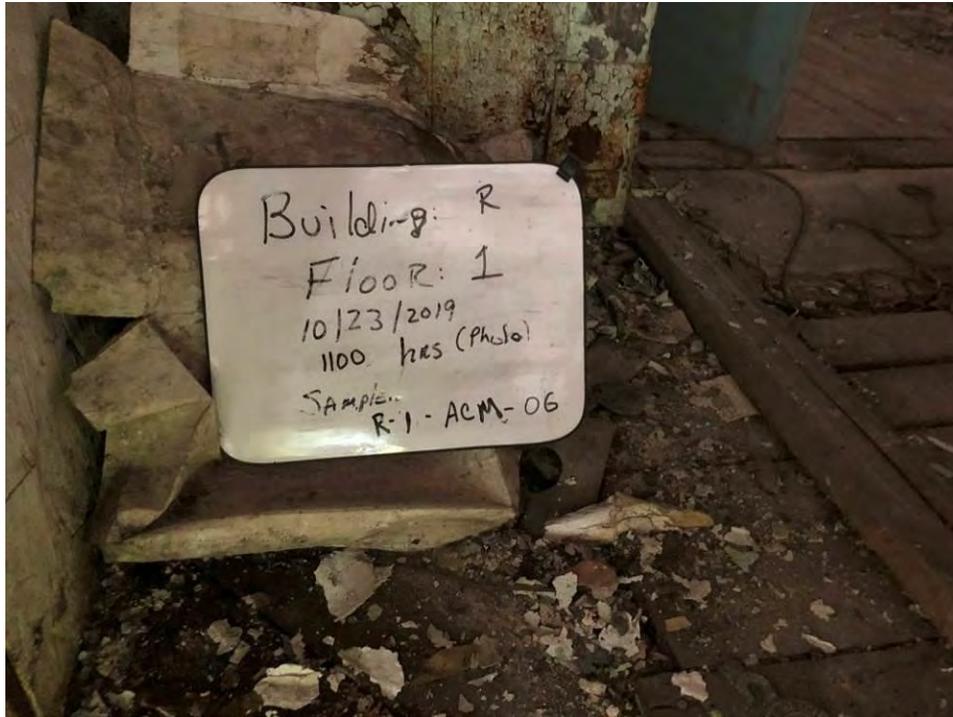
DATE: 23 October 2019

PHOTOGRAPHER: J. Kelly

TIME: 1051 hours

CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut

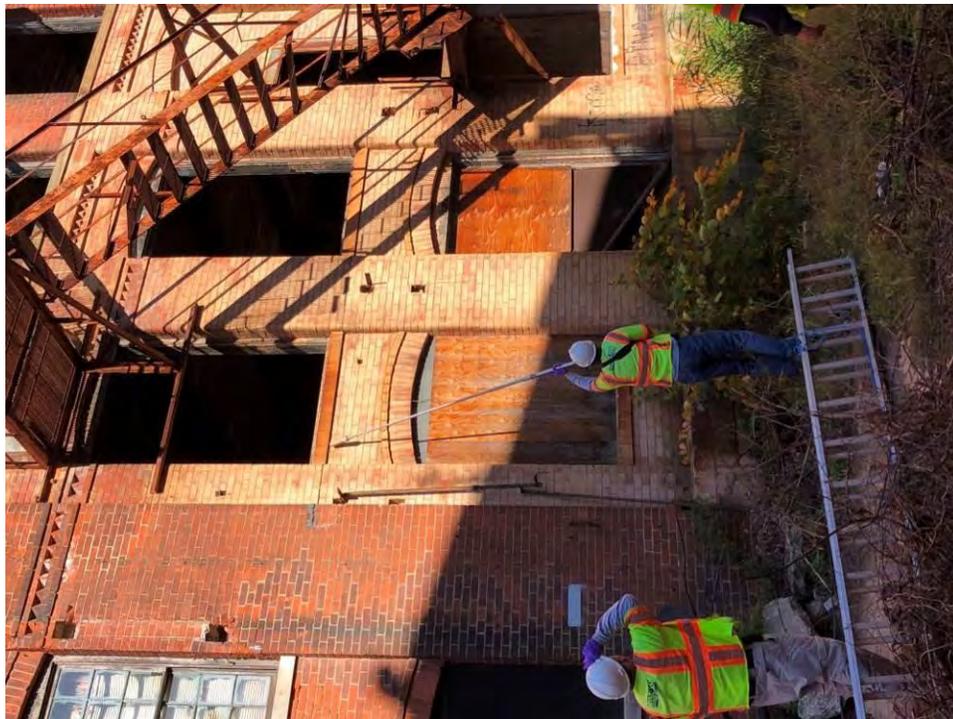


SCENE: View of bulk asbestos sample location R1-ACM-06, collected floor layer in Buildings R, Floor 1. Photograph taken facing east.

DATE: 23 October 2019
PHOTOGRAPHER: J. Kelly

TIME: 1102 hours
CAMERA: Apple iPhone 8

TOP



SCENE: View of radiation screening from the southern exterior of Building K. Photograph taken facing north.

DATE: 23 October 2019
PHOTOGRAPHER: B. Mace

TIME: 1312 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut

TOP



SCENE: View of radiation screening from the southern exterior of Building K. Photograph taken facing northeast.

DATE: 23 October 2019
PHOTOGRAPHER: B. Mace

TIME: 1324 hours
CAMERA: Apple iPhone 8



SCENE: View of compromised flooring inside the interior of Building K. Photograph taken facing north.

DATE: 23 October 2019
PHOTOGRAPHER: E. Ackerman

TIME: 1339 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of compromised floors inside the interior of Building L. Photograph taken facing northeast.

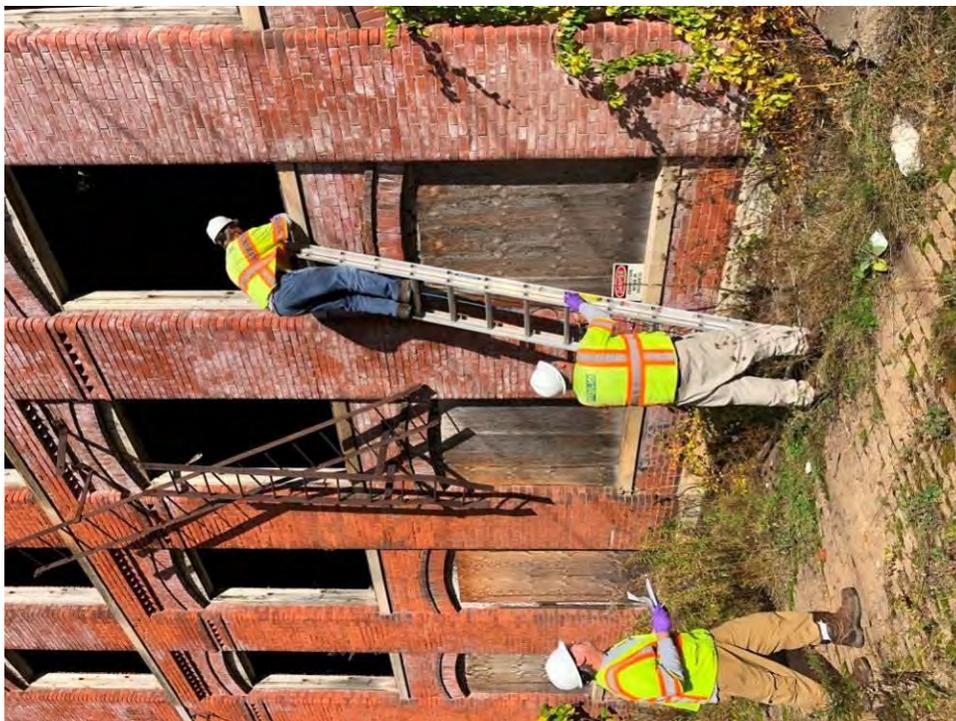
DATE: 23 October 2019

PHOTOGRAPHER: E. Ackerman

TIME: 1403 hours

CAMERA: Apple iPhone 8

TOP



SCENE: View of radiation screening from the western exterior of Building L. Photograph taken facing northeast.

DATE: 23 October 2019

PHOTOGRAPHER: B. Mace

TIME: 1416 hours

CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of compromised flooring inside the interior of Building L. Photograph taken facing southeast.

DATE: 23 October 2019

PHOTOGRAPHER: E. Ackerman

TIME: 1417 hours

CAMERA: Apple iPhone 8

TOP



SCENE: View of radiation screening of the western exterior of Building L. Photograph taken facing northeast.

DATE: 23 October 2019

PHOTOGRAPHER: B. Mace

TIME: 1424 hours

CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



SCENE: View of compromised flooring inside the interior of Building K. Photograph taken facing southeast.

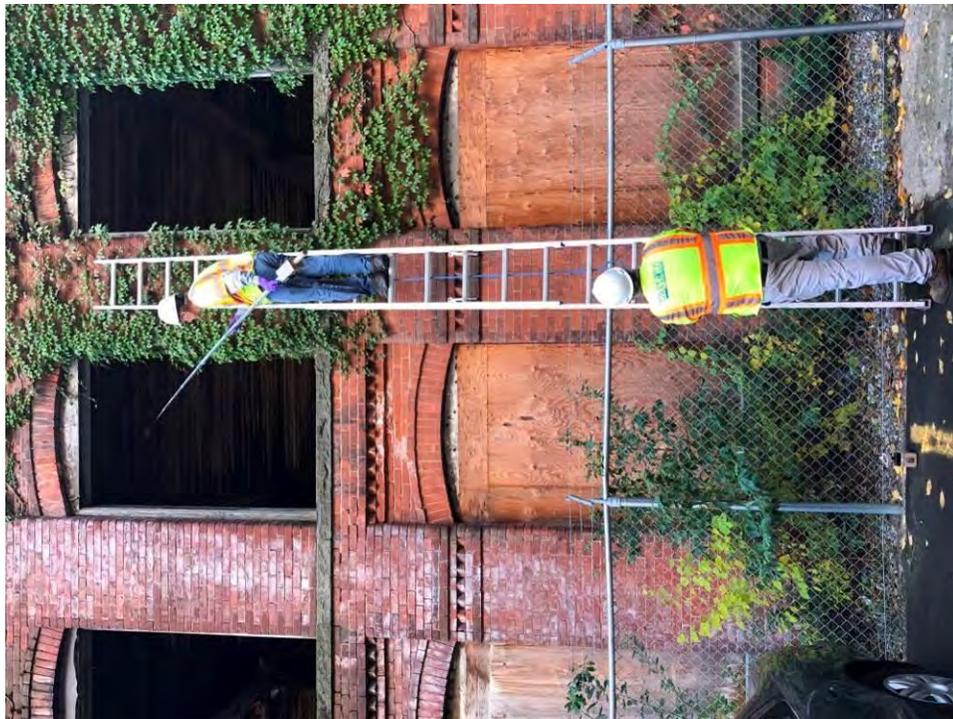
DATE: 23 October 2019

PHOTOGRAPHER: E. Ackerman

TIME: 1436 hours

CAMERA: Apple iPhone 8

TOP



SCENE: View of radiation screening from the northern exterior of Building K. Photograph taken facing south.

DATE: 23 October 2019

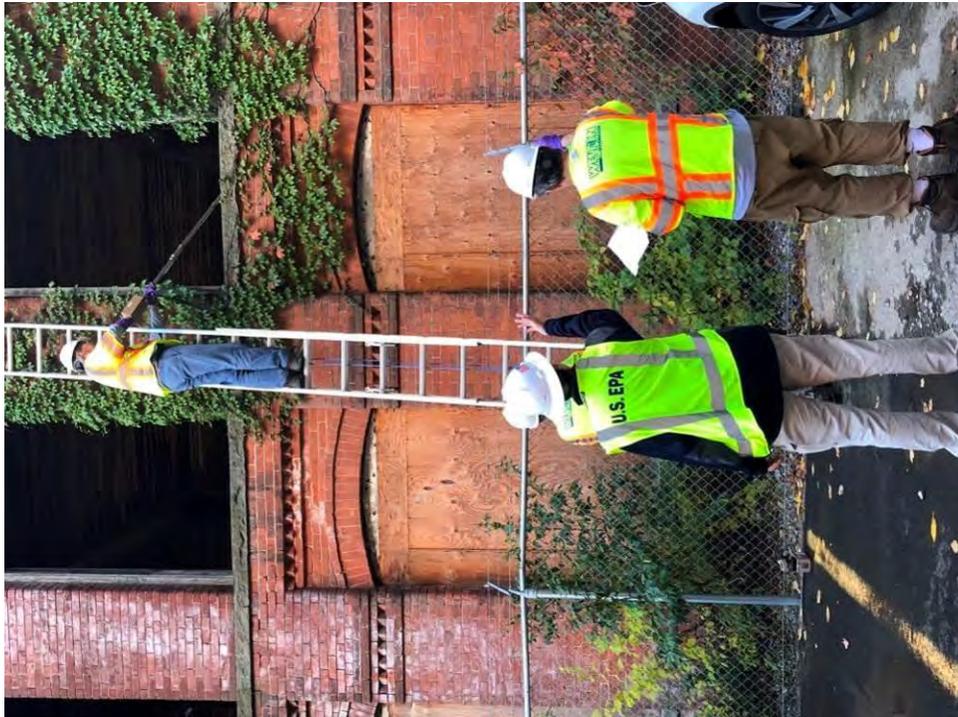
PHOTOGRAPHER: B. Mace

TIME: 1439 hours

CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut

TOP

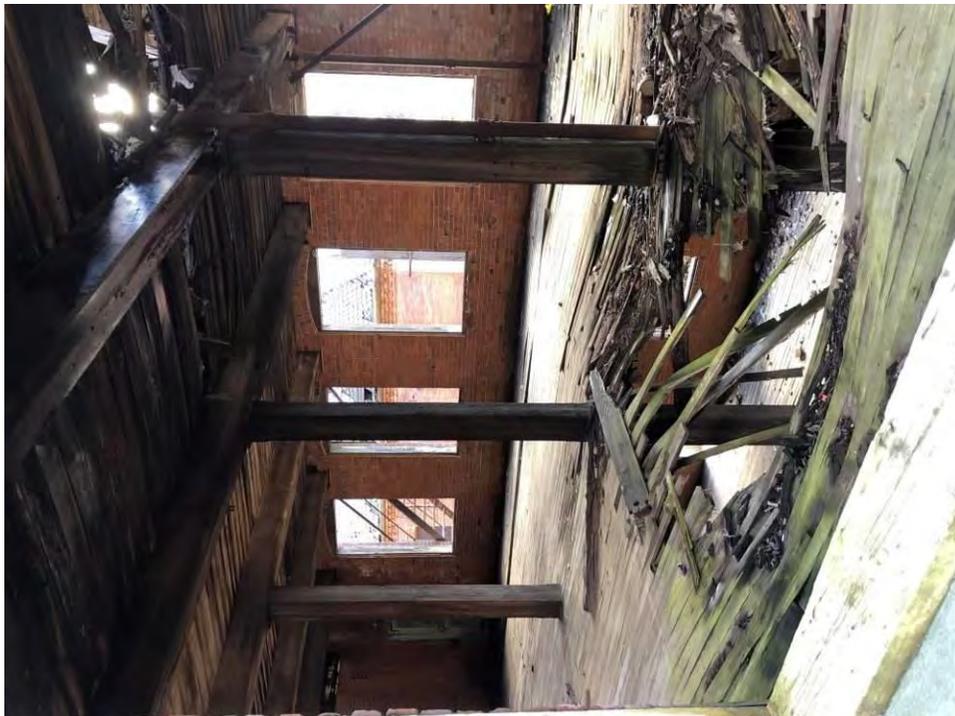


SCENE: View of radiation screening from the northern exterior of Building K. Photograph taken facing west.

DATE: 23 October 2019
PHOTOGRAPHER: B. Mace

TIME: 1442 hours
CAMERA: Apple iPhone8

TOP



SCENE: View of compromised flooring inside the interior of Building K. Photograph taken facing southeast.

DATE: 23 October 2019
PHOTOGRAPHER: E. Ackerman

TIME: 1446 hours
CAMERA: Apple iPhone 8

PHOTODOCUMENTATION LOG
Former Waterbury Clock Factory • Waterbury, Connecticut



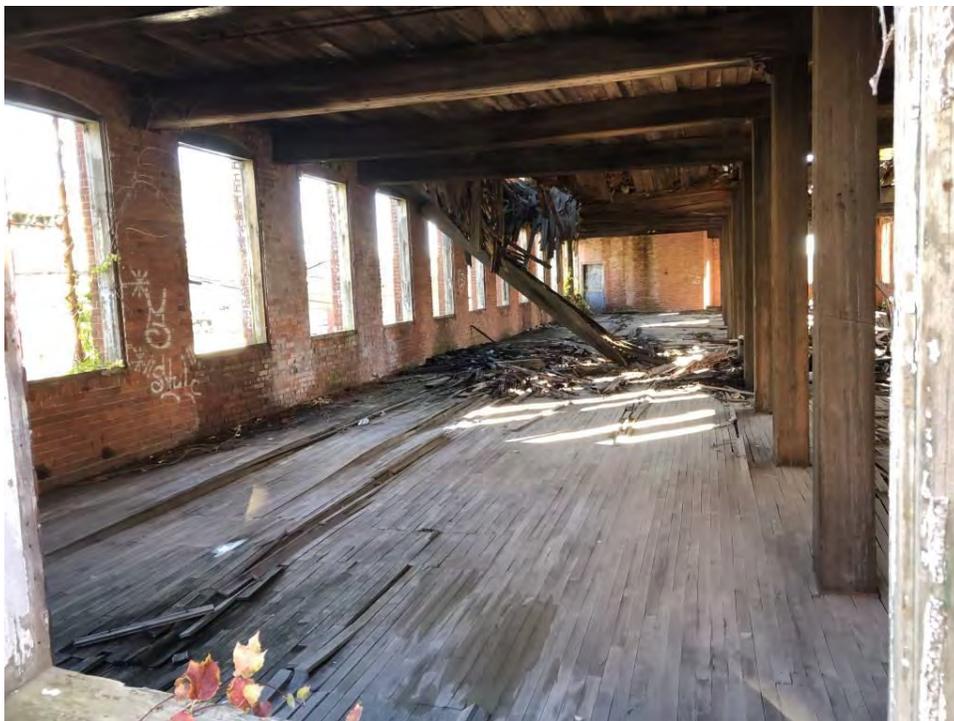
SCENE: View of compromised flooring inside the interior of Building L. Photograph taken facing southwest.

DATE: 23 October 2019

PHOTOGRAPHER: E. Ackerman

TIME: 1510 hours

CAMERA: Apple iPhone 8



SCENE: View of compromised flooring inside the interior of Building L. Photograph taken facing south.

DATE: 23 October 2019

PHOTOGRAPHER: E. Ackerman

TIME: 1510 hours

CAMERA: Apple iPhone 8

Appendix D

Analytical Data and Chain-of-Custody Records



Laboratory Report

November 04, 2019

Sherry Banks - Mail Code 02-2
US EPA New England R1

Project Number: 19100036
Project: Waterbury Clock Factory
Analysis: Bulk Asbestos Analysis by PLM
Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, INGASBSED2.

Analytical Method: Polarized Light Microscope (PLM) with Dispersion Staining.
All quantities are estimated volume percent.

Date Samples Received by the Laboratory: 10/24/2019

Data were reviewed in accordance with the internal verification procedures described in the EPA New England OEME Chemistry QA Plan.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Report may contain multiple sections and each section will be numbered independently.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by DANIEL BOUDREAU
DN: c=US, o=U.S. Government,
ou=Environmental Protection Agency,
cn=DANIEL BOUDREAU,
0.9.2342.19200300.100.1.1=68001003654558
Date: 2019.11.04 16:20:27 -05'00'

19100036\$ASBES

Waterbury Clock Factory
Bulk Asbestos Analysis by PLM

Client Sample ID: 0317-0023
Date of Collection: 10/23/2019
Date of Extraction: 10/29/19
Date of Analysis: 10/29/19

Lab Sample ID: AB83258
Matrix Waste

CAS Number	Compound	Concentration %	RL %	Qualifier
	Actinolite	ND	1.0	
	Amosite	ND	1.0	
	Anthophyllite	ND	1.0	
	Chrysotile	ND	1.0	
	Crocidolite	ND	1.0	
	Tremolite	ND	1.0	

Comments:

Client Sample ID: 0317-0024
Date of Collection: 10/23/2019
Date of Extraction: 10/29/19
Date of Analysis: 10/29/19

Lab Sample ID: AB83259
Matrix Waste

CAS Number	Compound	Concentration %	RL %	Qualifier
	Actinolite	ND	1.0	
	Amosite	ND	1.0	
	Anthophyllite	ND	1.0	
	Chrysotile	40	1.0	
	Crocidolite	ND	1.0	
	Tremolite	ND	1.0	

Comments:

Waterbury Clock Factory
Bulk Asbestos Analysis by PLM

Client Sample ID: 0317-0025
Date of Collection: 10/23/2019
Date of Extraction: 10/29/19
Date of Analysis: 10/29/19

Lab Sample ID: AB83260
Matrix Waste

CAS Number	Compound	Concentration %	RL %	Qualifier
	Actinolite	ND	1.0	
	Amosite	ND	1.0	
	Anthophyllite	ND	1.0	
	Chrysotile	50	1.0	
	Crocidolite	ND	1.0	
	Tremolite	ND	1.0	

Comments:

Client Sample ID: 0317-0026
Date of Collection: 10/23/2019
Date of Extraction: 10/29/19
Date of Analysis: 10/29/19

Lab Sample ID: AB83261
Matrix Waste

CAS Number	Compound	Concentration %	RL %	Qualifier
	Actinolite	ND	1.0	
	Amosite	ND	1.0	
	Anthophyllite	ND	1.0	
	Chrysotile	ND	1.0	
	Crocidolite	ND	1.0	
	Tremolite	ND	1.0	

Comments:

Waterbury Clock Factory
Bulk Asbestos Analysis by PLM

Client Sample ID: 0317-0027
Date of Collection: 10/23/2019
Date of Extraction: 10/29/19
Date of Analysis: 10/29/19

Lab Sample ID: AB83262
Matrix Waste

CAS Number	Compound	Concentration %	RL %	Qualifier
	Actinolite	ND	1.0	
	Amosite	ND	1.0	
	Anthophyllite	ND	1.0	
	Chrysotile	40	1.0	
	Crocidolite	ND	1.0	
	Tremolite	ND	1.0	

Comments:

Client Sample ID: 0317-0028
Date of Collection: 10/23/2019
Date of Extraction: 10/29/19
Date of Analysis: 10/29/19

Lab Sample ID: AB83263
Matrix Waste

CAS Number	Compound	Concentration %	RL %	Qualifier
	Actinolite	ND	1.0	
	Amosite	ND	1.0	
	Anthophyllite	ND	1.0	
	Chrysotile	ND	1.0	
	Crocidolite	ND	1.0	
	Tremolite	ND	1.0	

Comments:

QA Count Determination

Instrument: Ludlum 3030P Serial # 266689

Probe(s): N/A Serial # N/A

Calibration Due Date: 5/21/20

QA Source ID # DEP 003 / DEP 008

QA Source Physical Location Watney Clark / Start tracks

Count	Background	β Counts	α Counts
1	32\0	266609	3811
2	32\0	266383	3933
3	26\0	267521	3949
4	36\0	267552	3881
5	29\0	266949	3896
6	36\0	266343	4132
7	34\0	266513	3916
8	32\0	266561	3953
9	31\0	266601	3891
10	30\0	266454	3926
Average	31.2\0	266748.6	3928.8

QA Count_{avg} = Source Count_{avg} - Background Count_{avg} α 3928.8
 β 266717.4

Count Range = (Source Count_{avg} - Background Count_{avg}) X 20% 3143.04

QA Count = QA Count_{avg} +/- Count Range 7071.8 to 785.8
320060.9 213373.9

Comments: _____

Performed By: Lilly Quetschke Date: 10/23/19

Reviewed By: Mel E. Friel Date: 10/24/19

Instrument: Ludlum 3030 P Serial # 266689

Probe: N/A Serial # N/A

Source ID: DEP.008 Isotope: Th 230 Activity: 19,200 (DPM)

Efficiency Calculations		
Count #	Source Count	Background
1	3811	0
2	3933	0
3	3949	0
4	3881	0
5	3896	0
6	4132	0
7	3916	0
8	3953	0
9	3891	0
10	3926	0
Average	3928.8	0

Detector Efficiency = $\frac{\text{Source Count}_{\text{avg}} - \text{Background}_{\text{avg}}}{\text{Source Activity}}$

Detector Efficiency 20.5%

Performed By: Lilly Quetschke Date 10/23/19

Reviewed By: Mike E. Fisk Date 10/24/19

Correction Factor = $\frac{100}{\text{efficiency}\%} = \underline{4.9}$

Instrument: Ludlum 3030P Serial # 266

Probe: N/A Serial # N/A

Source ID: DEP 003 Isotope: CS-137 Activity: 1.8 E⁶ (DPM)
w/decay → 1.1 E⁶

Efficiency Calculations		
Count #	Source Count	Background
1	266609	32
2	266383	32
3	267521	26
4	267552	36
5	266949	29
6	266343	30
7	266513	34
8	266561	32
9	266601	31
10	266454	30
Average	266748.6	31.2

Detector Efficiency = $\frac{\text{Source Count}_{\text{avg}} - \text{Background}_{\text{avg}}}{\text{Source Activity}}$

Detector Efficiency 26.7 %

Performed By: Lilly Quetzschke Date 10/23/19

Reviewed By: Michael J. Ford Date October 24, 2019

Correction Factor = $\frac{100}{\text{efficiency}\%} = \underline{3.7}$



STATE OF CONNECTICUT DEPARTMENT OF PUBLIC HEALTH

Dr. Katherine A. Kelley State Public Health Laboratory 395 West Street, Rocky Hill, CT

Phone: (860) 920-6500 Fax: (860) 920-6718

LABORATORY TEST REPORT

Report To **CTDEEP BOAM RAD**
CTDEEP Bureau of Air Management-
Radiation
79 Elm Street
Hartford, CT 06106

Attention: B MACE/ SHERRY BANKS

November 19, 2019

RE: Workorder: 886516 WorkID: WATERBURY CLOCK 20191022 SO S

Dear B MACE/ SHERRY BANKS,

Enclosed are the analytical results for sample(s) received by the laboratory Thursday, October 24, 2019. The signature on this report indicates the samples were analyzed according to the laboratory's standard operating procedures, except as noted in the report narrative.

If you have any questions concerning this report, please contact Susan Isch at (860)920-6500 or by email at susan.isch@ct.gov.

A handwritten signature in cursive script, appearing to read 'Susan Isch'.

Susan Isch,
Division Director, Environmental Chemistry
This electronic signature is a true representation of my hand written signature

886516 - 15464192

REPORT OF ANALYSIS

Connecticut Registration No : PH-0905
EPA Certificate No. 2010CT01



STATE OF CONNECTICUT DEPARTMENT OF PUBLIC HEALTH

Dr. Katherine A. Kelley State Public Health Laboratory 395 West Street, Rocky Hill, CT

Phone: (860) 920-6500 Fax: (860) 920-6718

FINAL REPORT

Work Order #: 886516 (WATERBURY CLOCK 20191022 SO S)

EnvChem Sample Demographics

Property WATERBURY CLOCK FACTORY
Street 13 CHERRY AVE
Town WATERBURY
State CT
Zip Code 06702
Misc. SITE # 0317

Sample Summary

Table with 7 columns: Lab ID, Sample ID, Matrix, Date Collected, Date Received, Analytes Reported. Contains 9 rows of sample data.

886516 - 15464192

REPORT OF ANALYSIS

Connecticut Registration No : PH-0905
EPA Certificate No. 2010CT01



STATE OF CONNECTICUT DEPARTMENT OF PUBLIC HEALTH

Dr. Katherine A. Kelley State Public Health Laboratory 395 West Street, Rocky Hill, CT

Phone: (860) 920-6500 Fax: (860) 920-6718

FINAL REPORT

Work Order #: 886516 (WATERBURY CLOCK 20191022 SO S)

Analytical Results

Lab ID: 886516001	Date Received: 10/24/2019	Matrix: Soil
Sample ID: 0317-0001/ CB-1	Date Collected: 10/22/2019	Collector: B MACE/ SHERRY BANKS
Desc:		

-- Gamma Radiation --

Parameter	Results	Units	Report Limit	DF	Prepared	By	Analyzed	By
(EPA 901.1)								
Radium 226	0.98 +/- 0.35	pCi/g		1			10/25/2019 13:39	MH1

Lab ID: 886516002	Date Received: 10/24/2019	Matrix: Soil
Sample ID: 0317-0002/ SS-1	Date Collected: 10/22/2019	Collector: B MACE/ SHERRY BANKS
Desc:		

-- Gamma Radiation --

Parameter	Results	Units	Report Limit	DF	Prepared	By	Analyzed	By
(EPA 901.1)								
Radium 226	0.88 +/- 0.44	pCi/g		1			10/25/2019 13:46	MH1

Lab ID: 886516003	Date Received: 10/24/2019	Matrix: Soil
Sample ID: 0317-0003/ SS-2	Date Collected: 10/22/2019	Collector: B MACE/ SHERRY BANKS
Desc:		

-- Gamma Radiation --

Parameter	Results	Units	Report Limit	DF	Prepared	By	Analyzed	By
(EPA 901.1)								
Radium 226	0.83 +/- 0.32	pCi/g		1			10/25/2019 13:45	MH1

Lab ID: 886516004	Date Received: 10/24/2019	Matrix: Soil
Sample ID: 0317-0004/ SS-3	Date Collected: 10/22/2019	Collector: B MACE/ SHERRY BANKS
Desc:		

-- Gamma Radiation --

Parameter	Results	Units	Report Limit	DF	Prepared	By	Analyzed	By
(EPA 901.1)								
Radium 226	0.48 +/- 0.44	pCi/g		1			10/29/2019 10:10	MH1

886516 - 15464192

REPORT OF ANALYSIS

Connecticut Registration No : PH-0905

EPA Certificate No. 2010CT01



STATE OF CONNECTICUT DEPARTMENT OF PUBLIC HEALTH

Dr. Katherine A. Kelley State Public Health Laboratory 395 West Street, Rocky Hill, CT

Phone: (860) 920-6500 Fax: (860) 920-6718

FINAL REPORT

Work Order #: 886516 (WATERBURY CLOCK 20191022 SO S)

Analytical Results (cont.)

Lab ID: 886516005	Date Received: 10/24/2019	Matrix: Soil
Sample ID: 0317-0005/ SS-4	Date Collected: 10/22/2019	Collector: B MACE/ SHERRY BANKS
Desc:		

-- Gamma Radiation --

Parameter	Results	Units	Report Limit	DF	Prepared	By	Analyzed	By
(EPA 901.1)								
Radium 226	1.9 +/- 0.49	pCi/g		1			10/28/2019 02:30	MH1

Lab ID: 886516006	Date Received: 10/24/2019	Matrix: Soil
Sample ID: 0317-0006/ SS-5	Date Collected: 10/22/2019	Collector: B MACE/ SHERRY BANKS
Desc:		

-- Gamma Radiation --

Parameter	Results	Units	Report Limit	DF	Prepared	By	Analyzed	By
(EPA 901.1)								
Radium 226	1.2 +/- 0.39	pCi/g		1			10/29/2019 10:18	MH1

Lab ID: 886516007	Date Received: 10/24/2019	Matrix: Soil
Sample ID: 0317-0007/ SS-6	Date Collected: 10/22/2019	Collector: B MACE/ SHERRY BANKS
Desc:		

-- Gamma Radiation --

Parameter	Results	Units	Report Limit	DF	Prepared	By	Analyzed	By
(EPA 901.1)								
Radium 226	0.69 +/- 0.41	pCi/g		1			10/29/2019 11:08	MH1

Lab ID: 886516008	Date Received: 10/24/2019	Matrix: Soil
Sample ID: 0317-0008/ SS-7	Date Collected: 10/22/2019	Collector: B MACE/ SHERRY BANKS
Desc:		

-- Gamma Radiation --

Parameter	Results	Units	Report Limit	DF	Prepared	By	Analyzed	By
(EPA 901.1)								
Radium 226	0.67 +/- 0.41	pCi/g		1			10/30/2019 10:06	MH1

886516 - 15464192

REPORT OF ANALYSIS

Connecticut Registration No : PH-0905

EPA Certificate No. 2010CT01



STATE OF CONNECTICUT DEPARTMENT OF PUBLIC HEALTH

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FINAL REPORT

Work Order #: 886516 (WATERBURY CLOCK 20191022 SO S)

Analytical Results (cont.)

Lab ID: 886516009	Date Received: 10/24/2019	Matrix: Soil
Sample ID: 0317-0009/ SS-8	Date Collected: 10/22/2019	Collector: B MACE/ SHERRY BANKS
Desc:		

-- Gamma Radiation --

Parameter	Results	Units	Report Limit	DF	Prepared	By	Analyzed	By
(EPA 901.1)								
Radium 226	1.6 +/- 0.51	pCi/g		1			10/30/2019 10:07	MH1

886516 - 15464192

REPORT OF ANALYSIS

Connecticut Registration No : PH-0905

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