APPENDIX A

EXPERIMENT-LEVEL REPORTS

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Note: The gray shading in the results tables indicates samples that were not relevant to an experiment. For example, only two floor samples were collected in Tool and Observation rooms at each sampling stage in housing units. Thus, cells for potential third and fourth samples in all housing units experiments are gray and contain "n/a" to indicate that they were not applicable to the design. When "n/a" is entered in a non-shaded box, it indicates a sample that was not as specified for some reason.

Experiment-Specific Reports for Interior Window Replacement #1

Job: Interior window replacement (Low level interior)
City: Pittsburgh
Housing Unit: H16
Experiment #: 41
Interior Phase: Plastic Coverings/Rule Cleaning (Phase I)
Date of work: November 15, 2006

Paint Chip Results:
The average of 3 paint chip samples was 0.9% lead by weight.

Description of Job:
A window from the first floor living room was removed and replaced. The wood casing had to be sawed prior to installing the new window to ensure a proper fit. During the work stage, the window was covered with plastic on the outside.

Description of Study Room Layout:
The first floor dining room served as the Tool Room, while the first floor kitchen served as the Observation Room. Since the work was taking place adjacent to the front entry door, the side entry door which leads into the Observation Room was used as the entrance/exit. The covered front porch served as the staging area where study equipment was kept. Hallway exit samples were obtained from the bottom landing of the side door stairs and also from the top of the steps in the Observation Room. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just outside of the side door.

Pre-work Cleaning and Clearance:
The three rooms on the first floor underwent abatement-style cleaning. The Tool and Observation Rooms were covered with plastic. The entire second floor was blocked off with plastic. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 1).

Table 1. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	< 16.1	45.4	< 16.1	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
In order for the new window to fit correctly in the casing, an electric saw was used to trim down the wood casing, creating a lot of dust. Large debris was picked up and disposed of immediately after work concluded. An off-duty Pittsburgh police officer was present.

Soil Sampling Results:
The pre-work soil samples for this experiment come from the post-work soil samples of the exterior door replacement. There is no pre-work soil sample for under the work room window that maps to the location of the post-work soil sample for this experiment. The post-work soil samples resulted in an average of 2,984 ppm. The front door in this case is the side entry door, and the high lead content of the soil in that location is consistent with the post-work sample from the replacement of that door. There is no significant increase in the sample taken along the walkway (Table 2).

Table 2. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	8,120.0	457.0	n/a	n/a
Post-work	8,167.0	399.0	386.0	2984.0

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. See Table 3 for floor and dust wipe results. A dust collection tray was set up on the porch directly below the window that was replaced. The entire tray was sampled after the work stage and had a lead level of 19.3 $\mu g/ft^2$.

Table 3. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels ($\mu g/ft^2$)					Window Sill Lead Levels ($\mu g/ft^2$)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	18,574.6	19,099.9	10,250.5	252.4	12,044.4	10,936.8
	Post-cleaning	157.8	38.8	28.2	51.0	69.0	218.1
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	51.0	40.5	33.5	40.5	41.4	176.0
Tool Room	Post-work	21.2	19.5	n/a	n/a	20.4	71.0
	Post-cleaning	17.7	31.7	n/a	n/a	24.7	42.9
	Post-CV	599.4	73.8	n/a	n/a	336.6	71.0
Observation Room	Post-work	12.5	< 10	n/a	n/a	8.8	< 40
	Post-cleaning	12.5	< 10	n/a	n/a	8.8	< 40
	Post-CV	< 10	10.7	n/a	n/a	7.9	< 40
Hallway Exit	Post-CV	115.8	105.3	n/a	n/a	110.6	n/a
Exterior	Post-work	19.3	n/a	n/a	n/a	n/a	n/a

Indoor Air Monitoring Results:
The air monitoring results for the work and cleaning stages in the work room revealed levels of lead below the PEL. All other air monitoring results were below the detection limit (Table 4).

Table 4: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	**Post-work Cleaning**	**Cleaning Verification**
Work Room	31.47	13.84	< 56.56
Tool Room	< 4.06	< 6.66	< 62.34
Observation Room	< 3.99	< 6.57	< 61.43

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 51 µg measured of 52.6 µg spike (97%), and 490.6 µg measured of 534.4 µg spike (91.8%).
- Air Filter Spikes – 8.81 µg measured of 10 µg spike (88.1%).

Job: Interior window replacement (Low level interior)
City: Pittsburgh
Housing Unit: H16
Experiment #: 42
Interior Phase: Plastic Coverings/Baseline Cleaning (Phase II)
Date of work: November 20, 2006

Paint Chip Results:
The average of 3 paint chip samples was 1.9% lead by weight.

Description of Job:
A window from the first floor living room was removed and replaced. During the work stage, the window was covered with plastic on the outside.

Description of Study Room Layout:
The first floor dining room served as the Tool Room, while the first floor kitchen served as the Observation Room. Since the work was taking place adjacent to the front entry door, the side entry door which leads into the Observation Room was used as the entrance/exit. The covered front porch served as the staging area where study equipment was kept. Hallway exit samples were obtained from the bottom landing of the side door stairs and also from the top of the steps in the Observation Room. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just outside of the side door.

Pre-work Cleaning and Clearance:
The three rooms on the first floor underwent abatement-style cleaning. The Tool and Observation Rooms were covered with plastic. The entire second floor was blocked off with plastic. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 5).

Table 5. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	< 16.1	< 16.1	13.0	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
In order for the new window to fit correctly in the casing, an electric saw was used to trim down the wood casing, creating a lot of dust. Large debris was picked up and disposed of immediately after work concluded. An off-duty Pittsburgh police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 2,984 ppm. The post-work soil samples resulted in an average of 1,279 ppm. Post-work soil lead levels increased slightly along the walkway and under the work room window, however they decreased significantly close to the front door (side entry door in this experiment) (Table 6).

Table 6. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	8,167.0	399.0	386.0	2,984.0
Post-work	2,921.0	473.0	444.0	1,279.3

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:

All dust wipe samples were successfully collected. See Table 7 for floor and dust wipe results. A dust collection tray was set up on the porch directly below the window that was replaced. The entire tray was sampled after the work stage and had a lead level of 23,276.7 µg/ft^2. This result is likely due to debris falling during the removal of the plastic that was covering the exterior of the window.

Table 7. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	61,134.2	1,851.6	9,947.5	1,386.8	18,579.9	10,767.3
	Post-cleaning	90.4	412.2	54.7	176.2	183.4	611.9
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	194.1	108.3	40.4	42.1	96.2	504.8
Tool Room	Post-work	31.4	18.9	n/a	n/a	25.2	125.7
	Post-cleaning	83.3	26.1	n/a	n/a	54.7	61.2
	Post-CV	65.4	35.0	n/a	n/a	50.2	54
Observation Room	Post-work	17.1	< 10	n/a	n/a	17.1	75.6
	Post-cleaning	17.1	11.8	n/a	n/a	14.5	< 40
	Post-CV	26.1	18.9	n/a	n/a	22.5	< 40
Hallway Exit	Post-CV	342.5	174.4	n/a	n/a	258.5	n/a
Exterior	Post-work	23,276.7	n/a	n/a	n/a	n/a	n/a

Indoor Air Monitoring Results:

The air monitoring results for the work stage in the work and tool rooms revealed levels of lead below the PEL. All other air monitoring results were below the detection limit (Table 8).

Table 8: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	23.42	< 8.88	< 85.58
Tool Room	15.38	< 9.07	< 106.04
Observation Room	< 4.9	< 8.92	< 97.13

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 449.7 µg measured of 495.7 µg spike (90.7%), and 94 µg measured of 25.7 µg spike (365.8%).
- Air Filter Spikes – 11.29 µg measured of 10 µg spike (112.9%).

Job: Interior window replacement (Low level interior)
City: Pittsburgh
Housing Unit: H17
Experiment #: 43
Interior Phase: No Plastic/Baseline Cleaning (Phase IV)
Date of work: November 17, 2006

Paint Chip Results:
The average of 3 paint chip samples was 1.9% lead by weight.

Description of Job:
A window from the first floor living room was removed and replaced. During the work stage, the window was covered with plastic on the outside.

Description of Study Room Layout:
The first floor dining room served as the Tool Room, while the first floor kitchen served as the Observation Room. Since the work was taking place adjacent to the front entry door, the side entry door which leads into the Observation Room was used as the entrance/exit. The covered front porch served as the staging area where study equipment was kept. Hallway exit samples were obtained from the bottom landing of the side door stairs and also from the top of the steps in the Observation Room. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just outside of the side door.

Pre-work Cleaning and Clearance:
The three rooms on the first floor underwent abatement-style cleaning. The Tool and Observation Rooms were covered with plastic. The entire second floor was blocked off with plastic. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 9).

Table 9. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	20.2	65.3	< 16.1	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
The abatement cleaners mistakenly put plastic sheeting on the floor in the work room and the clearance samples were taken from that plastic. The plastic was not removed and served as the floor for the duration of the experiment (during work, cleaning, and verification stages). The construction workers used pry bars to remove the old window, and had to cut into the old wood casing with a saw to get the new window to fit. Large debris was picked up and disposed of immediately after work concluded. An off-duty Pittsburgh police officer was present.

Soil Sampling Results:
The pre-work soil samples for this experiment come from the post-work soil samples of the exterior door replacement. There is no pre-work soil sample for under the work room window

that maps to the location of the post-work soil sample for this experiment. The post-work soil samples resulted in an average of 449 ppm. The front door in this case is the side entry door, and the lead content of the soil in that location is slightly higher than the post-work sample from the replacement of that door. There is a decrease in the lead found in the sample taken along the walkway (Table 10).

Table 10. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	529.0	278.0	n/a	n/a
Post-work	622.0	203.0	521.0	448.7

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. See Table 11 for floor and dust wipe results. A dust collection tray was set up on the porch directly below the window that was replaced. The entire tray was sampled after the work stage and had a lead level of 49.2 $\mu g/ft^2$.

Table 11. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels ($\mu g/ft^2$)					Window Sill Lead Levels ($\mu g/ft^2$)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	26,830.8	18,223.1	1,179.8	570.7	11,701.1	6,612.7
	Post-cleaning	186.6	157.6	74.2	200.2	154.7	784.9
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	113.4	69.1	38.5	212.1	108.3	892.5
Tool Room	Post-work	14.6	23.2	n/a	n/a	18.9	68.1
	Post-cleaning	28.3	30.0	n/a	n/a	29.1	< 52.6
	Post-CV	21.5	35.1	n/a	n/a	28.3	< 52.6
Observation Room	Post-work	11.2	< 10	n/a	n/a	11.2	< 52.6
	Post-cleaning	11.2	31.7	n/a	n/a	21.5	< 52.6
	Post-CV	11.2	14.6	n/a	n/a	12.9	< 52.6
Hallway Exit	Post-CV	167.9	86.1	n/a	n/a	127.0	n/a
Exterior	Post-work	49.2	n/a	n/a	n/a	n/a	n/a

Indoor Air Monitoring Results:
The air monitoring results for the work stage in the work and tool rooms revealed levels of lead below the PEL. All other air monitoring results were below the detection limit (Table 12).

Table 12: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage ($\mu g/m^3$)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	4.8	< 8.99	< 86.28
Tool Room	4.88	< 9.05	< 86.88
Observation Room	< 4.65	< 8.93	< 85.87

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 57.2 µg measured of 56.4 µg spike (101.4%), and 48.7 µg measured of 51.9 µg spike (93.8%).
- Air Filter Spikes – 105.23 µg measured of 100 µg spike (105.2%).

Job: Interior window replacement (Low level interior)
City: Pittsburgh
Housing Unit: H17
Experiment #: 44
Interior Phase: No Plastic/Baseline Cleaning (Phase IV)
Date of work: November 22, 2006

Paint Chip Results:
The average of 3 paint chip samples was 4.1% lead by weight.

Description of Job:
A window from the first floor living room was removed and replaced. During the work stage, the window was covered with plastic on the outside.

Description of Study Room Layout:
The first floor dining room served as the Tool Room, while the first floor kitchen served as the Observation Room. Since the work was taking place adjacent to the front entry door, the side entry door which leads into the Observation Room was used as the entrance/exit. The covered front porch served as the staging area where study equipment was kept. Hallway exit samples were obtained from the bottom landing of the side door stairs and also from the top of the steps in the Observation Room. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just outside of the side door.

Pre-work Cleaning and Clearance:
The three rooms on the first floor underwent abatement-style cleaning. The Tool and Observation Rooms were covered with plastic. The entire second floor was blocked off with plastic. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 13).

Table 13. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	18.3	< 16.1	< 16.1	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
The construction workers used pry bars to remove the old window, and had to cut into the old wood casing with a saw to get the new window to fit. Dark, 'coal-like' soot and dust was uncovered beneath upper window frame. Large debris was picked up and disposed of immediately after work concluded. An off-duty Pittsburgh police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 449 ppm. The post-work soil samples resulted in an average of 675 ppm. Post-work soil lead levels increased close to the front door (side entry door in this experiment) and along the walkway, however the lead content under the work room window decreased (Table 14).

Table 14. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	622.0	203.0	521.0	448.7
Post-work	1,138.0	542.0	346.0	675.3

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. See Table 15 for floor and dust wipe results. A dust collection tray was set up on the porch directly below the window that was replaced. The entire tray was sampled after the work stage and had a lead level of 338.2 μg/ft^2.

Table 15. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (μg/ft^2)					Window Sill Lead Levels (μg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	38,833.0*	64,668.0*	1,786.3	1,083.5	26,592.7	13,101.1
	Post-cleaning	22.6	91.2	17.5	20.9	38.0	< 52.6
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	92.9	89.5	17.5	24.3	56.1	281.5
Tool Room	Post-work	31.2	15.8	n/a	n/a	23.5	< 52.6
	Post-cleaning	39.8	29.5	n/a	n/a	34.6	< 52.6
	Post-CV	58.6	29.5	n/a	n/a	44.0	< 52.6
Observation Room	Post-work	15.8	10.6	n/a	n/a	13.2	92.0
	Post-cleaning	20.9	14.1	n/a	n/a	17.5	< 52.6
	Post-CV	53.5	17.5	n/a	n/a	35.5	< 52.6
Hallway Exit	Post-CV	63.8	55.2	n/a	n/a	59.5	n/a
Exterior	Post-work	338.2	n/a	n/a	n/a	n/a	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
The air monitoring results for the work stage in the work and tool rooms revealed levels of lead below the PEL. All other air monitoring results were below the detection limit (Table 16).

Table 16: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (μg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	13.02	< 8.99	< 86.28
Tool Room	7.9	< 9.98	< 67.73
Observation Room	< 138.6	< 10.16	< 61.58

QA/QC Results:

- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 50.1 µg measured of 49.3 µg spike (101.6%), and 475.2 µg measured of 497.9 µg spike (95.4%).
- Air Filter Spikes – 9.98 µg measured of 10 µg spike (99.8%).

Experiment-Specific Reports for Interior Window Replacement #2

Job: Interior window replacement (Low level interior)
City: Columbus
Housing Unit: H09
Experiment #: 09
Interior Phase: No Plastic/Rule Cleaning (Phase III)
Date of work: October 19, 2006

Paint Chip Results:
The average of 4 paint chip samples was 7.3% lead by weight.

Description of Job:
The window and window casing in a second floor bedroom was removed and replaced. New wood casing was installed prior to installing the new window. During the work stage, the window was covered with plastic on the outside.

Description of Study Room Layout:
A second level bedroom served as the Work Room. The second floor hallway served as the Tool Room. Another bedroom down the hallway from the Work Room served as the Observation Room. The first floor living room served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the front door to the bottom of the steps leading to the second floor and also from the steps. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was right inside the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning along with the stairway, first floor main entry area and first floor room which contained the stairway. Other areas of the first floor and the other second floor rooms were barricaded with plastic. The work room floors and the work room and observation room windowsills had to undergo re-cleaning once as samples were above clearance levels. Following all pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 17).

Table 17. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	30.0	10.5	19.6	20.6
Sills	120.8	< 10	58.5	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
The removal of the window revealed a severely deteriorated wood casing. The deteriorated wood was removed and replaced with new wood. Large debris was picked up and disposed of immediately after work concluded. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 595 ppm. The post-work soil samples resulted in an average of 454.7 ppm. Post-work soil lead levels did not increase at any location (Table 18).

Table 18. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	679.0	401.0	705.0	595.0
Post-work	391.0	273.0	700.0	454.7

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. See Table 19 for floor and dust wipe results. A dust collection tray was set up on the porch roof directly below the window that was replaced. The entire tray was sampled after the work stage and had a lead level of 291.2 μg/ft^2.

Table 19. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (μg/ft^2)					Window Sill Lead Levels (μg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	11,633.6	402.6	1344.3	561.4	3,485.5	487.6
	Post-cleaning	258.5	158.8	88.7	25.9	133.0	44.5
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	188.4	85.0	92.4	107.1	118.2	< 40
Tool Room	Post-work	254.8	14.8	n/a	n/a	134.8	2,182.3
	Post-cleaning	59.1	< 10	n/a	n/a	59.1	503.8
	Post-CV	469.0	59.1	n/a	n/a	264.0	570.9
Observation Room	Post-work	37.0	158.8	n/a	n/a	97.9	539.9
	Post-cleaning	631.5	88.7	n/a	n/a	360.1	< 38.5
	Post-CV	85.0	62.8	n/a	n/a	73.9	99.6
Hallway	Post-CV	29.6	133.0	11.1	n/a	57.9	n/a
Exterior	Post-work	291.2	n/a	n/a	n/a	n/a	n/a

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 20).

Table 20: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (μg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 2.77	< 6.64	< 17.27
Tool Room	< 2.69	< 6.46	< 16.54
Observation Room	< 2.73	< 6.32	< 16.43

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 22.2 µg measured of 28.5 µg spike (77.9%), and 96.1 µg measured of 99.8 µg spike (96.3%)
- Air Filter Spikes – 8.82 µg measured of 10 µg spike (88.2%).

Job: Interior window replacement (Low level interior)
City: Columbus
Housing Unit: H09
Experiment #: 10
Interior Phase: No plastic/Baseline cleaning (Phase IV)
Date of work: October 24, 2006

Paint Chip Results:
The average of 4 paint chip samples was 3.3% lead by weight.

Description of Job:
The window and window casing in a second floor bedroom was removed and replaced. New wood casing was installed prior to installing the new window. During the work stage, the window was covered with plastic on the outside.

Description of Study Room Layout:
A second level bedroom served as the Work Room. The second floor hallway served as the Tool Room. Another bedroom down the hallway from the Work Room served as the Observation Room. The first floor living room served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the front door to the bottom of the steps leading to the second floor and also from the steps. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was right inside the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning along with the stairway, first floor main entry area and first floor room which contained the stairway. Other areas of the first floor and the other second floor rooms were barricaded with plastic. Following the pre-work cleaning, the average floor lead level in the work room was below EPA/HUD clearance standards (see Table 21). Plastic sheeting was placed over the tool room and observation room floors prior to work commencing.

Table 21. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	55.8**	44.7**	8.4
Sills	30.9	756.9***	44.0	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Plastic sheeting placed on floors before work began.
*** Collection tray used during study instead of sill.

Problems/Issues with Job:
The removal of the window revealed a severely deteriorated wood casing. The deteriorated wood was removed and replaced with new wood. Large debris was picked up and disposed of immediately after work concluded. After the work stage, the tool room dust collection tray was sampled in its entirety. All subsequent samples were taken from the designated section of the tray. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 455 ppm. The post-work soil samples resulted in an average of 934 ppm. Post-work soil lead levels increased slightly at the entrance and along the walkway, and a larger increase was observed under the work room window (Table 22).

Table 22. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	391.0	273.0	700.0	454.7
Post-work	408.0	317.0	2,077.0	934.0

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. See Table 23 for floor and dust wipe results. A dust collection tray was set up on the porch roof directly below the window that was replaced. The entire tray was sampled after the work stage and had a lead level of 232.0 μg/ft^2.

Table 23. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (μg/ft^2)					Window Sill Lead Levels (μg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	15,816.5	14,745.9	15,031.4	112.8	11,426.7	1,692.0
	Post-cleaning	194.9	94.9	187.7	73.5	137.7	411.5
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	84.2	20.0	16.4	23.6	36.0	873.3
Tool Room	Post-work	344.7	< 10	n/a	n/a	174.9	< 9.6
	Post-cleaning	869.3	109.2	n/a	n/a	489.2	< 41.7
	Post-CV	237.7	16.4	n/a	n/a	127.0	< 41.7
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	673.0
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	61.2
	Post-CV	20.0	< 10	n/a	n/a	12.5	< 47.6
Hallway	Post-CV	45.0	30.7	173.4	n/a	83.0	n/a
Exterior	Post-work	232.0	n/a	n/a	n/a	n/a	n/a

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 24).

Table 24: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (μg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 4.95	< 8.44	< 19.03
Tool Room	< 4.94	< 8.87	< 18.67
Observation Room	< 4.95	< 8.56	< 18.18

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 23.6 µg measured of 27.5 µg spike (85.8%).
- Air Filter Spikes – No air filter spike analyzed with this experiment.

Job: Interior window replacement (Low level interior)
City: Columbus
Housing Unit: H09
Experiment #: 11
Interior Phase: Plastic coverings/Baseline cleaning (Phase II)
Date of work: November 8, 2006

Paint Chip Results:
The average of 4 paint chip samples was 10.1% lead by weight.

Description of Job:
The windows and window casings from two connected windows in a second floor bedroom were removed and replaced. New wood casing was installed prior to installing the new window. During the work stage, the windows were covered with plastic on the outside.

Description of Study Room Layout:
A second level bedroom served as the Work Room. The second floor hallway served as the Tool Room. Another bedroom down the hallway from the Work Room served as the Observation Room. The first floor living room served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the front door to the bottom of the steps leading to the second floor and also from the steps. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was right inside the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning along with the stairway, first floor main entry area and first floor room which contained the stairway. Other areas of the first floor and the other second floor rooms were barricaded with plastic. The work room and observation room floors had to undergo re-cleaning- once for the observation room floor and twice for the work room floor- as samples were above clearance levels. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 25).

Table 25. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	6.8	< 10	< 10	4.1
Sills	46.3	7,737.4**	228.8	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Sill sampled instead of dust collection tray.

Problems/Issues with Job:
The removal of the window revealed a severely deteriorated wood casing. The deteriorated wood was removed and replaced with new wood. Large debris was picked up and disposed of immediately after work concluded, however smaller debris remained on the floor to be collected during post-work sampling, as appropriate. The air-lock separating the work room from the rest of the study areas associated with a plastic phase was not in place during the work. The airlock

was erected after work and before cleaning. A dust collection tray should have been used in place of the tool room windowsill as it did not pass clearance, however it appears as if the sill was inadvertently sampled, resulting in high windowsill lead levels. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 5396 ppm, well above the EPA soil threshold of 1200 ppm. The post-work soil samples resulted in an average of 4567 ppm. Post-work soil lead levels increased slightly under the work room window, but did not increase in the other two locations (Table 26).

Table 26. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	5,551.0	276.0	10,361.0	5,396.0
Post-work	2,245.0	229.0	11,226.0	4566.7

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. See Table 27 for floor and dust wipe results. A dust collection tray was set up on the ground directly below the window that was replaced. The entire tray was sampled after the work stage and had a lead level of 31715.1 $\mu g/ft^2$. The high lead level could be affected by falling debris from the removal of the plastic covering the exterior of the replaced window and blowing soil from the surrounding area below the window.

Table 27. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels ($\mu g/ft^2$)					Window Sill Lead Levels ($\mu g/ft^2$)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	432,108*	131,019*	11,294*	50,547*	156,242	1,206.1
	Post-cleaning	78.8	141.0	123.7	44.2	96.9	106.9
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	30.4	33.9	28.7	40.8	33.5	45.5
Tool Room	Post-work	51.2	175.5	n/a	n/a	113.4	364.3
	Post-cleaning	97.8	280.9	n/a	n/a	189.3	414.7
	Post-CV	28.7	21.8	n/a	n/a	25.3	2,858.8
Observation Room	Post-work	189.3	< 10	n/a	n/a	97.2	232.3
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	453.4
	Post-CV	30.4	< 10	n/a	n/a	17.7	266.8
Hallway	Post-CV	18.3	78.8	914.1	n/a	337.1	n/a
Exterior	Post-work	31,715.1	n/a	n/a	n/a	n/a	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
The work room was determined to have an air lead level of 3.16 μg/m^3 after the work stage. This is well below the OSHA Action Limit of 30 μg/m^3. All other air monitoring results were below the detection limit, with the exception of the post-verification air sample in the observation room, where an anomalously high value was analyzed.

Table 28: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (μg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	3.16	< 7.47	< 61.37
Tool Room	< 2.92	< 7.38	< 60.3
Observation Room	< 2.97	< 9.53	379.12

QA/QC Results:

- Wipe Field Blanks – <10 μg of lead measured on two blanks
- Air Filter Field Blanks - <2 μg of lead measured
- Wipe Spikes – 104.7 μg measured of 103.5 μg spike (101.2%).
- Air Filter Spikes – No air filter spike analyzed with this experiment.

Job: Interior window replacement (Low level interior)
City: Columbus
Housing Unit: H09
Experiment #: 12
Interior Phase: Plastic coverings/Rule cleaning (Phase I)
Date of work: November 16, 2006

Paint Chip Results:
The average of 4 paint chip samples was 7.2% lead by weight.

Description of Job:
The window and window casing in a second floor bedroom was removed and replaced. New wood casing was installed prior to installing the new window. During the work stage, the window was covered with plastic on the outside.

Description of Study Room Layout:
A second level bedroom served as the Work Room. The second floor hallway served as the Tool Room. Another bedroom down the hallway from the Work Room served as the Observation Room. The first floor living room served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the front door to the bottom of the steps leading to the second floor and also from the steps. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was right inside the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning along with the stairway, first floor main entry area and first floor room which contained the stairway. Other areas of the first floor and the other second floor rooms were barricaded with plastic. The work room floor and sill had to undergo re-cleaning as samples were above clearance levels. Following the pre-work cleaning, the average floor lead level in the work room was slightly above EPA/HUD clearance standards. A decision was made to proceed with the work, as scheduled, in an effort to maintain the progression of the study. Floor lead levels were below EPA/HUD clearance standards in the other two rooms (see Table 29).

Table 29. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	43.9	< 10	< 10	< 10
Sills	346.9**	172**	404.7**	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Collection tray used during study instead of sill.

Problems/Issues with Job:
The removal of the window revealed a severely deteriorated wood casing. The deteriorated wood was removed, the interior casing area was vacuumed with a HEPA vacuum, and a new wood casing was installed. Large debris was picked up and disposed of immediately after work

concluded, however smaller debris remained on the floor to be collected during post-work sampling, as appropriate. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 1850 ppm. The post-work soil samples resulted in an average of 1639 ppm. Post-work soil lead levels increased slightly under the work room window, but did not increase in the other two locations (Table 30).

Table 30. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	3,460.0	343.0	1,746.0	1,849.7
Post-work	2,508.0	291.0	2,117.0	1,638.7

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. See Table 31 for floor and dust wipe results. A dust collection tray was set up on the ground directly below the window that was replaced. The entire tray was sampled after the work stage and had a lead level of 11.6 $\mu g/ft^2$.

Table 31. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels ($\mu g/ft^2$)					Window Sill Lead Levels ($\mu g/ft^2$)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	29,632*	7,879*	2,748.2	585.1	3,662.2	168.0
	Post-cleaning	65.4	24.5	58.3	93.8	60.5	<45.5
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	17.4	56.5	21.0	24.5	29.9	<45.5
Tool Room	Post-work	13.9	38.7	n/a	n/a	26.3	<45.5
	Post-cleaning	45.8	42.3	n/a	n/a	44.1	<45.5
	Post-CV	15.7	24.5	n/a	n/a	20.1	<45.5
Observation Room	Post-work	21.0	13.9	n/a	n/a	17.5	<45.5
	Post-cleaning	14.4	<10	n/a	n/a	9.7	<45.5
	Post-CV	37.0	<10	n/a	n/a	21	<45.5
Hallway	Post-CV	19.2	15.7	31.6	n/a	22.2	n/a
Exterior	Post-work	11.6	n/a	n/a	n/a	n/a	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 32).

Table 32: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	**Post-work Cleaning**	**Cleaning Verification**
Work Room	< 4.8	< 6.72	< 96.85
Tool Room	< 4.85	< 6.73	< 74.46
Observation Room	< 4.71	< 6.75	< 75.24

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 51.2 µg measured of 52.4 µg spike (97.7%), and 455.9 µg measured of 484.6 µg spike (94.1%).
- Air Filter Spikes - 9.88 µg measured of 10 µg spike (98.8%).

Experiment-Specific Reports for Interior Cut-out Job #1

Job: Interior ceiling cut-out (Low level interior)
City: Pittsburgh
Housing Unit: H16
Experiment #: 22
Interior Phase: No Plastic/Baseline Cleaning (Phase IV)
Date of work: October 24, 2006

Paint Chip Results:
Only one paint chip sample was collected for this experiment. The sample was 3.6% lead by weight.

Description of Job:
Cut-outs were made in the kitchen ceiling disturbing approximately 15 ft^2. Scaffolding was set up in the kitchen to perform the work. A reciprocating saw was used to cut two rectangular holes and a trough in the ceiling; then, two recessed lighting fixtures and wiring were installed. After the original ceiling sections were removed and the electrical work performed, a drywall panel was installed to restore the appearance of the ceiling.

Description of Study Room Layout:
The first-floor kitchen served as the Work Room. A separate dining room, situated between the kitchen and the living room/entryway, served as the Tool Room. The living room/entryway served as the Observation Room. The front porch of the property served as the staging area, where study equipment was kept. No hallway exit samples were obtained, since the exit pathway passed directly through the Observation Room. The primary decontamination area was in the Tool Room, immediately outside the Work Room. The secondary decontamination area was on the front porch, right outside the front door.

Pre-work Cleaning and Clearance:
The living room, dining room, and kitchen on the first floor of the unit underwent abatement-style cleaning. Other areas of the first floor and the stairway leading to the second floor were barricaded with plastic. Clearance samples were taken from floors and window sills in the Study Rooms. An additional clearance sample was taken from a mantle in the Observation Room. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 33).

Table 33. Final Clearance Lead Levels (<10 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	61.1	960.6**	35.8	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Sill in Tool Room was supposed to be replaced by tray during experiment, due to clearance failure. However, the Tool Room sill was inadvertently sampled during experiment.

Problems/Issues with Job:
The renovation activity was completed without difficulty. Debris generated during the work mainly fell directly under the affected ceiling areas; dust did not appear to spread very far. A special-duty Pittsburgh police officer was present.

Soil Sampling Results:
As shown in Table 34, the pre-work soil samples averaged 919 ppm of lead, with higher levels observed near the main entrance to the property and near the window closest to the work area. The post-work soil samples resulted in an average of 916 ppm of lead, with the highest levels observed near the window (levels near the main entrance were actually lower after the work).

Table 34. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	1,213	408	1,136	919
Post-work	910	429	1,410	916

* EPA soil threshold is 400 ppm for play areas and 1,200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Three post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 35 for floor and window sill dust wipe results. With the exception of post-work samples from the Work Room, all floor and window sill results were below clearance levels.

Table 35. Floor and Window Sill Dust Wipe Sample Results (<10 reported as 5 µg/ft^2)

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	84.3	33,914.4*	83,249.4*	478,885.3*	149,033.4	57,333.5
	Post-cleaning	14.8	< 10	14.8	32.2	16.7	198.2
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	< 10	< 10	< 10	< 10	<40.0
Tool Room	Post-work	11.3	< 10	n/a	n/a	8.2	59.2
	Post-cleaning	21.7	11.3	n/a	n/a	16.5	<32.3
	Post-CV	18.3	11.3	n/a	n/a	14.8	<32.3
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	<40.0
	Post-cleaning	< 10	14.8	n/a	n/a	9.9	<40.0
	Post-CV	< 10	< 10	n/a	n/a	< 10	<40.0
Hallway Exit	Post-CV	n/a	n/a	n/a	n/a	n/a	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
Air monitoring results are presented in Table 36. Air lead levels were relatively low during all three stages of the experiment. Nearly all post-cleaning and post-CV air monitoring results were below the detection limit.

Table 36: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	6.8	<7.2	<34.0
Tool Room	11.8	<7.1	50.0
Observation Room	<4.3	<5.9	<34.4

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blank – <2 µg of lead measured
- Wipe Spikes – 23.8 µg measured of 24.1 µg spike (98.8%), and 108.2 µg measured of 100.6 µg spike (107.6%)

Job: Interior ceiling cut-out (Low level interior)
City: Pittsburgh
Housing Unit: H16
Experiment #: 23
Interior Phase: Rule Plastic/Rule Cleaning (Phase I)
Date of work: October 31, 2006

Paint Chip Results:
Only one paint chip sample was collected for this experiment. The sample was 3.6% lead by weight.

Description of Job:
Cut-outs were made in the kitchen ceiling disturbing approximately 15 ft^2. Scaffolding was set up in the kitchen to perform the work. A reciprocating saw was used to cut two rectangular holes and a trough in the ceiling; then, two recessed lighting fixtures and wiring were installed. After the original ceiling sections were removed and the electrical work performed, a drywall panel was installed to restore the appearance of the ceiling.

Description of Study Room Layout:
The first-floor kitchen served as the Work Room. A separate dining room, situated between the kitchen and the living room/entryway, served as the Tool Room. The living room/entryway served as the Observation Room. The front porch of the property served as the staging area, where study equipment was kept. No hallway exit samples were obtained, since the exit pathway passed directly through the Observation Room. The primary decontamination area was in the Tool Room, immediately outside the Work Room. The secondary decontamination area was on the front porch, right outside the front door.

Pre-work Cleaning and Clearance:
The living room, dining room, and kitchen on the first floor of the unit underwent abatement-style cleaning. Other areas of the first floor and the stairway leading to the second floor were barricaded with plastic. Clearance samples were taken from floors and window sills in the Study Rooms. An additional clearance sample was taken from a mantle in the Observation Room. Following the pre-work cleaning, average floor and window sill lead levels were below EPA/HUD clearance standards (see Table 37).

Table 37. Final Clearance Lead Levels (<10 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	<15.9	73.3	<20.0	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
The renovation activity was completed without difficulty. Debris generated during the work mainly fell directly under the affected ceiling areas; dust did not appear to spread very far. A special-duty Pittsburgh police officer was present.

Soil Sampling Results:
The post-work soil samples from Experiment 22 served as the pre-work soil samples for this experiment. These samples averaged 916 ppm of lead, with the highest levels observed near the window closest to the work area. The post-work soil samples from Experiment 23 resulted in an average of 848 ppm of lead, with the highest levels once again observed near the window closest to the work area (levels near the main entrance and along the walkway were actually lower after the work). Soil sampling results are presented in Table 38.

Table 38. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	910	429	1,410	916
Post-work	485	286	1,772	848

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected; no bulk samples were taken. See Table 39 for floor and window sill dust wipe results. With the exception of post-work samples from the Work Room, all floor and window sill results were below clearance levels.

Table 39. Floor and Window Sill Dust Wipe Sample Results (<10 reported as 5 µg/ft^2)

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	4,174.0	3,469.1	312.8	3,146.0	2,775.48	382.5
	Post-cleaning	< 10	< 10	11.3	< 10	6.6	<40.0
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	< 10	< 10	< 10	< 10	<40.0
Tool Room	Post-work	< 10	< 10	n/a	n/a	< 10	102.5
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	52.2
	Post-CV	< 10	< 10	n/a	n/a	< 10	<40.0
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	<40.0
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	<40.0
	Post-CV	< 10	< 10	n/a	n/a	< 10	<40.0
Hallway Exit	Post-CV	n/a	n/a	n/a	n/a	n/a	n/a

Indoor Air Monitoring Results:
Air monitoring results are presented in Table 40. All post-cleaning and post-CV air monitoring results, as well as the post-work results in the Tool and Observation Rooms, were below the detection limit.

Table 40: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	9.14	<6.9	<39.1
Tool Room	<5.0	<7.0	<33.0
Observation Room	<2.9	<7.0	<33.3

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blank – <2 µg of lead measured
- Wipe Spikes – 27.4 µg measured of 28.8 µg spike (95.1%), and 25.6 µg measured of 28.5 µg spike (89.8%)
- Air Filter Spike – 59.7 µg measured of 100.0 µg spike (59.7%)

Job: Interior ceiling cut-out (Low level interior)
City: Pittsburgh
Housing Unit: H17
Experiment #: 24
Interior Phase: No Plastic/Rule Cleaning (Phase III)
Date of work: October 19, 2006

Paint Chip Results:
Only one paint chip sample was collected for this experiment. The sample was 5.0% lead by weight.

Description of Job:
Cut-outs were made in the kitchen ceiling disturbing approximately 40 ft^2. Scaffolding was set up in the kitchen to perform the work. A reciprocating saw was used to cut one large rectangular hole in the ceiling; then, six recessed lighting fixtures and wiring were installed. After the original ceiling section was removed and the electrical work performed, drywall panels were installed to restore the appearance of the ceiling.

Description of Study Room Layout:
The first-floor kitchen served as the Work Room. A separate dining room, situated between the kitchen and the living room/entryway, served as the Tool Room. The living room/entryway served as the Observation Room. The front porch of the property served as the staging area, where study equipment was kept. No hallway exit samples were obtained, since the exit pathway passed directly through the Observation Room. The primary decontamination area was in the Tool Room, immediately outside the Work Room. The secondary decontamination area was on the front porch, right outside the front door.

Pre-work Cleaning and Clearance:
The living room, dining room, and kitchen on the first floor of the unit underwent abatement-style cleaning. Other areas of the first floor and the stairway leading to the second floor were barricaded with plastic. Clearance samples were taken from floors and window sills in the Study Rooms. An additional clearance sample was taken from a mantle in the Observation Room. The Work Room had to undergo re-cleaning once, as one floor sample was above the clearance level. Following the pre-work cleaning, average floor and window sill lead levels were below EPA/HUD clearance standards (Table 41).

Table 41. Final Clearance Lead Levels (<10 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	12.7	21.4	n/a
Sills	<76.9	88.3	94.0	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
The renovation activity was completed without difficulty. Debris generated during the work mainly fell directly under the affected ceiling areas; dust did not appear to spread very far. A special-duty Pittsburgh police officer was present.

Soil Sampling Results:
As shown in Table 42, the pre-work soil samples averaged 569 ppm of lead, with higher levels observed near the main entrance to the property and near the window closest to the work area. The post-work soil samples resulted in an average of 482 ppm of lead and were lower than pre-work levels in all sampled areas, highlighting the variability in soil lead levels.

Table 42. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	752	334	622	569
Post-work	677	204	564	482

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Floor and tray dust wipe results are presented in Table 43.

Table 43. Floor and Window Sill Dust Wipe Sample Results (<10 reported as 5 µg/ft^2)

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	92.4	472.7	48.0	103.4	179.1	1,385.0
	Post-cleaning	14.8	99.7	< 10	< 10	31.1	<50.0
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	11.1	< 10	< 10	18.5	9.9	166.4
Tool Room	Post-work	70.2	48.0	n/a	n/a	59.1	166.4
	Post-cleaning	73.9	62.8	n/a	n/a	68.4	240.2
	Post-CV	73.9	70.2	n/a	n/a	72.0	203.3
Observation Room	Post-work	25.9	77.6	n/a	n/a	51.7	<50.0
	Post-cleaning	29.6	18.5	n/a	n/a	24.1	184.8
	Post-CV	33.3	81.3	n/a	n/a	57.3	55.6
Hallway Exit	Post-CV	n/a	n/a	n/a	n/a	n/a	n/a

Indoor Air Monitoring Results:
Air monitoring results are presented in Table 44. All post-cleaning and post-CV air monitoring results, as well as post-work results in the Tool and Observation Rooms, were below the detection limit.

Table 44: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	**Post-work Cleaning**	**Cleaning Verification**
Work Room	10.1	<5.3	<48.0
Tool Room	<2.7	<5.1	<51.0
Observation Room	<5.0	<5.3	<51.4

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blank – <2 µg of lead measured
- Wipe Spikes – 107.1 µg measured of 100.3 µg spike (106.8%) and 96.1 µg measured of 102.5 µg spike (93.8%)
- Air Filter Spike – 93.8 µg measured of 100.0 µg spike (93.8%)

Job: Interior ceiling cut-out (Low level interior)
City: Pittsburgh
Housing Unit: H16
Experiment #: 25
Interior Phase: Rule Plastic/Baseline Cleaning (Phase II)
Date of work: November 3, 2006

Paint Chip Results:
Only one paint chip sample was collected for this experiment. The sample was 3.6% lead by weight.

Description of Job:
Cut-outs were made in the kitchen ceiling disturbing approximately 15 ft^2. Scaffolding was set up in the kitchen to perform the work. A reciprocating saw was used to cut two rectangular holes and a trough in the ceiling; then, two recessed lighting fixtures and wiring were installed. After the original ceiling sections were removed and the electrical work performed, drywall panels were installed to restore the appearance of the ceiling.

Description of Study Room Layout:
The first-floor kitchen served as the Work Room. A separate dining room, situated between the kitchen and the living room/entryway, served as the Tool Room. The living room/entryway served as the Observation Room. The front porch of the property served as the staging area, where study equipment was kept. No hallway exit samples were obtained, since the exit pathway passed directly through the Observation Room. The primary decontamination area was in the Tool Room, immediately outside the Work Room. The secondary decontamination area was on the front porch, right outside the front door.

Pre-work Cleaning and Clearance:
The living room, dining room, and kitchen on the first floor of the unit underwent abatement-style cleaning. Other areas of the first floor and the stairway leading to the second floor were barricaded with plastic. Clearance samples were taken from floors and window sills in the Study Rooms. An additional clearance sample was taken from a mantle in the Observation Room. Following the pre-work cleaning, average floor and window sill lead levels were below EPA/HUD clearance standards (Table 45).

Table 45. Final Clearance Lead Levels (<10 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	<15.9	63.2	<20.0	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
The renovation activity was completed without difficulty. Debris generated during the work mainly fell directly under the affected ceiling areas; dust did not appear to spread very far. A special-duty Pittsburgh police officer was present.

Soil Sampling Results:
The post-work soil samples from Experiment 23 served as the pre-work soil samples for this experiment. These samples averaged 848 ppm of lead, with the highest levels observed near the window closest to the work area. The post-work soil samples from Experiment 25 resulted in an average of 1,068 ppm of lead, with the highest levels once again observed near the window closest to the work area. Soil sampling results are presented in Table 46.

Table 46. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	485	286	1,772	848
Post-work	575	274	2,355	1,068

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Three post-work sampling areas in the Work Room were covered with significant amounts of debris. This debris was collected in bags before the areas were wiped with dust wipes. Table 47 presents floor and tray dust wipe results.

Table 47. Floor and Window Sill Dust Wipe Sample Results (<10 reported as 5 µg/ft^2)

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	126.9	282,531*	25,483*	95,190*	100,833	197.3
	Post-cleaning	13.3	< 10	20.7	< 10	11.0	<52.6
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	11.4	13.3	< 10	8.7	<52.6
Tool Room	Post-work	< 10	15.1	n/a	n/a	10.1	128.7
	Post-cleaning	24.4	< 10	n/a	n/a	14.7	197.3
	Post-CV	13.3	< 10	n/a	n/a	9.2	89.4
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	<52.6
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	<52.6
	Post-CV	< 10	< 10	n/a	n/a	< 10	<52.6
Hallway Exit	Post-CV	n/a	n/a	n/a	n/a	n/a	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:
Air monitoring results are presented in Table 48. All post-cleaning and post-CV air monitoring results were below the detection limit, as were the post-work results in the Tool and Observation Rooms.

Table 48: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	**Post-work Cleaning**	**Cleaning Verification**
Work Room	9.1	<7.6	<57.2
Tool Room	<4.7	<7.4	<56.2
Observation Room	<4.7	<7.6	<48.7

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blank – <2 µg of lead measured
- Wipe Spikes – 93.4 µg measured of 100.2 µg spike (93.2%) and 35.6 µg measured of 38.1 µg spike (93.4%)

Experiment-Specific Reports for Interior Cut-Outs #2

Job: Interior Cut-Outs (Low level interior)
City: Columbus
Housing Unit: H08
Experiment #: 45
Interior Phase: No Plastic /Baseline Cleaning (Phase IV)
Date of work: November 9, 2006

Paint Chip Results:
The average of 2 paint chip samples was 1.8% lead by weight.

Description of Job:
Three cut-outs, disturbing approximately 6 ft^2 of lead-based paint, were made on a kitchen wall for installation of GFI outlets and a light switch. An electric saw was used to cut through the wall, then a hammer was used to remove the wood planks from the studs. The holes were not patched as part of the job.

Description of Study Room Layout:
The first floor kitchen served as the Work Room. The adjacent dining room served as the Tool Room, while the first floor living room served as the Observation Room. Hallway exit samples were collected in the Tool Room from the pathway leading from the entrance door to the Work Room. The covered front porch served as the staging area where study equipment was kept. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just outside of the main entrance door.

Pre-work Cleaning and Clearance:
The three first floor rooms underwent abatement-style cleaning. Other areas of the first floor and the entire second floor were barricaded with plastic. All three rooms underwent a second cleaning, due to the floor lead levels exceeding the clearance standards after the first cleaning. Following the pre-work cleaning, average floor lead levels in the Tool and Observation Rooms were below EPA/HUD clearance standards (see Table 49). Though the average floor lead level in the Work Room was above the clearance standard (with three samples between 50 and 66 $\mu g/ft^2$ and one at 202 $\mu g/ft^2$), work proceeded as scheduled to maintain study progress.

Table 49. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels ($\mu g/ft^2$)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	95.0	20.7	18.8	n/a
Sills	1,217.5	29.6	< 20.8	n/a

* EPA/HUD clearance levels are 40 $\mu g/ft^2$ for floors and 250 $\mu g/ft^2$ for sills.

Problems/Issues with Job:
Due to its high lead level, the window sill in the Work Room was to be replaced by a dust collection tray, however the window sill was inadvertently sampled during the post-work sampling stage. To keep the samples consistent, subsequent samples were also taken from the

window sill. Large pieces of debris were collected and discarded prior to post-work sampling. Since the wall was not repaired prior to cleaning, the edges of the cut-outs were covered with duct tape to prevent contamination due to crumbling of the wall. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 286 ppm. The post-work soil samples resulted in an average of 263 ppm. Post-work soil lead levels were not significantly different at any location (Table 50).

Table 50. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	359.0	133.0	367.0	286.3
Post-work	308.0	146.0	336.0	263.3

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Three post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. There was one floor zone that failed two wet cloth verifications; a post-wet cleaning verification sample was collected from that zone. See Table 51 for floor and dust wipe results.

Table 51. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	1,177,820.6*	231,876.9*	78,524.8*	620.5	372,210.7	999.8
	Post-cleaning	111.6	61.5	71.9	90.9	84.0	416.9
	Post-wet CV	61.5	n/a	n/a	n/a	61.5	n/a
	Post-CV	37.3	37.3	30.4	123.7	57.2	276.6
Tool Room	Post-work	40.8	40.8	n/a	n/a	40.8	164.2
	Post-cleaning	14.9	< 10	n/a	n/a	9.9	96.3
	Post-CV	13.2	16.6	n/a	n/a	14.9	312.3
Observation Room	Post-work	11.4	< 10	n/a	n/a	8.2	< 58.8
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	< 58.8
	Post-CV	< 10	< 10	n/a	n/a	< 10	< 58.8
Hallway Exit	Post-CV	27.0	11.4	25.3	n/a	21.2	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 52).

Table 52 Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	**Post-work Cleaning**	**Cleaning Verification**
Work Room	< 5.61	< 8.34	< 7.48
Tool Room	< 5.74	< 8.22	< 7.28
Observation Room	< 5.69	< 8.31	< 7.37

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 99.5 µg measured of 96.2 µg spike (103.4%).
- Air Filter Spikes – There was no air filter spike generated for this experiment.

Job: Interior Cut-Outs (Low level interior)
City: Columbus
Housing Unit: H08
Experiment #: 46
Interior Phase: No Plastic /Rule Cleaning (Phase III)
Date of work: November 17, 2006

Paint Chip Results:
The average of 2 paint chip samples was 1.8% lead by weight.

Description of Job:
Two cut-outs were made on a kitchen wall, disturbing approximately 7 ft^2 of lead-based paint. An electric saw was used to cut through the wall, then a hammer was used to remove the wood planks from the studs. The holes were not patched as part of the job.

Description of Study Room Layout:
The first floor kitchen served as the Work Room. The adjacent dining room served as the Tool Room, while the first floor living room served as the Observation Room. Hallway exit samples were collected in the Tool Room from the pathway leading from the entrance door to the Work Room. The covered front porch served as the staging area where study equipment was kept. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just outside of the main entrance door.

Pre-work Cleaning and Clearance:
The three first floor rooms underwent abatement-style cleaning. Other areas of the first floor and the entire second floor were barricaded with plastic. The Work Room underwent a second cleaning, due to the floor lead levels exceeding the clearance standards after the first cleaning. Following the pre-work cleaning, the average floor lead level in the Work Room was below EPA/HUD clearance standards (see Table 53). The Tool and Observation Room floors were covered with plastic after clearance sampling to provide a clean surface for the start of the experiment.

Table 53. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	19.0	39.3**	146.1**	n/a
Sills	336.8***	45***	< 20.8***	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Plastic placed over floors before work began.
*** Window sill replaced by a dust collection tray.

Problems/Issues with Job:
There were only two cut-outs made on the wall connecting the existing holes from experiment 45 so that the wall may be replaced with one sheet of drywall. The square footage of disturbed components remained consistent with the study requirements. Large pieces of debris were collected and discarded prior to post-work sampling. Since the wall was not repaired prior to

cleaning, the edges of the cut-outs were covered with duct tape to prevent contamination due to crumbling of the wall. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples come from the post-work soil samples of the first cut-out experiment at this housing unit, experiment 45, and resulted in an average of 263 ppm. The post-work soil samples resulted in an average of 527 ppm. The post-work soil lead level close to the front door was different than the pre-work sample, while the other post-work lead levels were not significantly different at any location (Table 54). Subsequent soil sampling close to the front door resulted in lead levels consistent with the pre-work soil sample.

Table 54. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	308.0	146.0	336.0	263.3
Post-work	940.0	121.0	519.0	526.7

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Two post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. The two post-verification samples in the Tool Room were anomalously high, considering that the average floor lead level is higher than the post-work average in the Work Room. The hallway exit samples were also collected in the Tool Room following the cleaning verification, providing inconsistent results. There was no identifiable event that could have lead to such high post-verification floor lead levels; the cause of the anomaly is being investigated. See Table 55 for floor and dust wipe results.

Table 55. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft²)					Window Sill Lead Levels (µg/ft²)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	10,858.0*	58,657.3*	215.6	89.5	17,455.1	88.5
	Post-cleaning	26.5	12.5	< 10	19.5	15.9	< 41.7
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	38.8	< 10	10.7	< 10	14.9	< 41.7
Tool Room	Post-work	17.7	< 10	n/a	n/a	11.4	< 41.7
	Post-cleaning	10.7	21.2	n/a	n/a	16.0	< 41.7
	Post-CV	26,265.5	14,006.7	n/a	n/a	20,136.1	< 41.7
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	< 41.7
	Post-cleaning	12.5	< 10	n/a	n/a	12.5	< 41.7
	Post-CV	< 10	10.7	n/a	n/a	7.8	< 41.7
Hallway Exit	Post-CV	17.7	14.2	14.2	n/a	15.4	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:

The post-cleaning air lead level in the Work Room was above the PEL. Due to the nature of the job and the small amount of debris on the floor after the work, it is assumed that there was some contamination of the sample. All personnel in the work room during that stage were wearing appropriate respiratory protection. All other air monitoring results were below the detection limit (Table 56).

Table 56: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m³)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 8.82	636.70	< 95.65
Tool Room	< 8.84	< 7.47	< 111.61
Observation Room	< 8.79	< 7.44	< 112.30

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 63.3 µg measured of 59.8 µg spike (105.9%), and 59.8 µg measured of 58.8 µg spike (101.7%).
- Air Filter Spikes – 96.56 µg measured of 100 µg spike (96.6%).

Job: Interior Cut-Outs (Low level interior)
City: Columbus
Housing Unit: H35
Experiment #: 71
Interior Phase: Plastic Coverings /Baseline Cleaning (Phase II)
Date of work: December 11, 2006

Paint Chip Results:
The average of 2 paint chip samples was 0.8% lead by weight.

Description of Job:
One large cut-out, disturbing approximately 6 ft^2 of lead-based paint, was made on a kitchen wall for installation of GFI outlets. Metal tile was removed from the wall in the area of the cut-out followed by the use of an electric saw to cut through the wall. The outlet was not installed and the holes were not patched as part of the job.

Description of Study Room Layout:
The first floor kitchen served as the Work Room. A portion of the first floor living room, closest to the Work Room served as the Tool Room, while the remainder of the living room served as the Observation Room. Due to bad weather, the staging area where study equipment was kept was located in the Observation Room. Hallway exit samples were obtained from the hallway connecting the main entrance to the Work Room. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just outside of the main entrance door on the front porch.

Pre-work Cleaning and Clearance:
The two first floor rooms, along with the hallway underwent abatement-style cleaning. Other areas of the first floor and the entire second floor were barricaded with plastic. The Tool and Observation Rooms were covered with plastic prior to clearance testing. Following the pre-work cleaning, average floor lead levels in the study rooms were below EPA/HUD clearance standards (see Table 57). One of the two hallway clearance samples was significantly above clearance, pulling the average above clearance; however, this sample was collected in a location that was not to be sampled as part of the experiment. Work proceeded as scheduled.

Table 57. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	8.0	< 10	141.1
Sills	22.4	n/a**	28.9	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Window sill replaced by a dust collection tray.

Problems/Issues with Job:
Large pieces of debris were collected and discarded prior to post-work sampling. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 505 ppm. The post-work soil samples resulted in an average of 493 ppm. Post-work soil lead levels were not significantly different at any location (Table 58).

Table 58. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	471.0	481.0	554.0	505.3
Post-work	413.0	500.0	567.0	493.3

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. The window sill designated for sampling in the Work Room in the pre-determined sampling plan was of insufficient size to sample; thus, a different sill in the Work Room was substituted. One post-cleaning sample in the Work Room was moved to an adjacent location due to the presence of a heat vent. See Table 59 for floor and dust wipe results.

Table 59. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	58.9	16.2	< 10	16.2	24.1	< 62.5
	Post-cleaning	11.0	12.8	< 10	< 10	8.5	101.1
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	26.4	29.8	< 10	17.9	19.8	< 62.5
Tool Room	Post-work	16.2	19.6	n/a	n/a	17.9	< 41.7
	Post-cleaning	19.6	24.7	n/a	n/a	22.2	< 41.7
	Post-CV	19.6	12.8	n/a	n/a	16.2	< 41.7
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	< 55.6
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	< 55.6
	Post-CV	14.5	< 10	n/a	n/a	9.8	< 55.6
Hallway Exit	Post-CV	36.7	23.0	19.6	n/a	26.4	n/a

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 60).

Table 60: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	**Post-work Cleaning**	**Cleaning Verification**
Work Room	< 9.88	< 7.97	< 75.56
Tool Room	< 9.27	< 7.37	< 75.47
Observation Room	< 9.34	< 7.32	< 67.96

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 48.6 µg measured of 49.6 µg spike (98%), and 616.6 µg measured of 635.1 µg spike (97.1%).
- Air Filter Spikes – < 2 µg measured of 100 µg spike (< 2%). This sample was re-analyzed by the laboratory and the result was confirmed. It is assumed that the air filter was mistakenly provided without any spike material.

Job: Interior Cut-Outs (Low level interior)
City: Columbus
Housing Unit: H35
Experiment #: 72
Interior Phase: Plastic Coverings /Rule Cleaning (Phase I)
Date of work: December 14, 2006

Paint Chip Results:
The concentration of 1 paint chip sample was 1.0% lead by weight.

Description of Job:
One large cut-out, disturbing approximately 6 ft^2 of lead-based paint, was made on a kitchen wall for installation of GFI outlets. Metal tile was removed from the wall in the area of the cut-out followed by the use of an electric saw and small knife to cut through the wall. The outlet was not installed and the holes were not patched as part of the job.

Description of Study Room Layout:
The first floor kitchen served as the Work Room. A portion of the first floor living room, closest to the Work Room served as the Tool Room, while the remainder of the living room served as the Observation Room. The staging area where study equipment was kept was located on the covered front porch. Hallway exit samples were obtained from the hallway connecting the main entrance to the Work Room. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just outside of the main entrance door on the front porch.

Pre-work Cleaning and Clearance:
The two first floor rooms, along with the hallway underwent abatement-style cleaning. Other areas of the first floor and the entire second floor were barricaded with plastic. The Tool and Observation Rooms were covered with plastic prior to clearance testing. Following the pre-work cleaning, average floor lead levels in the study rooms were below EPA/HUD clearance standards (see Table 61).

Table 61. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	17.2
Sills	< 18.5	n/a**	< 13.2	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Window sill replaced by a dust collection tray.

Problems/Issues with Job:
As the hole was being cut and plaster was falling off the wall, it became obvious that a heat duct behind the wall was wrapped in asbestos. In an effort not to disturb the asbestos, the remainder of the cut-out was made with a small knife instead of a power saw. Prior to cleaning, the heat duct was misted with water to prevent the asbestos from becoming airborne. Large pieces of debris were collected and discarded prior to post-work sampling. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 493 ppm. The post-work soil samples resulted in an average of 845 ppm. Post-work soil lead levels were significantly different at the location under the work room window (Table 62).

Table 62. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	413.0	500.0	567.0	493.3
Post-work	772.0	502.0	1260.0	844.7

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Due to the placement of the cut-out, the location of one post-work sample was switched with a post-cleaning sample, in order to have a post-work sample that was close to where the work actually occurred. See Table 63 for floor and dust wipe results.

Table 63. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	2,994.7	55.1	40.3	173.9	816.0	< 100.0
	Post-cleaning	32.9	10.6	< 10	10.6	14.8	< 100.0
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	< 10	< 10	< 10	< 10	< 100.0
Tool Room	Post-work	21.7	< 10	n/a	n/a	13.4	< 41.7
	Post-cleaning	< 10	18.0	n/a	n/a	11.5	< 41.7
	Post-CV	< 10	< 10	n/a	n/a	< 10	< 41.7
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	< 52.6
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	< 52.6
	Post-CV	< 10	< 10	n/a	n/a	< 10	< 52.6
Hallway Exit	Post-CV	10.6	32.9	27.3	n/a	23.6	n/a

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 64).

Table 64: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	**Post-work Cleaning**	**Cleaning Verification**
Work Room	< 7.69	< 6.30	< 94.12
Tool Room	< 7.58	< 6.45	< 93.85
Observation Room	< 7.56	< 6.54	< 95.10

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 51.4 µg measured of 40.4 µg spike (127.2%), and 57 µg measured of 47.6 µg spike (119.7%).
- Air Filter Spikes – < 2 µg measured of 100 µg spike (< 2%). This sample was re-analyzed by the laboratory and the result was confirmed. It is assumed that the air filter was mistakenly provided without any spike material.

Experiment-Specific Reports for Interior Cut-outs #3

Job: Interior cut-outs (Low level interior)
City: Columbus
Housing Unit: C01
Experiment #: 52
Interior Phase: No Plastic/Rule Cleaning (Phase III)
Date of work: November 7, 2006

Paint Chip Results:
The average of 2 paint chip samples was 9.5% lead by weight.

Description of Job:
The work performed included using an electric saw to make three cut-outs on a classroom wall, each disturbing 2 ft^2 of the wall. The plaster was then removed using a hammer.

Description of Study Room Layout:
The large area of the classroom allowed for a distinct Work Room to be identified within a subsection of the classroom and for the rest of the classroom to serve as the Tool Room. A non-traveled section of the hallway adjacent to the Work/Tool Room served as the Observation Room. The landing at the top of the entry stairwell served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the staging area to the Work/Tool Room. The primary decontamination area was in the Tool Room immediately outside the Work Room. The secondary decontamination area was at the end of the hallway.

Pre-work Cleaning and Clearance:
The classroom and the hallway that connected the staging area to the classroom underwent abatement-style cleaning. A plastic airlock was erected at the entrance to the hallway, separating the work areas from the rest of the school. Other areas of the first floor and the stairwell to other floors of the school were barricaded with plastic. There were no windowsill samples taken; instead, dust trays were used as a substitute in all three rooms. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 65).

Table 65. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	19.3	< 10
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
Since the support behind the plaster was masonry, only the plaster was removed during the work, resulting in a cut-out approximately one inch deep. The holes were taped up during the cleaning stage to avoid further contamination by falling debris. An off-duty Columbus police officer was present.

Figure A-1. Wall cut out at school

Soil Sampling Results:
Concrete covered the ground at the three soil sampling locations, thus no pre- or post- work soil samples were collected for this experiment.

Dust Wipe Results:
A labeling error occurred during the post-cleaning sampling in the Work Room. Sample 2 and Sample 3 may have been inadvertently switched, affecting only the location of each sample. All other dust wipe samples were successfully collected. Two post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 66 for floor and dust wipe results.

Table 66. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	56,461.0*	142,624.0*	452.9	219.6	49,939.4	436.2
	Post-cleaning	30.6	12.9	16.5	11.2	17.8	< 45.5
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	< 10	< 10	< 10	<10	< 45.5
Tool Room	Post-work	44.7	106.6	44.7	n/a	65.3	< 47.6
	Post-cleaning	16.5	64.2	< 10	n/a	28.6	< 45.5
	Post-CV	103.0	21.8	28.8	n/a	51.2	< 45.5
Observation Room	Post-work	35.9	48.3	n/a	n/a	42.1	< 45.5
	Post-cleaning	25.3	27.1	n/a	n/a	26.2	< 47.6
	Post-CV	32.4	34.1	n/a	n/a	33.3	< 47.6
Hallway	Post-CV	113.6	27.1	12.9	n/a	51.2	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 67).

Table 67: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	**Post-work Cleaning**	**Cleaning Verification**
Work Room	< 7.82	< 6.44	< 37.09
Tool Room	< 8.09	< 6.44	< 35.23
Observation Room	< 8.09	< 6.33	< 33.74

QA/QC Results:

- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 27.1 µg measured of 26.6 µg spike (101.9%).
- Air Filter Spikes – 94.46 µg measured of 100 µg spike (94.5%).

Job: Interior cut-outs (Low level interior)
City: Columbus
Housing Unit: C01
Experiment #: 53
Interior Phase: Plastic Coverings /Baseline Cleaning (Phase II)
Date of work: November 14, 2006

Paint Chip Results:
The average of 2 paint chip samples was 7.4% lead by weight.

Description of Job:
The work performed included using an electric saw to make three cut-outs on a classroom wall, each disturbing 2 ft^2 of the wall. The plaster was then removed using a hammer.

Description of Study Room Layout:
The large area of the classroom allowed for a distinct Work Room to be identified within a subsection of the classroom and for the rest of the classroom to serve as the Tool Room. A non-traveled section of the hallway adjacent to the Work/Tool Room served as the Observation Room. The landing at the top of the entry stairwell served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the staging area to the Work/Tool Room. The primary decontamination area was in the Tool Room immediately outside the Work Room. The secondary decontamination area was at the end of the hallway.

Pre-work Cleaning and Clearance:
The classroom and the hallway that connected the staging area to the classroom underwent abatement-style cleaning. A plastic airlock was erected at the entrance to the hallway, separating the work areas from the rest of the school. Other areas of the first floor and the stairwell to other floors of the school were barricaded with plastic. There were no windowsill samples taken; instead, dust trays were used as a substitute in all three rooms. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 68).

Table 68. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	8.9
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
Since the support behind the plaster was masonry, only the plaster was removed during the work, resulting in a cut-out approximately one inch deep. Large pieces of debris were picked up immediately after the work finished. Plastic was placed on the ground in the Work Room during the work stage; however, no vertical plastic was erected to isolate the Work Room from the Tool Room. This, in combination with the open Work Room/Tool Room layout, meant that there was no airlock in place to separate the two rooms. The window in the Work Room was covered with plastic during the work to minimize contamination on the blinds and windowsill. The holes were

taped up during the cleaning stage to avoid further contamination by falling debris. An off-duty Columbus police officer was present.

Soil Sampling Results:
Concrete covered the ground at the three soil sampling locations, thus no pre- or post- work soil samples were collected for this experiment.

Dust Wipe Results:
All dust wipe samples were successfully collected. One post-work sampling area in the Work Room was covered with a significant amount of debris. In this instance, debris was collected in a plastic bag before the sample area was wiped with a dust wipe. See Table 69 for floor and dust wipe results.

Table 69. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	879.6	842,895.8*	233.6	127.7	211,034.2	57.1
	Post-cleaning	16.3	< 10	< 10	< 10	7.8	48.7
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	< 10	< 10	< 10	< 10	< 45.5
Tool Room	Post-work	46.0	33.0	64.6	n/a	47.9	82.5
	Post-cleaning	55.3	20.0	34.9	n/a	36.7	< 45.5
	Post-CV	27.4	18.1	57.1	n/a	34.2	< 45.5
Observation Room	Post-work	38.6	33.0	n/a	n/a	35.8	< 45.5
	Post-cleaning	33.0	280.0	n/a	n/a	156.5	< 45.5
	Post-CV	23.7	23.7	n/a	n/a	23.7	< 45.5
Hallway	Post-CV	23.7	10.7	16.3	n/a	16.9	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 70).

Table 70: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 8.88	< 7.49	< 111.42
Tool Room	< 8.88	< 7.54	< 111.11
Observation Room	< 8.9	< 7.46	< 113.57

QA/QC Results:
- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 53.4 µg measured of 50.4 µg spike (106%), and 53.4 µg measured of 48.8 µg spike (109.4%).
- Air Filter Spikes – There was no air filter spike generated for this experiment.

Job: Interior cut-outs (Low level interior)
City: Columbus
Housing Unit: C01
Experiment #: 54
Interior Phase: No Plastic /Baseline Cleaning (Phase IV)
Date of work: November 22, 2006

Paint Chip Results:
The average of 2 paint chip samples was 7.4% lead by weight.

Description of Job:
The work performed included using an electric saw to make three cut-outs on a classroom wall, each disturbing 2 ft^2 of the wall. The plaster was then removed using a hammer.

Description of Study Room Layout:
The large area of the classroom allowed for a distinct Work Room to be identified within a subsection of the classroom and for the rest of the classroom to serve as the Tool Room. A non-traveled section of the hallway adjacent to the Work/Tool Room served as the Observation Room. The landing at the top of the entry stairwell served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the staging area to the Work/Tool Room. The primary decontamination area was in the Tool Room immediately outside the Work Room. The secondary decontamination area was at the end of the hallway.

Pre-work Cleaning and Clearance:
The classroom and the hallway that connected the staging area to the classroom underwent abatement-style cleaning. A plastic airlock was erected at the entrance to the hallway, separating the work areas from the rest of the school. Other areas of the first floor and the stairwell to other floors of the school were barricaded with plastic. There were no windowsill samples taken; instead, dust trays were used as a substitute in all three rooms. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 71).

Table 71. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	< 10
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
Since the support behind the plaster was masonry, only the plaster was removed during the work, resulting in a cut-out approximately one inch deep. The holes were taped up during the cleaning stage to avoid further contamination by falling debris. An off-duty Columbus police officer was present.

Soil Sampling Results:
Concrete covered the ground at the three soil sampling locations, thus no pre- or post- work soil samples were collected for this experiment.

Dust Wipe Results:
All dust wipe samples were successfully collected. Due to an excessive amount of plaster in the location of Work Room post-work Sample 2, the sample was taken from an adjacent location that was not previously assigned a sample. Two post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 72 for floor and dust wipe results.

Table 72. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	66,507.2*	424,740.6*	712.3	841.4	123,200.4	255.4
	Post-cleaning	22.9	12.4	< 10	< 10	11.3	< 41.7
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	< 10	< 10	< 10	< 10	< 41.7
Tool Room	Post-work	17.7	17.7	152.0	n/a	62.5	153.6
	Post-cleaning	12.4	47.3	80.5	n/a	46.7	175.4
	Post-CV	10.7	29.9	15.9	n/a	18.8	175.4
Observation Room	Post-work	29.9	15.9	n/a	n/a	22.9	< 41.7
	Post-cleaning	28.1	24.7	n/a	n/a	26.4	< 41.7
	Post-CV	15.9	19.4	n/a	n/a	17.6	< 41.7
Hallway	Post-CV	24.7	12.4	29.9	n/a	22.3	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 73).

Table 73: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 8.7	< 6.61	< 22.75
Tool Room	< 8.59	< 6.63	< 21.72
Observation Room	< 8.82	< 6.51	< 24.2

QA/QC Results:
- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 490.5 µg measured of 516.1 µg spike (95%), and 462.6 µg measured of 471.9 µg spike (98%).
- Air Filter Spikes – 9.82 µg measured of 10 µg spike (98.2%).

Job: Interior cut-outs (Low level interior)
City: Columbus
Housing Unit: C01
Experiment #: 55
Interior Phase: Plastic Coverings/Rule Cleaning (Phase I)
Date of work: November 29, 2006

Paint Chip Results:
The average of 2 paint chip samples was 7.4% lead by weight.

Description of Job:
The work performed included using an electric saw to make three cut-outs on a classroom wall, each disturbing 2 ft^2 of the wall. The plaster was then removed using a hammer.

Description of Study Room Layout:
The large area of the classroom allowed for a distinct Work Room to be identified within a subsection of the classroom and for the rest of the classroom to serve as the Tool Room. A non-traveled section of the hallway adjacent to the Work/Tool Room served as the Observation Room. The landing at the top of the entry stairwell served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the staging area to the Work/Tool Room. The primary decontamination area was in the Tool Room immediately outside the Work Room. The secondary decontamination area was at the end of the hallway.

Pre-work Cleaning and Clearance:
The classroom and the hallway that connected the staging area to the classroom underwent abatement-style cleaning. A plastic airlock was erected at the entrance to the hallway, separating the work areas from the rest of the school. Other areas of the first floor and the stairwell to other floors of the school were barricaded with plastic. There were no windowsill samples taken; instead, dust trays were used as a substitute in all three rooms. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 74).

Table 74. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	6.8	< 10	< 10	< 10
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
Since the support behind the plaster was masonry, only the plaster was removed during the work, resulting in a cut-out approximately one inch deep. Plastic was placed on the ground in the Work Room during the work stage; however, no vertical plastic was erected to isolate the Work Room from the Tool Room. This, in combination with the open Work Room/Tool Room layout, meant that there was no airlock in place to separate the two rooms. The plastic on the ground suffered minor tears due to falling plaster and the use of ladders. The holes were taped up during the cleaning stage to avoid further contamination by falling debris. An off-duty Columbus police officer was present.

Soil Sampling Results:
Concrete covered the ground at the three soil sampling locations, thus no pre- or post- work soil samples were collected for this experiment.

Dust Wipe Results:
All dust wipe samples were successfully collected. One post-work sampling area in the Work Room was covered with a significant amount of debris. In this instance, debris was collected in a plastic bag before the sample area was wiped with a dust wipe. See Table 75 for floor and dust wipe results.

Table 75. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	288,030.1*	1,655.4	270.5	124.2	72,520.1	596.5
	Post-cleaning	< 10	< 10	< 10	< 10	< 10	< 41.7
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	< 10	< 10	< 10	< 10	< 41.7
Tool Room	Post-work	17.5	12.3	29.5	n/a	19.8	< 41.7
	Post-cleaning	10.6	20.9	48.5	n/a	26.7	< 41.7
	Post-CV	22.7	26.1	39.9	n/a	29.6	< 41.7
Observation Room	Post-work	70.9	14.1	n/a	n/a	42.5	< 41.7
	Post-cleaning	24.4	22.7	n/a	n/a	23.6	< 41.7
	Post-CV	24.4	48.5	n/a	n/a	36.4	< 41.7
Hallway	Post-CV	31.3	14.1	31.3	n/a	25.6	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 76).

Table 76: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 8.69	< 6.7	< 41.51
Tool Room	< 8.75	< 6.75	< 47.37
Observation Room	< 8.95	< 6.76	< 41.57

QA/QC Results:
- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 51.9 µg measured of 47.3 µg spike (109.7%), and 51.9 µg measured of 47.2 µg spike (110%).
- Air Filter Spikes – < 2 µg measured of 100 µg spike (< 2%). This sample was re-analyzed by the laboratory and the result was confirmed. It is assumed that the air filter was mistakenly provided without any spike material.

Experiment-Specific Reports for Interior Door Plane Job #1

Job:	Interior door planing (Medium level interior)
City:	Columbus
Housing Unit:	H08
Experiment #:	77
Interior Phase:	Rule Plastic/Baseline Cleaning (Phase II)
Date of work:	December 6, 2006

Paint Chip Results:
The average of 2 paint chip samples was 1.7% lead by weight.

Description of Job:
An electric planer was used to remove paint from two doors – one taken from the first floor dining room and one taken from a second floor bedroom – using an electric planer. The doors, which had previously been removed from their hinges, were positioned horizontally across two sawhorses in the center of the Work Room. Workers first used hammers and screwdrivers to remove all hinges, knobs, screws, and other metal components before using the planer to remove the paint down to the wood on one side of each door. One door was planed at a time. At the beginning of the cleaning stage, the planed doors were carried from the Work Room into the Tool Room and placed on a sheet of plastic, then wrapped securely in the plastic and propped against a wall in the Observation Room.

Description of Study Room Layout:
The first floor kitchen served as the Work Room. The adjacent dining room served as the Tool Room, while the first floor living room served as the Observation Room. The staging area, where study equipment was kept, was located in a portion of the Observation Room due to extremely cold weather. Hallway exit samples were not collected because there was no defined pathway between the unit's main entrance and the Work Room – workers and study personnel walked throughout the Tool Room to access the study supplies, since the staging area had to be set up indoors. Dust collection trays were used as replacements for window sills in all three study rooms. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just outside of the main entrance door.

Pre-work Cleaning and Clearance:
The living room, dining room, and kitchen on the first floor of the unit underwent abatement-style cleaning. Other areas of the first floor and the stairways leading to the second floor and to the basement were barricaded with plastic. Clearance samples were taken from floors and window sills in the Study Rooms. No hallway clearance samples were obtained, as the exit pathway was located within the Tool Room. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 77).

Table 77. Final Clearance Lead Levels (<10 µg/ft^2 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	7.5	< 10	< 10	n/a
Sills	3,304.9**	25.4	25.1	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Above clearance levels. Dust collection trays were used in place of sills.

Problems/Issues with Job:
Approximately two linear inches of paint along all inside edges of the door panels (four per door) could not be removed, due to the size and configuration of the planer. Although door planing was classified as a medium level interior job, the process generated tremendous amounts of dust, which settled on all visible surfaces of the Work Room. An off-duty Columbus police officer was present.

Figure A-2. Door with paint removed

Soil Sampling Results:
Post-work soil samples from Experiment 69 were used as the pre-work soil samples for this experiment. As shown in Table 78, the pre-work samples averaged 294 ppm of lead. The post-work soil samples resulted in an average of 285 ppm of lead; however, this value excludes the third post-work sample, which was collected from a location that was not previously sampled. Pre-work soil lead levels are unknown at the third location sampled for Experiment 77.

Table 78. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	347	118	416	294
Post-work	395	175	1,578**	285

* EPA soil threshold is 400 ppm for play areas and 1,200 ppm for yard.
** Value excluded from average - sample mistakenly collected from yard on north side of unit, where no previous or subsequent soil samples were taken; therefore, value cannot be compared to pre-work sample.

Dust Wipe Results:
All dust wipe samples were successfully collected, though no hallway exit samples were obtained, as previously noted. Three post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 79 for floor and window sill dust wipe results.

As shown in Table 79, floor and window sill lead levels in the Tool Room remained above clearance levels following all three stages of the experiment.

Table 79. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	802,798*	783,633*	569,470*	21,771.4	544,418	33,256.8
	Post-cleaning	50.7	72.3	45.3	34.6	50.7	278.6
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	18.4	56.1	27.4	23.8	31.4	61.7
Tool Room	Post-work	242.9	66.9	n/a	n/a	154.9	331.0
	Post-cleaning	75.9	108.2	n/a	n/a	92.0	383.4
	Post-CV	239.3	41.7	n/a	n/a	140.5	286.1
Observation Room	Post-work	47.1	34.6	n/a	n/a	43.6	54.2
	Post-cleaning	59.7	27.4	n/a	n/a	43.6	< 41.7
	Post-CV	38.1	68.7	n/a	n/a	53.4	< 41.7
Hallway Exit	Post-CV	n/a	n/a	n/a	n/a	n/a	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:
Air monitoring results are presented in Table 80. Air lead levels were high in the Work Room during the work stage and dropped considerably during the cleaning stage. During the cleaning and verification stages, all air monitoring results were below the detection limit.

Table 80: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	**Post-work Cleaning**	**Cleaning Verification**
Work Room	147.3	< 6.9	< 85.8
Tool Room	15.3	< 7.1	< 75.8
Observation Room	14.3	< 7.2	< 77.3

QA/QC Results:

- Wipe Field Blanks – <10.0 µg of lead measured on two blanks
- Air Filter Field Blank – <2 µg of lead measured
- Wipe Spike – 332.6 µg measured of 324.7 µg spike (102.4%) and 384.7 µg measured of 400.5 µg spike (96.1%)
- Air Filter Spike – 9.4 µg measured of 10.0 µg spike (94.2%)

Job: Interior door planing (Medium level interior)
City: Columbus
Housing Unit: H08
Experiment #: 78
Interior Phase: No Plastic/Baseline Cleaning (Phase IV)
Date of work: December 13, 2006

Paint Chip Results:
The average of 2 paint chip samples was 2.0% lead by weight.

Description of Job:
An electric planer was used to remove paint from two doors – taken from a second floor bedroom – using an electric planer. The doors, which had previously been removed from their hinges, were positioned horizontally across two sawhorses in the center of the Work Room. Workers first used hammers and screwdrivers to remove all hinges, knobs, screws, and other metal components before using the planer to remove the paint down to the wood on one side of each door. One door was planed at a time. At the beginning of the cleaning stage, the planed doors were carried from the Work Room into the Tool Room and placed on a sheet of plastic, then wrapped securely in the plastic and propped against a wall in the Observation Room.

Description of Study Room Layout:
The first floor kitchen served as the Work Room. The adjacent dining room served as the Tool Room, while the first floor living room served as the Observation Room. Hallway exit samples were collected in the area of Tool Room between the unit's entrance door and the door to the Work Room. The covered front porch served as the staging area, where study equipment was kept. Dust collection trays were used as replacements for all window sills due to high lead levels on sill in Work Room (see clearance information below), which may have been caused by flaking lead-based paint. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just outside of the main entrance door.

Pre-work Cleaning and Clearance:
The living room, dining room, and kitchen on the first floor of the unit underwent abatement-style cleaning. Other areas of the first floor and the stairways leading to the second floor and to the basement were barricaded with plastic. Clearance samples were taken from floors and window sills in the Study Rooms. No hallway clearance samples were obtained, as the exit pathway was located within the Tool Room. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 81).

Table 81. Final Clearance Lead Levels (<10 µg/ft^2 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	18.0	< 10	< 10	n/a
Sills	1,161.1**	90.5	10.4	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Above clearance levels. Dust collection trays were used in place of sills.

Problems/Issues with Job:
Approximately two linear inches of paint along all inside edges of the door panels (four on each side) could not be removed, due to the size and configuration of the planer. Although door planing was classified as a medium level interior job, the process generated tremendous amounts of dust, which settled on all visible surfaces of the Work Room. An off-duty Columbus police officer was present.

Soil Sampling Results:
The post-work soil samples for Experiment 77 served as the pre-work soil samples for this experiment. As shown in Table 82, these samples averaged 285 ppm of lead; however, this value excludes the results observed in the third pre-work sampling area, since this area was not sampled for this experiment. The post-work soil samples from Experiment 78 resulted in an average of 309 ppm of lead.

Table 82. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	395	175	1,578**	285
Post-work	311	139	478	309

* EPA soil threshold is 400 ppm for play areas and 1,200 ppm for yard.
** Value excluded from average - post-work sample was collected from west side of unit, while pre-work sample was mistakenly collected from north side of unit; therefore, values are not comparable.

Dust Wipe Results:
All dust wipe samples were successfully collected. Three post-work sampling areas on the Work Room floor were covered with significant amounts of debris. This debris was collected in bags before the areas were wiped with dust wipes. The full amount of lead that landed in the sampling areas is reported in Table 83 below.

As shown in Table 83, average floor lead levels in all three Study Rooms remained above clearance levels following all three stages of the experiment.

Table 83. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	206,951*	167,863*	154,632*	4,998.8	133,611.2	54,716.1
	Post-cleaning	126.6	311.6	133.8	112.1	171.0	277.9
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	59.4	30.4	32.2	68.5	47.6	96.5
Tool Room	Post-work	257.2	202.8	n/a	n/a	230.0	300.6
	Post-cleaning	355.2	191.9	n/a	n/a	273.6	262.8
	Post-CV	277.2	137.5	n/a	n/a	207.4	73.8
Observation Room	Post-work	81.2	55.8	n/a	n/a	68.5	43.6
	Post-cleaning	81.2	50.4	n/a	n/a	65.8	58.7
	Post-CV	50.4	128.4	n/a	n/a	89.4	51.2
Hallway Exit	Post-CV	220.9	141.1	144.7	n/a	168.9	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:
Air monitoring results are presented in Table 84. Air lead levels in the Observation Room were measurable during the work and verification stages.

Table 84: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	157.5	9.6	< 21.8
Tool Room	< 6.0	< 7.7	< 20.9
Observation Room	22.7	< 7.7	133.3

QA/QC Results:
- Wipe Field Blanks – <10.0 µg of lead measured on two blanks
- Air Filter Field Blank – <2.0 µg of lead measured
- Wipe Spike – 54.0 µg measured of 52.3 µg spike (103.3%) and 54.0 µg measured of 51.2 µg spike (105.5%)
- Air Filter Spike – 9.7 µg measured of 10.0 µg spike (97.1%)

Job: Interior door planing (Medium level interior)
City: Columbus
Housing Unit: H09
Experiment #: 79
Interior Phase: Rule Plastic/Rule Cleaning (Phase I)
Date of work: December 12, 2006

Paint Chip Results:
The average of 2 paint chip samples was 2.1% lead by weight.

Description of Job:
Paint was removed from both sides of a 2nd-floor bedroom door using an electric planer. The door was removed from its hinges and positioned horizontally across two sawhorses in the center of the Work Room. Workers first used hammers and screwdrivers to remove all hardware from the door before using the planer to remove the paint down to the wood on each side of the door. At the beginning of the cleaning stage, this hardware was re-attached, and the planed door was put back on its hinges.

Description of Study Room Layout:
A second level bedroom served as the Work Room. The second floor hallway served as the Tool Room. Another bedroom down the hallway from the Work Room served as the Observation Room. The first floor living room served as the staging area, where study equipment was kept. Hallway exit samples were obtained from the pathway between the main entrance and the bottom of the steps leading to the second floor, as well as from the steps. Dust collection trays were used during the experiment as a substitute for window sills in all three study rooms. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just inside of the unit's main entrance.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning, along with the stairway, first floor main entry area, and the first floor room that contained the stairway. Other areas of the first floor and the other second floor rooms were barricaded with plastic. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards in the Work and Tool Rooms but above clearance standards in the Observation Room (see Table 85). Prior to beginning work, the floor of the Observation Room was covered in plastic sheeting to ensure a clean sampling surface.

Table 85. Final Clearance Lead Levels (<10 µg/ft^2 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	48.9	8.2
Sills	1,691.9**	1,078.8**	104.7	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Above clearance levels. Dust collection trays were used in place of sills.

Problems/Issues with Job:
Approximately two linear inches of paint along all inside edges of the door panels could not be removed, due to the size and configuration of the planer. Although door planing was classified as a medium level interior job, the process generated tremendous amounts of dust, which settled on all visible surfaces of the Work Room. An off-duty Columbus police officer was present.

Soil Sampling Results:
As shown in Table 86, pre-work soil samples averaged 3,947 ppm of lead. The post-work soil samples resulted in an average of 6,085 ppm of lead, with two sampling areas showing substantial increases in lead levels following the work.

Table 86. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	684	35	11,121	3,947
Post-work	1,659	49	16,547	6,085

* EPA soil threshold is 400 ppm for play areas and 1,200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Three post-work sampling areas on the Work Room floor were covered with significant amounts of debris. This debris was collected in bags before the areas were wiped with dust wipes. The full amount of lead that landed in the selected square foot sampling area is reported in Table 87 below.

As shown below, average floor lead levels in all three Study Rooms remained above clearance levels following all three stages of the experiment.

Table 87. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	525,793*	411,651*	69,394*	13,484.0	255,081	92,809.7
	Post-cleaning	75.2	136.4	246.3	98.6	139.1	104.2
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	53.6	69.8	73.4	152.6	87.4	< 45.5
Tool Room	Post-work	87.8	78.8	n/a	n/a	83.3	79.7
	Post-cleaning	114.8	98.6	n/a	n/a	106.7	87.9
	Post-CV	132.8	84.2	n/a	n/a	108.5	63.3
Observation Room	Post-work	53.6	37.3	n/a	n/a	45.4	153.2
	Post-cleaning	78.8	15.7	n/a	n/a	47.3	104.2
	Post-CV	64.4	44.5	n/a	n/a	54.5	104.2
Hallway Exit	Post-CV	287.7	134.6	75.2	n/a	165.8	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:
Air monitoring results are presented in Table 88. All post-cleaning and post-verification monitoring results were below the detection limit.

Table 88: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	**Post-work Cleaning**	**Cleaning Verification**
Work Room	195.0	< 5.5	< 112.6
Tool Room	< 6.2	< 5.2	< 84.4
Observation Room	9.7	< 5.2	< 97.3

QA/QC Results:

- Wipe Field Blanks – <10.0 µg of lead measured on two blanks
- Air Filter Field Blank – <2.0 µg of lead measured
- Wipe Spikes – 55.4 µg measured of 52.5 µg spike (105.5%) and 48.1 µg measured of 46.2 µg spike (104.1%)
- Air Filter Spike – 84.2 µg measured of 100.0 µg spike (84.2%).

Job: Interior door planing (Medium level interior)
City: Columbus
Housing Unit: H09
Experiment #: 80
Interior Phase: No Plastic/Rule Cleaning (Phase III)
Date of work: December 15, 2006

Paint Chip Results:
The average of 2 paint chip samples was 5.9% lead by weight.

Description of Job:
Paint was removed from both sides of a 2nd-floor bedroom door using an electric planer. The door was removed from its hinges and positioned horizontally across two sawhorses in the center of the Work Room. Workers first used hammers and screwdrivers to remove all hardware from the door before using the planer to remove the paint down to the wood on each side of the door. At the beginning of the cleaning stage, this hardware was re-attached, and the planed door was put back on its hinges.

Description of Study Room Layout:
A second level bedroom served as the Work Room. The second floor hallway served as the Tool Room. Another bedroom down the hallway from the Work Room served as the Observation Room. The first floor living room served as the staging area, where study equipment was kept. Hallway exit samples were obtained from first floor room containing the unit's main entrance, from a landing on the stairway leading to the second floor, and from the top of the stairway. Dust collection trays were used during the experiment as a substitute for window sills in all three study rooms. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just inside of the unit's main entrance.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning, along with the stairway, first floor main entry area, and the first floor room that contained the stairway. Other areas of the first floor and the other second floor rooms were barricaded with plastic. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 89).

Table 89. Final Clearance Lead Levels (<10 µg/ft^2 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	9.6	< 10	38.6	37.0
Sills	417.9**	7.8	7.4	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Above clearance levels. Dust collection trays were used in place of sills.

Problems/Issues with Job:
Approximately two linear inches of paint along all inside edges of the door panels could not be removed, due to the size and configuration of the planer. Although door planing was classified

as a medium level interior job, the process generated tremendous amounts of dust, which settled on all visible surfaces of the Work Room. An off-duty Columbus police officer was present.

Soil Sampling Results:
The post-work soil samples for Experiment 73 (Experiment 13 for the third sampling location) were used as pre-work soil samples for this Experiment. As shown in Table 90, these samples averaged 1,518 ppm of lead. The post-work soil samples for Experiment 80 resulted in an average of 1,598 ppm of lead. Increases in lead levels were observed in two of the three sampling areas following the work.

Table 90. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	1,659	49	2,845**	1,518
Post-work	3,098	308	1,387	1,598

* EPA soil threshold is 400 ppm for play areas and 1,200 ppm for yard.
** Value from Experiment 13 shown here because no samples were collected from a comparable area in Experiment 73.

Dust Wipe Results:
All dust wipe samples were successfully collected. Two post-work sampling areas on the Work Room floor were covered with significant amounts of debris. This debris was collected in bags before the areas were wiped with dust wipes. The full amount of lead that landed in the selected square foot sampling area is reported in Table 91 below.

Dust wipe sample results indicate that lead levels in the Work, Tool, and Observation Rooms remained well above clearance levels throughout all three stages of the experiment. Lead levels were also high in the pathway leading from the unit's main entrance to the Work Room, as evidenced by the hallway exit samples.

Table 91. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft²)					Window Sill Lead Levels (µg/ft²)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	49,253.8	3,868,973*	972,897*	41,628.3	1,233,188	33,328.6
	Post-cleaning	2,347.3	941.5	458.0	836.2	1,145.8	2,546.1
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	1,058.2	332.8	2,583.3	629.2	1,150.9	3,378.2
Tool Room	Post-work	4,053.9	1,566.6	n/a	n/a	2,810.2	993.2
	Post-cleaning	3,509.2	1,475.8	n/a	n/a	2,492.5	1,076.4
	Post-CV	2,891.9	1,475.8	n/a	n/a	2,183.8	932.6
Observation Room	Post-work	2,674.1	931.1	n/a	n/a	1,802.6	970.5
	Post-cleaning	1,421.3	676.4	n/a	n/a	1,048.9	388.0
	Post-CV	651.0	927.0	n/a	n/a	789.0	887.2
Hallway Exit	Post-CV	952.4	1,155.5	311.0	n/a	806.3	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:

Air monitoring results are presented in Table 92. Significant airborne lead was measured in all three Study Rooms during the work stage. Air lead levels in all three rooms declined substantially during the cleaning stage and were below detection limits during the verification stage.

Table 92: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m³)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	696.1	9.1	< 98.7
Tool Room	489.1	14.0	< 98.1
Observation Room	257.0	7.7	< 97.7

QA/QC Results:

- Wipe Field Blanks – <10.0 µg of lead measured on two blanks
- Air Filter Field Blank – <2.0 µg of lead measured
- Wipe Spikes – 56.8 µg measured of 56.9 µg spike (99.8%) and 51.4 µg measured of 50.4 µg spike (102.0%)

Experiment-Specific Reports for Interior Door Plane Job #2

Job: Interior door planing (Medium level interior)
City: Columbus
Housing Unit: H08
Experiment #: 47
Interior Phase: No Plastic/Baseline Cleaning (Phase IV)
Date of work: October 27, 2006

Paint Chip Results:
The average of 2 paint chip samples was 3.9% lead by weight.

Description of Job:
Paint was removed from both sides of a kitchen door using an electric planer. The door, which had previously been removed from its hinges, was positioned horizontally in the center of the Work Room (kitchen) using two sawhorses. Workers first used hammers and screwdrivers to remove all hinges, knobs, screws, and other metal components before using the planer to remove the paint down to the wood on each side of the door. After planing, the door was replaced (i.e., put back on its hinges).

Description of Study Room Layout:
The first floor kitchen served as the Work Room. The adjacent dining room served as the Tool Room, while the first floor living room served as the Observation Room. Hallway exit samples were collected in the area of Tool Room between the unit's entrance door and the door to the Work Room. The covered front porch served as the staging area, where study equipment was kept. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just outside of the main entrance door.

Pre-work Cleaning and Clearance:
The living room, dining room, and kitchen on the first floor of the unit underwent abatement-style cleaning. Other areas of the first floor and the stairways leading to the second floor and to the basement were barricaded with plastic. Clearance samples were taken from floors and window sills in the Study Rooms. No hallway clearance samples were obtained, as the exit pathway was located within the Tool Room. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 93).

Table 93. Final Clearance Lead Levels (<10 µg/ft^2 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	107.1	<10.9	<1.8	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
Approximately two linear inches of paint along all inside edges of the door panels (four on each side) could not be removed, due to the size and configuration of the planer. Although door

planing was classified as a medium level interior job, the process generated tremendous amounts of dust, which settled on all visible surfaces of the Work, Tool, and Observation Rooms. An off-duty Columbus police officer was present.

Soil Sampling Results:
As shown in Table 94, the pre-work soil samples averaged 383 ppm of lead, with two sampling areas just exceeding the EPA soil threshold for play areas. The post-work soil samples resulted in an average of 255 ppm of lead. Following the work, slightly lower levels were observed in post-work lead levels in each of the three sampled areas.

Table 94. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	450	218	482	383
Post-work	390	170	204	255

* EPA soil threshold is 400 ppm for play areas and 1,200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Four post-work sampling areas in the Work Room (three floor areas and one window sill area) were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 95 for floor and window sill dust wipe results. As shown in Table 95, floor and window sill lead levels in the Study Rooms remained high following all three stages of the experiment.

Table 95. Floor and Window Sill Dust Wipe Sample Results (<10 µg/ft^2 reported as 5 µg/ft^2)

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	6,636,630*	149,537*	348,150*	11,267.0	1,786,396	13,980,951*
	Post-cleaning	1,614.5	1,579.9	1,597.2	699.3	1,372.7	1,798.7
	Post-wet CV	550.8	n/a	n/a	n/a	550.8	n/a
	Post-CV	373.8	643.6	422.3	142.3	395.5	2,625.3
Tool Room	Post-work	9,031.1	3,583.1	n/a	n/a	6,307.1	14,425.7
	Post-cleaning	13,166.5	4,032.0	n/a	n/a	8,599.3	15,001.3
	Post-CV	6,902.3	4,151.2	n/a	n/a	5,526.8	11,893.7
Observation Room	Post-work	2,564.2	2,253.4	n/a	n/a	2,408.8	1,367.0
	Post-cleaning	2,840.5	2,685.1	n/a	n/a	2,762.8	1,597.3
	Post-CV	2,087.0	2,087.0	n/a	n/a	2,087.0	1,448.6
Hallway Exit	Post-CV	1,566.5	5,286.9	4,712.5	n/a	3,855.3	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:
Air monitoring results are presented in Table 96. Air lead levels were high in all three Study Rooms during the work stage, but dropped considerably during the cleaning stage. During the verification stage, all air monitoring results were below the detection limit.

Table 96: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	1,443.9	43.2	<13.3
Tool Room	1,044.5	47.3	<12.4
Observation Room	838.1	107.0	<12.3

QA/QC Results:

- Wipe Field Blanks – <10.0 µg of lead measured on two blanks
- Air Filter Field Blank – <2 µg of lead measured
- Wipe Spike – 28.5 µg measured of 26.4 µg spike (108.0%) and 106.2 µg measured of 104.5 µg spike (101.6%)
- Air Filter Spike – 28.4 µg measured of 10.0 µg spike (283.8%)

Job: Interior door planing (Medium level interior)
City: Columbus
Housing Unit: H08
Experiment #: 48
Interior Phase: Rule Plastic/Rule Cleaning (Phase I)
Date of work: October 31, 2006

Paint Chip Results:
The average of 2 paint chip samples was 7.8% lead by weight.

Description of Job:
Paint was removed from both sides of a kitchen door using an electric planer. The door, which had previously been removed from its hinges, was positioned horizontally in the center of the Work Room (kitchen) using two sawhorses. Workers first used hammers and screwdrivers to remove all hinges, knobs, screws, and other metal components before using the planer to remove the paint down to the wood on each side of the door. After planing, the door was replaced (i.e., put back on its hinges).

Description of Study Room Layout:
The first floor kitchen served as the Work Room. The adjacent dining room served as the Tool Room, while the first floor living room served as the Observation Room. Hallway exit samples were collected in the area of Tool Room between the unit's entrance door and the door to the Work Room. The covered front porch served as the staging area, where study equipment was kept. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just outside of the main entrance door.

Pre-work Cleaning and Clearance:
The living room, dining room, and kitchen on the first floor of the unit underwent abatement-style cleaning. Other areas of the first floor and the stairways leading to the second floor and to the basement were barricaded with plastic. Clearance samples were taken from floors and window sills in the Study Rooms. No hallway clearance samples were obtained, as the exit pathway was located within the Tool Room. Following the pre-work cleaning, average floor lead levels, along with window sill lead levels in the Work and Tool Rooms, were significantly above EPA/HUD clearance standards (see Table 97). Because of schedule constraints, this experiment was conducted before clearance results were known. As a precaution, plastic was laid on the floors of the Tool and Observation Rooms before work started to provide a clean sampling surface. Because this was a Phase I experiment, plastic was also used on the Work Room floor during the work stage, and Rule cleaning was performed in the Work Room prior to any sampling of the original floor surface.

Table 97. Final Clearance Lead Levels (<10 µg/ft^2 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	150.7	708.7	250.3	n/a
Sills	516.8	599.7	55.7	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
Approximately two linear inches of paint along all inside edges of the door panels (four on each side) could not be removed, due to the size and configuration of the planer. Although door planing was classified as a medium level interior job, the process generated tremendous amounts of dust, which settled on all visible surfaces of the Work Room. An off-duty Columbus police officer was present.

Soil Sampling Results:
The post-work soil samples for Experiment 47 served as the pre-work soil samples for this experiment. As shown in Table 98, these samples averaged 255 ppm of lead. The post-work soil samples from Experiment 48 resulted in an average of 286 ppm of lead, with consistent levels observed at both times.

Table 98. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	390	170	204	255
Post-work	359	133	367	286

* EPA soil threshold is 400 ppm for play areas and 1,200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Note that dust wipe samples were taken from the window sills in the Work and Tool Rooms, which would have been replaced by trays due to the clearance failures, if that had been known. While the starting lead levels appear to have been higher than planned, the post-work levels are significantly higher indicating 1) large amounts of dust in the work room depositing on the window sill and 2) that there was some spread of dust from the work room to the adjacent room, even with use of a plastic airlock. Three post-work sampling areas on the Work Room floor were covered with significant amounts of debris. This debris was collected in bags before the areas were wiped with dust wipes. The full amount of lead that landed in the sampling areas is reported in Table 99 below.

Table 99. Floor and Window Sill Dust Wipe Sample Results (<10 µg/ft^2 reported as 5 µg/ft^2)

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	1,742,888*	1,657,870*	1,380,133*	38,101.3	1,204,748	124,783.4**
	Post-cleaning	273.3	163.8	136.9	149.5	180.9	521.3**
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	352.3	196.1	185.4	427.7	290.4	1,707.9**
Tool Room	Post-work	1,153.7	228.4	n/a	n/a	691.0	1,072.1**
	Post-cleaning	920.0	390.0	n/a	n/a	655.0	1,344.7**
	Post-CV	718.9	334.3	n/a	n/a	526.6	1,112.0**
Observation Room	Post-work	379.2	90.2	n/a	n/a	234.7	162.3
	Post-cleaning	372.0	108.2	n/a	n/a	240.1	142.3
	Post-CV	593.3	210.5	n/a	n/a	401.9	192.2
Hallway Exit	Post-CV	575.4	476.1	701.0	n/a	584.2	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.
** Actual window sills were used for these samples, but clearance levels were >250

Indoor Air Monitoring Results:
Air monitoring results are presented in Table 100. Air lead levels during the work stage were highest in the Work Room but declined substantially during the cleaning stage. All air monitoring results during the verification stage were below the detection limit.

Table 100: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	3,651.5	37.5	<61.3
Tool Room	45.1	<7.3	<60.1
Observation Room	61.0	<7.1	<60.7

QA/QC Results:
- Wipe Field Blanks – <10.0 µg of lead measured on two blanks
- Air Filter Field Blank – <2.0 µg of lead measured
- Wipe Spike – 22.0 µg measured of 24.9 µg spike (88.4%) and 88.4 µg measured of 86.5 µg spike (102.2%)
- Air Filter Spike – 9.8 µg measured of 10.0 µg spike (97.9%)

Job: Interior door planing (Medium level interior)
City: Columbus
Housing Unit: H35
Experiment #: 73
Interior Phase: Rule Plastic/Baseline Cleaning (Phase II)
Date of work: December 4, 2006

Paint Chip Results:
The average of 2 paint chip samples was 1.2% lead by weight.

Description of Job:
Paint was removed from both sides of a 2nd-floor bedroom door using an electric planer. The door, which had previously been removed from its hinges, was positioned horizontally in the center of the Work Room (kitchen) using two sawhorses. Workers first used hammers and screwdrivers to remove all hinges, knobs, screws, and other metal components before using the planer to remove the paint down to the wood on each side of the door. At the beginning of the cleaning stage, the planed door was carried from the Work Room into the Tool Room and placed on a sheet of plastic, then wrapped securely in the plastic and removed from the study areas.

Description of Study Room Layout:
The first floor kitchen served as the Work Room. A portion of the first floor living room, closest to the Work Room, served as the Tool Room, while the remainder of the living room served as the Observation Room. The staging area, where study equipment was kept, was located in a portion of the Observation Room, due to extremely cold weather. Hallway exit samples were obtained from the hallway connecting the main entrance to the Work Room. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was on the covered front porch, just outside the main entrance door.

Pre-work Cleaning and Clearance:
The unit's kitchen, first-floor hallway leading from the main entrance to the kitchen, and living room underwent abatement-style cleaning, along with the lower landing of the stairwell leading up to the second floor. Other rooms and areas within the house were barricaded with plastic. No window sill clearance samples were taken from the Tool Room, which had no window sills. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 101).

Table 101. Final Clearance Lead Levels (<10 µg/ft^2 reported as 5 µg/ft^2 for averaging)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	< 10
Sills	<18.9	n/a	13.4	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
Approximately two linear inches of paint along all inside edges of the door panels (four on each side) could not be removed, due to the size and configuration of the planer. Although door planing was classified as a medium level interior job, the process generated tremendous amounts

of dust, which settled on all visible surfaces of the Work Room. An off-duty Columbus police officer was present.

Soil Sampling Results:
The post-work soil samples for Experiment 70 were used as pre-work soil samples for this Experiment. As shown in Table 102, these samples averaged 405 ppm of lead. The post-work soil samples for Experiment 73 resulted in an average of 413 ppm of lead, with none of the sampling areas showing substantial increases or decreases in lead levels following the work.

Table 102. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	383	355	478	405
Post-work	476	337	426	413

* EPA soil threshold is 400 ppm for play areas and 1,200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Three post-work sampling areas on the Work Room floor were covered with significant amounts of debris. This debris was collected in bags before the areas were wiped with dust wipes. The full amount of lead that landed in the selected square foot sampling area is reported in Table 103 below.

Table 103. Floor and Window Sill Dust Wipe Sample Results (<10 µg/ft^2 reported as 5 µg/ft^2)

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	16,511.1	287,137*	342,656*	94,148*	185,113	1,621.5
	Post-cleaning	280.6	95.5	319.7	239.8	233.9	127.1
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	61.5	39.4	188.9	175.3	116.3	115.7
Tool Room	Post-work	115.9	51.3	n/a	n/a	83.6	<41.7
	Post-cleaning	27.6	47.9	n/a	n/a	37.8	<41.7
	Post-CV	44.5	14.0	n/a	n/a	29.3	44.0
Observation Room	Post-work	15.7	41.1	n/a	n/a	28.4	64.6
	Post-cleaning	30.9	25.9	n/a	n/a	28.4	100.3
	Post-CV	24.2	25.9	n/a	n/a	25.1	<52.6
Hallway Exit	Post-CV	309.5	229.6	289.1	n/a	276.1	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:
Air monitoring results are presented in Table 104. Measurable lead was detected in the air sample collected in the Work Room during the work stage; all other monitoring results were below the detection limit.

Table 104. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	**Post-work Cleaning**	**Cleaning Verification**
Work Room	62.8	<7.3	<67.9
Tool Room	<6.9	<7.2	<0.9
Observation Room	<6.8	<7.4	<62.4

QA/QC Results:

- Wipe Field Blanks – <10.0 µg of lead measured on two blanks
- Air Filter Field Blank – <2.0 µg of lead measured
- Wipe Spikes – 392.7 µg measured of 404.4 µg spike (97.1%) and 482.7 µg measured of 499.5 µg spike (96.6%)
- Air Filter Spike – 10.5 µg measured of 10.0 µg spike (105.0%)

Job: Interior door planing (Medium level interior)
City: Columbus
Housing Unit: H35
Experiment #: 74
Interior Phase: No Plastic/Rule Cleaning (Phase III)
Date of work: December 7, 2006

Paint Chip Results:
The average of 2 paint chip samples was 3.2% lead by weight.

Description of Job:
Paint was removed from one side of two 2nd-floor bedroom doors using an electric planer. The doors, which had previously been removed from their hinges, were positioned horizontally in the center of the Work Room (kitchen) using two sawhorses. Workers first used hammers and screwdrivers to remove all hinges, knobs, screws, and other metal components before using the planer to remove the paint down to the wood on one side of each door. One door was planed at a time. At the beginning of the cleaning stage, the planed doors were carried from the Work Room into the Tool Room and placed on a sheet of plastic, then wrapped securely in the plastic and removed from the study areas.

Description of Study Room Layout:
The first floor kitchen served as the Work Room. A portion of the first floor living room, closest to the Work Room, served as the Tool Room, while the remainder of the living room served as the Observation Room. The staging area, where study equipment was kept, was located in a portion of the Observation Room, due to extremely cold weather. Study supplies were kept under a sheet of plastic to prevent contamination. Hallway exit samples were obtained from the hallway connecting the main entrance to the Work Room. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was on the covered front porch, just outside the main entrance door.

Pre-work Cleaning and Clearance:
The unit's kitchen, first-floor hallway leading from the main entrance to the kitchen, and living room underwent abatement-style cleaning, along with the lower landing of the stairwell leading up to the second floor. Other rooms and areas within the house were barricaded with plastic. No window sill clearance samples were taken from the Tool Room, which had no window sills. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 105).

Table 105. Final Clearance Lead Levels (<10 µg/ft^2 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	< 10
Sills	<14.5	n/a	23.2	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
Approximately two linear inches of paint along all inside edges of the door panels (four on each side) could not be removed, due to the size and configuration of the planer. Although door planing was classified as a medium level interior job, the process generated tremendous amounts of dust, which settled on all visible surfaces of the Work, Tool, and Observation Rooms. An off-duty Columbus police officer was present.

Soil Sampling Results:
The post-work soil samples for Experiment 73 were used as pre-work soil samples for this Experiment. As shown in Table 106, these samples averaged 413 ppm of lead. The post-work soil samples for Experiment 74 resulted in an average of 502 ppm of lead. Slight increases in lead levels were observed in two of the three sampling areas following the work.

Table 106. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	476	337	426	413
Post-work	471	481	554	502

* EPA soil threshold is 400 ppm for play areas and 1,200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. All four post-work sampling areas on the Work Room floor were covered with significant amounts of debris. This debris was collected in bags before the areas were wiped with dust wipes. The full amount of lead that landed in the selected square foot sampling area is reported in Table 107 below.

Dust wipe sample results indicate that lead levels in the Work, Tool, and Observation Rooms remained well above clearance levels throughout all three stages of the experiment. Lead levels were also very high in the hallway leading from the unit's main entrance to the Work Room, as evidenced by the hallway exit samples.

Table 107. Floor and Window Sill Dust Wipe Sample Results (<10 µg/ft^2 reported as 5 µg/ft^2)

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	194,606*	133,593*	325,362*	232,103*	221,416	2,980.1
	Post-cleaning	279.9	116.7	118.6	122.2	159.4	170.4
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	252.7	109.5	138.5	109.5	152.6	<100.0
Tool Room	Post-work	405.0	1,508.2	n/a	n/a	956.6	667.7
	Post-cleaning	374.1	1,145.6	n/a	n/a	759.9	546.8
	Post-CV	267.2	399.5	n/a	n/a	333.4	108.8
Observation Room	Post-work	354.2	390.5	n/a	n/a	372.4	690.7
	Post-cleaning	321.6	187.4	n/a	n/a	254.5	671.7
	Post-CV	196.5	381.4	n/a	n/a	289.0	404.5
Hallway Exit	Post-CV	1,317.8	831.7	632.3	n/a	927.3	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:

Air monitoring results are presented in Table 108. Measurable levels of lead were observed in all three study rooms during the work stage. All post-cleaning and post-verification air monitoring samples were below the detection limit.

Table 108. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	63.6	<5.4	<96.3
Tool Room	28.0	<6.0	<134.1
Observation Room	34.6	<6.1	<113.6

QA/QC Results:

- Wipe Field Blanks – <10.0 µg of lead measured on two blanks
- Air Filter Field Blank – <2.0 µg of lead measured
- Wipe Spikes – 319.8 µg measured of 336.3 µg spike (95.1%) and 58.7 µg measured of 49.5 µg spike (118.6%)
- Air Filter Spike – 9.2 µg measured of 10.0 µg spike (92.1%)

Experiment-Specific Reports for Interior Dry Scrape #1

Job: Interior dry scraping of wall (Medium level interior)
City: Columbus
Housing Unit: H03
Experiment #: 05
Interior Phase: Rule Plastic/Rule Cleaning (Phase I)
Date of work: October 3, 2006

Paint Chip Results:
The average of 2 paint chip samples was 1.6% lead by weight.

Description of Job:
Paint was removed from one wall of a second floor room. Using dry scraping tools, paint was removed down to the plaster.

Description of Study Room Layout:
A second level bedroom served as the Work Room. The second floor hallway served as the Tool Room. Another bedroom at the far end of the hallway away from the Work Room served as the Observation Room. The first floor living room served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the front door to the bottom of the steps leading to the second floor. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was right inside the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning along with the stairway and first floor main entry area. Other areas of the first floor and the other second floor rooms were barricaded with plastic. The tool and observation rooms had to undergo re-cleaning once as multiple samples were above clearance levels. Following pre-work cleaning, sill lead levels were still above EPA/HUD clearance standards. Thus, it was decided to use tray samples as replacements for window sills at this property. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 109).

Table 109. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	28.4	29.8	25.7	<10
Sills	323.1**	n/a	1,980**	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Tray samples used as replacement for window sills.

Problems/Issues with Job:
The job presented challenges as the workers attempted to scrape all paint off the wall, which took a long time and resulted in the wall crumbling in places. The workers also thought the plaster wall might contain asbestos. As a result, a plaster sample was obtained and quickly analyzed by a laboratory. When no asbestos was found in the sample, work resumed. Because

of the length of time required to perform the work, the post-cleaning wait time was skipped. An off-duty Columbus police officer was present.

Figure A-3. Work room floor following removal of paint

Soil Sampling Results:
The pre-work soil samples resulted in an average of 380 ppm. The post-work soil samples resulted in an average of 715 ppm. Post-work soil lead levels did increase somewhat in all locations (Table 110).

Table 110. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	903	96	141	380
Post-work	1,635	125	385	715

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Some post-work sampling areas were covered with significant amounts of debris. This debris was collected in a bag and the area subsequently wiped with a dust wipe. Dust collection trays were used in place of window sill samples, because of the poor condition or lack of window sills. See Table 111 for floor and dust wipe results.

Table 111. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	1,692,489.1*	610,168.9*	35,732.6*	1,288.9	584,919.9	14,246.6
	Post-cleaning	41.6	19.8	27.1	38.0	31.6	<10.0
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	12.6	41.6	45.3	16.2	28.9	<10.0
Tool Room	Post-work	194.1	34.4	n/a	n/a	114.3	<50.0
	Post-cleaning	234.1	107	n/a	n/a	170.6	<10.0
	Post-CV	59.8	52.5	n/a	n/a	56.2	<10.0
Observation Room	Post-work	41.6	321.2	n/a	n/a	181.4	<50.0
	Post-cleaning	16.2	23.5	n/a	n/a	19.9	<10.0
	Post-CV	56.2	30.7	n/a	n/a	43.5	<10.0
Hallway	Post-CV	52.5	63.4	77.9	n/a	64.6	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 112).

Table 112. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	<2.8	<9.0	<24.2
Tool Room	<2.7	<7.9	<18.3
Observation Room	<2.7	<8.4	<17.4

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 23.5 µg measured of 27.4 µg spike (85.8%), and 103.4 µg measured of 100.9 µg spike (102.5%)
- Air Filter Spikes – 94.1 µg measured of 100 µg spike (94.1%)

Job: Interior dry scraping of wall (Medium level interior)
City: Columbus
Housing Unit: H03
Experiment #: 06
Interior Phase: Rule Plastic/Baseline Cleaning (Phase II)
Date of work: October 11, 2006

Paint Chip Results:
The average of 2 paint chip samples was 2.7% lead by weight.

Description of Job:
Paint was removed from one wall of a second floor room. Using dry scraping tools, deteriorated paint was removed in preparation for repainting, but not all paint was removed down to the plaster, if intact.

Figure A-4. Dry scraping paint from wall

Description of Study Room Layout:
A second level bedroom served as the Work Room. The second floor hallway served as the Tool Room. Another bedroom at the far end of the hallway away from the Work Room served as the Observation Room. The first floor living room served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the front door to the bottom of the steps leading to the second floor. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was right inside the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning along with the stairway and first floor main entry area. Other areas of the first floor and the other second floor rooms were barricaded with plastic. The work room had to undergo re-cleaning

once as multiple floor samples were >40 µg/ft^2. Following all pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards. Clearance samples were not obtained for window sills as tray samples were used in place of window sill samples (Table 113).

Table 113. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	27.4	15.3	22.1	<10
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
With the workers not attempting to remove all paint down to the substrate but just scraping deteriorated paint to prepare the wall for repainting, this job went relatively smoothly. An off-duty Columbus police officer was present.

Soil Sampling Results:
The post-work soil samples from Experiment 5 served as the pre-work soil samples for this experiment. Those samples resulted in an average of 715 ppm, with higher levels near the front porch. The post-work soil samples from Experiment 6 resulted in an average of 385 ppm (Table 114). The significantly lower soil lead levels near the front porch (which is closer to the 905 starting level before Experiment 5) highlights the variability of the soil lead levels even in similar locations.

Table 114. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	1,635	125	385	715
Post-work	737.0	129.0	288.0	384.7

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Two post-work sampling areas were covered with significant amounts of debris. This debris was collected in a bag and the area subsequently wiped with a dust wipe. The full amount of lead that landed in the selected square foot sampling area is reported in Table 115 below. Note that the post-cleaning levels in the work room were higher for this experiment using baseline cleaning than the previous one using rule cleaning.

Table 115. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	5,401,959*	7,229,448*	2886.1	5357.8	3,159,913	352.6
	Post-cleaning	346.8	281.3	45.1	48.7	180.5	< 50
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	66.9	41.4	74.2	52.3	58.7	< 50
Tool Room	Post-work	190.5	56.0	n/a	n/a	123.3	< 50
	Post-cleaning	88.7	63.3	n/a	n/a	76.0	< 50
	Post-CV	< 10	106.9	n/a	n/a	56.0	1,134.1
Observation Room	Post-work	26.9	452.2	n/a	n/a	239.6	< 50
	Post-cleaning	63.3	41.4	n/a	n/a	52.4	< 50
	Post-CV	45.1	96.0	n/a	n/a	70.5	< 50
Hallway	Post-CV	81.4	88.7	154.1	n/a	108.1	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 116).

Table 116. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 5.63	< 8.4	< 51.11
Tool Room	< 5.6	< 8.31	< 60.57
Observation Room	< 5.74	< 8.2	< 60.02

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <6.7 µg of lead measured
- Wipe Spikes – 26.9 µg measured of 26.8 µg spike (100.4%), and 110.5 µg measured of 99.5 µg spike (111.1%)
- Air Filter Spikes – 8.5 µg measured of 10 µg spike (85.0%)

Job: Interior dry scraping of wall (Medium level interior)
City: Columbus
Housing Unit: H03
Experiment #: 07
Interior Phase: No Plastic/Baseline Cleaning (Phase IV)
Date of work: October 16, 2006

Paint Chip Results:
The average of 2 paint chip samples was 1.66% lead by weight.

Description of Job:
Paint was removed from one wall of a second floor room. Using dry scraping tools, deteriorated paint was removed in preparation for repainting, but not all paint was removed down to the plaster, if intact.

Description of Study Room Layout:
A second level bedroom served as the Work Room. The second floor hallway served as the Tool Room. Another bedroom at the far end of the hallway away from the Work Room served as the Observation Room. The first floor living room served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the front door to the bottom of the steps leading to the second floor. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was right inside the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning along with the stairway and first floor main entry area. Other areas of the first floor and the other second floor rooms were barricaded with plastic. Following all pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (Table 117). Clearance samples were not obtained for window sills as tray samples were used in place of window sill samples.

Table 117. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	35.0	32.3	17.8	<10
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
With the workers not attempting to remove all paint down to the substrate but just scraping deteriorated paint to prepare the wall for repainting, this job went relatively smoothly. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 385 ppm. The post-work soil samples from Experiment 7 resulted in an average of 329 ppm (Table 118).

Table 118. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	737	129	288	384.7
Post-work	856	86	44	328.7

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Some post-work sampling areas were covered with paint chips. Post work samples included paint chips which were collected in a bag and the area subsequently wiped with a dust wipe. Dust collection trays were used in place of window sills to get window sill samples, because of the poor condition or lack of window sills. Floor and tray dust wipe results are presented in Table 119.

Table 119. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	6,191,699*	592,139*	3,145.9	255.8	1,696,810	85.0
	Post-cleaning	51.6	41.2	58.5	72.4	55.9	<50
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	48.1	58.5	17.0	41.2	41.2	<50.0
Tool Room	Post-work	103.5	93.1	n/a	n/a	98.3	<50.0
	Post-cleaning	283.4	86.2	n/a	n/a	184.8	50.4
	Post-CV	117.3	86.2	n/a	n/a	101.8	50.4
Observation Room	Post-work	41.2	82.7	n/a	n/a	61.9	<50.0
	Post-cleaning	20.5	107.0	n/a	n/a	63.8	<50.0
	Post-CV	44.7	13.5	n/a	n/a	29.1	<50.0
Hallway	Post-CV	37.8	58.5	44.7	n/a	47.0	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 120).

Table 120. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	<5.08	<8.94	<16.99
Tool Room	<1.24	<8.87	<10.69
Observation Room	<5.17	<8.52	<10.67

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 100 µg measured of 104.8 µg spike (95.4%), and 10.1 µg measured of 15.1 µg spike (66.89%)
- Air Filter Spikes – 94.1 µg measured of 100 µg spike (94.1%)

Job: Interior dry scraping of wall (Medium level interior)
City: Columbus
Housing Unit: H03
Experiment #: 08
Interior Phase: No Plastic/Rule Cleaning (Phase III)
Date of work: October 23, 2006

Paint Chip Results:
The average of 2 paint chip samples was 1.66% lead by weight.

Description of Job:
Paint was removed from one wall of a second floor room. Using dry scraping tools, deteriorated paint was removed in preparation for repainting, but not all paint was removed down to the plaster, if intact.

Description of Study Room Layout:
A second level bedroom served as the Work Room. The second floor hallway served as the Tool Room. Another bedroom at the far end of the hallway away from the Work Room served as the Observation Room. The first floor living room served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the front door to the bottom of the steps leading to the second floor. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was right inside the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning along with the stairway and first floor main entry area. Other areas of the first floor and the other second floor rooms were barricaded with plastic. The tool room was re-cleaned to meet clearance standards. Following pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (Table 121). Clearance samples were not obtained for window sills as tray samples were used in place of window sill samples.

Table 121. Final Clearance Lead Levels (<10 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)			
	Work Room	Tool Room	Observation Room	Hallway
Floors	7.1	8.3	< 10	< 10
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
With the workers not attempting to remove all paint down to the substrate but just scraping deteriorated paint to prepare the wall for repainting, this job went relatively smoothly. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 328.7 ppm. The post-work soil samples from Experiment 8 resulted in an average of 296 ppm (Table 122).

Table 122. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	856	86	44	328.7
Post-work	709	74	105	296

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Some post-work sampling areas were covered with paint chips. Post work samples included paint chips which were collected in a bag and the area subsequently wiped with a dust wipe. Dust collection trays were used in place of window sills to get window sill samples, because of the poor condition or lack of window sills. Table 123 presents floor and tray dust wipe results.

Table 123. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	2,471,327*	778,841*	48,439.7	69.2	824,669.2	54.1
	Post-cleaning	<10	11.9	<10	29.8	12.9	<45.5
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	<10	22.7	<10	<10	9.4	<45.5
Tool Room	Post-work	567.4	44.2	n/a	n/a	305.8	<45.5
	Post-cleaning	144.5	51.3	n/a	n/a	97.9	70.4
	Post-CV	58.5	40.6	n/a	n/a	49.5	<45.5
Observation Room	Post-work	44.2	15.5	n/a	n/a	29.9	<45.5
	Post-cleaning	22.7	33.4	n/a	n/a	28.1	<45.5
	Post-CV	83.6	87.2	n/a	n/a	85.4	n/a
Hallway	Post-CV	54.9	22.7	11.9	n/a	29.8	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 124).

Table 124. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	<4.21	<6.16	<44.93
Tool Room	<12.31	<8.98	<41.34
Observation Room	<4.19	<6.47	<39.11

QA/QC Results:
- Wipe Field Blanks – 10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 87.2 µg measured of 98.2 µg spike (88.8%)
- Air Filter Spikes – n/a

Experiment-Specific Reports for Interior Dry Scrape #2

Job: Interior dry scrape (Medium level interior)
City: Pittsburgh
Housing Unit: H17
Experiment #: 26
Interior Phase: No Plastic/Rule Cleaning (Phase III)
Date of work: October 30, 2006

Paint Chip Results:
The average of 2 paint chip samples was 2.1% lead by weight.

Description of Job:
Workers removed the top layers of paint from approximately 60 ft^2 of an interior kitchen wall. Paint scrapers/razors and wallpaper removal blades were used.

Description of Study Room Layout:
The first floor dining room served as the Tool Room, while the first floor living room served as the Observation Room. The covered front porch served as the staging area where study equipment was kept. There were no hallway exit samples collected, as the path traveled by the workers took them through the observation and tool rooms. The primary decontamination area was immediately outside the Work Room in the Tool Room. The secondary decontamination area was just outside of the front door.

Pre-work Cleaning and Clearance:
The three rooms on the first floor underwent abatement-style cleaning. The entire second floor was blocked off with plastic. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 125). In addition to the samples below, a wipe sample was collected from the mantle in the Observation Room, which came back below the laboratory's detection limit.

Table 125. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	8.7	n/a
Sills	< 20	143.7	24.4	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
The workers were not able to scrape the paint off of the wall down to the plaster without severely damaging the wall. Only the top few layers of paint that were not intact were removed. There was a small section of the wall, approximately 5 ft^2, for which the paint could not be easily removed. That area was subtracted off of the total area of disturbed paint. An off-duty Pittsburgh police officer was present.

Soil Sampling Results:
The pre-work soil samples for this experiment come from the post-work soil samples of Experiment 68, the gutting of the kitchen. The pre-work soil samples resulted in an average of 491 ppm, while the post-work soil samples resulted in an average of 585 ppm. The only increase in soil lead level is seen on the side of the house under the work room window (Table 126).

Table 126. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	616	213	644	491.0
Post-work	571	272	911	584.7

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples from the Work, Tool and Observation Rooms were successfully collected. There were no hallway exit samples collected for this experiment. Three post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. For one of the bulk samples, the total weight of debris is not known. The value in the table for that sample represents the minimum total floor lead level, using the weight and concentration of the sub-sample analyzed by the laboratory. See Table 127 for floor and dust wipe results.

Table 127. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	1,604,057.2*	930,716.4*	28,535.7*	2,033.2	641,335.6	110.1
	Post-cleaning	15.4	32.0	28.3	17.2	23.2	< 52.6
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	19.1	35.7	17.2	< 10	19.3	< 52.6
Tool Room	Post-work	26.5	30.1	n/a	n/a	28.3	168.3
	Post-cleaning	55.9	46.7	n/a	n/a	51.3	90.7
	Post-CV	55.9	32.0	n/a	n/a	44.0	139.2
Observation Room	Post-work	22.8	15.4	n/a	n/a	19.1	< 52.6
	Post-cleaning	19.1	32.0	n/a	n/a	25.6	< 52.6
	Post-CV	19.1	20.9	n/a	n/a	20.0	< 52.6
Hallway Exit	Post-CV	n/a	n/a	n/a	n/a	n/a	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
The air monitoring results in all rooms and at all stages were below the detection limit (Table 128).

Table 128. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 4.4	< 5.62	< 64.35
Tool Room	< 4.52	< 5.74	< 64.72
Observation Room	< 4.46	< 5.71	< 59.05

QA/QC Results:

- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 24.6 µg measured of 26.6 µg spike (92.5%), and 87.2 µg measured of 104.3 µg spike (83.6%).
- Air Filter Spikes – No air filter spike was analyzed with this experiment.

Job: Interior dry scrape (Medium level interior)
City: Pittsburgh
Housing Unit: H17
Experiment #: 27
Interior Phase: No Plastic/Baseline Cleaning (Phase IV)
Date of work: November 2, 2006

Paint Chip Results:
The average of 2 paint chip samples was 2.5% lead by weight.

Description of Job:
Workers removed the top layers of paint from approximately 64 ft^2 of an interior kitchen wall. Paint scrapers/razors and wallpaper removal blades were used.

Description of Study Room Layout:
The first floor dining room served as the Tool Room, while the first floor living room served as the Observation Room. The covered front porch served as the staging area where study equipment was kept. There were no hallway exit samples collected, as the path traveled by the workers took them through the observation and tool rooms. The primary decontamination area was immediately outside the Work Room in the Tool Room. The secondary decontamination area was just outside of the front door.

Pre-work Cleaning and Clearance:
The three rooms on the first floor underwent abatement-style cleaning. The entire second floor was blocked off with plastic. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 129). In addition to the samples below, a wipe sample was collected from the mantle in the Observation Room, which came back below the laboratory's detection limit.

Table 129. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	25.9	78.8	19.7	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
The workers were not able to scrape the paint off of the wall down to the plaster without severely damaging the wall. Only the top few layers of paint that were not intact were removed. An off-duty Pittsburgh police officer was present.

Soil Sampling Results:
The pre-work soil samples for this experiment come from the post-work soil samples of Experiment 26, the first dry scraping. The pre-work soil samples resulted in an average of 585 ppm, while the post-work soil samples resulted in an average of 528 ppm. There is a slight increase in the soil lead level close to the front door (Table 130).

Table 130. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	571	272	911	584.7
Post-work	685	287	613	528.3

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples from the Work, Tool and Observation Rooms were successfully collected. There were no hallway exit samples collected for this experiment. Two post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 131 for floor and dust wipe results.

Table 131. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	5,310,602.9*	12,841.0*	1,389.1	106.9	1,331,235.0	160.2
	Post-cleaning	108.7	74.9	114.0	39.3	84.2	150.8
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	67.8	137.1	58.9	30.4	73.6	< 52.6
Tool Room	Post-work	64.2	39.3	n/a	n/a	51.8	225.7
	Post-cleaning	44.7	30.4	n/a	n/a	37.6	141.5
	Post-CV	69.6	57.1	n/a	n/a	63.4	75.8
Observation Room	Post-work	14.4	16.2	n/a	n/a	15.3	< 52.6
	Post-cleaning	28.7	185.1	n/a	n/a	106.9	< 52.6
	Post-CV	23.3	25.1	n/a	n/a	24.2	< 52.6
Hallway Exit	Post-CV	n/a	n/a	n/a	n/a	n/a	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
The air monitoring results in all rooms and at all stages were below the detection limit (Table 132).

Table 132. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 4.25	< 7.21	< 83.96
Tool Room	< 4.17	< 7.08	< 83.82
Observation Room	< 4.21	< 7.19	< 84.46

QA/QC Results:

- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 99.8 µg measured of 95.9 µg spike (104.1%), and 108.7 µg measured of 105.3 µg spike (103.2%).
- Air Filter Spikes – 8.84 µg measured of 10 µg spike (88.4%).

Job: Interior dry scrape (Medium level interior)
City: Pittsburgh
Housing Unit: H17
Experiment #: 28
Interior Phase: Plastic Coverings/Rule Cleaning (Phase I)
Date of work: November 8, 2006

Paint Chip Results:
The average of 2 paint chip samples was 2.5% lead by weight.

Description of Job:
Workers removed the top layers of paint from approximately 65 ft^2 of an interior kitchen wall. Paint scrapers/razors and wallpaper removal blades were used.

Description of Study Room Layout:
The first floor dining room served as the Tool Room, while the first floor living room served as the Observation Room. The covered front porch served as the staging area where study equipment was kept. There were no hallway exit samples collected, as the path traveled by the workers took them through the observation and tool rooms. The primary decontamination area was immediately outside the Work Room in the Tool Room. The secondary decontamination area was just outside of the front door.

Pre-work Cleaning and Clearance:
The three rooms on the first floor underwent abatement-style cleaning. The entire second floor was blocked off with plastic. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 133). In addition to the samples below, a wipe sample was collected from the mantle in the Observation Room, which came back below the laboratory's detection limit.

Table 133. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	< 20	18.9	29.4	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
The workers were not able to scrape the paint off of the wall down to the plaster without severely damaging the wall. Only the top few layers of paint that were not intact were removed. An off-duty Pittsburgh police officer was present.

Soil Sampling Results:
The pre-work soil samples for this experiment come from the post-work soil samples of Experiment 27, the second dry scraping. The pre-work soil samples resulted in an average of 528 ppm, while the post-work soil samples resulted in an average of 493 ppm. There were no significant increases in soil lead levels at any location (Table 134).

Table 134. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	685	287	613	528.3
Post-work	541	286	652	493.0

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples from the Work, Tool and Observation Rooms were successfully collected. There were no hallway exit samples collected for this experiment. Two post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 135 for floor and dust wipe results.

Table 135. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	1,605,000.6*	2,011,626.3*	4,240.8	458.1	905,331.5	12624.3
	Post-cleaning	130.8	57.4	70.0	159.4	104.4	85.8
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	68.2	28.8	37.8	23.4	39.5	57.5
Tool Room	Post-work	28.8	12.7	n/a	n/a	20.7	66.9
	Post-cleaning	< 10	19.9	n/a	n/a	12.5	151.7
	Post-CV	77.1	< 10	n/a	n/a	41.1	< 52.6
Observation Room	Post-work	10.9	19.9	n/a	n/a	15.4	452.9
	Post-cleaning	19.9	< 10	n/a	n/a	12.5	< 52.6
	Post-CV	< 10	36.0	n/a	n/a	20.5	< 52.6
Hallway Exit	Post-CV	n/a	n/a	n/a	n/a	n/a	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
The air monitoring results in all rooms and at all stages were below the detection limit (Table 136).

Table 136: Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 5.29	< 7.92	< 111.36
Tool Room	< 5.43	< 8.6	< 96.53
Observation Room	< 5.32	< 8.38	< 83.09

QA/QC Results:

- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 121.8 µg measured of 109 µg spike (111.7%).
- Air Filter Spikes – 89.86 µg measured of 100 µg spike (89.9%).

Job: Interior dry scrape (Medium level interior)
City: Pittsburgh
Housing Unit: H17
Experiment #: 29
Interior Phase: Plastic Coverings/Baseline Cleaning (Phase II)
Date of work: November 14, 2006

Paint Chip Results:
The average of 4 paint chip samples was 2.6% lead by weight.

Description of Job:
Workers removed the top layers of paint from approximately 72 ft^2 of an interior kitchen wall. Paint scrapers/razors and wallpaper removal blades were used.

Description of Study Room Layout:
The first floor dining room served as the Tool Room, while the first floor living room served as the Observation Room. The covered front porch served as the staging area where study equipment was kept. There were no hallway exit samples collected, as the path traveled by the workers took them through the observation and tool rooms. The primary decontamination area was immediately outside the Work Room in the Tool Room. The secondary decontamination area was just outside of the front door.

Pre-work Cleaning and Clearance:
The three rooms on the first floor underwent abatement-style cleaning. The entire second floor was blocked off with plastic. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 137). In addition to the samples below, a wipe sample was collected from the mantle in the Observation Room, which came back below the laboratory's detection limit.

Table 137. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	< 20	< 20	16.5	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
The workers were not able to scrape the paint off of the wall down to the plaster without severely damaging the wall. Only the top few layers of paint that were not intact were removed. There was not enough square footage on one kitchen wall, therefore paint was also removed from sections of the two adjacent walls in order to satisfy the required area of disturbed paint. An off-duty Pittsburgh police officer was present.

Soil Sampling Results:
The pre-work soil samples for this experiment come from the post-work soil samples of Experiment 28, the third dry scraping. The pre-work soil samples resulted in an average of 493

ppm, while the post-work soil samples resulted in an average of 771 ppm. There were slight increases seen along the walkway and under the work room window, and a more significant increase observed close to the front door (Table 138).

Table 138. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	541	286	652	493.0
Post-work	1,105	329	879	771.0

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:

All dust wipe samples from the Work, Tool and Observation Rooms were successfully collected. There were no hallway exit samples collected for this experiment. Two post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. One of the post-verification floor samples in the Tool Room appears to be much higher than the other Tool Room sample. This could be due to the location of the sample- immediately adjacent to the Work Room decontamination area. See Table 139 for floor and dust wipe results.

Table 139. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	497,845.3*	2,410.4	12,396.5*	385.9	128,259.5	17,476.8
	Post-cleaning	259.6	254.0	21.9	88.7	156.1	467.0
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	16.3	10.7	20.0	105.4	38.1	115.0
Tool Room	Post-work	16.3	< 10	n/a	n/a	10.7	85.7
	Post-cleaning	18.1	< 10	n/a	n/a	11.6	< 52.6
	Post-CV	1,121.6	51.6	n/a	n/a	586.6	56.4
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	95.5
	Post-cleaning	12.6	23.7	n/a	n/a	18.2	< 52.6
	Post-CV	16.3	151.9	n/a	n/a	84.1	< 52.6
Hallway Exit	Post-CV	n/a	n/a	n/a	n/a	n/a	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:

The air monitoring results in all rooms and at all stages were below the detection limit (Table 140).

Table 140. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 4.9	< 7.42	< 62.62
Tool Room	< 5.13	< 7.52	< 69.32
Observation Room	< 4.99	< 7.33	< 75.7

QA/QC Results:

- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks – 3.15 µg of lead measured
- Wipe Spikes – 98 µg measured of 101.7 µg spike (96.4%), and 29.3 µg measured of 30.2 µg spike (97%).

Air Filter Spikes – 4.19 µg measured of 10 µg spike (41.9%).

Experiment-Specific Reports for Interior Kitchen Gut Job #1

Job: Interior gutting of kitchen (High level interior)
City: Pittsburgh
Housing Unit: H31
Experiment #: 49
Interior Phase: Rule Plastic/Rule Cleaning (Phase II)
Date of work: November 6, 2006

Paint Chip Results:
The average of 3 paint chip samples was 1.7% lead by weight.

Description of Job:
Built-in wooden cabinets and all associated components (e.g., sink, cabinet doors, countertops) were removed from the kitchen of an apartment. Workers used a pry bar to detach the cabinets from the walls. Large components were HEPA-vacuumed before removal, then carried out of the Work Room, through the Tool Room, and across an apartment building hallway for storage in another apartment that was not part of this experiment.

Description of Study Room Layout:
The Study unit was located within a three-level apartment building. Each floor of the apartment building contained two apartments (with identical floor plans) connected by a hallway, with apartment entry doors facing each other at opposite ends of the hallway. The Study unit's kitchen served as the Work Room. A hallway directly outside the kitchen served as the Tool Room. A bedroom adjacent to the Tool Room served as the Observation Room. A tray was used as a substitute for a window sill in the Tool Room. An empty apartment within the same building served as the staging area where study equipment was kept. Hallway exit samples were obtained from outside the Tool Room, from the lower landing of the stairway leading down to the entry door of the building, and from outside the door to an apartment across the hallway from the Study unit (i.e., where debris from the work was stored). The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was outside the front door to the apartment building.

Pre-work Cleaning and Clearance:
The unit's kitchen, hallway, and bedroom underwent abatement-style cleaning, along with the hallway immediately outside the apartment's front door. Other rooms and areas within the apartment were barricaded with plastic. No window sill clearance samples were taken from the Tool Room, which had no window sills. No hallway clearance samples were taken, as the exit hallway was carpeted. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 141).

Table 141. Final Clearance Lead Levels (<10 µg/ft^2 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	<30.3	n/a	<13.3	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
The job was completed without incident. A special-duty Pittsburgh police officer was present.

Soil Sampling Results:
No soil samples were taken for this experiment, since the unit was located in an apartment building surrounded by pavement.

Dust Wipe Results:
All dust wipe samples were successfully collected. Dust wipe samples were inadvertently taken from the window sill in the Work Room, which did not meet the minimum size requirements for the Study. A tray should have been used in place of this window sill. Four post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 142 for floor and window sill dust wipe results.

Table 142. Floor and Window Sill Dust Wipe Sample Results (<10 µg/ft^2 reported as 5 µg/ft^2)

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	12,707.3*	9,083.3*	293,082.7*	4,352.8*	79,806.5	<100.0**
	Post-cleaning	30.6	46.7	59.2	46.7	45.8	<100.0**
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	< 10	27.0	< 10	10.5	<100.0**
Tool Room	Post-work	55.6	28.8	n/a	n/a	42.2	440.5
	Post-cleaning	28.8	12.7	n/a	n/a	20.7	798.8
	Post-CV	30.6	21.7	n/a	n/a	26.2	358.5
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	<40.0
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	<40.0
	Post-CV	< 10	< 10	n/a	n/a	< 10	<40.0
Hallway Exit	Post-CV	34.2	23.4	< 10	n/a	20.9	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.
** Window sill did not meet minimum size requirement of 18 in^2.

Indoor Air Monitoring Results:
Air monitoring results are presented in Table 143. All air monitoring results were below the detection limit. However, the pump used in the Work Room failed during both the work and cleaning stages and had to be replaced.

Table 143. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	<7.5	<18.0	<33.9
Tool Room	<6.5	<9.9	<33.7
Observation Room	<6.6	<10.0	<33.9

QA/QC Results:

- Wipe Field Blanks – <10.0 µg of lead measured on two blanks
- Air Filter Field Blank – <2 µg of lead measured
- Wipe Spike – 111.1 µg measured of 96.3 µg spike (115.4%)
- Air Filter Spike – 10.0 µg measured of 10.0 µg spike (100.1%)

Job: Interior gutting of kitchen (High level interior)
City: Pittsburgh
Housing Unit: H32
Experiment #: 50
Interior Phase: No Plastic/Baseline Cleaning (Phase IV)
Date of work: November 10, 2006

Paint Chip Results:
The average of two paint chip sample collected was 2.3% lead by weight.

Description of Job:
Metal cabinets and all associated components (e.g., sink, cabinet doors, countertops) were removed from the kitchen of an apartment. The cabinets were attached to the wall with screws, so workers unscrewed the cabinets in order to detach them. Large components were HEPA-vacuumed before removal, then carried out of the Work Room, through the Tool Room, and across an apartment building hallway for storage in another apartment that was not part of this experiment.

Description of Study Room Layout:
The Study unit was located within a three-level apartment building. Each floor of the apartment building contained two apartments (with identical floor plans) connected by a hallway, with apartment entry doors facing each other at opposite ends of the hallway. The Study unit's kitchen served as the Work Room. A hallway directly outside the kitchen served as the Tool Room. A bedroom adjacent to the Tool Room served as the Observation Room. Trays were used as a substitute for window sills in the Work and Tool Rooms. An empty apartment within the same building served as the staging area where study equipment was kept. Hallway exit samples were not obtained, as plastic was inadvertently removed from the carpeted exit path before samples could be taken. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was outside the front door to the apartment building.

Pre-work Cleaning and Clearance:
The unit's kitchen, hallway, and bedroom underwent abatement-style cleaning, along with the hallway immediately outside the apartment's front door. Other rooms and areas within the apartment were barricaded with plastic. No window sill clearance samples were taken from the Tool Room, which had no window sills. No hallway clearance samples were taken, as the exit hallway was carpeted. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 144).

Table 144. Final Clearance Lead Levels (<10 µg/ft^2 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	<30.3	n/a	5.0	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
The job was completed without incident. A special-duty Pittsburgh police officer was present.

Soil Sampling Results:
No soil samples were taken for this experiment, since the unit was located in an apartment building surrounded by pavement.

Dust Wipe Results:
All but three dust wipe samples were successfully collected. The exit hallway, which was carpeted, had to be covered in plastic prior to the experiment in order to provide an appropriate sampling surface. This plastic was inadvertently removed from the pathway before the three exit samples could be taken; therefore, these samples are not included below. One post-work sampling area in the Work Room was covered with significant amounts of debris. This debris was collected in bags before the area was wiped with dust wipes. The full amount of lead that landed in the selected square foot sampling area is reported in Table 145 below.

Table 145. Floor and Window Sill Dust Wipe Sample Results (<10 µg/ft^2 reported as 5 µg/ft^2)

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	6,294.1*	1,414.4	14,560.2	480.6	5,687.3	51.4
	Post-cleaning	82.9	< 10	139.7	31.3	64.7	130.3
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	< 10	< 10	< 10	< 10	<41.7
Tool Room	Post-work	38.2	265.4	n/a	n/a	151.8	216.4
	Post-cleaning	15.8	< 10	n/a	n/a	10.4	295.3
	Post-CV	< 10	112.2	n/a	n/a	58.6	1,593.5
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	<83.3
	Post-cleaning	< 10	162.1	n/a	n/a	83.6	<83.3
	Post-CV	< 10	< 10	n/a	n/a	< 10	<83.3
Hallway Exit	Post-CV	n/a	n/a	n/a	n/a	n/a	n/a

* Bulk debris sample was collected and analyzed, and is included with wipe results.

Indoor Air Monitoring Results:
Air monitoring results are presented in Table 146. All air monitoring results were below the detection limit.

Table 146. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	<8.5	<7.2	<56.9
Tool Room	<8.6	<7.3	<57.5
Observation Room	<8.5	<7.1	<52.1

QA/QC Results:

- Wipe Field Blanks – <10.0 µg of lead measured on two blanks
- Air Filter Field Blank – <2.0 µg of lead measured
- Wipe Spike – 27.8 µg measured of 26.5 µg spike (104.9%)
- Air Filter Spike – 9.0 µg measured of 10.0 µg spike (90.2%)

Job: Interior gutting of kitchen (High level interior)
City: Pittsburgh
Housing Unit: H33
Experiment #: 51
Interior Phase: Rule Plastic/Rule Cleaning (Phase I)
Date of work: November 16, 2006

Paint Chip Results:
The average of 2 paint chip samples was 3.5% lead by weight.

Description of Job:
Built-in wooden cabinets and all associated components (e.g., sink, cabinet doors, countertops) were removed from the kitchen of an apartment. Workers used a pry bar to detach the cabinets from the walls. Large components were HEPA-vacuumed before removal, then carried out of the Work Room, through the Tool Room, and across an apartment building hallway for storage in another apartment that was not part of this experiment.

Description of Study Room Layout:
The Study unit was located within a multi-level apartment building. Each floor of the apartment building contained two apartments connected by a hallway, with apartment entry doors facing each other at opposite ends of the hallway. The Study unit's kitchen served as the Work Room. A hallway directly outside the kitchen served as the Tool Room. A bedroom adjacent to the Tool Room served as the Observation Room. Trays were used as a substitute for window sills in the Work and Tool Rooms. An empty apartment within the same building served as the staging area where study equipment was kept. Hallway exit samples were obtained from immediately outside the Study area, from a stairwell landing on the same floor as the Study unit, and from immediately outside the apartment across the hallway from the Study unit (i.e., where debris from the work was stored). The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was outside the front door to the apartment building.

Pre-work Cleaning and Clearance:
The unit's kitchen, hallway, and bedroom underwent abatement-style cleaning, along with the hallway immediately outside the apartment's front door. Other rooms and areas within the apartment were barricaded with plastic. No window sill clearance samples were taken from the Tool Room, which had no window sills. No hallway clearance samples were taken, as the exit hallway was carpeted. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 147).

Table 147. Final Clearance Lead Levels (<10 µg/ft^2 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	<30.3	n/a	154.2	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
When cabinets were removed, part of the plaster wall in the kitchen broke away from the inside of the brick exterior wall. This added to the total square footage disturbed by the job but necessitated that the total area be approximated due to the unusual shape of the disturbed area. A special-duty Pittsburgh police officer was present.

Soil Sampling Results:
No soil samples were taken for this experiment, since the unit was located in an apartment building surrounded by pavement.

Dust Wipe Results:
All dust wipe samples were successfully collected. All four post-work floor sampling areas in the Work Room were covered with significant amounts of debris. This debris was collected in bags before the areas were wiped with dust wipes. The full amount of lead that landed in the selected square foot sampling area is reported in Table 148 below.

Table 148. Floor and Window Sill Dust Wipe Sample Results (<10 µg/ft^2 reported as 5 µg/ft^2)

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	3,607.1*	284,274.7*	41,214.7*	47,138.9*	94,058.9	159.9
	Post-cleaning	28.1	45.8	28.1	79.6	45.4	<45.5
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	13.9	109.7	15.7	29.9	42.3	<45.5
Tool Room	Post-work	429.3	306.8	n/a	n/a	368.0	<45.5
	Post-cleaning	70.7	431.0	n/a	n/a	250.8	<45.5
	Post-CV	< 10	83.1	n/a	n/a	44.0	<45.5
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	184.4
	Post-cleaning	37.0	< 10	n/a	n/a	21.0	226.7
	Post-CV	< 10	< 10	n/a	n/a	< 10	167.7
Hallway Exit	Post-CV	76.0	45.8	12.1	n/a	44.6	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:
Air monitoring results are presented in Table 149. All air monitoring results were below the detection limit.

Table 149. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	<7.4	<7.3	<113.3
Tool Room	<7.5	<7.4	<113.6
Observation Room	<7.4	<7.3	<96.3

QA/QC Results:

- Wipe Field Blanks – <10.0 µg of lead measured on two blanks
- Air Filter Field Blanks - <2.0 µg of lead measured
- Wipe Spikes – 84.9 µg measured of 88.4 µg spike (96.0%) and 28.1 µg measured of 27.2 µg spike (103.3%)
- Air Filter Spike – <2.0 µg measured (this is one of three air filter samples prepared by the laboratory that did not appear to contain any spike material)

Job: Interior gutting of kitchen (High level interior)
City: Pittsburgh
Housing Unit: H36
Experiment #: 76
Interior Phase: No Plastic/Rule Cleaning (Phase III)
Date of work: November 21, 2006

Paint Chip Results:
The average of 2 paint chip samples was 1.6% lead by weight.

Description of Job:
Built-in wooden cabinets and all associated components (e.g., sink, cabinet doors, countertops) were removed from the kitchen of an apartment. Workers used a pry bar to detach the cabinets from the walls. Large components were HEPA-vacuumed before removal, then carried out of the Work Room, through the Tool Room, and across an apartment building hallway for storage in another apartment that was not part of this experiment.

Description of Study Room Layout:
The Study unit was located within a multi-level apartment building. Each floor of the apartment building contained two apartments connected by a hallway, with apartment entry doors facing each other at opposite ends of the hallway. The Study unit's kitchen served as the Work Room. A hallway directly outside the kitchen served as the Tool Room. A bedroom adjacent to the Tool Room served as the Observation Room. Trays were used as a substitute for window sills in the Work and Tool Rooms. An empty apartment within the same building served as the staging area where study equipment was kept. Hallway exit samples were obtained from immediately outside the Study area, from a stairwell landing on the same floor as the Study unit, and from immediately outside the apartment across the hallway from the Study unit (i.e., where debris from the work was stored). The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was outside the front door to the apartment building.

Pre-work Cleaning and Clearance:
The unit's kitchen, hallway, and bedroom underwent abatement-style cleaning, along with the hallway immediately outside the apartment's front door. Other rooms and areas within the apartment were barricaded with plastic. No window sill clearance samples were taken from the Tool Room, which had no window sills. An extra clearance sample was taken from a mantle in the Observation Room. No hallway clearance samples were taken, as the exit hallway was carpeted. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 151).

Table 151. Final Clearance Lead Levels (<10 µg/ft^2 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	<30.3	n/a	404.6**	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Sill in Observation Room was supposed to be replaced by tray during experiment, due to clearance failure. However, the Observation Room sill was inadvertently sampled during experiment.

Problems/Issues with Job:
Paint flaked off the kitchen wall during the cleaning stage, raising the possibility that post-cleaning samples were contaminated by chips of lead-based paint. A special-duty Pittsburgh police officer was present.

Soil Sampling Results:
No soil samples were taken for this experiment, since the unit was located in an apartment building surrounded by pavement.

Dust Wipe Results:
All dust wipe samples were successfully collected. However, dust wipe samples were inadvertently taken from the window sill in the Observation Room, which should have been replaced by a tray due to high initial clearance results. Therefore, it is unclear whether the lead levels shown below are a result of the work or of pre-existing contamination. No bulk samples were collected. Table 152 presents floor and tray dust wipe results.

Dust wipe sample results indicate that lead levels in the Tool Room were particularly high following cleaning and remained well above clearance levels following verification. Lead levels in the Work Room were below the detection limit following cleaning but higher following verification.

Table 152. Floor and Window Sill Dust Wipe Sample Results (<10 µg/ft^2 reported as 5 µg/ft^2)

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	10,170.0	136.9	16,408.9	20,073.7	11,697.6	3,807.5
	Post-cleaning	< 10	< 10	< 10	< 10	< 10	86.2
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	326.4	15.3	11.8	89.6	138.3
Tool Room	Post-work	22.5	70.7	n/a	n/a	46.6	130.9
	Post-cleaning	1,033.1	101.1	n/a	n/a	567.1	78.8
	Post-CV	397.9	33.2	n/a	n/a	215.5	<41.7
Observation Room	Post-work	85.0	< 10	n/a	n/a	45.0	98.5
	Post-cleaning	17.1	11.8	n/a	n/a	14.5	345.4
	Post-CV	11.8	< 10	n/a	n/a	8.4	353.9
Hallway Exit	Post-CV	217.3	< 10	< 10	n/a	75.8	n/a

Indoor Air Monitoring Results:

One air sample was not collected – the Work Room pump fell off its stand during the verification stage, stopping the pump. All other air monitoring results are presented in Table 153. As shown below, all collected air monitoring samples were below the detection limit.

Table 153. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	<6.8	<7.8	n/a
Tool Room	<7.0	<7.5	<68.7
Observation Room	<6.8	<7.5	<68.7

QA/QC Results:

- Wipe Field Blanks – 17.1 µg of lead measured on one blank, and 13.5 µg of lead measured on another blank.
- Air Filter Field Blanks – <2.0 µg of lead measured.
- Wipe Spikes – 342.5 µg measured of 330.3 µg spike (103.7%) and 695.7 µg measured of 682.6 µg spike (101.9%).
- Air Filter Spike – 100.2 µg measured of 100.0 µg spike (100.2%).

Experiment-Specific Reports for Interior Kitchen Gut #2

Job: Interior Kitchen Gut (High level interior)
City: Pittsburgh
Housing Unit: H16
Experiment #: 67
Interior Phase: Plastic Coverings/Rule Cleaning (Phase I)
Date of work: November 9, 2006

Paint Chip Results:
The average of 4 paint chip samples was 1.2% lead by weight.

Description of Job:
The job included the removal of a counter tops and upper cabinets along one wall and a tall pantry on another wall in a first floor kitchen. The cabinets were attached by screws and the removal of them caused minimal disturbance of the paint.

Description of Study Room Layout:
The adjacent first floor dining room served as the Tool Room, while the first floor living room served as the Observation Room. The covered front porch served as the staging area where study equipment was kept. Hallway exit samples were not collected as the pathway from the entrance to the Work Room passed through the Tool and Observation Rooms. The primary decontamination area was in the Tool Room immediately outside of the Work Room. The secondary decontamination area was just outside of the main entrance door.

Pre-work Cleaning and Clearance:
The three rooms on the first floor underwent abatement-style cleaning. The entire second floor was barricaded off with plastic. Following the pre-work cleaning, average floor lead levels in the study rooms were below EPA/HUD clearance standards (see Table 154).

Table 154. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	n/a
Sills	< 16.1	131.3	< 16.1	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
There were no problems or issues with this job. An off-duty Pittsburgh police officer was present.

Soil Sampling Results:
The pre-work soil samples for this experiment come from experiment 25, the final interior cut-out at H16, and resulted in an average of 1,068 ppm. The post-work soil samples resulted in an average of 1,724 ppm. There are significant differences in the soil lead levels near the front door

and under the work room window, but the soil lead levels were quite variable at these locations (Table 155).

Table 155. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	575.0	274.0	2,355.0	1,068.0
Post-work	1,178.0	344.0	3,650.0	1,724.0

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. See Table 156 for floor and dust wipe results.

Table 156. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	474.4	161.9	< 10	< 10	161.6	< 40
	Post-cleaning	< 10	< 10	< 10	< 10	< 10	< 40
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	< 10	< 10	< 10	< 10	< 40
Tool Room	Post-work	< 10	< 10	n/a	n/a	< 10	< 40
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	86.8
	Post-CV	< 10	< 10	n/a	n/a	< 10	79.8
Observation Room	Post-work	< 10	23.5	n/a	n/a	14.3	< 40
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	< 40
	Post-CV	< 10	11.2	n/a	n/a	8.1	< 40
Hallway	Post-CV	n/a	n/a	n/a	n/a	n/a	n/a

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 157).

Table 157. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 7.25	< 7.52	< 89.25
Tool Room	< 7.21	< 7.69	< 70.03
Observation Room	< 7.23	< 7.52	< 69.47

QA/QC Results:
- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 30.5 µg measured of 28.8 µg spike (105.9%).
- Air Filter Spikes – There was no air filter spike analyzed with this experiment.

Job: Interior Kitchen Gut (High level interior)
City: Pittsburgh
Housing Unit: H17
Experiment #: 68
Interior Phase: No Plastic /Rule Cleaning (Phase III)
Date of work: October 25, 2006

Paint Chip Results:
The average of 2 paint chip samples was 2.5% lead by weight.

Description of Job:
The job included the removal of a counter top, sink and upper cabinets along one wall. The cabinets were attached to the wall with nails and there was minimal disturbance of the paint.

Description of Study Room Layout:
The adjacent first floor dining room served as the Tool Room, while the first floor living room served as the Observation Room. The covered front porch served as the staging area where study equipment was kept. Hallway exit samples were not collected as the pathway from the entrance to the Work Room passed through the Tool and Observation Rooms. The primary decontamination area was in the Tool Room immediately outside of the Work Room. The secondary decontamination area was just outside of the main entrance door.

Pre-work Cleaning and Clearance:
The three rooms on the first floor underwent abatement-style cleaning. The entire second floor was blocked off with plastic. Following the pre-work cleaning, average floor lead levels in the study rooms were below EPA/HUD clearance standards (see Table 158). An extra sample was collected from the mantle in the Observation Room. The lead level of that sample was below the laboratory's detection limit.

Table 158. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	<10	n/a
Sills	152.1	19.2	66.1	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
There were no problems or issues with this job. An off-duty Pittsburgh police officer was present.

Soil Sampling Results:
The pre-work soil samples for this experiment come from experiment 24, an interior cut-out experiment, and resulted in an average of 482 ppm. The post-work soil samples resulted in an average of 491 ppm. There are no significant differences in the soil lead observed at any of the sampling locations (Table 159).

Table 159. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	677	204	564	481.7
Post-work	616	213	644	491.0

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. See Table 160 for floor and dust wipe results.

Table 160. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	3,133.0	7,385.9	222.3	12.3	2,688.4	< 52.6
	Post-cleaning	36.8	15.8	33.3	12.3	24.5	396.5
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	26.3	12.3	< 10	< 10	12.2	< 52.6
Tool Room	Post-work	< 10	< 10	n/a	n/a	< 10	< 52.6
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	83.4
	Post-CV	12.3	< 10	n/a	n/a	8.7	< 52.6
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	< 52.6
	Post-cleaning	< 10	36.8	n/a	n/a	20.9	< 52.6
	Post-CV	< 10	< 10	n/a	n/a	< 10	< 52.6
Hallway	Post-CV	n/a	n/a	n/a	n/a	n/a	n/a

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 161).

Table 161. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 7.25	< 7.52	< 89.25
Tool Room	< 7.21	< 7.69	< 70.03
Observation Room	< 7.23	< 7.52	< 69.47

QA/QC Results:
- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 30.5 µg measured of 28.8 µg spike (105.9%).
- Air Filter Spikes – There was no air filter spike analyzed with this experiment.

Job: Interior Kitchen Gut (High level interior)
City: Columbus
Housing Unit: H08
Experiment #: 69
Interior Phase: No Plastic /Baseline Cleaning (Phase IV)
Date of work: December 1, 2006

Paint Chip Results:
The average of 2 paint chip samples was 5.2% lead by weight.

Description of Job:
The job included the removal of a counter top, sink and cabinets from a first floor kitchen.

Figure A-5. Kitchen cabinets prior to removal

Description of Study Room Layout:
The adjacent dining room served as the Tool Room, while the first floor living room served as the Observation Room. The covered front porch served as the staging area where study equipment was kept. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just outside of the main entrance door.

Pre-work Cleaning and Clearance:
The three rooms on the first floor underwent abatement-style cleaning. The floors of the Tool and Observation Rooms were covered with plastic prior to the clearance sampling. The entire second floor was blocked off with plastic. Following the pre-work cleaning, average floor lead levels in the study rooms were below EPA/HUD clearance standards (see Table 162).

Table 162. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	<10	n/a
Sills	264.8	55.1	< 15.4	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
While a dust collection tray should have been used for the sill in the work room, the actual sill was inadvertently sampled at all three sampling stages. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples for this experiment came from the post-experiment soil samples of experiment 46 and resulted in an average of 527 ppm. The post-work soil samples resulted in an average of 294 ppm. There is no observed increase in the soil lead levels at any of the sample locations (Table 163).

Table 163. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	940.0	121.0	519.0	526.7
Post-work	347.0	118.0	416.0	293.7

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. See Table 164 for floor and dust wipe results.

Table 164. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	3,264.5	911.0	195.7	5,238.2	2,402.4	171.8
	Post-cleaning	90.4	56.4	161.7	90.4	99.7	1,414.2
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	112.5	24.2	177.0	44.5	89.6	73.5
Tool Room	Post-work	10.6	< 10	n/a	n/a	7.8	< 40
	Post-cleaning	< 10	39.4	n/a	n/a	22.2	69.4
	Post-CV	29.2	< 10	n/a	n/a	17.1	117.0
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	< 52.6
	Post-cleaning	10.6	< 10	n/a	n/a	7.8	< 52.6
	Post-CV	< 10	< 10	n/a	n/a	< 10	< 52.6
Hallway	Post-CV	n/a	n/a	n/a	n/a	n/a	n/a

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 165).

Table 165. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 7.23	< 7.88	< 84.46
Tool Room	< 7.49	< 8.31	< 96.02
Observation Room	< 7.59	< 8.20	< 98.28

QA/QC Results:

- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 38.1 µg measured of 34.3 µg spike (111.1%), and 582.5 µg measured of 568 µg spike (102.6%).
- Air Filter Spikes – 93.14 µg measured of 100 µg spike (93.1%).

Job: Interior Kitchen Gut (High level interior)
City: Columbus
Housing Unit: H35
Experiment #: 70
Interior Phase: Plastic Coverings /Baseline Cleaning (Phase II)
Date of work: November 29, 2006

Paint Chip Results:
The average of 2 paint chip samples was 0.8% lead by weight.

Description of Job:
The job included the removal of a counter top, sink and upper cabinets along one wall in a first floor kitchen.

Description of Study Room Layout:
A portion of the first floor living room, closest to the Work Room served as the Tool Room, while the remainder of the living room served as the Observation Room. The covered front porch served as the staging area where study equipment was kept. Hallway exit samples were obtained from the hallway connecting the main entrance to the Work Room. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just outside of the main entrance door on the front porch.

Pre-work Cleaning and Clearance:
The three rooms on the first floor underwent abatement-style cleaning. The entire second floor was blocked off with plastic. Following the pre-work cleaning, average floor lead levels in the study rooms were below EPA/HUD clearance standards (see Table 166). The average of the hallway samples was above clearance, however, in the interest of proceeding with the study in a timely manner, the hallway was not re-cleaned. There was no sill in the Tool Room, and a dust collection tray was used during the experiment.

Table 166. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	8.4	< 10	<10	69.2
Sills	< 30.3	n/a	27.4	< 25

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
After removing the countertop and sink, the floor underneath, which was not yet covered with plastic, as per the protection protocol, was revealed. That section of the floor was swept with a broom and dustpan and covered with plastic before proceeding with the removal of the upper cabinets. That section of floor also played a role in sections of the floor failing cleaning verification due to the poor quality of the floor (it was rotting and badly deteriorated) and residual, tar-like substances on the floor surface. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples for this experiment resulted in an average of 553 ppm. The post-work soil samples resulted in an average of 405 ppm. There is no observed increase in the soil lead levels at any of the sample locations (Table 167).

Table 167. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	496	411	752	553.0
Post-work	383	355	478	405.3

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. An extra dust wipe sample was collected from the floor underneath the countertop and sink after those components were removed and the floor swept. That sample had a lead level of 1,990.8 µg/ft^2. See Table 168 for floor and dust wipe results.

Table 168. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	2,940.1	1,704.2	18.2	3,513.3	2,044.0	< 66.7
	Post-cleaning	16.4	147.1	1.4	105.9	67.7	< 66.7
	Post-wet CV	150.7	< 10	< 10	n/a	53.6	n/a
	Post-CV	150.7	< 10	< 10	< 10	41.4	< 66.7
Tool Room	Post-work	12.8	< 10	n/a	n/a	8.9	< 41.7
	Post-cleaning	16.4	28.9	n/a	n/a	22.7	< 41.7
	Post-CV	14.6	< 10	n/a	n/a	9.8	< 41.7
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	< 52.6
	Post-cleaning	11	< 10	n/a	n/a	8.0	< 52.6
	Post-CV	< 10	< 10	n/a	n/a	< 10	< 52.6
Hallway	Post-CV	57.6	39.7	41.5	n/a	46.3	n/a

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 169).

Table 169. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 5.11	< 8.13	< 5.06
Tool Room	< 4.91	< 8.07	< 5.01
Observation Room	< 5.04	< 8.18	< 5.09

QA/QC Results:

- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 541.5 µg measured of 543.8 µg spike (99.6%), and 469.5 µg measured of 485.7 µg spike (96.7%).
- Air Filter Spikes – 9.7 µg measured of 10 µg spike (97%).

Experiment-Specific Reports for Interior Heat Gun (> 1100°F) Job #1

Job: Interior heat gunning of doors (High level interior)
City: Pittsburgh
Housing Unit: H10
Experiment #: 30
Interior Phase: No Plastic/Baseline Cleaning (Phase IV)
Date of work: October 23, 2006

Paint Chip Results:
The average of 4 paint chip samples was 10.0% lead by weight.

Description of Job:
Paint was removed from two doors: the entry door to a second-floor bedroom, which also served as the Work Room, and a door from a third-floor bedroom. During the work, both doors were positioned horizontally on sawhorses in the Work Room. Using a heat gun over 1100° Fahrenheit and metal blades to remove the softened paint, paint was removed down to the wood from both sides of each door. Workers removed all the paint from one door before moving on to the second door.

Description of Study Room Layout:
A second-floor bedroom served as the Work Room. The second-floor hallway served as the Tool Room. Another bedroom adjacent to the Work Room served as the Observation Room. Due to the poor condition of the window sills in the Work and Observation Rooms, and the lack of windows in the Tool Room, trays were used as replacements for window sills at this property. The front porch served as the staging area where study equipment was kept. Hallway exit samples were obtained from a landing on the stairway connecting the first and second levels, from the floor at the bottom of that stairway, and from the entryway just inside the front door of the unit. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was on the front porch, right outside the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning, along with the stairway and the first floor room, which contained the main entryway and the stairway. Other areas of the first floor and the other second floor rooms were barricaded with plastic. The Work, Tool, and Observation Rooms had to undergo re-cleaning once, as multiple samples were above clearance levels. Clearance samples were not taken from window sills, since trays were used as replacement sills. An additional clearance sample was taken from a mantle in the Work Room. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 170).

Table 170. Final Clearance Lead Levels (<10 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	11.0	< 10	< 10	29.3
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
The job was time-consuming, lasting over four hours. Because of the length of time required to perform the work, the post-cleaning wait time was reduced to 30 minutes. An off-duty Pittsburgh police officer was present.

Soil Sampling Results:
The post-work soil samples from Experiment 36 served as the pre-work soil samples for this experiment. These samples resulted in an average of 1,002 ppm, with higher levels near the unit's front porch. The post-work soil samples from Experiment 30 resulted in an average of 1,103 ppm. Pre- and post-work soil lead levels could not be compared in the area under the work room window, as no soil sample was collected from the same area during Experiment 36. Post-work soil lead levels decreased in one location and increased slightly in another location (Table 171).

Table 171. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	1,230	773	n/a**	1,002
Post-work	929	940	1,441	1,103

* EPA soil threshold is 400 ppm for play areas and 1,200 ppm for yard.
** No soil sample was collected from a comparable area prior to this experiment.

Dust Wipe Results:
All dust wipe samples were successfully collected. One post-CV wipe sample was taken from an area behind one of the doors that was heat-gunned; this area was vacuumed but not wiped with the wet verification cloths. Three post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. Dust collection trays were used in place of window sill samples because of the poor condition or lack of window sills in Study Rooms. See Table 172 for floor and window sill dust wipe results.

As shown below, post-cleaning and post-CV lead levels remained quite high in all Study Rooms. This could be attributable to the apparent porosity of the floor surfaces in the Study Rooms and the difficulty of removing the fine dust particles generated by the use of heat guns.

Table 172. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft²)					Window Sill Lead Levels (µg/ft²)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	1,261,303.0*	426,759.3*	723,888.6*	91,472.1	625,855.8	27,255.2
	Post-cleaning	2,753.9	1,245.7	2,649.7	1,954.8	2,151.0	1,697.6
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	1,864.2	1,746.1	98.2	1,454.2	1,290.7	1,784.5
Tool Room	Post-work	2,371.7	66.9	n/a	n/a	1,219.3	3,290.1
	Post-cleaning	3,553.1	1,398.6	n/a	n/a	2,475.8	2,450.4
	Post-CV	768.8	841.8	n/a	n/a	805.3	2,334.6
Observation Room	Post-work	862.6	539.5	n/a	n/a	701.0	640.8
	Post-cleaning	1,058.1	532.5	n/a	n/a	795.3	973.7
	Post-CV	1,509.8	827.9	n/a	n/a	1,168.9	886.9
Hallway Exit	Post-CV	522.1	390.1	1,058.1	n/a	656.8	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:

Air monitoring results are presented in Table 173. Compared to post-work air lead levels, post-cleaning air lead levels were higher in the Work and Observation rooms but lower in the Tool room. All post-CV air monitoring results were below the detection limit.

Table 173. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m³)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	70.2	175.0	<25.5
Tool Room	92.3	41.7	<26.3
Observation Room	56.5	57.9	<26.5

QA/QC Results:

- Wipe Field Blanks – 46.1 µg and 32.2 µg of lead measured on two blanks
- Air Filter Field Blanks – <2 µg of lead measured
- Wipe Spikes – 29.2 µg measured of 29.1 µg spike (100.3%), and 14.9 µg measured of 15.0 µg spike (99.3%)
- Air Filter Spikes – 96.7 µg measured of 100 µg spike (96.7%)

Job: Interior heat gunning of doors (High level interior)
City: Pittsburgh
Housing Unit: H10
Experiment #: 31
Interior Phase: Rule Plastic/Baseline Cleaning (Phase II)
Date of work: November 1, 2006

Paint Chip Results:
The average of 4 paint chip samples was 5.1% lead by weight.

Description of Job:
Paint was removed from two doors taken out of a second-floor bedroom, which also served as the Observation Room. Both doors were positioned horizontally on sawhorses in the center of the Work Room and heat-gunned simultaneously. Using a heat gun over 1100° Fahrenheit and metal blades to remove the softened paint, paint was removed down to the wood from both sides of each door.

Description of Study Room Layout:
A second-floor bedroom served as the Work Room. The second-floor hallway served as the Tool Room. Another bedroom adjacent to the Work Room served as the Observation Room. Due to the poor condition of the window sills in the Work and Observation Rooms, and the lack of windows in the Tool Room, trays were used as replacements for window sills at this property. Hallway exit samples were obtained from the first landing on the stairway connecting the first and second levels, from the floor at the bottom of that stairway, and from the entryway just inside the front door of the unit. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was on the front porch, right outside the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning, along with the stairway and the first floor room, which contained the main entryway and the stairway. Other areas of the first floor and the other second floor rooms were barricaded with plastic. The Work and Observation Rooms had to undergo re-cleaning once, as multiple samples were above clearance levels. Clearance samples were not taken from window sills, since trays were used as replacement sills. An additional clearance sample was taken from a mantle in the Work Room. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (Table 174).

Table 174. Final Clearance Lead Levels (<10 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	17.8	< 10	< 10	< 10
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
The workers had difficulty removing all layers of paint from the doors. They removed as much paint as possible in three hours, but patches of varnish still remained on the doors. An off-duty Pittsburgh police officer was present.

Soil Sampling Results:
The post-work soil samples from Experiment 37 served as the pre-work soil samples for this experiment. Those samples resulted in an average of 1,479 ppm, with much higher levels near the front porch. The post-work soil samples from Experiment 31 resulted in an average of 1,830 ppm (Table 175). Pre- and post-work soil lead levels could not be compared in the area under the work room window, as no soil sample was collected from the same area during Experiment 37. The significantly lower post-work soil lead levels near the front porch highlights the variability of the soil lead levels even in similar locations.

Table 175. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	2,258.0	700.0	n/a**	1,479.0
Post-work	1,033.0	426.0	4,031.0	1,830.0

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.
** No soil sample was collected from a comparable area prior to this experiment.

Dust Wipe Results:
All dust wipe samples were successfully collected. Three post-work sampling areas in the Work Room were covered with significant amounts of debris. This debris was collected in bags before the areas were wiped with dust wipes. The full amount of lead that landed in the selected square foot sampling area is reported in Table 176 below. Note the variability in lead levels detected at various stages of the study on the sill (tray) in the Observation Room.

As shown below, post-cleaning and post-CV lead levels remained quite high, particularly in the Work and Tool Rooms. This could be attributable to the apparent porosity of the floor surfaces in the Study Rooms and the difficulty of removing the fine dust particles generated by the use of heat guns.

Table 176. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	630,942*	100,274*	3,533,304*	32,040	1,074,140	892.5
	Post-cleaning	2,020.1	1,054.7	1,637.6	859.4	1,392.9	8,838.8
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	2,001.9	460.7	1,601.1	427.9	1,122.9	927.2
Tool Room	Post-work	8,666.7	1,674.0	n/a	n/a	5,170.4	2,583.1
	Post-cleaning	2,420.8	1,619.3	n/a	n/a	2,020.1	1,118.1
	Post-CV	1,801.5	608.0	n/a	n/a	1,204.8	849.2
Observation Room	Post-work	225.7	154.6	n/a	n/a	190.2	19,073.8
	Post-cleaning	149.2	457.0	n/a	n/a	303.1	2.8
	Post-CV	182.0	205.7	n/a	n/a	193.8	198.7
Hallway Exit	Post-CV	946.8	345.9	484.3	n/a	592.3	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:

Air monitoring results are presented in Table 177. All post-work cleaning and post-CV air monitoring results were below the detection limit.

Table 177. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	59.5	<7.9	<55.6
Tool Room	42.6	<9.4	<51.3
Observation Room	27.1	<7.9	<51.3

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 27.1 µg measured of 25.7 µg spike (105.4%), and 32.6 µg measured of 28.1 µg spike (116.0%)

Job: Interior heat gunning of doors (High level interior)
City: Pittsburgh
Housing Unit: H10
Experiment #: 32
Interior Phase: No Plastic/Rule Cleaning (Phase III)
Date of work: November 7, 2006

Paint Chip Results:
The average of 4 paint chip samples was 8.5% lead by weight.

Description of Job:
Paint was removed from two doors taken out of a second-floor bedroom. Both doors were positioned horizontally on sawhorses in the center of the Work Room and heat-gunned simultaneously. Using a heat gun over 1100° Fahrenheit and metal blades to remove the softened paint, paint was removed down to the wood from both sides of each door. Approximately 90% of the paint was removed from each door – door panel grooves were not scraped in order to finish the experiment in a reasonable amount of time.

Description of Study Room Layout:
A second-floor bedroom served as the Work Room. The second-floor hallway served as the Tool Room. Another bedroom adjacent to the Work Room served as the Observation Room. Due to the poor condition of the window sills in the Work and Observation Rooms, and the lack of windows in the Tool Room, trays were used as replacements for window sills at this property. Hallway exit samples were obtained from the first landing on the stairway connecting the first and second levels, from the floor at the bottom of that stairway, and from the entryway just inside the front door of the unit. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was on the front porch, right outside the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning, along with the stairway and the first floor room, which contained the main entryway and the stairway. Other areas of the first floor and the other second floor rooms were barricaded with plastic. An additional clearance sample was taken from a mantle in the Work Room. Clearance samples were not obtained for window sills, as tray samples were used in place of window sill samples. Following all pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (Table 178).

Table 178. Final Clearance Lead Levels (<10 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	18.3	< 10	< 10	12.0
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:

During heat gun use, a noticeable amount of "fog" was visible in the Observation Room. During cleaning, a broom had to be used to sweep up large amounts of debris prior to HEPA-vacuuming, resulting in the collection of approximately 12 pounds of scraped paint. Some paint melted onto the floor during work – this paint was removed from the floor with a scraper. An off-duty Pittsburgh police officer was present.

Soil Sampling Results:
The post-work soil samples from Experiment 31 served as the pre-work soil samples for this experiment. Those samples resulted in an average of 1,830 ppm, with the highest observed levels under the work room window. The post-work soil samples from Experiment 32 resulted in an average of 1,113 ppm (Table 179). Two of the three post-work soil samples had lead levels lower than those of pre-work samples.

Table 179. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	1,033	426	4,031	1,830
Post-work	957	877	1,505	1,113

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. All four post-work floor sampling areas in the Work Room were covered with significant amounts of debris. This debris was collected in bags before the areas were wiped with dust wipes. Dust collection trays were used in place of window sills due to the poor condition or lack of window sills in the Study Rooms. Floor and tray dust wipe results are presented in Table 180.

As shown below, post-cleaning and post-CV lead levels remained quite high, particularly in the Work and Tool Rooms. This could be attributable to the apparent porosity of the floor surfaces in the Study Rooms and the difficulty of removing the fine dust particles generated by the use of heat guns.

Table 180. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	1,425,952*	3,435,999*	3,714,885*	658,400*	2,308,809	120,226.6
	Post-cleaning	3,115.1	3,768.8	2,143.4	2,479.1	2,876.6	18,132.8
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	2,019.7	4,263.5	5,205.5	415.8	2,976.1	2,669.6
Tool Room	Post-work	1,860.7	1,083.3	n/a	n/a	1,472.0	1,445.2
	Post-cleaning	3,415.5	1,472.0	n/a	n/a	2,443.8	2,713.7
	Post-CV	3,963.2	1,542.7	n/a	n/a	2,752.9	2,448.7
Observation Room	Post-work	598.3	313.3	n/a	n/a	455.8	738.5
	Post-cleaning	1,101.0	580.6	n/a	n/a	840.8	1,349.5
	Post-CV	753.8	937.5	n/a	n/a	845.6	1,172.8
Hallway Exit	Post-CV	767.9	1,101.0	226.7	n/a	698.5	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:

Air monitoring results are presented in Table 181. All post-CV air monitoring results were below the detection limit. A flow restriction was observed during calibration of the Observation Room air pump following the work stage of the experiment.

Table 181. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	118.0	229.2	<96.8
Tool Room	81.5	56.7	<97.7
Observation Room	63.7	112.5	<74.9

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead and 11.2 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 115.4 µg measured of 99.2 µg spike (116.3%)

Job: Interior heat gunning of doors (High level interior)
City: Pittsburgh
Housing Unit: H10
Experiment #: 33
Interior Phase: Rule Plastic/Rule Cleaning (Phase I)
Date of work: November 13, 2006

Paint Chip Results:
The average of 4 paint chip samples was 3.5% lead by weight.

Description of Job:
Paint was removed from two doors taken out of a third-floor bedroom. Both doors were positioned horizontally on sawhorses in the center of the Work Room and heat-gunned simultaneously. Using three heat guns over 1100° Fahrenheit and metal blades to remove the softened paint, paint was removed down to the wood from both sides of each door. Door panel grooves were not scraped in order to finish the experiment in a reasonable amount of time.

Description of Study Room Layout:
A second-floor bedroom served as the Work Room. The second-floor hallway served as the Tool Room. Another bedroom adjacent to the Work Room served as the Observation Room. Due to the poor condition of the window sills in the Work and Observation Rooms, and the lack of windows in the Tool Room, trays were used as replacements for window sills at this property. Hallway exit samples were obtained from the first landing on the stairway connecting the first and second levels, from the floor at the bottom of that stairway, and from the entryway just inside the front door of the unit. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was on the front porch, right outside the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning, along with the stairway and the first floor room, which contained the main entryway and the stairway. Other areas of the first floor and the other second floor rooms were barricaded with plastic. An additional clearance sample was taken from a mantle in the Work Room. Clearance samples were not obtained for window sills, as tray samples were used in place of window sill samples. Following all pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (Table 182).

Table 182. Final Clearance Lead Levels (<10 reported as 5 µg/ft^2)

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	10.0
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
With two teams of workers heat gunning simultaneously, this job went relatively smoothly. An off-duty Pittsburgh police officer was present.

Soil Sampling Results:
The post-work soil samples from Experiment 32 served as the pre-work soil samples for this experiment. Those samples resulted in an average of 1,113 ppm. The post-work soil samples from Experiment 33 resulted in an average of 861 ppm. Like the pre-work samples, the highest lead level among the post-work samples was observed in the sample obtained from under the work room window (Table 183).

Table 183. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	957	877	1,505	1,113
Post-work	886	544	1,154	861

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Three post-work sampling areas in the Work Room were covered with significant amounts of debris. This debris was collected in bags before the areas were wiped with dust wipes. Dust collection trays were used in place of window sills due to the poor condition/inadequate size or lack of window sills. Table 184 presents floor and tray dust wipe results.

Table 184. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	492,998*	6,034,407*	1,276,049*	5,773.9	1,952,307	344.6
	Post-cleaning	108.7	492.6	113.9	51.9	191.8	1,005.3
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	158.7	143.2	96.7	191.4	147.5	790.2
Tool Room	Post-work	3,101.4	923.2	n/a	n/a	2,012.3	661.1
	Post-cleaning	568.6	2,567.8	n/a	n/a	1,568.2	1,112.9
	Post-CV	644.4	682.2	n/a	n/a	663.3	603.7
Observation Room	Post-work	156.9	60.5	n/a	n/a	108.7	101.6
	Post-cleaning	225.8	363.5	n/a	n/a	294.7	345.5
	Post-CV	330.8	105.3	n/a	n/a	218.0	173.3
Hallway Exit	Post-CV	630.6	459.9	296.4	n/a	462.3	n/a

* Bulk debris samples were collected and analyzed, and are included with wipe results.

Indoor Air Monitoring Results:
Air monitoring results are presented in Table 16185 All post-cleaning and post-CV air monitoring results were below the detection limit. However, the Tool Room and Observation Room monitoring pumps were not turned on until 60 minutes into the job; both pumps ran for approximately one hour and 20 minutes of the Work stage.

Table 185. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	90.5	<7.6	<115.9
Tool Room	17.6	<7.5	<99.0
Observation Room	18.6	<7.4	<52.3

QA/QC Results:

- Wipe Field Blanks – 10.6 µg of lead measured on one blank, and <10 µg of lead measured on another blank
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 43.3 µg measured of 46.2 µg spike (93.7%) and 51.9 µg measured of 52.6 µg spike (98.7%)
- Air Filter Spikes – n/a

Experiment-Specific Reports for Interior Heat Gun (> 1100°F) Job #2

Job:	Interior heat gun > 1100°F (High level interior)
City:	Columbus
Housing Unit:	H09
Experiment #:	13
Interior Phase:	Plastic Coverings /Baseline Cleaning (Phase II)
Date of work:	December 7, 2006

Paint Chip Results:
The average of 5 paint chip samples was 8.1% lead by weight.

Description of Job:
Approximately 53 ft^2 of paint was removed from the baseboards, window trim, fireplace, and door trim of a second floor bedroom using two heat guns operating at temperatures above 1100°F.

Figure A-6. Using chisel to remove heated paint from door

Description of Study Room Layout:
A second level bedroom served as the Work Room. The second floor hallway served as the Tool Room. Another bedroom down the hallway from the Work Room served as the Observation Room. The first floor living room served as the staging area where study equipment was kept. Hallway exit samples were obtained from the pathway from the front door to the bottom of the steps leading to the second floor and also from the steps. The primary decontamination area was

immediately outside the Work Room. The secondary decontamination area was just inside of the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning along with the stairway, first floor main entry area and first floor room which contained the stairway. Other areas of the first floor and the other second floor rooms were barricaded with plastic. Dust collection trays were used during the experiment as a substitute for the window sills in all three study rooms. Following the pre-work cleaning, average floor lead levels in the study rooms were below EPA/HUD clearance standards (see Table 186). While the average hallway floor lead level was above the clearance standard, work proceeded as scheduled.

Table 186. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	10.4	< 10	8.7	57.6
Sills	18.3**	481.3**	80.5**	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Window sill replaced by a dust collection tray.

Problems/Issues with Job:
The removal of the paint from non-flat surfaces during this experiment proved to be a long and arduous task. After five continuous hours of work, the site supervisor stopped work with approximately 20 ft^2 of paint left to remove. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 2,553 ppm. The post-work soil samples resulted in an average of 1,736 ppm. Post-work soil lead levels did not significantly increase at any location (Table 187).

Table 187. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	5,006.0	241.0	2,411.0	2,552.7
Post-work	2,074.0	289.0	2,845.0	1,736.0

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Three post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 188 for floor and dust wipe results.

Table 188. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	3,199,753.9*	27,630.4	279,656.0*	149,518.2*	914,139.6	1,115.0
	Post-cleaning	162.6	52.4	55.8	117.8	97.2	253.7
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	50.6	314.2	36.9	419.3	205.3	81.4
Tool Room	Post-work	128.2	21.4	n/a	n/a	74.8	191.0
	Post-cleaning	143.7	59.3	n/a	n/a	101.5	57.9
	Post-CV	266.0	88.5	n/a	n/a	177.3	< 45.5
Observation Room	Post-work	38.6	11.0	n/a	n/a	24.8	< 45.5
	Post-cleaning	45.5	23.1	n/a	n/a	34.3	< 45.5
	Post-CV	26.5	17.9	n/a	n/a	22.2	< 45.5
Hallway Exit	Post-CV	376.2	297.0	128.2	n/a	267.1	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
The air lead level in the Work Room during the work stage was less than the PEL. All other air monitoring results were below the detection limit (Table 189).

Table 189. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	25.14	< 9.73	< 69.57
Tool Room	< 1.84	< 9.26	< 62.32
Observation Room	< 1.79	< 9.56	< 61.80

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 452 µg measured of 467.5 µg spike (96.7%), and 484.7 µg measured of 511.7 µg spike (94.7%).
- Air Filter Spikes – 8.75 µg measured of 10 µg spike (87.5%).

Job: Interior heat gun > 1100°F (High level interior)
City: Columbus
Housing Unit: H09
Experiment #: 14
Interior Phase: No Plastic /Rule Cleaning (Phase III)
Date of work: December 4, 2006

Paint Chip Results:
The average of 5 paint chip samples was 2.0% lead by weight.

Description of Job:
Approximately 75 ft^2 of paint was removed from the baseboards, closet door and door trim of a second floor bedroom using two heat guns operating at temperatures above 1100°F.

Description of Study Room Layout:
A second level bedroom served as the Work Room. The second floor hallway served as the Tool Room. Another bedroom down the hallway from the Work Room served as the Observation Room. The first floor living room served as the staging area where study equipment was kept. Hallway exit samples were obtained from the pathway from the front door to the bottom of the steps leading to the second floor and also from the steps. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just inside of the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning along with the stairway, first floor main entry area and first floor room which contained the stairway. Other areas of the first floor and the other second floor rooms were barricaded with plastic. Dust collection trays were used during the experiment as a substitute for the window sills in all three study rooms. The Work Room underwent a second cleaning after the first cleaning did not produce floor lead levels below the clearance standards. Following the pre-work cleaning, average floor lead levels in the study rooms were below EPA/HUD clearance standards (see Table 190).

Table 190. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	28.2	32.5	9.9
Sills	1684.4**	1096.6**	74.7**	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Window sill replaced by a dust collection tray.

Problems/Issues with Job:
During the work, a significant amount of debris spilled out of the Work Room onto the decontamination plastic. This debris was vacuumed with a HEPA vacuum at the conclusion of the work to avoid contamination of the housing unit. The post-cleaning one hour wait time was reduced by 10 min in an effort to complete the experiment before sunset (after which the

verification process would have been extremely difficult, as there were no interior lights in the unit). An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 5,001 ppm. The post-work soil samples resulted in an average of 4,093 ppm. Post-work soil lead levels are not significantly different at any location (Table 191).

Table 191. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	4,540.0	367.0	10,097.0	5,001.3
Post-work	3,348.0	288.0	8,643.0	4,093.0

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. One post-work floor sample in the Work Room was moved to an adjacent location due to the presence of an air vent in the original location. Two post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 192 for floor and dust wipe results.

Table 192. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	426.6	168,554.3*	6,223.2	3,540,368.4*	928,893.1	117.5
	Post-cleaning	32.6	19.1	112.5	175.3	84.9	< 45.5
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	119.3	51.3	37.7	97.2	76.4	< 45.5
Tool Room	Post-work	68.3	51.3	n/a	n/a	59.8	< 45.5
	Post-cleaning	56.4	< 10	n/a	n/a	30.7	133.0
	Post-CV	119.3	41.1	n/a	n/a	80.2	< 45.5
Observation Room	Post-work	54.7	95.5	n/a	n/a	75.1	< 45.5
	Post-cleaning	34.3	27.6	n/a	n/a	31.0	< 45.5
	Post-CV	36.0	20.8	n/a	n/a	28.4	< 45.5
Hallway Exit	Post-CV	95.5	85.3	39.4	n/a	73.4	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
The air lead levels in the Work Room and Tool Room during the work stage were less than the PEL. All other air monitoring results were below the detection limit (Table 193).

Table 193. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	2.30	< 5.82	< 67.25
Tool Room	2.60	< 5.70	< 74.43
Observation Room	< 2.18	< 5.87	< 85.11

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 578.2 µg measured of 579.8 µg spike (99.7%), and 458.9 µg measured of 489 µg spike (93.8%).
- Air Filter Spikes – 100.61 µg measured of 100 µg spike (100.6%).

Job: Interior heat gun > 1100°F (High level interior)
City: Columbus
Housing Unit: H09
Experiment #: 15
Interior Phase: No Plastic /Baseline Cleaning (Phase IV)
Date of work: November 27, 2006

Paint Chip Results:
The average of 6 paint chip samples was 10.2% lead by weight.

Description of Job:
Approximately 75 ft^2 of paint was removed from the closet door, fireplace, mantle and baseboards of a second floor bedroom using two heat guns operating at temperatures above 1100°F.

Description of Study Room Layout:
A second level bedroom served as the Work Room. The second floor hallway served as the Tool Room. Another bedroom down the hallway from the Work Room served as the Observation Room. The first floor living room served as the staging area where study equipment was kept. Hallway exit samples were obtained from the pathway from the front door to the bottom of the steps leading to the second floor and also from the steps. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just inside of the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning along with the stairway, first floor main entry area and first floor room which contained the stairway. Other areas of the first floor and the other second floor rooms were barricaded with plastic. Dust collection trays were used during the experiment as a substitute for the window sills in all three study rooms. Following the pre-work cleaning, average floor lead levels in the study rooms were below EPA/HUD clearance standards (see Table 194). While the average hallway floor lead level was above the clearance standard, work proceeded as scheduled.

Table 194. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	45.7
Sills	89.7**	453.3**	552.3**	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Window sill replaced by a dust collection tray.

Problems/Issues with Job:
No problems or issues with this experiment were noted. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 3,007 ppm. The post-work soil samples resulted in an average of 6,911 ppm. While there exists a significant difference in the lead level under the work room window for this experiment, lead levels observed in the same location for previous experiments are consistent with the post-work level (Table 195).

Table 195. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	3,026.0	323.0	5,672.0	3,007.0
Post-work	5,352.0	230.0	15,150.0	6,910.7

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Two post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 196 for floor and dust wipe results.

Table 196. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	4,137,412.1*	6,000,504.4*	180,280.5	6,095.6	2,581,073.2	1,592.3
	Post-cleaning	6,419.5	195.0	980.2	3,083.8	2,669.6	1,352.4
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	530.4	767.9	559.2	857.9	678.9	182.7
Tool Room	Post-work	182.4	106.8	n/a	n/a	144.6	220.2
	Post-cleaning	186.0	117.6	n/a	n/a	151.8	197.7
	Post-CV	256.2	92.4	n/a	n/a	174.3	130.2
Observation Room	Post-work	49.3	29.5	n/a	n/a	39.4	122.7
	Post-cleaning	72.6	88.8	n/a	n/a	80.7	92.8
	Post-CV	42.1	70.8	n/a	n/a	56.5	122.7
Hallway Exit	Post-CV	414.5	151.8	261.6	n/a	276.0	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
The air lead levels in all three study rooms during the work and cleaning stages were less than the PEL. The cleaning verification air lead levels were below the detection limit (Table 197).

Table 197. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	8.9	17.1	< 95.83
Tool Room	14.9	10.1	< 55.28
Observation Room	8.7	12.5	< 56.09

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on one blank, and 34.9 µg of lead measured on another blank.
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 54.7 µg measured of 51.4 µg spike (106.4%), and 452.3 µg measured of 450.9 µg spike (100.3%).
- Air Filter Spikes – 10.21 µg measured of 10 µg spike (102.1%).

Job: Interior heat gun > 1100°F (High level interior)
City: Columbus
Housing Unit: H09
Experiment #: 16
Interior Phase: Plastic Coverings /Rule Cleaning (Phase I)
Date of work: November 21, 2006

Paint Chip Results:
The average of 5 paint chip samples was 4.0% lead by weight.

Description of Job:
Approximately 75 ft^2 of paint was removed from the closet door and baseboards of a second floor bedroom using two heat guns operating at temperatures above 1100°F.

Description of Study Room Layout:
A second level bedroom served as the Work Room. The second floor hallway served as the Tool Room. Another bedroom down the hallway from the Work Room served as the Observation Room. The first floor living room served as the staging area where study equipment was kept. Hallway exit samples were obtained from the pathway from the front door to the bottom of the steps leading to the second floor and also from the steps. The primary decontamination area was immediately outside the Work Room. The secondary decontamination area was just inside of the front door.

Pre-work Cleaning and Clearance:
The two bedrooms and the hallway on the second floor underwent abatement-style cleaning along with the stairway, first floor main entry area and first floor room which contained the stairway. Other areas of the first floor and the other second floor rooms were barricaded with plastic. Dust collection trays were used during the experiment as a substitute for the window sills in all three study rooms. Following the pre-work cleaning, average floor lead levels in the study rooms were below EPA/HUD clearance standards (see Table 198).

Table 198. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	6.0
Sills	374.3**	1,828.1**	7.3**	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.
** Window sill replaced by a dust collection tray.

Problems/Issues with Job:
No problems or issues with this experiment were noted. An off-duty Columbus police officer was present.

Soil Sampling Results:
The pre-work soil samples resulted in an average of 1,639 ppm. The post-work soil samples resulted in an average of 3,585 ppm. Post-work soil lead levels are only significantly different at the sampling location close to the front door (Table 199).

Table 199. Soil Lead Levels

Sample Type	Soil Lead Levels (ppm)*			
	Sample 1 – Close to front door	Sample 2 – Along walkway	Sample 3 – Under work room window	Average
Pre-work	2,508.0	291.0	2,117.0	1,638.7
Post-work	8,044.0	268.0	2,442.0	3,584.7

* EPA soil threshold is 400 ppm for play areas and 1200 ppm for yard.

Dust Wipe Results:
All dust wipe samples were successfully collected. Two post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 200 for floor and dust wipe results.

Table 200. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	46,149.0*	5,504.6	4,795,673.4*	5,904.6	1,213,307.9	2,723.9
	Post-cleaning	44.2	42.4	97.5	31.7	54.0	< 41.7
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	40.6	76.2	90.4	54.8	65.5	< 41.7
Tool Room	Post-work	325.1	120.6	n/a	n/a	222.9	< 41.7
	Post-cleaning	211.3	207.7	n/a	n/a	209.5	< 41.7
	Post-CV	909.8	51.3	n/a	n/a	480.5	< 41.7
Observation Room	Post-work	13.9	< 10	n/a	n/a	9.4	< 41.7
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	< 41.7
	Post-CV	22.8	26.4	n/a	n/a	24.6	< 41.7
Hallway Exit	Post-CV	172.2	90.4	181.1	n/a	147.9	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
The air lead level in the Work Room during the work stage was less than the PEL. All other air monitoring results were below the detection limit (Table 201).

Table 201. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	8.49	< 6.80	< 84.07
Tool Room	< 2.53	< 6.50	< 67.05
Observation Room	< 2.50	< 6.45	< 67.00

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured on two blanks
- Air Filter Field Blanks - <2 µg of lead measured
- Wipe Spikes – 51.3 µg measured of 54.7 µg spike (93.8%), and 51.3 µg measured of 50.2 µg spike (102.2%).
- Air Filter Spikes – 92.27 µg measured of 100 µg spike (92.3%).

Experiment-Specific Reports for Interior Heat Gun (> 1100°F) Job #3

Job: Interior Heat Gun > 1100°F (High level interior)
City: Columbus
Housing Unit: C01
Experiment #: 60
Interior Phase: Plastic Coverings /Baseline Cleaning (Phase II)
Date of work: November 30, 2006

Paint Chip Results:
The concentration of 1 paint chip sample was 2.9% lead by weight.

Description of Job:
Approximately 75 ft^2 of paint was removed from a classroom wall using two heat guns operating at temperatures above 1100°F and paint scrapers.

Description of Study Room Layout:
The large area of the classroom allowed for a distinct Work Room to be identified within a subsection of the classroom and for the rest of the classroom to serve as the Tool Room. A non-traveled section of the hallway adjacent to the Work/Tool Room served as the Observation Room. The landing at the top of the entry stairwell served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the staging area to the Work/Tool Room. The primary decontamination area was in the Tool Room immediately outside the Work Room. The secondary decontamination area was at the end of the hallway.

Pre-work Cleaning and Clearance:
The classroom and the hallway that connected the staging area to the classroom underwent abatement-style cleaning. A plastic airlock was erected at the entrance to the hallway, separating the work areas from the rest of the school. Other areas of the first floor and the stairwell to other floors of the school were barricaded with plastic. There were no windowsill samples taken; instead, dust trays were used as a substitute in all three rooms. Although the lead level in the Tool Room was above clearance standards after pre-work cleaning, the experiment was conducted as planned in order to maintain the progress of the study. The average floor lead levels in the other rooms were below EPA/HUD clearance standards (see Table 202).

Table 202. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	14.1	82.0	< 10	< 10
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
It proved extremely difficult to remove all of the paint on the wall down to the plaster, thus only the top layers of paint were removed. There were not very many layers (one or two) remaining after paint removal. Vertical plastic 'walls' extending from the ceiling to the floor were erected

prior to the commencement of work in order to separate the Work Room from the Tool Room. These 'walls' allowed an airlock entry door to the Work Room to be created, as per the proposed renovation rule. The vertical plastic was misted before being taken down during the cleaning stage of the experiment. An off-duty Columbus police officer was present.

Soil Sampling Results:
Concrete covered the ground at the three soil sampling locations, thus no pre- or post- work soil samples were collected for this experiment.

Dust Wipe Results:
All dust wipe samples were successfully collected. Three post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 203 for floor and dust wipe results.

Table 203. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	732,726.0*	211,292.6*	89,017.8*	193.3	258,307.4	362.0
	Post-cleaning	10.0	76.0	13.7	21.0	30.2	170.4
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	19.2	15.5	< 10	11.8	12.9	< 45.5
Tool Room	Post-work	33.8	10.0	< 10	n/a	16.3	< 45.5
	Post-cleaning	61.3	43.0	11.8	n/a	38.7	< 45.5
	Post-CV	90.6	32.0	10.0	n/a	44.2	< 45.5
Observation Room	Post-work	10.0	< 10	n/a	n/a	7.5	< 45.5
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	< 45.5
	Post-CV	54.0	< 10	n/a	n/a	29.5	< 45.5
Hallway	Post-CV	< 10	< 10	< 10	n/a	< 10	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
During the work, the air monitor in the Work Room stopped working due to a flow obstruction. The flow obstruction was caused by the sampling of excessive amount of fumes generated during the paint removal at such high heat gun temperatures; fumes/smoke hung in the air and were trapped within the work room containment zone because of the presence of the vertical plastic. The clogged cartridge was removed and replaced with a new cartridge. The value in the table represents the combined air lead level from the two cartridges. The air lead level in the Work Room during the work stage was below the PEL. All other air monitoring results were below the detection limit of the laboratory (Table 204).

Table 204. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	8.60	< 6.40	< 95.33
Tool Room	< 2.45	< 6.14	< 96.95
Observation Room	< 2.43	< 6.14	< 95.83

QA/QC Results:

- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 275.7 µg measured of 304.8 µg spike (90.5%), and 365.5 µg measured of 408.3 µg spike (89.5%).
- Air Filter Spikes – 86.87 µg measured of 100 µg spike (86.9%).

Job: Interior Heat Gun > 1100°F (High level interior)
City: Columbus
Housing Unit: C01
Experiment #: 61
Interior Phase: No Plastic /Rule Cleaning (Phase III)
Date of work: December 8, 2006

Paint Chip Results:
The concentration of 1 paint chip sample was 2.2% lead by weight.

Description of Job:
Approximately 75 ft^2 of paint was removed from a classroom wall using two heat guns operating at temperatures above 1100°F and paint scrapers.

Description of Study Room Layout:
The large area of the classroom allowed for a distinct Work Room to be identified within a subsection of the classroom and for the rest of the classroom to serve as the Tool Room. A non-traveled section of the hallway adjacent to the Work/Tool Room served as the Observation Room. The landing at the top of the entry stairwell served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the staging area to the Work/Tool Room. The primary decontamination area was in the Tool Room immediately outside the Work Room. The secondary decontamination area was at the end of the hallway.

Pre-work Cleaning and Clearance:
The classroom and the hallway that connected the staging area to the classroom underwent abatement-style cleaning. A plastic airlock was erected at the entrance to the hallway, separating the work areas from the rest of the school. Other areas of the first floor and the stairwell to other floors of the school were barricaded with plastic. There were no windowsill samples taken; instead, dust trays were used as a substitute in all three rooms. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 205).

Table 205. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	12.5	11.2	< 10	< 10
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
It proved extremely difficult to remove all of the paint on the wall down to the plaster, thus only the top layers of paint were removed. There were not very many layers remaining after paint removal. An off-duty Columbus police officer was present.

Soil Sampling Results:
Concrete covered the ground at the three soil sampling locations, thus no pre- or post- work soil samples were collected for this experiment.

Dust Wipe Results:
All dust wipe samples were successfully collected. Two post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 206 for floor and dust wipe results.

Table 206. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	154,526.4*	140,836.5*	95.4	50.6	73,877.2	232.5
	Post-cleaning	< 10	< 10	30.0	< 10	11.3	< 41.7
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	< 10	< 10	< 10	< 10	< 41.7
Tool Room	Post-work	14.5	14.5	< 10	n/a	11.3	< 41.7
	Post-cleaning	12.7	< 10	19.6	n/a	12.4	45.9
	Post-CV	12.7	11.0	14.5	n/a	12.7	< 41.7
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	< 41.7
	Post-cleaning	17.9	< 10	n/a	n/a	11.5	< 41.7
	Post-CV	< 10	< 10	n/a	n/a	< 10	< 41.7
Hallway	Post-CV	< 10	< 10	< 10	n/a	< 10	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
The air lead level in all three study rooms during the work stage was below the PEL. All other air monitoring results were below the detection limit of the laboratory (Table 207).

Table 207. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	4.22	< 6.97	< 119.40
Tool Room	2.98	< 7.11	< 105.71
Observation Room	3.73	< 6.83	< 88.50

QA/QC Results:
- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 518.2 µg measured of 548.2 µg spike (94.5%), and 61 µg measured of 61.6 µg spike (99%).
- Air Filter Spikes – 100.19 µg measured of 100 µg spike (100.2%).

Job: Interior Heat Gun > 1100°F (High level interior)
City: Columbus
Housing Unit: C01
Experiment #: 62
Interior Phase: No Plastic /Baseline Cleaning (Phase IV)
Date of work: December 1, 2006

Paint Chip Results:
The concentration of 1 paint chip sample was 2.2% lead by weight.

Description of Job:
Approximately 73 ft^2 of paint was removed from a classroom wall using two heat guns operating at temperatures above 1100°F and paint scrapers.

Description of Study Room Layout:
The large area of the classroom allowed for a distinct Work Room to be identified within a subsection of the classroom and for the rest of the classroom to serve as the Tool Room. A non-traveled section of the hallway adjacent to the Work/Tool Room served as the Observation Room. The landing at the top of the entry stairwell served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the staging area to the Work/Tool Room. The primary decontamination area was in the Tool Room immediately outside the Work Room. The secondary decontamination area was at the end of the hallway.

Pre-work Cleaning and Clearance:
The classroom and the hallway that connected the staging area to the classroom underwent abatement-style cleaning. A plastic airlock was erected at the entrance to the hallway, separating the work areas from the rest of the school. Other areas of the first floor and the stairwell to other floors of the school were barricaded with plastic. There were no windowsill samples taken; instead, dust trays were used as a substitute in all three rooms. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 208).

Table 208. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	< 10
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
It proved extremely difficult to remove all of the paint on the wall down to the plaster, thus only the top layers of paint were removed. There were not very many layers remaining after paint removal. There was a 2 ft^2 section of the wall where the wall had been repaired and it was difficult to remove any of the paint. That area of the wall was subtracted from the area of total disturbed paint. The electricity at the school turned off on several occasions for approximately 5-10 seconds, but there was no significant delay in completing the work. An off-duty Columbus police officer was present.

Soil Sampling Results:
Concrete covered the ground at the three soil sampling locations, thus no pre- or post- work soil samples were collected for this experiment.

Dust Wipe Results:
All dust wipe samples were successfully collected. Three post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 209 for floor and dust wipe results.

Table 209. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	139,993.0*	324,489.8*	477.6	121,475.3*	146,608.9	6,424.3
	Post-cleaning	47.0	19.1	37.7	25.9	32.4	94.4
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	10.6	< 10	< 10	6.4	< 45.5
Tool Room	Post-work	44.5	24.2	12.3	n/a	27.0	48.0
	Post-cleaning	10.6	24.2	10.6	n/a	15.1	< 45.5
	Post-CV	12.3	17.4	19.1	n/a	16.3	< 45.5
Observation Room	Post-work	12.3	< 10	n/a	n/a	8.7	< 45.5
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	< 45.5
	Post-CV	10.6	10.6	n/a	n/a	10.6	< 45.5
Hallway	Post-CV	12.3	< 10	20.8	n/a	12.7	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit of the laboratory (Table 210).

Table 210. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 2.49	< 6.67	< 28.89
Tool Room	< 2.55	< 6.81	< 29.23
Observation Room	< 2.52	< 6.72	< 30.95

QA/QC Results:
- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 496.8 µg measured of 489.5 µg spike (101.5%), and 48.5 µg measured of 51.3 µg spike (94.5%).
- Air Filter Spikes – 9.59 µg measured of 10 µg spike (95.9%).

Job: Interior Heat Gun > 1100°F (High level interior)
City: Columbus
Housing Unit: C01
Experiment #: 63
Interior Phase: Plastic Coverings /Rule Cleaning (Phase I)
Date of work: December 6, 2006

Paint Chip Results:
The concentration of 1 paint chip sample was 1.6% lead by weight.

Description of Job:
Approximately 75 ft^2 of paint was removed from a classroom wall using two heat guns operating at temperatures above 1100°F and paint scrapers.

Description of Study Room Layout:
The large area of the classroom allowed for a distinct Work Room to be identified within a subsection of the classroom and for the rest of the classroom to serve as the Tool Room. A non-traveled section of the hallway adjacent to the Work/Tool Room served as the Observation Room. The landing at the top of the entry stairwell served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the staging area to the Work/Tool Room. The primary decontamination area was in the Tool Room immediately outside the Work Room. The secondary decontamination area was at the end of the hallway.

Pre-work Cleaning and Clearance:
The classroom and the hallway that connected the staging area to the classroom underwent abatement-style cleaning. A plastic airlock was erected at the entrance to the hallway, separating the work areas from the rest of the school. Other areas of the first floor and the stairwell to other floors of the school were barricaded with plastic. There were no windowsill samples taken; instead, dust trays were used as a substitute in all three rooms. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 211).

Table 211. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	< 10	< 10	< 10	< 10
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
It proved extremely difficult to remove all of the paint on the wall down to the plaster, thus only the top layers of paint were removed. There were not very many layers remaining after paint removal. Vertical plastic 'walls' extending from the ceiling to the floor were erected prior to the commencement of work in order to separate the Work Room from the Tool Room. These 'walls' allowed an airlock entry door to the Work Room to be created, as per the proposed renovation rule. The plastic was vacuumed with a HEPA vacuum and misted before being taken down during the cleaning stage of the experiment. There was a section of the upper wall approximately 6-8 ft^2 in area from which the paint could not be removed. In order to reach the

75 ft^2 requirement, 6-8 ft^2 of paint was removed from the lower wall, directly below where the work occurred. An off-duty Columbus police officer was present.

Soil Sampling Results:
Concrete covered the ground at the three soil sampling locations, thus no pre- or post- work soil samples were collected for this experiment.

Dust Wipe Results:
All dust wipe samples were successfully collected. Three post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 212 for floor and dust wipe results.

Table 212. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	41,671.5*	2,566,210.4*	14,101.2*	65.1	655,512.1	373.3
	Post-cleaning	< 10	< 10	< 10	< 10	< 10	< 45.5
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	< 10	< 10	< 10	< 10	< 45.5
Tool Room	Post-work	< 10	13.9	< 10	n/a	8.0	< 45.5
	Post-cleaning	< 10	< 10	< 10	n/a	< 10	< 45.5
	Post-CV	< 10	12.5	< 10	n/a	7.5	< 45.5
Observation Room	Post-work	< 10	< 10	n/a	n/a	< 10	70.8
	Post-cleaning	< 10	< 10	n/a	n/a	< 10	< 45.5
	Post-CV	< 10	41.2	n/a	n/a	23.1	47.5
Hallway	Post-CV	< 10	< 10	22.4	n/a	10.8	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
The air lead level in the Work Room during the work stage was below the PEL. All other air monitoring results were below the detection limit of the laboratory (Table 213).

Table 213. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	4.88	< 5.96	< 70.60
Tool Room	< 2.85	< 5.87	< 84.18
Observation Room	< 2.82	< 5.84	< 76.83

QA/QC Results:

- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 452.4 µg measured of 470.2 µg spike (96.2%), and 48 µg measured of 45.7 µg spike (105%).
- Air Filter Spikes – 89.33 µg measured of 100 µg spike (89.3%).

Experiment-Specific Reports for Interior Heat Gun (< 1100°F) Job #1

Job: Interior Heat Gun < 1100°F (Medium level interior)
City: Columbus
Housing Unit: C01
Experiment #: 56
Interior Phase: Plastic Coverings /Baseline Cleaning (Phase II)
Date of work: November 13, 2006

Paint Chip Results:
The concentration of 1 paint chip sample was 2.2% lead by weight.

Description of Job:
Approximately 50 ft^2 of paint was removed from a classroom wall using two heat guns operating at temperatures below 1100°F and paint scrapers.

Description of Study Room Layout:
The large area of the classroom allowed for a distinct Work Room to be identified within a subsection of the classroom and for the rest of the classroom to serve as the Tool Room. A non-traveled section of the hallway adjacent to the Work/Tool Room served as the Observation Room. The landing at the top of the entry stairwell served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the staging area to the Work/Tool Room. The primary decontamination area was in the Tool Room immediately outside the Work Room. The secondary decontamination area was at the end of the hallway.

Pre-work Cleaning and Clearance:
The classroom and the hallway that connected the staging area to the classroom underwent abatement-style cleaning. A plastic airlock was erected at the entrance to the hallway, separating the work areas from the rest of the school. Other areas of the first floor and the stairwell to other floors of the school were barricaded with plastic. There were no windowsill samples taken; instead, dust trays were used as a substitute in all three rooms. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 214).

Table 214. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	7.9	10.8	< 10	< 10
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
It proved extremely difficult to remove all of the paint on the wall down to the plaster, thus only the top layers of paint were removed. There were not very many layers remaining after paint removal. Vertical plastic 'walls' extending from the ceiling to the floor were erected prior to the commencement of work in order to separate the Work Room from the Tool Room. These 'walls' allowed an airlock entry door to the Work Room to be created, as per the proposed

renovation rule. The plastic was vacuumed with a HEPA vacuum and misted before being taken down during the cleaning stage of the experiment. An off-duty Columbus police officer was present.

Soil Sampling Results:
Concrete covered the ground at the three soil sampling locations, thus no pre- or post- work soil samples were collected for this experiment.

Dust Wipe Results:
All dust wipe samples were successfully collected. Two post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 215 for floor and dust wipe results.

Table 215. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	399,473.1*	436,945.7*	324.6	294.9	209,259.6	369.5
	Post-cleaning	12.6	20.0	21.9	47.9	25.6	285.1
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	23.7	< 10	10.7	29.3	17.2	133.1
Tool Room	Post-work	18.1	16.3	72.0	n/a	35.5	209.1
	Post-cleaning	46.0	10.7	12.6	n/a	23.1	133.1
	Post-CV	12.6	40.4	73.9	n/a	42.3	99.3
Observation Room	Post-work	55.3	25.6	n/a	n/a	40.4	< 45.5
	Post-cleaning	33.0	27.4	n/a	n/a	30.2	< 45.5
	Post-CV	337.6	47.9	n/a	n/a	192.8	< 45.5
Hallway	Post-CV	94.3	49.7	406.4	n/a	183.5	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
The air lead level in the Work Room during the work stage was below the PEL. All other air monitoring results were below the detection limit (Table 216).

Table 216. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	11.85	< 5.93	< 44.9
Tool Room	< 2.47	< 5.86	< 42.35
Observation Room	< 2.44	< 5.9	< 39.64

QA/QC Results:

- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 306.1 µg measured of 302 µg spike (101.4%), and 59 µg measured of 51.9 µg spike (113.7%).
- Air Filter Spikes – There was no air filter spike analyzed with this experiment.

Job: Interior Heat Gun < 1100°F (Medium level interior)
City: Columbus
Housing Unit: C01
Experiment #: 57
Interior Phase: No Plastic /Baseline Cleaning (Phase IV)
Date of work: November 15, 2006

Paint Chip Results:
The average of 2 paint chip samples was 2.4% lead by weight.

Description of Job:
Approximately 50 ft^2 of paint was removed from a classroom wall using two heat guns operating at temperatures below 1100°F and paint scrapers.

Description of Study Room Layout:
The large area of the classroom allowed for a distinct Work Room to be identified within a subsection of the classroom and for the rest of the classroom to serve as the Tool Room. A non-traveled section of the hallway adjacent to the Work/Tool Room served as the Observation Room. The landing at the top of the entry stairwell served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the staging area to the Work/Tool Room. The primary decontamination area was in the Tool Room immediately outside the Work Room. The secondary decontamination area was at the end of the hallway.

Pre-work Cleaning and Clearance:
The classroom and the hallway that connected the staging area to the classroom underwent abatement-style cleaning. A plastic airlock was erected at the entrance to the hallway, separating the work areas from the rest of the school. Other areas of the first floor and the stairwell to other floors of the school were barricaded with plastic. There were no windowsill samples taken; instead, dust trays were used as a substitute in all three rooms. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 217).

Table 217. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	6.8	8.6	8.6	12.3
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
It proved extremely difficult to remove all of the paint on the wall down to the plaster, thus only the top layers of paint were removed. There were not very many layers remaining after paint removal. An off-duty Columbus police officer was present.

Soil Sampling Results:
Concrete covered the ground at the three soil sampling locations, thus no pre- or post- work soil samples were collected for this experiment.

Dust Wipe Results:
All dust wipe samples were successfully collected. Two post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 218 for floor and dust wipe results.

Table 218. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	57,248.2*	60,381.4*	729.7	120.2	29,619.9	155.3
	Post-cleaning	65.9	30.2	25.1	55.7	44.2	246.8
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	45.5	101.5	35.3	21.7	51.0	70.4
Tool Room	Post-work	20.0	25.1	13.2	n/a	19.4	< 38.5
	Post-cleaning	31.9	37.0	26.8	n/a	31.9	57.3
	Post-CV	38.7	76.1	37.0	n/a	50.6	201.0
Observation Room	Post-work	28.5	11.5	n/a	n/a	20.0	< 38.5
	Post-cleaning	30.2	21.7	n/a	n/a	26.0	< 38.5
	Post-CV	21.7	18.3	n/a	n/a	20.0	< 38.5
Hallway	Post-CV	20.0	20.0	25.1	n/a	21.7	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
The air lead level in all three study rooms during the work and post-work cleaning stages were below the PEL. The results for the verification stage were below the detection limit (Table 219).

Table 219. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	6.1	9.48	< 44.81
Tool Room	4.14	8.3	< 42.49
Observation Room	5.93	8.01	< 42.18

QA/QC Results:
- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 386.9 µg measured of 380 µg spike (101.8%), and 539.4 µg measured of 520 µg spike (103.7%).
- Air Filter Spikes – 77.69 µg measured of 100 µg spike (77.7%).

Job: Interior Heat Gun < 1100°F (Medium level interior)
City: Columbus
Housing Unit: C01
Experiment #: 58
Interior Phase: No Plastic /Rule Cleaning (Phase III)
Date of work: November 20, 2006

Paint Chip Results:
The concentration of 1 paint chip sample was 2.8% lead by weight.

Description of Job:
Approximately 50 ft^2 of paint was removed from a classroom wall using two heat guns operating at temperatures below 1100°F and paint scrapers.

Description of Study Room Layout:
The large area of the classroom allowed for a distinct Work Room to be identified within a subsection of the classroom and for the rest of the classroom to serve as the Tool Room. A non-traveled section of the hallway adjacent to the Work/Tool Room served as the Observation Room. The landing at the top of the entry stairwell served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the staging area to the Work/Tool Room. The primary decontamination area was in the Tool Room immediately outside the Work Room. The secondary decontamination area was at the end of the hallway.

Pre-work Cleaning and Clearance:
The classroom and the hallway that connected the staging area to the classroom underwent abatement-style cleaning. A plastic airlock was erected at the entrance to the hallway, separating the work areas from the rest of the school. Other areas of the first floor and the stairwell to other floors of the school were barricaded with plastic. There were no windowsill samples taken; instead, dust trays were used as a substitute in all three rooms. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 220).

Table 220. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	18.4	12.5	9.1	< 10
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
It proved extremely difficult to remove all of the paint on the wall down to the plaster, thus only the top layers of paint were removed. There were not very many layers remaining after paint removal. An off-duty Columbus police officer was present.

Soil Sampling Results:
Concrete covered the ground at the three soil sampling locations, thus no pre- or post- work soil samples were collected for this experiment.

Dust Wipe Results:
The post-verification window sill sample from the Work Room dust collection tray was collected by the field technicians, however the laboratory was unable to locate the sample for analysis. All other dust wipe samples were successfully collected. Two post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 221 for floor and dust wipe results.

Table 221. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	265,109.2*	1,519,492.6*	197.8	64.6	446,216.1	106.2
	Post-cleaning	14.8	13.0	< 10	< 10	9.5	< 41.7
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	< 10	< 10	14.8	< 10	7.5	n/a
Tool Room	Post-work	< 10	18.4	30.8	n/a	18.1	< 41.7
	Post-cleaning	29.0	16.6	34.4	n/a	26.7	< 41.7
	Post-CV	13.0	20.2	61.0	n/a	31.4	< 41.7
Observation Room	Post-work	18.4	11.3	n/a	n/a	14.8	< 41.7
	Post-cleaning	18.4	16.6	n/a	n/a	17.5	< 41.7
	Post-CV	13.0	< 10	n/a	n/a	9.0	< 41.7
Hallway	Post-CV	13.0	11.3	13.0	n/a	12.4	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
All air monitoring results were below the detection limit (Table 222).

Table 222. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	Post-work Cleaning	Cleaning Verification
Work Room	< 2.88	< 6.87	< 66.4
Tool Room	< 3.24	< 6.86	< 67.1
Observation Room	< 2.87	< 6.93	< 66.71

QA/QC Results:
- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 450 µg measured of 506.2 µg spike (88.9%), and 57.5 µg measured of 55.1 µg spike (104.4%).
- Air Filter Spikes – 12.36 µg measured of 10 µg spike (123.6%).

Job: Interior Heat Gun < 1100°F (Medium level interior)
City: Columbus
Housing Unit: C01
Experiment #: 59
Interior Phase: Plastic Coverings /Rule Cleaning (Phase I)
Date of work: November 28, 2006

Paint Chip Results:
The average of 2 paint chip samples was 13.0% lead by weight.

Description of Job:
Approximately 50 ft^2 of paint was removed from a classroom wall using two heat guns operating at temperatures below 1100°F and paint scrapers.

Description of Study Room Layout:
The large area of the classroom allowed for a distinct Work Room to be identified within a subsection of the classroom and for the rest of the classroom to serve as the Tool Room. A non-traveled section of the hallway adjacent to the Work/Tool Room served as the Observation Room. The landing at the top of the entry stairwell served as the staging area where study equipment was kept. Hallway samples were obtained from the pathway from the staging area to the Work/Tool Room. The primary decontamination area was in the Tool Room immediately outside the Work Room. The secondary decontamination area was at the end of the hallway.

Pre-work Cleaning and Clearance:
The classroom and the hallway that connected the staging area to the classroom underwent abatement-style cleaning. A plastic airlock was erected at the entrance to the hallway, separating the work areas from the rest of the school. Other areas of the first floor and the stairwell to other floors of the school were barricaded with plastic. There were no windowsill samples taken; instead, dust trays were used as a substitute in all three rooms. Following the pre-work cleaning, average floor lead levels were below EPA/HUD clearance standards (see Table 223).

Table 223. Final Clearance Lead Levels

Component	Average Pre-Work Clearance Lead Levels (µg/ft^2)*			
	Work Room	Tool Room	Observation Room	Hallway
Floors	9.4	14.4	< 10	< 10
Sills	n/a	n/a	n/a	n/a

* EPA/HUD clearance levels are 40 µg/ft^2 for floors and 250 µg/ft^2 for sills.

Problems/Issues with Job:
It proved extremely difficult to remove all of the paint on the wall down to the plaster, thus only the top layers of paint were removed. There were not very many layers remaining after paint removal. Vertical plastic 'walls' extending from the ceiling to the floor were erected prior to the commencement of work in order to separate the Work Room from the Tool Room. These 'walls' allowed an airlock entry door to the Work Room to be created, as per the proposed renovation rule. The plastic was vacuumed with a HEPA vacuum and misted before being taken down during the cleaning stage of the experiment.

After the failure of the first wet verification cloth in one of the verification zones, the zone underwent a re-cleaning. The second wet verification cloth turned out to be even dirtier (grayer) after the re-cleaning than the first. This was concluded to be the result of a combination of a dirty mop head spreading dust and a Simple Green solution that was not dilute enough leaving a grayish residue on the floor, not a dirty floor. The verification process did not proceed to the dry verification stage. A post-wet verification sample was taken in that zone, anyway, to verify the lead level, and the result was 26.1 µg/ft^2, below the EPA/HUD clearance level. An off-duty Columbus police officer was present.

Soil Sampling Results:
Concrete covered the ground at the three soil sampling locations, thus no pre- or post- work soil samples were collected for this experiment.

Dust Wipe Results:
All dust wipe samples were successfully collected. Two post-work sampling areas in the Work Room were covered with significant amounts of debris. In these instances, debris was collected in plastic bags before the sample areas were wiped with dust wipes. See Table 224 for floor and dust wipe results.

Table 224. Floor and Window Sill Dust Wipe Sample Results

Room	Sample Type	Floor Lead Levels (µg/ft^2)					Window Sill Lead Levels (µg/ft^2)
		Sample 1	Sample 2	Sample 3	Sample 4	Average	
Work Room	Post-work	1,311,816.0*	1,156,044.1*	11,403.4	1,302.3	620,141.5	835.0
	Post-cleaning	288.6	124.8	33.1	42.1	122.2	137.7
	Post-wet CV	n/a	n/a	n/a	n/a	n/a	n/a
	Post-CV	15.1	11.5	43.9	45.7	29.1	< 41.7
Tool Room	Post-work	189.6	108.6	< 10	n/a	101.1	160.2
	Post-cleaning	76.2	78.0	97.8	n/a	84.0	70.3
	Post-CV	211.2	20.5	13.3	n/a	81.7	< 41.7
Observation Room	Post-work	119.4	25.9	n/a	n/a	72.7	100.3
	Post-cleaning	31.3	69.0	n/a	n/a	50.1	< 41.7
	Post-CV	13.3	29.5	n/a	n/a	21.4	< 41.7
Hallway	Post-CV	58.3	38.5	60.1	n/a	52.3	n/a

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

Indoor Air Monitoring Results:
The air lead level in the Work Room the work stage was above the PEL, however all personnel present were wearing full-face respirators at all times in the study areas. The post-work cleaning air levels in the Work and Tool rooms were below the PEL. All other air monitoring results were below the detection limit (Table 225).

Table 225. Indoor Air Samples

Room	Air Lead Levels by Sampling Stage (µg/m^3)		
	Work	**Post-work Cleaning**	**Cleaning Verification**
Work Room	110.1	24.61	< 25.66
Tool Room	< 3.22	10.1	< 25.87
Observation Room	< 3.31	< 7.53	< 24.07

QA/QC Results:

- Wipe Field Blanks – < 10 µg of lead measured on two blanks
- Air Filter Field Blanks - < 2 µg of lead measured
- Wipe Spikes – 45.7 µg measured of 41 µg spike (111.5%), and 42.1 µg measured of 38.6 µg spike (109.1%).
- Air Filter Spikes – 10.57 µg measured of 10 µg spike (105.7%).

Experiment-Specific Report for Exterior Soffit/Trim Replacement #1

Job: Exterior soffit/trim placement (Low level exterior)
City: Columbus
Housing Unit: H02
Experiment #: 04
Date of work: October 2, 2006

Paint Chip Results:
The average of 3 paint chip samples was 15.3% lead by weight.

Description of Job:
The workers removed the old fascia and soffit around an exterior back porch and installed new components. Tearing off the old components created a lot of dust and debris that was captured in the trays on the rule plastic.

Description of Containment:
Vertical containment was set up approximately 10 feet away from the porch, reaching about 12 feet high. Rule plastic was placed 6 feet from the porch on both sides and on the porch. Containment plastic extended another 2-4 feet beyond the rule plastic.

Problems/Issues with Job:
The job and subsequent sampling took place with no problems. An off-duty Columbus police officer was present. The weather was calm with wind speeds ranging from 1.6 mph to 2.0 mph. Containment set up took about 2.5 hrs. The work took about 3.5 hours.

Background Tray Sample Results:
The three background tray samples obtained on 9/28/2006 all yielded results <10 $\mu g/ft^2$ over approximately 6 hours.

Soil Sample Results:
The pre-work soil samples resulted in an average of 206 ppm (218 and 194 ppm). The post-work soil samples resulted in an average of 200 ppm (147 and 253 ppm) (Table 226).

Table 226. Soil Lead Levels

Sample Type	Sample 1 - Near Foundation	Sample 2 - Edge of Rule Plastic	Sample 3 - Edge of Containment Plastic	Average
Pre-work	n/a	218.0	194.0	206.0
Post-work	n/a	253.0	147.0	200.0

Dust Collection Tray Results:
All dust collection tray samples were successfully collected; although a few trays were bumped during the course of the work, with one tray significantly affected. See Table 227 for collection tray dust wipe sample results.

Table 227. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top of rule plastic (1-2 ft. from porch)	3,950.9*	64,610.2**	110,776.2	59,779
Under rule plastic	6,380.1	395.1	110.6	2,295
Outside rule plastic (5-6 ft. from porch)	59,027.0	26,040.0	52,741.6	45,936

* disturbed significantly during work

** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

QA/QC Results:

- Wipe Field Blanks – 11.8 µg of lead measured
- Wipe Field Spikes – 118.5 µg measured of 100.9 µg spike (117.4%)
- Air Filter Field Blanks - <2 µg of lead measured

Experiment-Specific Report for Exterior Soffit/Trim Replacement #2

Job: Exterior soffit/trim placement (Low level exterior)
City: Pittsburgh
Housing Unit: H10
Experiment #: 36
Date of work: October 18, 2006

Paint Chip Results:
The average of 5 paint chip samples taken from various components was 16.8% lead by weight.

Description of Job:
The workers removed the old fascia and soffit around a front porch and installed new components.

Description of Containment:
A lean-to containment was set up around the front porch with boards and plastic. This containment trapped all dust and debris inside the contained area. The bottom of the lean-to structure was approximately 14 feet away from the porch on the front side. On the two sides of the porch running perpendicular to the house, there were only a few feet of property on which to erect the containment. Thus, there were only a few feet of space on those sides of the porch. Rule plastic was placed on the porch, 6 feet from the porch on the front, and along the sides from the base of the porch to the vertical containment. Containment plastic extended another 6-8 feet beyond the rule plastic in the front of the house.

Problems/Issues with Job:
The job and subsequent sampling took place with no problems. A Pittsburgh police officer was present. The weather was calm with wind speeds measuring 0.7 mph from the south.

Background Tray Sample Results:
The three background tray samples obtained on 10/16/2006 yielded results ranging from 39.1 $\mu g/ft^2$ to <10.0 $\mu g/ft^2$ over approximately 4 hours.

Soil Sample Results:
Three pre-work soil samples resulted in an average of 778 ppm. Three post-work soil samples resulted in an average of 787 ppm, decreasing from 1,230 ppm near the perimeter to 358 near the back of the containment (Table 228).

Table 228. Soil Lead Levels.

Sample Type	Sample 1 - Near Foundation	Sample 2 - Edge of Rule Plastic	Sample 3 - Edge of Containment Plastic	Average
Pre-work	1,075.0	944.0	316.0	778.3
Post-work	1,230.0	773.0	358.0	787.0

Dust Collection Tray Results:
All dust collection tray samples were successfully collected. See Table 229 for collection tray dust wipe sample results.

Table 229. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top of rule plastic (2-3 ft from porch)	154,824.9	14,275.2*	93,036.2	87,378.8
Under rule plastic (7 ft from porch)	124.3	71.1	23,792.6	7,996
Outside rule plastic	18,536.2	128,548.6	209,519.6	118,868

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

QA/QC Results:
- Wipe Field Blanks – < 10.0 µg/ft^2
- Wipe Spikes – 48 µg measured of 44.9 µg spike (106.9%)
- Air Filter Field Blanks - <2 µg of lead measured

Experiment-Specific Report for Exterior Door Replacement #1

Job: Exterior door replacement (Low level exterior)
City: Pittsburgh
Housing Unit: H16
Experiment #: 34
Date of work: October 16, 2006

Paint Chip Results:
The paint chip sample from the door resulting in 9.9% lead by weight or 2.6 mg/cm^2. One sample taken from the door casing contained 11.0% lead by weight or 2.9 mg/cm^2.

Description of Job:
The workers removed a side door and surrounding trim and installed a new door frame in which a new exterior door will be fastened.

Description of Containment:
Scaffolding was erected along the side of the house creating a 14' by 7.5' containment area. Plastic was attached to the scaffolding to create a vertical containment zone. Rule plastic was placed on the ground covering 14' by 4' from the house. Containment plastic covered the full ground area inside the containment zone.

Problems/Issues with Job:
After the old door had been removed and the next door frame fit and fastened in the entryway, the job was called complete because most of the disturbance of surrounding paint had occurred. This was consistent with the first time the job was conducted. The 1-hour post-work wait time did occur. A Pittsburgh police officer was present. The wind speed prior to beginning work registered 1.8 mph.

Background Tray Sample Results:
The background tray samples obtained on 10/12/2006 all yielded results <10 µg/ft^2 over approximately 9 hours.

Soil Sample Results:
Because there was no soil near the foundation, only two samples were taken at each stage. The pre-work soil samples resulted in an average of 1,696 ppm. Individual samples measured 2,953 ppm three feet from the side door and 438 ppm eight feet from the side door. The post-work soil samples taken at similar distances resulted in an average of 4,289 ppm with individual samples measuring 8,120 and 457 ppm at similar distances to the pre-work samples (Table 230).

Table 230. Soil Lead Levels

Sample Type	Sample 1 - Near Foundation	Sample 2 - Edge of Rule Plastic	Sample 3 - Edge of Containment Plastic	Average
Pre-work	n/a	2,953.0	438.0	1,695.5
Post-work	n/a	8,120.0	457.0	4288.5

Dust Collection Tray Results:
All dust collection tray samples were successfully collected. No trays could be placed in the approximately 3' by 3' area directly in front of the door because of the need for the workers to be moving around within that area. See Table 231 for collection tray dust wipe sample results.

Table 231. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top of rule plastic (1-3 ft from wall)	217,310.8*	79,163.0	14,441.0	103,638.3
Under rule plastic (1-3 ft from wall)	359.5	22.6	18.9	133.7
Outside rule plastic (6 ft from wall)	31,708.1	84,289.7	1,129.2	39,042.3

* Results of bulk debris samples added to dust wipe sample

QA/QC Results:
- Wipe Field Blanks – < 10 µg
- Wipe Field Spikes – 29.9 µg measured of 32.8 µg spike (91.2%)
- Air Filter Field Blanks - <2 µg of lead measured

Experiment-Specific Report for Exterior Door Replacement #2

Job: Exterior door replacement (Low level exterior)
City: Pittsburgh
Housing Unit: H17
Experiment #: 35
Date of work: October 12, 2006

Paint Chip Results:
The paint chip sample from the door resulting in 7.7% lead by weight. Two samples taken from the door casing averaged 14.6% lead by weight.

Description of Job:
The workers removed a side door and surrounding trim and installed a new door frame in which a new exterior door will be fastened.

Description of Containment:
Scaffolding was erected along the side of the house creating a 14' by 7.5' containment area. Plastic was attached to the scaffolding to create a vertical containment zone. Rule plastic was placed on the ground covering 14' by 4' from the house. Containment plastic covered the full ground area inside the containment zone.

Problems/Issues with Job:
After the old door had been removed and the next door frame fit and fastened in the entryway, the job was called complete because most of the disturbance of surrounding paint had occurred and the weather was becoming windier. The 1-hour wait time was waived because of concern about having sampling trays overturned by wind. A Pittsburgh police officer was present. Although the wind speed prior to beginning work only registered 2 mph, gusts during work were beginning to lift up the plastic on the ground inside the containment.

Background Tray Sample Results:
The background tray samples obtained on 10/12/2006 all yielded results <10 $\mu g/ft^2$ over approximately 9 hours.

Soil Sample Results:
Because there was no soil near the foundation, only two samples were taken at each stage (Table 232). The pre-work soil samples resulted in an average of 428 ppm. Individual samples measured 562 ppm three feet from the side door and 294 ppm eight feet from the side door. The post-work soil samples taken at similar distances resulted in an average of 404 ppm.

Table 232. Soil Lead Levels

Sample Type	Sample 1 - Near Foundation	Sample 2 - Edge of Rule Plastic	Sample 3 - Edge of Containment Plastic	Average
Pre-work	n/a	562.0	294.0	428.0
Post-work	n/a	529.0	278.0	403.5

Dust Collection Tray Results:
All dust collection tray samples were successfully collected. No trays could be placed in the approximately 3' by 3' area directly in front of the door because of the need for the workers to be moving around within that area. See Table 233 for collection tray dust wipe sample results.

Table 233. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top of rule plastic (1-3 ft from wall)	30,060.2	43,975.9	79,162.9	51,066.3
Under rule plastic	15.3	26.3	18.9	20.2
Outside rule plastic (6-7 ft from wall)	3,793.4	30,426.4	17,590.4	17,270.1

QA/QC Results:
- Wipe Field Blanks – < 10 µg
- Wipe Field Spikes – 40.9 µg measured of 38.2 µg spike (107.1%)
- Air Filter Field Blanks - <2 µg of lead measured

Experiment-Specific Report for Exterior Dry Scraping #1

Job: Exterior dry scraping #1 (Medium level exterior)
City: Columbus
Housing Unit: H19
Experiment #: 40
Date of work: October 18, 2006

Paint Chip Results:
The average of 2 paint chip samples was 15.7% lead by weight.

Description of Job:
The workers removed deteriorated paint from a single story garage using paint scrapers for dry scraping. The workers did not remove all of the paint down to the substrate. The north wall that they removed paint from had a peak in the middle that went up to about 14 feet high. The scraping generated a large amount of paint chips and debris, especially within a few feet of the garage wall. It took approximately 2 hours to complete the paint removal.

Description of Containment:
Vertical containment was set up approximately 12 feet away from the garage, reaching about 12 feet high. Boards with cross-beams were used to provide a stable structure that would not be blown over by wind. Rule plastic extended 6 feet from the entire north face of the garage. Containment plastic extended another 6 feet beyond the rule plastic.

Problems/Issues with Job:
The job and subsequent sampling took place with no problems other than background sampling trays being stolen. An off-duty Columbus police officer was present. The weather was calm with wind speeds ranging from 0.2 mph to 1.3 mph. Containment set up took about 2 hrs. The work also took about 2 hours.

Background Tray Sample Results:
The background tray samples obtained on 10/13/2006 yielded two results <10 μg/ft^2 and one result of 11.4 μg/ft^2 over approximately 4 hours.

Soil Sample Results:
The pre-work soil samples resulted in an average of 1,205 ppm. The post-work soil samples resulted in an average of 1,706 ppm (Table 234).

Table 234. Soil Lead Levels

Sample Type	Sample 1 - Near Foundation	Sample 2 - Edge of Rule Plastic	Sample 3 - Edge of Containment Plastic	Average
Pre-work	3,164.0	306.0	146.0	1,205.3
Post-work	4,522.0	371.0	226.0	1,706.3

Dust Collection Tray Results:
All dust collection tray samples were successfully collected; although a few trays were bumped during the course of the work. See Table 235 for collection tray dust wipe sample results.

Table 235. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top Rule Plastic (2-6 ft from wall)	14,347.8	11,480,352*	268,359*	3,921,019.6
Under Rule Plastic (1-6 ft from wall)	53.1	200.7	21.5	91.8
Outside Rule Plastic (9-11 ft from wall)	7,595.6	12,168.7	16,597.2	12,120.5

* Results of bulk debris samples added to dust wipe sample

QA/QC Results:
- Wipe Field Blanks – <10 µg of lead measured
- Wipe Field Spikes – 109.4 µg measured of 99.8 µg spike (109.6%)
- Air Filter Field Blanks - <2 µg of lead measured

Experiment-Specific Report for Exterior Dry Scraping #2

Job: Exterior dry scraping #2 (Medium level exterior)
City: Columbus
Housing Unit: H01
Experiment #: 01
Date of work: October 25, 2006

Paint Chip Results:
The average of two paint chip samples was 13.5% lead by weight.

Description of Job:
The workers removed deteriorated paint from a one story section of a single family home garage using paint scrapers for dry scraping. The workers did not remove all of the paint down to the substrate. The north wall that they removed paint from was about 10 feet high. The scraping generated a large amount of paint chips and debris, especially within a few feet of the wall. It took approximately 35 minute to complete the paint removal.

Description of Containment:
Because the 2-story section of the wall of this house was being used for additional jobs, a large vertical containment structure made of scaffolding was set up that went up two stories high and stretched across the entire side of the house. For this job, rule plastic extended 6 feet from Wall 4, the north wall. Containment plastic extended another 6 feet beyond the rule plastic.

Problems/Issues with Job:
The job and subsequent sampling took place with no problems. An off-duty Columbus police officer was present. The weather was calm with wind speeds ranging from 0.2 mph to 2.0 mph from the N/NW. Containment set up the morning of the job took about 3.5 hours, although the contractor had spent over a full day setting up the vertical containment structure. The work only lasted about 35 minutes.

Background Tray Sample Results:
A background tray sample collected on 11/6/2006 measured 51.2 µg/ft^2 of lead over about 4 hours.

Soil Sample Results:
The pre-work soil samples resulted in an average of 1,006 ppm. The post-work soil samples resulted in an average of 1,404 ppm. The post-work samples are not much different at all sampling locations (Table 236).

Table 236. Soil Lead Levels

Sample Type	Sample 1 - Near Foundation	Sample 2 - Edge of Rule Plastic	Sample 3 - Edge of Containment Plastic	Average
Pre-work	2,347.0	371.0	299.0	1,005.7
Post-work	2,880.0	853.0	480.0	1,404.3

Dust Collection Tray Results:
All dust collection tray samples were successfully collected. The plastic appears to have prevented lead dust from getting underneath, as all the Under Rule Plastic samples were less than 1,000 µg/ft^2. See Table 237 for collection tray dust wipe sample results.

Table 237. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top Rule Plastic (2-6 ft from wall)	12,516,130*	48,864.6	8,227.4	4,191,074.0
Under Rule Plastic (1-6 ft from wall)	14.2	929.7	101.1	348.3
Outside Rule Plastic (9-11 ft from wall)	4017.8	916.3	892.9	913.0

* Results of bulk debris samples added to dust wipe sample

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured
- Wipe Field Spikes – n/a
- Air Filter Field Blanks - <2 µg of lead measured

Experiment-Specific Report for Exterior Dry Scraping #3

Job: Exterior dry scraping #3 (Medium level exterior)
City: Columbus
Housing Unit: H09
Experiment #: 21
Date of work: November 2, 2006

Paint Chip Results:
The average of two paint chip samples was 1.3% lead by weight.

Description of Job:
The workers removed deteriorated paint from the second story of a two story wall at a single family home using paint scrapers for dry scraping. The workers did not remove all of the paint down to the substrate. Approximately 150 ft^2 of wall was scraped. The scraping generated a large amount of paint chips and debris. It took approximately 1 hour to complete the paint removal.

Description of Containment:
Because the wall was two stories high, a 2-story vertical containment structure made of scaffolding was set up that stretched across the entire side of the house. For this job, rule plastic extended 12 feet from Wall 3, the north wall. Containment plastic extended another 6 feet beyond the rule plastic.

Problems/Issues with Job:
The job and subsequent sampling took place with no problems. An off-duty Columbus police officer was present. The weather was calm with wind speeds ranging from 0.8 mph to 2.7 mph from the west. Containment set up took about 8-12 hrs. The work took about 45 minutes.

Background Tray Sample Results:
The background tray sample obtained on 11/6/2006 measured <10 $\mu g/ft^2$ over approximately 4.5 hours.

Soil Sample Results:
The pre-work soil samples resulted in an average of 604 ppm. The post-work soil samples resulted in an average of 907 ppm. There appeared to be a slight increase in soil lead levels at the edge of the rule plastic (Table 238).

Table 238. Soil Lead Levels

Sample Type	Sample 1 - Near Foundation	Sample 2 - Edge of Rule Plastic	Sample 3 - Edge of Containment Plastic	Average
Pre-work	657.0	352	550	603.5
Post-work	373.0	1,882.0	467.0	907.3

Dust Collection Tray Results:
All dust collection tray samples were successfully collected; although a few trays were bumped during the course of the work. See Table 239 for collection tray dust wipe sample results.

Table 239. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top Rule Plastic (2-6 ft from wall)	1,463,974*	2,266.4	400.7	488,880.4
Under Rule Plastic (1-6 ft from wall)	64.9	63.1	163.3	97.1
Outside Rule Plastic (9-11 ft from wall)	263.6	165.1	551.7	326.8

* Results of bulk debris samples added to dust wipe sample

QA/QC Results:
- Wipe Field Blanks – 30.9 µg of lead measured
- Wipe Field Spikes – n/a
- Air Filter Field Blanks - <2 µg of lead measured

Experiment-Specific Report for Exterior Dry Scraping #4

Job: Exterior dry scraping #4 (Medium level exterior)
City: Columbus
Housing Unit: H09
Experiment #: 75
Date of work: November 2, 2006

Paint Chip Results:
The average of two paint chip samples was 1.3% lead by weight.

Description of Job:
The workers removed deteriorated paint from the first story of a two story wall at a single family home using paint scrapers for dry scraping. The workers did not remove all of the paint down to the substrate. Approximately 100 ft^2 of wall was scraped. The scraping generated a large amount of paint chips and debris. It took approximately 45 minutes to complete the paint removal.

Description of Containment:
Because the wall was two stories high, a 2-story vertical containment structure made of scaffolding was set up that stretched across the entire side of the house. For this job, rule plastic extended 6 feet from Wall 3, the north wall. Containment plastic extended another 12 feet beyond the rule plastic.

Problems/Issues with Job:
The job and subsequent sampling took place with no problems. An off-duty Columbus police officer was present. The weather was calm with wind speeds ranging from 1.8 mph to 3.1 mph from the west. Containment set up took about 8-12 hrs. The work took about 45 minutes.

Background Tray Sample Results:
The background tray sample obtained on 11/6/2006 measured <10 $\mu g/ft^2$ over approximately 4.5 hours.

Soil Sample Results:
The pre-work soil samples resulted in an average of 907 ppm. The post-work soil samples resulted in an average of 803 ppm. The post-work soil samples from the experiment on the top half of the wall served as the pre-work soil samples (Table 240).

Table 240. Soil Lead Levels

Sample Type	Sample 1 - Near Foundation	Sample 2 - Edge of Rule Plastic	Sample 3 - Edge of Containment Plastic	Average
Pre-work	373.0	1,882.0	467.0	907.3
Post-work	382.0	1,592.0	434.0	802.7

Dust Collection Tray Results:
All dust collection tray samples were successfully collected. See Table 241 for collection tray dust wipe sample results.

Table 241. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top Rule Plastic (1-7 ft from wall)	1,961,779*	13,793.5	1,774.1	659,115.5
Under Rule Plastic (2-6 ft from wall)	2,073.0	22.7	17.4	704.4
Outside Rule Plastic (8-15 ft from wall)	1,158.8	182.7	469.3	603.6

* Results of bulk debris samples added to dust wipe sample

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured
- Wipe Field Spikes – n/a
- Air Filter Field Blanks - <2 µg of lead measured

Experiment-Specific Report for Power Sanding #1

Job: Power Sanding #1 (High level exterior)
City: Columbus
Housing Unit: H01
Experiment #: 02
Date of work: October 30, 2006

Paint Chip Results:
The average of two paint chip samples was 11.7% lead by weight.

Description of Job:
The workers removed deteriorated paint from 100 ft^2 on a 2-story section of wall at a single family home using power grinders that used metal disks rather than sandpaper. The north wall that they removed paint from was about 20 feet high. The scraping generated a large amount of paint chips and dust throughout the entire containment zone. It took approximately 2 hours to complete the paint removal.

Figure A-7. Power grinding paint from 2nd story wall

Description of Containment:
A large vertical containment structure made of scaffolding that went up two stories high was stretched across the entire side of the house. For this job, rule plastic extended 12 feet from Wall 4, the north wall. Containment plastic extended another 4-6 feet beyond the rule plastic.

Problems/Issues with Job:
The first time the job was attempted, it was rained out after about 30 ft^2 of paint was sanded. This job was completed with minimal problems. An off-duty Columbus police officer was present. The weather was calm with wind speeds ranging from 1.6 mph to

2.2 mph from the south and west. Containment set up took about 3 hrs, as much of the vertical plastic attached to the scaffolding had to be put up again.

Background Tray Sample Results:
A background tray sample collected on 11/6/2006 measured 51.2 µg/ft^2 of lead over about 4 hours.

Soil Sample Results:
The pre-work soil samples resulted in an average of 1,007 ppm, while the post-work soil lead average increased to 5,639 ppm (Table 242).

Table 242. Soil Lead Levels

Sample Type	Sample 1 - Near Foundation	Sample 2 - Edge of Rule Plastic	Sample 3 - Edge of Containment Plastic	Average
Pre-work	2,733	111	178	1,007.3
Post-work	16,540	279	97	5,638.7

Dust Collection Tray Results:
All dust collection tray samples were successfully collected. Two bags of debris were filled from Sample 1 on top of the plastic. See Table 243 for collection tray dust wipe sample results.

Table 243. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top Rule Plastic (1-11 ft from wall)	4,666,776*	328,357.9	102,290.9	1,699,141.6
Under Rule Plastic (1-10 ft from wall)	42,401.8	532.7	9,936.1	17,623.5
Outside Rule Plastic (14-15 ft from wall)	56,459.9	82,677.8	63,191.5	67,443.1

* Results of bulk debris samples added to dust wipe sample

QA/QC Results:
- Wipe Field Blanks – 221.7 µg of lead measured
- Wipe Field Spikes – n/a
- Air Filter Field Blanks - <2 µg of lead measured

Experiment-Specific Report for Power Sanding #2

Job: Power Sanding #2 (High level exterior)
City: Columbus
Housing Unit: H01
Experiment #: 03
Date of work: November 1, 2006

Paint Chip Results:
The average of 2 paint chip samples was 13.1% lead by weight.

Description of Job:
The workers removed deteriorated paint from 100 ft^2 on a 2-story section of wall at a single family home using power sanders that used metal disks rather than sandpaper. The north wall that they removed paint from was about 20 feet high. The scraping generated a large amount of paint chips and dust throughout the entire containment zone. It took approximately 2 hours to complete the paint removal.

Description of Containment:
A large vertical containment structure made of scaffolding that went up two stories high was stretched across the entire side of the house. For this job, rule plastic extended 12 feet from Wall 4, the north wall. Containment plastic extended another 4-6 feet beyond the rule plastic.

Problems/Issues with Job:
The job was completed with minimal problems. Some scaffolding pieces had been stolen from the job site, but work was able to proceed without these pieces. An off-duty Columbus police officer was present. The weather was calm with no wind registering on the wind gauge. Containment set up took about 2 hrs, as the vertical containment remained from the previous job and only the ground plastic had to be set up.

Background Tray Sample Results:
A background tray sample collected on 11/6/2006 measured 51.2 $\mu g/ft^2$ of lead over about 4 hours.

Soil Sample Results:
The pre-work soil samples resulted in an average of 1,757 ppm. The post-work soil samples resulted in an average of 866 ppm (Table 244).

Table 244. Soil Lead Levels

Sample Type	Sample 1 - Near Foundation	Sample 2 - Edge of Rule Plastic	Sample 3 - Edge of Containment Plastic	Average
Pre-work	4,590	422	258	1,756.7
Post-work	1,782	480	336	866.0

Dust Collection Tray Results:
All dust collection tray samples were successfully collected; although a few trays were bumped during the course of the work. See Table 245 for collection tray dust wipe sample results.

Table 245. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top Rule Plastic (2-6 ft from wall)	158,815.3*	225,843.2	124,748.4	169,802.3
Under Rule Plastic (1-6 ft from wall)	208,261.5	309.3	752.2	69,774.3
Outside Rule Plastic (9-11 ft from wall)	17,309.8	9,485.9	16,254.9	14,350.2

* Results of bulk debris samples added to dust wipe sample

QA/QC Results:

- Wipe Field Blanks – <10 µg of lead measured
- Wipe Field Spikes – n/a
- Air Filter Field Blanks - <2 µg of lead measured

Experiment-Specific Report for Exterior Torch Burning #1

Job: Exterior torch burning (High level exterior)
City: Pittsburgh
Housing Unit: H10
Experiment #: 37
Date of work: October 27, 2006

Paint Chip Results:
The average of 2 paint chip samples from the porch ceiling was 2.7% lead by weight.

Description of Job:
The workers removed the paint from the ceiling of an exterior porch using torches. The job created a lot of paint chips and debris.

Description of Containment:
A lean-to containment was set up around the front porch with boards and plastic. This containment trapped all dust and debris inside the contained area. The bottom of the lean-to structure was approximately 14 feet away from the porch on the front side. Rule plastic was placed on the porch, 6 feet from the porch on the front, and along the sides from the base of the porch to the vertical containment. Containment plastic extended another 6-8 feet beyond the rule plastic in the front of the house. Workers used supplied air respirators to protect themselves from the fumes generated from the burning.

Problems/Issues with Job:
Workers needed to be trained on the use of supplied air respirators and the necessary equipment had to be procured. Otherwise, the job and subsequent sampling took place with no problems. A Pittsburgh police officer was present. The weather was calm with no wind speed registering on the wind gauge. Containment set up took about 4 hrs. The work took a little under 3 hours.

Background Tray Sample Results:
The background tray samples were obtained on 10/16/2006 for experiment 36, which was performed at the same property. The three trays yielded results ranged from 39.1 $\mu g/ft^2$ to <10.0 $\mu g/ft^2$ over approximately 4 hours.

Soil Sample Results:
The pre-work soil samples resulted in an average of 664 ppm, while the post-work soil samples resulted in an average of 1,098 ppm (Table 246).

Table 246. Soil Lead Levels

Sample Type	Sample 1 - Near Foundation	Sample 2 - Edge of Rule Plastic	Sample 3 - Edge of Containment Plastic	Average
Pre-work	1,230.0	548.0	213.0	663.7
Post-work	2,258.0	700.0	335.0	1,097.7

Dust Collection Tray Results:
All dust collection tray samples were successfully collected. For the Top of Rule Plastic samples and Under Rule Plastic samples, one tray was on the porch, one was on the ground within a foot of the porch, and one was about six feet away from the porch. See Table 247 for collection tray dust wipe sample results.

Table 247. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top Rule Plastic (4.5 – 12 ft from front of house)	35,375.9*	919.4	21,057.3*	19,117.5
Under Rule Plastic	450.9	10,788.4	691.3	3,976.9
Outside Rule Plastic (15 ft from front of house)	143.7	190.3	145.4	159.8

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

QA/QC Results:

- Air Filter Field Blanks - <2 µg of lead measured

Experiment-Specific Report for Exterior Torch Burning #2

Job: Exterior torch burning (High level exterior)
City: Pittsburgh
Housing Unit: H13
Experiment #: 38
Date of work: October 26, 2006

Paint Chip Results:
The average of 2 paint chip samples was 11.4% lead by weight.

Description of Job:
The workers removed the paint from the ceiling of an exterior porch using torches. The job created a lot of paint chips and debris.

Description of Containment:
A lean-to containment was set up around the front porch with boards and plastic. This containment trapped all dust and debris inside the contained area. The bottom of the lean-to structure was approximately 14 feet away from the porch on the front side. Rule plastic was placed on the porch, 6 feet from the porch on the front, and along the sides from the base of the porch to the vertical containment. Containment plastic extended another 6-8 feet beyond the rule plastic in the front of the house. Workers used supplied air respirators to protect themselves from the fumes generated from the burning.

Problems/Issues with Job:
Workers needed to be trained on the use of supplied air respirators and the necessary equipment had to be procured. Otherwise, the job and subsequent sampling took place with no problems. A Pittsburgh police officer was present. The weather was calm with no wind registering on the wind gauge. Containment set up took about 4 hrs. The work took a little over 2 hours.

Background Tray Sample Results:
Three background tray samples obtained on 10/26/2006 yielded two results of 18.2 $\mu g/ft^2$ and one of 91.2 $\mu g/ft^2$ over approximately 10 hours.

Soil Sample Results:
The pre-work soil samples resulted in an average of 702 ppm, while the post-work soil samples resulted in an average of 874 ppm (Table 248).

Table 248. Soil Lead Levels

Sample Type	Sample 1 - Near Foundation	Sample 2 - Edge of Rule Plastic	Sample 3 - Edge of Containment Plastic	Average
Pre-work	1,123.0	543.0	439.0	701.7
Post-work	1,529.0	678.0	416.0	874.3

Dust Collection Tray Results:
All dust collection tray samples were successfully collected. For the Top of Rule Plastic samples and Under Rule Plastic samples, one tray was on the porch, one was on the ground within a foot of the porch, and one was about six feet away from the porch. See Table 249 for collection tray dust wipe sample results.

Table 249. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top Rule Plastic (2 – 10.5 ft from front of house)	417,924.6*	130,398.7*	149,431.6*	232,585.0
Under Rule Plastic	541,603.9	1,486.4	243,873.6	262,321.3
Outside Rule Plastic (16.5 ft from front of house)	811.9	2,267.1	1,349.2	1,476.1

***** Bulk debris samples were collected and analyzed; value represents the sum of the dust wipe lead levels and bulk sample lead levels.

QA/QC Results:
- Wipe Field Blanks – <10 µg of lead measured
- Wipe Field Spikes – 139.9 µg measured of 84.8 µg spike (165%).
- Air Filter Field Blanks - <2 µg of lead measured

Experiment-Specific Report for
Exterior Needle Gun Paint Removal at a COF

Job: Exterior paint removal from railing (COF- Low level exterior)
City: Columbus
Housing Unit: C01
Experiment #: 65
Date of work: November 3, 2006

Paint Chip Results:
The paint chip sample from the railing registered 5.3% lead by weight.

Description of Job:
The workers removed deteriorated paint from a metal railing outside a school using a needle gun tool. The railing, located in a courtyard surrounded on three sides by 3-story brick walls, extended about 20 feet from the wall opposite the opening. The railing is set in concrete raised about 1 foot off the ground. One side of the raised concrete was a drop to a set of stairs and a patio about six feet below the base of the railing. The paint removal work took approximately 4 hours to complete.

Figure A-8. Removing paint from railing

Description of Containment:
Rule plastic was laid on the concrete surrounding the railing by approximately 4 feet on all sides. Containment plastic covered all other ground areas inside the courtyard. A vertical wall of plastic covered the entire entrance to the courtyard. Set up of rule and containment ground plastic and the vertical plastic containment took approximately 2 hours.

Problems/Issues with Job:
The job and subsequent sampling took place with no problems. An off-duty Columbus police officer was present. The wind was measured at 1.6 mph from the west.

Background Tray Sample Results:
A background tray sample obtained on 11/7/2006 yielded a result of 78.3 µg/ft^2 over approximately 4 hours.

Soil Sample Results:
No soil was present anywhere in vicinity of the work area.

Dust Collection Tray Results:
All dust collection tray samples were successfully collected. Two samples on top of the plastic required both a bulk debris sample and a dust wipe. See Table 250 for collection tray dust wipe sample results.

Table 250. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top Rule Plastic (1-3 ft from railing)	381,586.2*	21,157.6	888,166.7*	430,303.5
Under Rule Plastic (2-4 ft from railing)	433.7	156.1	258.2	282.7
Outside Rule Plastic (5-11 ft from railing)	20,343.9	8,430.7	1,326.8	10,033.8

* Results of bulk debris samples added to dust wipe sample

QA/QC Results:
- Wipe Field Blanks – <10 µg of lead measured
- Wipe Field Spikes – n/a
- Air Filter Field Blanks - <2 µg of lead measured

Figure A-9. Close-up of railing paint removal

Experiment-Specific Report for
Exterior Paint Removal Using a Heat Gun >1100 at a COF

Job:	Exterior paint removal using heat gun >1100 degrees (COF- High level exterior)
City:	Columbus
Housing Unit:	C01
Experiment #:	66
Date of work:	November 6, 2006

Paint Chip Results:
The paint chip sample taken from the awning measured 18.3% lead by weight.

Description of Job:
Two workers removed paint from an exterior awning above a doorway outside a school using heat guns above 1100 degrees Fahrenheit. The awning is located in the same courtyard as the other two exterior jobs at the school that is surrounded on three sides by 3-story brick walls. The awning extends about 4 feet from the wall above the doorway. Paint was removed from trim, the ceiling, and the ornate painted supports. Work was halted after approximately five hours of paint removal work even though only about 30 ft^2 of surface area was worked on.

Figure A-10. Awning prior to work

Description of Containment:
Rule plastic was laid on the concrete underneath the awning extending approximately 10 feet from the wall to which the awning is attached (or about 6 feet beyond where the edge of the awning) and about 6 feet from the side of the awning. Containment plastic covered all other ground areas inside the courtyard. A vertical wall of plastic covered the entire entrance to the courtyard. Set up of rule and containment ground plastic and the vertical plastic containment took approximately one and a half hours.

Problems/Issues with Job:
The paint removal went very slowly as there were few flat surfaces on the awning. Removal of paint from ornate trim and small surfaces using heat guns takes a long time. Removal of paint from the ceiling was abandoned due to smoke observed coming from inside a hollow part of the awning. Probable cause was hot metal in contact with birds' nests. An off-duty Columbus police officer was present. The wind ranged from 0.4 to 2.5 mph from the east.

Background Tray Sample Results:
A background tray sample obtained on 11/7/2006 yielded a result of 78.3 µg/ft^2 over approximately 4 hours.

Soil Sample Results:
No soil was present anywhere in vicinity of the work area.

Dust Collection Tray Results:
All dust collection tray samples were successfully collected. Bulk debris samples were collected from each of the trays on top of the rule plastic. See Table 251 for collection tray dust wipe sample results.

Table 251. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top Rule Plastic (0-3 ft from awning)	196,760*	494,822*	831,062*	507,548
Under Rule Plastic (0-4 ft from wall)	83.5	425.4	1,464.1	657.7
Outside Rule Plastic (5-12 ft from awning)	14,124.0	318.2	348.8	4,930.3

* Results of bulk debris samples added to dust wipe sample

QA/QC Results:
- Wipe Field Blanks – 32.5 µg of lead measured
- Wipe Field Spikes – n/a
- Air Filter Field Blanks - <2 µg of lead measured

Figure A-11. Removing paint from awning using heat gun

Experiment-Specific Report for
Exterior Paint Removal Using a Heat Gun <1100 at a COF

Job:	Exterior paint removal using heat gun <1100 degrees (COF-Medium level exterior)
City:	Columbus
Housing Unit:	C01
Experiment #:	64
Date of work:	November 10, 2006

Paint Chip Results:
The paint chip sample from the door registered 28.1% lead by weight and the paint chip sample from the trim contained 34.9% lead by weight.

Description of Job:
The workers removed paint from all flat surfaces on an exterior door and door casing using heat guns operated at about 1000 degrees Fahrenheit. The door, which opens into the ground level of a closed school, was located at the bottom of a set of stairs. Small areas of paint remained door panels and curved sections of door casing. It took approximately 1 hour and 20 minutes to set up the containment area and 4 hours to complete the paint removal.

Figure A-12. Removing paint from door trim using heat gun

Description of Containment:
Rule plastic extended 4 feet from the wall containing the exterior door and about 8 feet along the wall. Ground containment plastic covered the entire plaza at the bottom of the steps, extending about 7 feet from the wall containing the door, and about 12 feet along that same wall. Vertical plastic containment blocked the main entry to the courtyard.

Problems/Issues with Job:
The job and subsequent sampling took place with no problems. An off-duty Columbus police officer was present. There were mild winds with measurements ranging from 0 to 5.4 mph from the east.

Background Tray Sample Results:
A background tray sample obtained on 11/7/2006 yielded a result of 78.3 µg/ft^2 over approximately 4 hours.

Soil Sample Results:
No soil was present anywhere in vicinity of the work area.

Dust Collection Tray Results:
All dust collection tray samples were successfully collected. The heat gun paint removal resulted in large strips of paint that fell into the dust collection trays closest to the door, which resulted in extremely high lead levels in the trays on top of the rule plastic. See Table 252 for collection tray dust wipe sample results.

Table 252. Collection Tray Dust Wipe Sample Results.

Sample Type	Dust Tray Lead Levels (µg/ft^2)			
	Sample 1	Sample 2	Sample 3	Average
Top Rule Plastic (1-5 ft from door)	130,674,045*	1,133,090*	2,538,052*	44,411,623.2
Under Rule Plastic (2-5 ft from door)	63,283.5	1,840.0	238.6	21,787.4
Outside Rule Plastic (7-8 ft from door)	2,692,069*	26,586.6	16,234.7	911,630.1

* Results of bulk debris samples added to dust wipe sample

Figure A-13. Dust collection trays outside door paint removal job

QA/QC Results:
- Wipe Field Blanks – <10 µg of lead measured
- Wipe Field Spike – 89.8 µg measured of 88.7 µg spike (101.1%)
- Air Filter Field Blanks - <2 µg of lead measured