Appendices

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Appendix A. Inputs Used for Estimating Indoor Air and Dust Concentrations

A. INPUTS USED FOR ESTIMATING INDOOR AIR AND DUST CONCENTRATIONS

This appendix presents the indoor dust and indoor air input parameter values used in this approach. Chapters 3 and 4 describe how each of these parameters is used. This appendix presents the input values in seven tables. The first table, Exhibit A-1, presents a crosswalk of the control option names and descriptions used in this approach (and in subsequent tables in this appendix) and the control option names and descriptions used in the U.S. EPA's Office of Pollution Prevention and Toxics (OPPT) Dust Study (Battelle 2007). The second table, Exhibit A-2, presents a crosswalk between the exposure periods and phases modeled in this approach and the associated sample types from the OPPT Dust Study (Battelle 2007). The third table, Exhibit A-3, outlines the dimension types, names, and IDs used in this approach and in subsequent tables in this appendix. The fourth table, Exhibit A-4, includes the input values used to calculate indoor dust exposures in the single activity example (i.e., window replacement). The fifth table, Exhibit A-5, includes the input values used to calculate the indoor dust exposures in the multiple activities example. The sixth table, Exhibit A-6, presents the input values used to calculate indoor air exposures in the single activity example. The seventh table, Exhibit A-7 presents the input values used to calculate indoor air exposures in the multiple activities example.

Exhibit A-1. Crosswalk between the Control Options used in this Approach for Indoor Dust and Air and the Associated Variables from the OPPT Dust Study

THIS APPROACH			OPPT DUST STUDY	
Control Option (CO) Name	**Description**	**Control Option (CO) ID**	**Phase ID[a]**	**Description**
Base Control Option	No plastic sheeting, Baseline cleaning	0	Phase IV	No plastic and baseline cleaning
Control Option 1	No plastic sheeting, Rule cleaning	1	Phase III	No plastic and rule cleaning
Control Option 2	Plastic sheeting, Baseline cleaning	2	Phase II	Plastic coverings and baseline cleaning
Control Option 3	Plastic sheeting, Rule cleaning	3	Phase I	Plastic coverings and rule cleaning

[a] Note that the use of the term Phase in the OPPT Dust Study is not the same as the use of the term when referring to the different parts of exposure periods in this approach. In the OPPT Dust Study, Phase refers to a unique combination of control strategies.

Exhibit A-2. Crosswalk between the Exposure Periods and Phases Used in this Approach and the Associated Sample Types from the OPPT Dust Study

THIS APPROACH		OPPT DUST STUDY
Exposure Phase (PH) Name	**Exposure Phase (PH) ID**	**Sample Types** [a]
Indoor Air		
Pre-Renovation (Background)	I	N/A
Renovation (Dust Generating)	Ii	Post Work
Renovation (Settling)	Iii	N/A
Renovation (Background)	Iv	N/A
Post-Renovation (Background)	V	N/A
Indoor Dust		
Pre-Renovation (Background)	1	N/A
Renovation (Dust Generating)	2	Post Work
Renovation (After Baseline Cleaning)	3	Post Cleaning
Post-Renovation (Routine Cleaning)	4	Post Cleaning ***or*** Post Verification [b]
Post-Renovation (Background)	5	N/A
Outdoor Soil		
Pre-Renovation (Background)	A	N/A
Renovation	B	Post Work
Post-Renovation	C	Post Work

[a] These samples form the basis for the concentrations associated with each corresponding phase.
[b] The initial loading for the Post-Renovation (Routine Cleaning) phase is defined by Post Cleaning data from the OPPT Dust Study (Battelle 2007) when only baseline cleaning is implemented (i.e., Base Control Option and Control Option 2). When verification cleaning is implemented (i.e., Control Options 1 and 3), the initial loading for the Post-Renovation (Routine Cleaning) phase is defined by the Post Verification data from the OPPT Dust Study (Battelle 2007).

Exhibit A-3. Dimension Types, Names, and IDs used in this Approach

Dimension Type	Dimension Name	Dimension ID
Location (LOC) ***Indoor***	Workspace	1
	Adjacent	2
	Rest of Building	3
Location (LOC) ***Outdoor***	Dripline	A
	Nearby	B
	Rest of Yard	C
Exposure Phase (PH) ***Indoor Dust***	Pre-Renovation (Background)	1
	Renovation (Dust Generating)	2
	Renovation (After Baseline Cleaning)	3
	Post-Renovation (Routine Cleaning)	4
	Post-Renovation (Background)	5
Phase (PH) ***Indoor Air***	Pre-Renovation (Background)	i
	Renovation (Dust Generating)	ii
	Renovation (Settling)	iii
	Renovation (Background)	iv
	Post-Renovation (Background)	v
Phase (PH) ***Outdoor Soil***	Pre-Renovation (Background)	A
	Renovation	B
	Post-Renovation	C
Control Option (CO) ***Indoor Dust and Air***	Base Control Option	0
	Control Option 1	1
	Control Option 2	2
	Control Option 3	3
Control Option (CO) ***Outdoor Soil***	Control Option A	A
	Control Option B	B
Activity (ACT)	Window replacement(s)	1
	Interior flat component LBP removal, scraping	2
	Renovating kitchen	3
	Cut-Outs	4
Sampling Method (SM)	Wipe	W
	Blue Nozzle	BN
Vintage (VIN)	< 1940	1
	1940 to 1959	2
	1960 to 1979	3

Exhibit A-4. Inputs for Indoor Air Calculations, Single Activity Example

Input	Dimension Name	Mid [a]	Units	In Monte Carlo Analysis?[b]	References	Notes
Independent of Control Options, Activity Types, and Vintage						
Air Decay Constant	DecayConst	-0.089	$Hour^{-1}$		Choe et al. 2000	c
Background Concentration	$ACONC_{BG}$	0.025	$\mu g/m^3$		EPA's Air Quality Systems (AQS) database (USEPA 2006a)	c
Dependent on Activity Types (Independent of Control Options and Vintage)						
Window Replacement						
% Area of Building – Workspace	PAW	20	%		NAHB 2006; HomePlans Website 2007	c, d
% Area of Building – Adjacent Room	PAA	32	%		NAHB 2006; HomePlans Website 2007	c, e
Dependent on Activity Types AND Control Options (Independent of Vintage)						
Window Replacement AND No plastic sheeting, Baseline cleaning (Base Control Option)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=0, ACT=1}$	3.64	$\mu g/m^3$		Battelle 2007	c, d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii, CO=0, ACT=1}$	3.68	$\mu g/m^3$		Battelle 2007	c, e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=0, ACT=1}$	2.40	$\mu g/m^3$		Battelle 2007	c, f
Window Replacement AND No plastic sheeting, Verification cleaning (Control Option 1)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=1, ACT=1}$	7.20	$\mu g/m^3$		Battelle 2007	c, d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii, CO=1, ACT=1}$	4.62	$\mu g/m^3$		Battelle 2007	c, e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=1, ACT=1}$	1.37	$\mu g/m^3$		Battelle 2007	c, f, g
Window Replacement AND Plastic sheeting, Baseline cleaning (Control Option 2)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=2, ACT=1}$	13.29	$\mu g/m^3$		Battelle 2007	c, d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii, CO=2, ACT=1}$	8.42	$\mu g/m^3$		Battelle 2007	c, e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=2, ACT=1}$	1.97	$\mu g/m^3$		Battelle 2007	c, f
Window Replacements AND Plastic sheeting, Verification cleaning (Control Option 3)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=3, ACT=1}$	16.94	$\mu g/m^3$		Battelle 2007	c, d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii, CO=3, ACT=1}$	2.23	$\mu g/m^3$		Battelle 2007	c, e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=3, ACT=1}$	2.18	$\mu g/m^3$		Battelle 2007	c, f

Notes for Exhibit A-4. Inputs for Indoor Air Calculations, Single Activity Example

a	The mid value is the arithmetic mean of two air samples taken at two different houses in the OPPT Dust Study (Battelle 2007).
b	Air input variables were not included in the Monte Carlo analysis.
c	The value for this input variable is the same in both the single activity example and the multiple activities example.
d	Workspace Loading in the OPPT Dust Study (Battelle 2007) is measured in the Work Room (where the RRP work was performed). The Post Work air sample from the OPPT Dust Study corresponds to the Renovation (Dust Generating) phase used in this approach for indoor air (see Exhibit A-2).
e	Adjacent Loading in the OPPT Dust Study (Battelle 2007) is measured in the Tool Room (an interior room immediately adjacent to the Work Room where workers might place equipment and materials needed for a job). The Post Work air sample from the OPPT Dust Study corresponds to the Renovation (Dust Generating) phase used in this approach for indoor air (see Exhibit A-2).
f	Rest of Building Loading in the OPPT Dust Study (Battelle 2007) is measured in the Observation Room (an interior room adjacent to the Tool Room but not the Work Room), which represents other areas of the house impacted by RRP work. The Post Work air sample from the OPPT Dust Study corresponds to the Renovation (Dust Generating) phase used in this approach for indoor air (see Exhibit A-2).
g	This value is a minimum value, not an average due to an outlier, which only had a five minute measuring time and was excluded from the analysis.

Exhibit A-5. Inputs for Indoor Air Calculations, Multiple Activities Example

Input	Dimension Name	Mid [a]	Units	In Monte Carlo Analysis? [b]	References	Notes
Independent of Control Options, Activity Types, and Vintage						
Air Decay Constant	DecayConst	-0.089	$Hour^{-1}$		Choe et al. 2000	c
Background Concentration	$ACONC_{BG}$	0.025	$\mu g/m^3$		EPA's Air Quality Systems (AQS) database (USEPA 2006a)	c
Dependent on Activity Types (Independent of Control Options and Vintage)						
Window Replacements						
% Area of Building – Workspace	PAW	20	%		NAHB 2006; HomePlans Website 2007	c, d
% Area of Building – Adjacent Room	PAA	32	%		NAHB 2006; HomePlans Website 2007	c, e
Interior flat component LBP removal, scraping						
% Area of Building – Workspace	PAW	20	%		NAHB 2006; HomePlans Website 2007	c, d
% Area of Building – Adjacent Room	PAA	32	%		NAHB 2006; HomePlans Website 2007	c, e
Kitchen renovation						
% Area of Building – Workspace	PAW	13	%		NAHB 2006; HomePlans Website 2007	c, d
% Area of Building – Adjacent Room	PAA	40	%		NAHB 2006; HomePlans Website 2007	c, e
Cut-Outs						
% Area of Building – Workspace	PAW	20	%		NAHB 2006; HomePlans Website 2007	c, d

Exhibit A-5. Inputs for Indoor Air Calculations, Multiple Activities Example

Input	Dimension Name	Mid [a]	Units	In Monte Carlo Analysis? [b]	References	Notes
% Area of Building – Adjacent Room	PAA	32	%		NAHB 2006; HomePlans Website 2007	c, e
Dependent on Activity Types AND Control Options (Independent of Vintage)						
Window Replacements AND No plastic sheeting, Baseline cleaning (Base Control Option)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=0, ACT=1}$	3.64	$\mu g/m^3$		Battelle 2007	c, d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii , CO=0, ACT=1}$	3.68	$\mu g/m^3$		Battelle 2007	c, e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=0, ACT=1}$	2.40	$\mu g/m^3$		Battelle 2007	c, f
Window Replacements AND No plastic sheeting, Verification cleaning (Control Option 1)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=1, ACT=1}$	7.20	$\mu g/m^3$		Battelle 2007	c, d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii , CO=1, ACT=1}$	4.62	$\mu g/m^3$		Battelle 2007	c, e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=1, ACT=1}$	1.37	$\mu g/m^3$		Battelle 2007	c, f, g
Window Replacements AND Plastic sheeting, Baseline cleaning (Control Option 2)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=2, ACT=1}$	13.29	$\mu g/m^3$		Battelle 2007	c, d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii , CO=2, ACT=1}$	8.42	$\mu g/m^3$		Battelle 2007	c, e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=2, ACT=1}$	1.97	$\mu g/m^3$		Battelle 2007	c, f
Window Replacements AND Plastic sheeting, Verification cleaning (Control Option 3)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=3, ACT=1}$	16.94	$\mu g/m^3$		Battelle 2007	c, d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii , CO=3, ACT=1}$	2.23	$\mu g/m^3$		Battelle 2007	c, e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=3, ACT=1}$	2.18	$\mu g/m^3$		Battelle 2007	c, f
Interior flat component LBP removal, scraping AND No plastic sheeting, Baseline cleaning (Base Control Option)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=0, ACT=2}$	2.33	$\mu g/m^3$		Battelle 2007	d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii , CO=0, ACT=2}$	1.35	$\mu g/m^3$		Battelle 2007	e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=0, ACT=2}$	2.35	$\mu g/m^3$		Battelle 2007	f
Interior flat component LBP removal, scraping AND No plastic sheeting, Verification cleaning (Control Option 1)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=1, ACT=2}$	2.15	$\mu g/m^3$		Battelle 2007	d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii , CO=1, ACT=2}$	4.21	$\mu g/m^3$		Battelle 2007	e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=1, ACT=2}$	2.16	$\mu g/m^3$		Battelle 2007	f

Exhibit A-5. Inputs for Indoor Air Calculations, Multiple Activities Example

Input	Dimension Name	Mid [a]	Units	In Monte Carlo Analysis? [b]	References	Notes
Interior flat component LBP removal, scraping AND Plastic sheeting, Baseline cleaning (Control Option 2)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=2, ACT=2}$	2.63	$\mu g/m^3$		Battelle 2007	d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii, CO=2, ACT=2}$	2.68	$\mu g/m^3$		Battelle 2007	e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=2, ACT=2}$	2.68	$\mu g/m^3$		Battelle 2007	f
Interior flat component LBP removal, scraping AND Plastic sheeting, Verification cleaning (Control Option 3)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=3, ACT=2}$	2.02	$\mu g/m^3$		Battelle 2007	d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii, CO=3, ACT=2}$	2.03	$\mu g/m^3$		Battelle 2007	e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=3, ACT=2}$	2.01	$\mu g/m^3$		Battelle 2007	f
Kitchen renovation AND No plastic sheeting, Baseline cleaning (Base Control Option)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=0, ACT=3}$	3.92	$\mu g/m^3$		Battelle 2007	d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii, CO=0, ACT=3}$	4.03	$\mu g/m^3$		Battelle 2007	e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=0, ACT=3}$	4.02	$\mu g/m^3$		Battelle 2007	f
Kitchen renovation AND No plastic sheeting, Verification cleaning (Control Option 1)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=1, ACT=3}$	3.08	$\mu g/m^3$		Battelle 2007	d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii, CO=1, ACT=3}$	3.11	$\mu g/m^3$		Battelle 2007	e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=1, ACT=3}$	3.08	$\mu g/m^3$		Battelle 2007	f
Kitchen renovation AND Plastic sheeting, Baseline cleaning (Control Option 2)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=2, ACT=3}$	3.16	$\mu g/m^3$		Battelle 2007	d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii, CO=2, ACT=3}$	2.85	$\mu g/m^3$		Battelle 2007	e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=2, ACT=3}$	2.90	$\mu g/m^3$		Battelle 2007	f
Kitchen renovation AND Plastic sheeting, Verification cleaning (Control Option 3)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=3, ACT=3}$	3.67	$\mu g/m^3$		Battelle 2007	d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii, CO=3, ACT=3}$	3.68	$\mu g/m^3$		Battelle 2007	e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=3, ACT=3}$	3.65	$\mu g/m^3$		Battelle 2007	f
Cut-Outs AND No plastic sheeting, Baseline cleaning (Base Control Option)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=0, ACT=4}$	4.79	$\mu g/m^3$		Battelle 2007	d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii, CO=0, ACT=4}$	7.32	$\mu g/m^3$		Battelle 2007	e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=0, ACT=4}$	2.49	$\mu g/m^3$		Battelle 2007	f

Exhibit A-5. Inputs for Indoor Air Calculations, Multiple Activities Example

Input	Dimension Name	Mid [a]	Units	In Monte Carlo Analysis? [b]	References	Notes
Cut-Outs AND No plastic sheeting, Verification cleaning (Control Option 1)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=1, ACT=4}$	7.27	$\mu g/m^3$		Battelle 2007	d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii , CO=1, ACT=4}$	2.89	$\mu g/m^3$		Battelle 2007	e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=1, ACT=4}$	4.69	$\mu g/m^3$		Battelle 2007	f
Cut-Outs AND Plastic sheeting, Baseline cleaning (Control Option 2)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=2, ACT=4}$	7.04	$\mu g/m^3$		Battelle 2007	d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii , CO=2, ACT=4}$	3.48	$\mu g/m^3$		Battelle 2007	e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=2, ACT=4}$	3.52	$\mu g/m^3$		Battelle 2007	f
Cut-Outs AND Plastic sheeting, Verification cleaning (Control Option 3)						
Workspace Concentration – Post Work	$ACONC_{LOC=1, PH= ii, CO=3, ACT=4}$	6.49	$\mu g/m^3$		Battelle 2007	d
Adjacent Concentration – Post Work	$ACONC_{LOC=2, PH= ii , CO=3, ACT=4}$	3.15	$\mu g/m^3$		Battelle 2007	e
Rest of building Concentration – Post Work	$ACONC_{LOC=3, PH= ii, CO=3, ACT=4}$	2.62	$\mu g/m^3$		Battelle 2007	f

Notes for Exhibit A-5. Inputs for Indoor Air Calculations, Multiple Activities Example

a	The mid value is the arithmetic mean of two air samples taken at two different houses in the OPPT Dust Study (Battelle 2007).
b	Air input variables were not included in the Monte Carlo analysis.
c	The value for this input variable is the same in both the single activity example and the multiple activities example.
d	Workspace Loading in the OPPT Dust Study (Battelle 2007) is measured in the Work Room (where the RRP work was performed). The Post Work air sample from the OPPT Dust Study corresponds to the Renovation (Dust Generating) phase used in this approach for indoor air (see Exhibit A-2).
e	Adjacent Loading in the OPPT Dust Study (Battelle 2007) is measured in the Tool Room (an interior room immediately adjacent to the Work Room where workers might place equipment and materials needed for a job). The Post Work air sample from the OPPT Dust Study corresponds to the Renovation (Dust Generating) phase used in this approach for indoor air (see Exhibit A-2).
f	Rest of Building Loading in the OPPT Dust Study (Battelle 2007) is measured in the Observation Room (an interior room adjacent to the Tool Room but not the Work Room), which represents other areas of the house impacted by RRP work. The Post Work air sample from the OPPT Dust Study corresponds to the Renovation (Dust Generating) phase used in this approach for indoor air (see Exhibit A-2).
g	This value is a minimum value, not an average due to an outlier, which only had a five minute measuring time and was excluded from the analysis.

Exhibit A-6. Inputs for Indoor Dust Calculations – Single Activity Example (i.e., Window Replacement)

Input Description	Input Name	Low	Mid	High	CV [a]	Units	In Monte Carlo Analysis?	References	Notes
Independent of Control Options, Activity Types, and Vintage									
% Area of Building – Carpet	PAC	10	72	90	0.3	%	✓	Hilton Personal Communication 2007; Turner Personal Communication 2007	b, l
Cleaning Frequency	CleanFrequency	0.3	1	2	0.4	cleanings/ week	✓	Simcox 1995; USEPA 2006b	c, l
Dependent on Activity Types (Independent of Control Options and Vintage)									
Window Replacement									
% Area of Building – Workspace	PAW	3	20	36	0.4	%	✓	NAHB 2006; HomePlans Website 2007	g, l
% Area of Building – Adjacent Room	PAA	7	32	57	0.4	%	✓	NAHB 2006; HomePlans Website 2007	f, l
Dependent on Activity Types AND Control Options (Independent of Vintage)									
Window Replacement AND No plastic sheeting, Baseline cleaning (Base Control Option)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=0, ACT=1}$	15.1	452.3	2,512.3	2	$\mu g/ft^2$	✓	Battelle 2007	f, j, l, m
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=0, ACT=1}$ $DLOAD_{W, LOC=1, PH=4, CO=0, ACT=1}$	10.1	17.8	35	0.3	$\mu g/ft^2$	✓	Battelle 2007	f, k, l, m
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=0, ACT=1}$	0.8	4.1	43.4	1.3	$\mu g/ft^2$	✓	Battelle 2007	d, j, l, m
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=0, ACT=1}$ $DLOAD_{W, LOC=2, PH=4, CO=0, ACT=1}$	4.2	12.8	101.1	0.9	$\mu g/ft^2$	✓	Battelle 2007	d, k, l, m
Rest of Building Loading - Post Work	$DLOAD_{W, LOC=3, PH=2, CO=0, ACT=1}$	0.8	1	10.7	0.7	$\mu g/ft^2$	✓	Battelle 2007	e, j, l, m
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=0, ACT=1}$ $DLOAD_{W, LOC=3, PH=4, CO=0, ACT=1}$	0.8	1.5	5.4	0.5	$\mu g/ft^2$	✓	Battelle 2007	e, k, l, m

Exhibit A-6. Inputs for Indoor Dust Calculations – Single Activity Example (i.e., Window Replacement)

Input Description	Input Name	Low	Mid	High	CV [a]	Units	In Monte Carlo Analysis?	References	Notes
Window Replacement AND No plastic sheeting, Verification cleaning (Control Option 1)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=1, ACT=1}$	49.2	1,120.7	5,675.9	1.8	$\mu g/ft^2$	✓	Battelle 2007	f, j, l, m
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=1, ACT=1}$	2.7	7.6	33.1	0.7	$\mu g/ft^2$	✓	Battelle 2007	f, k, l, m
Workspace Loading – Post Verification	$DLOAD_{W, LOC=1, PH=4, CO=1, ACT=1}$	2.7	9.6	27.6	0.6	$\mu g/ft^2$	✓	Battelle 2007	f, k, l, m
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=1, ACT=1}$	2.3	5.3	57.2	1	$\mu g/ft^2$	✓	Battelle 2007	d, j, l, m
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=1, ACT=1}$	0.8	3.6	14.6	0.8	$\mu g/ft^2$	✓	Battelle 2007	d, k, l, m
Adjacent Loading – Post Verification	$DLOAD_{W, LOC=2, PH=4 , CO=1, ACT=1}$	4.3	11.3	63.2	0.8	$\mu g/ft^2$	✓	Battelle 2007	d, k, l, m
Rest of Building Loading - Post Work	$DLOAD_{W, LOC=3, PH=2, CO=1, ACT=1}$	1.7	4.6	27.2	0.8	$\mu g/ft^2$	✓	Battelle 2007	e, j, l, m
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=1, ACT=1}$	2.2	8.9	75.2	1.1	$\mu g/ft^2$	✓	Battelle 2007	e, k, l, m
Rest of Building Loading – Post Verification	$DLOAD_{W, LOC=3, PH=4, CO=1, ACT=1}$	2.7	6.7	12.8	0.4	$\mu g/ft^2$	✓	Battelle 2007	e, k, l, m
Window replacements AND Plastic sheeting, Baseline cleaning (Control Option 2)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=2, ACT=1}$	155.7	2,018.2	32,727.6	2.2	$\mu g/ft^2$	✓	Battelle 2007	f, j, l, m
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=2, ACT=1}$ $DLOAD_{W, LOC=1, PH=4, CO=2, ACT=1}$	6.3	14.7	57.3	0.6	$\mu g/ft^2$	✓	Battelle 2007	f, k, l, m
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=2, ACT=1}$	2.9	6.8	27.1	0.6	$\mu g/ft^2$	✓	Battelle 2007	d, j, l, m
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=2, ACT=1}$ $DLOAD_{W, LOC=2, PH=4, CO=2, ACT=1}$	3.9	11.9	40	0.6	$\mu g/ft^2$	✓	Battelle 2007	d, k, l, m
Rest of Building Loading – Post Work	$DLOAD_{W, LOC=3, PH=2, CO=2, ACT=1}$	0.8	2.6	27.2	1.1	$\mu g/ft^2$	✓	Battelle 2007	e, j, l, m
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=2, ACT=1}$ $DLOAD_{W, LOC=3, PH=4, CO=2, ACT=1}$	0.8	1.3	8.7	0.6	$\mu g/ft^2$	✓	Battelle 2007	e, k, l, m
Window Replacement AND Plastic sheeting, Verification cleaning (Control Option 3)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=3, ACT=1}$	31.9	732.1	2,786.3	1.6	$\mu g/ft^2$	✓	Battelle 2007	f, j, l, m
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=3, ACT=1}$	3.6	7.6	23.2	0.5	$\mu g/ft^2$	✓	Battelle 2007	f, k, l, m

Exhibit A-6. Inputs for Indoor Dust Calculations – Single Activity Example (i.e., Window Replacement)

Input Description	Input Name	Low	Mid	High	CV [a]	Units	In Monte Carlo Analysis?	References	Notes
Workspace Loading – Post Verification	$DLOAD_{W, LOC=1, PH=4, CO=3, ACT=1}$	2.6	4.8	10.2	0.3	µg/ft^2	✓	Battelle 2007	f, k, l, m
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=3, ACT=1}$	2.1	3.2	6.5	0.3	µg/ft^2	✓	Battelle 2007	d, j, l, m
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=3, ACT=1}$	2.7	4.7	7.1	0.2	µg/ft^2	✓	Battelle 2007	d, k, l, m
Adjacent Loading – Post Verification	$DLOAD_{W, LOC=2, PH=4, CO=3, ACT=1}$	2.4	8.9	72.1	1	µg/ft^2	✓	Battelle 2007	d, k, l, m
Rest of Building Loading - Post Work	$DLOAD_{W, LOC=3, PH=2, CO=3, ACT=1}$	0.8	1.8	3.5	0.4	µg/ft^2	✓	Battelle 2007	e, j, l, m
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=3, ACT=1}$	0.8	1.4	3	0.3	µg/ft^2	✓	Battelle 2007	e, k, l, m
Rest of Building Loading – Post Verification	$DLOAD_{W, LOC=3, PH=4, CO=3, ACT=1}$	0.8	1.6	5.6	0.5	µg/ft^2	✓	Battelle 2007	e, k, l, m
Dependent on Vintage (Independent of Activity Types and Control Options)									
< 1940									
Background Loading	$DLOAD_{W, BG, VIN=1}$	0.1	0.6	5.7	1.4	µg/ft^2	✓	HUD 2002	g, l
Load-concentration Intercept	$Intercept_{VIN=1}$	4.2	5.5	6.9	0.1	unitless	✓	See Appendix C	h, l
Load-concentration Slope	$Slope_{VIN=1}$	N/A	0.5	N/A	N/A	unitless		ICF Professional Judgment	h, l
1940 to 1959									
Background Loading	$DLOAD_{W, BG, VIN=2}$	0.1	0.3	4.1	1.3	µg/ft^2	✓	HUD 2002	g
Load-concentration Intercept	$Intercept_{VIN=2}$	3.5	4.9	6.3	0.1	unitless	✓	See Appendix C	h
Load-concentration Slope	$Slope_{VIN=2}$	N/A	0.4	N/A	N/A	unitless		ICF Professional Judgment	h, i
1960 to 1979									
Background Loading	$DLOAD_{W, BG, VIN=3}$	0.1	0.2	1.7	0.9	µg/ft^2	✓	HUD 2002	g
Load-concentration Intercept	$Intercept_{VIN=3}$	3	4.7	6.4	0.2	unitless	✓	See Appendix C	h
Load-concentration Slope	$Slope_{VIN=3}$	N/A	0.4	N/A	N/A	unitless		ICF Professional Judgment	h, i

Notes for Exhibit A-6. Inputs for Indoor Dust Calculations – Single Activity Example (i.e., Window Replacement)

a	The CV is equal to the standard deviation divided by the mean. Italicized CV values were pulled from existing data. Un-italicized CV values were calculated from the low, mid, and high values for each input. Bolded CV values were approximated because low and high values were not available. For the un-italicized CV values, either a normal or log-normal distribution was selected for each parameter based on the symmetry between the low, mid, and high input values, with normal better representing symmetric distributions and log-normal better representing highly skewed distributions. For the normal distribution, the mean was approximated as the mid value. Two estimates of the normal standard deviation were obtained by assuming that the low and high values were each two standard deviations from the mean. These two estimates were then averaged to obtain a single estimate of the standard deviation. For the lognormal distribution, the geometric mean was approximated as the mid value. The standard deviation was approximated by first taking the natural log of the low, mid, and high values (to convert to the normal distribution), then two estimates of the normal standard deviation were obtained by assuming that the low and high values were each two standard deviations from the mean. These two estimates were then averaged to obtain a single estimate of the standard deviation (σ). The log normal CV was then calculated using the following equation: CV= sqrt[($e^{(\sigma^{\wedge}2)}$]. For the bolded CV values, a CV could not be calculated because no low and high values were available. These CVs were approximated as 2, which represents a conservative CV estimate. See Appendix D for more details.
b	For the percentage of area that is carpeted, the low value (10%) and high value (90%) were chosen based on ICF professional judgment. The low value represents houses containing minimal or no wall-to-wall carpeting, but some area rugs. The high value represents houses containing wall-to-wall carpeting, except in the bathroom(s) and kitchen. The mid value (72%) was chosen based on personal communications with Michael Hilton, Carpet Buyer's Handbook and Carroll Turner, Carpet & Rug Institute. Turner noted that Floor Covering Weekly estimated the percentage of carpeted area in the home today as 62%. For 1997, Turner found a value of 70%. However, data about the percent carpeting in building prior to 1978 was not available. Turner provided 72% as his professional best estimate of the percentage carpeted area in building built prior to 1978.
c	The low, mid, and high cleaning frequencies were set to one cleaning every four weeks, one cleaning per week, and two cleanings per week respectively. These cleaning frequencies were chosen based on the values presented in USEPA (2006b), which is based on Simcox et al. (1995) and the 2000 HUD National Survey of Pb and Allergens in Housing (NSLAH). Based on data from Simcox et al. (1995), the USEPA (2006b) report estimated that 40% of households clean more frequently than weekly, 45% clean weekly, and 15% clean less frequently than weekly. The 2000 NSLAH indicated that 57% of the people in the survey reported cleaning within the past 6 days, 25% had not cleaned in the past 7-13 days, 10% had not cleaned in the past 14-20 days, 3% had not cleaned in the past 21 days, and 5% had not cleaned in the past 28 days. The NSLAH survey data do not necessarily represent the survey respondents' typical cleaning frequencies, but they do suggest that a significant number of homes are cleaned less frequently than once every two weeks.
d	Adjacent Loading in the OPPT Dust Study (Battelle 2007) is measured in the Tool Room (an interior room immediately adjacent to the Work Room where workers might place equipment and materials needed for a job). The Post Work, Post Cleaning, and Post Verification sample types from the OPPT Dust Study correspond to different phases used in this approach (see Exhibit A-2).
e	Rest of Building Loading in the OPPT Dust Study (Battelle 2007) is measured in the Observation Room (an interior room adjacent to the Tool Room but not the Work Room), which represents other areas of the house impacted by RRP work. The Post Work, Post Cleaning, and Post Verification sample types from the OPPT Dust Study correspond to different phases used in this approach (see Exhibit A-2).
f	Workspace Loading in the OPPT Dust Study (Battelle 2007) is measured in the Work Room (where the RRP work was performed). The Post Work, Post Cleaning, and Post Verification sample types from the OPPT Dust Study correspond to different phases used in this approach (see Exhibit A-2).

Notes for Exhibit A-6. Inputs for Indoor Dust Calculations – Single Activity Example (i.e., Window Replacement)

g	The National Survey of Lead and Allergens in Housing (NSLAH) (HUD 2002) provided the Pb loading data that were used to estimate background indoor dust Pb concentrations. The NSLAH data set was selected from a number of potential studies, which are described in the Risk Analysis to Support Standards for Lead in Paint, Dust, and Soil (USEPA 1998), including the HUD National Survey of Lead-Based Paint in Housing (NSLBPH), HUD Grantees Evaluation of HUD Lead-Based Paint Hazard Control Grant Program ("HUD Grantees"), Lead-Based Paint Abatement and Repair & Maintenance (R&M) Study in Baltimore, and the Rochester Lead-in-Dust Study. The HUD (2002) data set was selected based on a study design that provides data that are representative of all housing groups throughout the U.S. and focused on homes with children (HUD 2002). It is also the largest and most recent survey completed that used wipe samples in accordance with ASTM E1728-95 (USEPA 1998).
h	The Load-concentration Intercept and Load-concentration Slope were determined through ICF analysis. Please see Appendix C for a more detailed discussion of this analysis.
i	There were no low and high values for the Load-concentration Slope, however a CV of 2 was deemed too high. Therefore, the Load-concentration Slope CV was estimated by setting the CV equal to the Load-concentration Intercept CV.
j	Post Work loading represents the total loading which occurs within the course of an activity and is defined by the post-work loading measurements from Battelle (2007). This likely results in an overestimate of exposure during the Renovation exposure period because loading increases as the activity progresses.
k	The Post-Renovation (Routine Cleaning) phase is defined by post cleaning data from the OPPT Dust Study (Battelle 2007) when only baseline cleaning is implemented (i.e., Base Control Option and Control Option 2). When verification cleaning is implemented (i.e., Control Options 1 and 3), the Post-Renovation (Routine Cleaning) phase is defined by the post verification data from the OPPT Dust Study (Battelle 2007).
l	The value for this input variable is the same in both the single activity example and the multiple activities example.
m	See Section 3.4 for an explanation of selecting low, mid, and high values, and use of the geometric mean to calculate mid values.

Exhibit A-7. Inputs for Indoor Dust Calculations – Multiple Activities Example

Input	Dimension Name	Low	Mid	High	CV [a]	Units	In Monte Carlo Analysis?	Sources	Notes
Independent of Control Options, Activity Types, and Vintage									
% Area of Building – Carpet	PAC	10	72	90	0.3	%	✓	Hilton Personal Communication 2007; Turner Personal Communication 2007	b, p
Cleaning Frequency	CleanFrequency	0.3	1	2	0.4	cleanings/ week	✓	Simcox et al. 1995; USEPA 2006b	c, p
Dependent on Activity Types (Independent of Control Options and Vintage)									
Renovating kitchen									
% Area of Building – Adjacent Room	PAA	13	40	66	0.3	%	✓	NAHB 2006; HomePlans Website 2007	d
% Area of Building – Workspace	PAW	10	13	16	0.1	%	✓	NAHB 2006; HomePlans Website 2007	e
Cut-Outs									
% Area of Building – Adjacent Room	PAA	7	32	57	0.4	%	✓	NAHB 2006; HomePlans Web site 2007	f
% Area of Building – Workspace	PAW	3	20	36	0.4	%	✓	NAHB 2006; HomePlans Website 2007	g
Window replacements									
% Area of Building – Adjacent Room	PAA	7	32	57	0.4	%	✓	NAHB 2006; HomePlans Website 2007	f, p
% Area of Building – Workspace	PAW	3	20	36	0.4	%	✓	NAHB 2006; HomePlans Website 2007	g, p

Exhibit A-7. Inputs for Indoor Dust Calculations – Multiple Activities Example

Input	Dimension Name	Low	Mid	High	CV [a]	Units	In Monte Carlo Analysis?	Sources	Notes
Interior flat component LBP removal, scraping									
% Area of Building – Adjacent Room	PAA	7	32	57	0.4	%	✓	NAHB 2006; HomePlans Website 2007	f
% Area of Building – Workspace	PAW	3	20	36	0.4	%	✓	NAHB 2006; HomePlans Website 2007	g
Dependent on Activity Types AND Control Options (Independent of Vintage)									
Renovating kitchen AND No plastic sheeting, Baseline cleaning (Base Control Option)									
Workspace Loading – Post Work	$DLOAD_{W,\ LOC=1,\ PH=2,\ CO=0,\ ACT=3}$	21.1	296.6	1,391.7	1.4	µg/ft^2	✓	Battelle 2007	j, n
Workspace Loading – Post Cleaning	$DLOAD_{W,\ LOC=1,\ PH=3,\ CO=0,\ ACT=3}$ $DLOAD_{W,\ LOC=1,\ PH=4,\ CO=0,\ ACT=3}$	0.8	8.2	37.8	1.2	µg/ft^2	✓	Battelle 2007	i, o
Adjacent Loading – Post Work	$DLOAD_{W,\ LOC=2,\ PH=2,\ CO=0,\ ACT=3}$	0.8	4	35.9	1.2	µg/ft^2	✓	Battelle 2007	h, n
Adjacent Loading – Post Cleaning	$DLOAD_{W,\ LOC=2,\ PH=3,\ CO=0,\ ACT=3}$ $DLOAD_{W,\ LOC=2,\ PH=4,\ CO=0,\ ACT=3}$	0.8	1.7	9.5	0.7	µg/ft^2	✓	Battelle 2007	h, o
Rest of Building Loading – Post Work	$DLOAD_{W,\ LOC=3,\ PH=2,\ CO=0,\ ACT=3}$	0.8	0.8	1.5	0.4	µg/ft^2	✓	Battelle 2007	i, n
Rest of Building Loading – Post Cleaning	$DLOAD_{W,\ LOC=3,\ PH=3,\ CO=0,\ ACT=3}$ $DLOAD_{W,\ LOC=3,\ PH=4,\ CO=0,\ ACT=3}$	0.8	2.2	21.6	1	µg/ft^2	✓	Battelle 2007	i, o
Renovating kitchen AND No plastic sheeting, Verification cleaning (Control Option 1)									
Workspace Loading – Post Work	$DLOAD_{W,\ LOC=1,\ PH=2,\ CO=1,\ ACT=3}$	1.9	170	1,907.7	4.3	µg/ft^2	✓	Battelle 2007	j, n
Workspace Loading – Post Cleaning	$DLOAD_{W,\ LOC=1,\ PH=3,\ CO=1,\ ACT=3}$	0.8	1.7	10.5	0.7	µg/ft^2	✓	Battelle 2007	i, o
Workspace Loading – Post Verification	$DLOAD_{W,\ LOC=1,\ PH=4,\ CO=1,\ ACT=3}$	0.8	2.3	42.1	1.3	µg/ft^2	✓	Battelle 2007	i, o
Adjacent Loading – Post Work	$DLOAD_{W,\ LOC=2,\ PH=2,\ CO=1,\ ACT=3}$	0.8	2.2	11.4	0.7	µg/ft^2	✓	Battelle 2007	h, n
Adjacent Loading – Post Cleaning	$DLOAD_{W,\ LOC=2,\ PH=3,\ CO=1,\ ACT=3}$	0.8	5.8	119.3	1.9	µg/ft^2	✓	Battelle 2007	h, o
Adjacent Loading – Post Verification	$DLOAD_{W,\ LOC=2,\ PH=4\ ,\ CO=1,\ ACT=3}$	0.8	4.4	49	1.4	µg/ft^2	✓	Battelle 2007	h, o
Rest of Building Loading – Post Work	$DLOAD_{W,\ LOC=3,\ PH=2,\ CO=1,\ ACT=3}$	0.8	1.6	12.8	0.8	µg/ft^2	✓	Battelle 2007	i, n
Rest of Building Loading – Post Cleaning	$DLOAD_{W,\ LOC=3,\ PH=3,\ CO=1,\ ACT=3}$	0.8	2.1	9.8	0.7	µg/ft^2	✓	Battelle 2007	i, o
Rest of Building Loading – Post Verification	$DLOAD_{W,\ LOC=3,\ PH=4,\ CO=1,\ ACT=3}$	0.8	1	6.7	0.6	µg/ft^2	✓	Battelle 2007	i, o

Exhibit A-7. Inputs for Indoor Dust Calculations – Multiple Activities Example

Input	Dimension Name	Low	Mid	High	CV [a]	Units	In Monte Carlo Analysis?	Sources	Notes
Renovating kitchen AND Plastic sheeting, Baseline cleaning (Control Option 2)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=2, ACT=3}$	2.8	587.6	22,748.2	12.7	$\mu g/ft^2$	✓	Battelle 2007	j, n
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=2, ACT=3}$ $DLOAD_{W, LOC=1, PH=4, CO=2, ACT=3}$	2.5	6.4	19.9	0.6	$\mu g/ft^2$	✓	Battelle 2007	i, o
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=2, ACT=3}$	0.8	2.7	13.4	0.8	$\mu g/ft^2$	✓	Battelle 2007	h, n
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=2, ACT=3}$ $DLOAD_{W, LOC=2, PH=4, CO=2, ACT=3}$	2	3.1	14.6	0.5	$\mu g/ft^2$	✓	Battelle 2007	h, o
Rest of Building Loading – Post Work	$DLOAD_{W, LOC=3, PH=2, CO=2, ACT=3}$	0.8	0.8	1.2	0.2	$\mu g/ft^2$	✓	Battelle 2007	i, n
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=2, ACT=3}$ $DLOAD_{W, LOC=3, PH=4, CO=2, ACT=3}$	0.8	1	2.1	0.2	$\mu g/ft^2$	✓	Battelle 2007	i, o
Renovating kitchen AND Plastic sheeting, Verification cleaning (Control Option 3)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=3, ACT=3}$	0.8	324.8	22,111.8	25.7	$\mu g/ft^2$	✓	Battelle 2007	j, n
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=3, ACT=3}$	0.8	2.2	11.2	0.7	$\mu g/ft^2$	✓	Battelle 2007	i, o
Workspace Loading – Post Verification	$DLOAD_{W, LOC=1, PH=4, CO=3, ACT=3}$	0.8	1.9	15	0.8	$\mu g/ft^2$	✓	Battelle 2007	i, o
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=3, ACT=3}$	0.8	6.1	52.5	1.4	$\mu g/ft^2$	✓	Battelle 2007	h, n
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=3, ACT=3}$	0.8	4.3	53.4	1.4	$\mu g/ft^2$	✓	Battelle 2007	h, o
Adjacent Loading – Post Verification	$DLOAD_{W, LOC=2, PH=4 , CO=3, ACT=3}$	0.8	1.6	12.3	0.8	$\mu g/ft^2$	✓	Battelle 2007	h, o
Rest of Building Loading – Post Work	$DLOAD_{W, LOC=3, PH=2, CO=3, ACT=3}$	0.8	1.2	6	0.5	$\mu g/ft^2$	✓	Battelle 2007	i, n
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=3, ACT=3}$	0.8	1.3	8.3	0.6	$\mu g/ft^2$	✓	Battelle 2007	i, o
Rest of Building Loading – Post Verification	$DLOAD_{W, LOC=3, PH=4, CO=3, ACT=3}$	0.8	1	4.1	0.4	$\mu g/ft^2$	✓	Battelle 2007	i, o
Cut-Outs AND No plastic sheeting, Baseline cleaning (Base Control Option)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=0, ACT=4}$	8.6	979.4	83,427.6	13.9	$\mu g/ft^2$	✓	Battelle 2007	j, n
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=0, ACT=4}$ $DLOAD_{W, LOC=1, PH=4, CO=0, ACT=4}$	0.8	4.9	20	0.9	$\mu g/ft^2$	✓	Battelle 2007	i, o
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=0, ACT=4}$	0.8	2.7	8	0.6	$\mu g/ft^2$	✓	Battelle 2007	h, n
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=0, ACT=4}$ $DLOAD_{W, LOC=2, PH=4, CO=0, ACT=4}$	0.8	1.8	4.6	0.4	$\mu g/ft^2$	✓	Battelle 2007	h, o
Rest of Building Loading – Post Work	$DLOAD_{W, LOC=3, PH=2, CO=0, ACT=4}$	0.8	1	2.2	0.2	$\mu g/ft^2$	✓	Battelle 2007	i, n
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=0, ACT=4}$ $DLOAD_{W, LOC=3, PH=4, CO=0, ACT=4}$	0.8	1.1	2.7	0.3	$\mu g/ft^2$	✓	Battelle 2007	i, o

Exhibit A-7. Inputs for Indoor Dust Calculations – Multiple Activities Example

Input	Dimension Name	Low	Mid	High	CV [a]	Units	In Monte Carlo Analysis?	Sources	Notes
Cut-Outs AND No plastic sheeting, Verification cleaning (Control Option 1)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=1, ACT=4}$	0.8	2.1	13.7	3.8	$\mu g/ft^2$	✓	Battelle 2007	j, n
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=1, ACT=4}$	0.8	1.5	7.8	0.8	$\mu g/ft^2$	✓	Battelle 2007	i, o
Workspace Loading – Post Verification	$DLOAD_{W, LOC=1, PH=4, CO=1, ACT=4}$	9.7	133.5	2,409.5	0.6	$\mu g/ft^2$	✓	Battelle 2007	i, o
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=1, ACT=4}$	0.8	3.5	11.8	0.7	$\mu g/ft^2$	✓	Battelle 2007	h, n
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=1, ACT=4}$	9.7	133.5	2,409.5	0.6	$\mu g/ft^2$	✓	Battelle 2007	h, o
Adjacent Loading – Post Verification	$DLOAD_{W, LOC=2, PH=4 , CO=1, ACT=4}$	0.8	2.3	11	2.4	$\mu g/ft^2$	✓	Battelle 2007	h, o
Rest of Building Loading – Post Work	$DLOAD_{W, LOC=3, PH=2, CO=1, ACT=4}$	0.8	2.1	6.8	0.7	$\mu g/ft^2$	✓	Battelle 2007	i, n
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=1, ACT=4}$	0.8	2.9	11.8	0.6	$\mu g/ft^2$	✓	Battelle 2007	i, o
Rest of Building Loading – Post Verification	$DLOAD_{W, LOC=3, PH=4, CO=1, ACT=4}$	6.8	248.6	5,098.4	0.7	$\mu g/ft^2$	✓	Battelle 2007	i, o
Cut-Outs AND Plastic sheeting, Baseline cleaning (Control Option 2)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=2, ACT=4}$	0.8	362.8	21,985.8	25.6	$\mu g/ft^2$	✓	Battelle 2007	j, n
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=2, ACT=4}$ $DLOAD_{W, LOC=1, PH=4, CO=2, ACT=4}$	0.8	1.3	4.5	0.4	$\mu g/ft^2$	✓	Battelle 2007	i, o
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=2, ACT=4}$	0.8	1.9	4.7	0.5	$\mu g/ft^2$	✓	Battelle 2007	h, n
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=2, ACT=4}$ $DLOAD_{W, LOC=2, PH=4, CO=2, ACT=4}$	0.8	2.4	6.3	0.5	$\mu g/ft^2$	✓	Battelle 2007	h, o
Rest of Building Loading – Post Work	$DLOAD_{W, LOC=3, PH=2, CO=2, ACT=4}$	0.8	0.8	1.2	0.3	$\mu g/ft^2$	✓	Battelle 2007	i, n
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=2, ACT=4}$ $DLOAD_{W, LOC=3, PH=4, CO=2, ACT=4}$	0.8	0.8	1.2	0.3	$\mu g/ft^2$	✓	Battelle 2007	i, o
Cut-Outs AND Plastic sheeting, Verification cleaning (Control Option 3)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=3, ACT=4}$	5.8	71.2	438.1	1.5	$\mu g/ft^2$	✓	Battelle 2007	j, n
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=3, ACT=4}$	0.8	1.3	5.5	0.5	$\mu g/ft^2$	✓	Battelle 2007	i, o
Workspace Loading – Post Verification	$DLOAD_{W, LOC=1, PH=4, CO=3, ACT=4}$	0.8	0.8	1.6	0.5	$\mu g/ft^2$	✓	Battelle 2007	i, o
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=3, ACT=4}$	0.8	1.2	4.7	0.5	$\mu g/ft^2$	✓	Battelle 2007	h, n
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=3, ACT=4}$	0.8	1.1	3.5	0.4	$\mu g/ft^2$	✓	Battelle 2007	h, o
Adjacent Loading – Post Verification	$DLOAD_{W, LOC=2, PH=4 , CO=3, ACT=4}$	0.8	0.8	1.1	0.2	$\mu g/ft^2$	✓	Battelle 2007	h, o
Rest of Building Loading – Post Work	$DLOAD_{W, LOC=3, PH=2, CO=3, ACT=4}$	0.8	0.8	1.2	0.2	$\mu g/ft^2$	✓	Battelle 2007	i, n

Exhibit A-7. Inputs for Indoor Dust Calculations – Multiple Activities Example

Input	Dimension Name	Low	Mid	High	CV [a]	Units	In Monte Carlo Analysis?	Sources	Notes
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=3, ACT=4}$	0.8	0.8	1.2	0.2	µg/ft^2	✓	Battelle 2007	i, o
Rest of Building Loading – Post Verification	$DLOAD_{W, LOC=3, PH=4, CO=3, ACT=4}$	0.8	0.8	1.2	0.2	µg/ft^2	✓	Battelle 2007	i, o
Window replacements AND No plastic sheeting, Baseline cleaning (Base Control Option)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=0, ACT=1}$	15.1	452.3	2,512.3	2	µg/ft^2	✓	Battelle 2007	j, n, p
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=0, ACT=1}$ $DLOAD_{W, LOC=1, PH=4, CO=0, ACT=1}$	10.1	17.8	35	0.3	µg/ft^2	✓	Battelle 2007	i, o, p
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=0, ACT=1}$	0.8	4.1	43.4	1.3	µg/ft^2	✓	Battelle 2007	h, n, p
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=0, ACT=1}$ $DLOAD_{W, LOC=2, PH=4, CO=0, ACT=1}$	4.2	12.8	101.1	0.9	µg/ft^2	✓	Battelle 2007	h, o, p
Rest of Building Loading – Post Work	$DLOAD_{W, LOC=3, PH=2, CO=0, ACT=1}$	0.8	1	10.7	0.7	µg/ft^2	✓	Battelle 2007	i, n, p
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=0, ACT=1}$ $DLOAD_{W, LOC=3, PH=4, CO=0, ACT=1}$	0.8	1.5	5.4	0.5	µg/ft^2	✓	Battelle 2007	i, o, p
Window replacements AND No plastic sheeting, Verification cleaning (Control Option 1)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=1, ACT=1}$	49.2	1,120.7	5,675.9	1.8	µg/ft^2	✓	Battelle 2007	j, n, p
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=1, ACT=1}$	2.7	7.6	33.1	0.7	µg/ft^2	✓	Battelle 2007	i, o, p
Workspace Loading – Post Verification	$DLOAD_{W, LOC=1, PH=4, CO=1, ACT=1}$	2.7	9.6	27.6	0.6	µg/ft^2	✓	Battelle 2007	i, o, p
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=1, ACT=1}$	2.3	5.3	57.2	1.0	µg/ft^2	✓	Battelle 2007	h, n, p
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=1, ACT=1}$	0.8	3.6	14.6	0.8	µg/ft^2	✓	Battelle 2007	h, o, p
Adjacent Loading – Post Verification	$DLOAD_{W, LOC=2, PH=4 , CO=1, ACT=1}$	4.3	11.3	63.2	0.8	µg/ft^2	✓	Battelle 2007	h, o, p
Rest of Building Loading – Post Work	$DLOAD_{W, LOC=3, PH=2, CO=1, ACT=1}$	1.7	4.6	27.2	0.8	µg/ft^2	✓	Battelle 2007	i, n, p
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=1, ACT=1}$	2.2	8.9	75.2	1.1	µg/ft^2	✓	Battelle 2007	i, o, p
Rest of Building Loading – Post Verification	$DLOAD_{W, LOC=3, PH=4, CO=1, ACT=1}$	2.7	6.7	12.8	0.4	µg/ft^2	✓	Battelle 2007	i, o, p
Window replacements AND Plastic sheeting, Baseline cleaning (Control Option 2)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=2, ACT=1}$	31.9	732.1	2,786.3	1.6	µg/ft^2	✓	Battelle 2007	j, n, p
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=2, ACT=1}$ $DLOAD_{W, LOC=1, PH=4, CO=2, ACT=1}$	3.6	7.6	23.2	0.5	µg/ft^2	✓	Battelle 2007	i, o, p
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=2, ACT=1}$	2.1	3.2	6.1	0.3	µg/ft^2	✓	Battelle 2007	h, n, p

Exhibit A-7. Inputs for Indoor Dust Calculations – Multiple Activities Example

Input	Dimension Name	Low	Mid	High	CV [a]	Units	In Monte Carlo Analysis?	Sources	Notes
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=2, ACT=1}$ $DLOAD_{W, LOC=2, PH=4, CO=2, ACT=1}$	2.7	4.7	7.1	0.2	µg/ft^2	✓	Battelle 2007	h, o, p
Rest of Building Loading - Post Work	$DLOAD_{W, LOC=3, PH=2, CO=2, ACT=1}$	0.8	1.8	3.5	0.4	µg/ft^2	✓	Battelle 2007	i, n, p
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=2, ACT=1}$ $DLOAD_{W, LOC=3, PH=4, CO=2, ACT=1}$	0.8	1.4	3	0.3	µg/ft^2	✓	Battelle 2007	i, o, p
Window replacements AND Plastic sheeting, Verification cleaning (Control Option 3)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=0, ACT=2}$	14.3	3,290.2	389,356.8	26.0	µg/ft^2	✓	Battelle 2007	j, n, p
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=0, ACT=2}$ $DLOAD_{W, LOC=1, PH=4, CO=0, ACT=2}$	5.6	9.1	17.7	0.3	µg/ft^2	✓	Battelle 2007	i, o, p
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=3, ACT=1}$	2.1	3.2	6.5	0.3	µg/ft^2	✓	Battelle 2007	i, o, p
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=3, ACT=1}$	2.7	4.7	7.1	0.2	µg/ft^2	✓	Battelle 2007	h, n, p
Adjacent Loading – Post Verification	$DLOAD_{W, LOC=2, PH=4 , CO=3, ACT=1}$	2.4	8.9	72.1	1	µg/ft^2	✓	Battelle 2007	h, o, p
Rest of Building Loading – Post Work	$DLOAD_{W, LOC=3, PH=2, CO=3, ACT=1}$	0.8	1.8	3.5	0.4	µg/ft^2	✓	Battelle 2007	h, o, p
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=3, ACT=1}$	0.8	1.4	3	0.3	µg/ft^2	✓	Battelle 2007	i, n, p
Rest of Building Loading – Post Verification	$DLOAD_{W, LOC=3, PH=4, CO=3, ACT=1}$	0.8	1.6	5.6	0.5	µg/ft^2	✓	Battelle 2007	i, o, p
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=3, ACT=1}$	31.9	732.1	2,786.3	1.6	µg/ft^2	✓	Battelle 2007	i, o, p
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=3, ACT=1}$	3.6	7.6	23.2	0.5	µg/ft^2	✓	Battelle 2007	j, n, p
Workspace Loading – Post Verification	$DLOAD_{W, LOC=1, PH=4, CO=3, ACT=1}$	2.6	4.8	10.2	0.3	µg/ft^2	✓	Battelle 2007	i, o, p
Interior flat component LBP removal, scraping AND No plastic sheeting, Baseline cleaning (Base Control Option)									
Workspace loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=0, ACT=2}$	14.3	3,290.2	389,356.8	26.0	µg/ft^2		Battelle 2007	j, n
Workspace loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=0, ACT=2}$ $DLOAD_{W, LOC=1, PH=4, CO=0, ACT=2}$	5.6	9.1	17.7	0.3	µg/ft^2		Battelle 2007	i, o
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=0, ACT=2}$	5.6	9.7	16.7	0.3	µg/ft^2	✓	Battelle 2007	h, n
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=0, ACT=2}$ $DLOAD_{W, LOC=2, PH=4, CO=0, ACT=2}$	4.4	10.4	37.2	0.6	µg/ft^2	✓	Battelle 2007	h, o
Rest of Building Loading – Post Work	$DLOAD_{W, LOC=3, PH=2, CO=0, ACT=2}$	2.2	4.4	11.6	0.4	µg/ft^2	✓	Battelle 2007	i, n
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=0, ACT=2}$ $DLOAD_{W, LOC=3, PH=4, CO=0, ACT=2}$	3.1	8.2	24.2	0.6	µg/ft^2	✓	Battelle 2007	i, o
Interior flat component LBP removal, scraping AND No plastic sheeting, Verification cleaning (Control Option 1)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=1, ACT=2}$	9.6	3,732.5	165,573.8	19.6	µg/ft^2	✓	Battelle 2007	j, n

Exhibit A-7. Inputs for Indoor Dust Calculations – Multiple Activities Example

Input	Dimension Name	Low	Mid	High	CV [a]	Units	In Monte Carlo Analysis?	Sources	Notes
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=1, ACT=2}$	0.8	2.3	5	0.5	µg/ft^2	✓	Battelle 2007	i, o
Workspace Loading – Post Verification	$DLOAD_{W, LOC=1, PH=4, CO=1, ACT=2}$	0.8	1.7	5.5	0.5	µg/ft^2	✓	Battelle 2007	i, o
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=1, ACT=2}$	3.9	9.3	69.6	0.8	µg/ft^2	✓	Battelle 2007	h, n
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=1, ACT=2}$	6.6	9.2	20.1	0.3	µg/ft^2	✓	Battelle 2007	h, o
Adjacent Loading – Post Verification	$DLOAD_{W, LOC=2, PH=4, CO=1, ACT=2}$	4.7	6.5	10	0.2	µg/ft^2	✓	Battelle 2007	h, o
Rest of Building Loading – Post Work	$DLOAD_{W, LOC=3, PH=2, CO=1, ACT=2}$	2.4	3.3	6.6	0.3	µg/ft^2	✓	Battelle 2007	i, n
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=1, ACT=2}$	2.9	3.9	5.2	0.1	µg/ft^2	✓	Battelle 2007	i, o
Rest of Building Loading – Post Verification	$DLOAD_{W, LOC=3, PH=4, CO=1, ACT=2}$	2.9	5.9	12.2	0.4	µg/ft^2	✓	Battelle 2007	i, o
Interior flat component LBP removal, scraping AND Plastic sheeting, Baseline cleaning (Control Option 2)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=2, ACT=2}$	47.3	1,705.4	343,010.8	11.8	µg/ft^2	✓	Battelle 2007	j, n
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=2, ACT=2}$ $DLOAD_{W, LOC=1, PH=4, CO=2, ACT=2}$	3.3	15.1	48.2	0.8	µg/ft^2	✓	Battelle 2007	i, o
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=2, ACT=2}$	0.8	4.5	25.6	1.0	µg/ft^2	✓	Battelle 2007	h, n
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=2, ACT=2}$ $DLOAD_{W, LOC=2, PH=4, CO=2, ACT=2}$	0.8	3.9	12.4	0.8	µg/ft^2	✓	Battelle 2007	h, o
Rest of Building Loading – Post Work	$DLOAD_{W, LOC=3, PH=2, CO=2, ACT=2}$	0.8	3.5	55.9	1.4	µg/ft^2	✓	Battelle 2007	i, n
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=2, ACT=2}$ $DLOAD_{W, LOC=3, PH=4, CO=2, ACT=2}$	2	4.4	9.1	0.4	µg/ft^2	✓	Battelle 2007	i, o
Interior flat component LBP removal, scraping AND Plastic sheeting, Verification cleaning (Control Option 3)									
Workspace Loading – Post Work	$DLOAD_{W, LOC=1, PH=2, CO=3, ACT=2}$	55.5	5,879.4	136,791.9	6.6	µg/ft^2	✓	Battelle 2007	j, n
Workspace Loading – Post Cleaning	$DLOAD_{W, LOC=1, PH=3, CO=3, ACT=2}$	3	7.6	21.8	0.5	µg/ft^2	✓	Battelle 2007	i, o
Workspace Loading – Post Verification	$DLOAD_{W, LOC=1, PH=4, CO=3, ACT=2}$	2	4.4	10.2	0.4	µg/ft^2	✓	Battelle 2007	i, o
Adjacent Loading – Post Work	$DLOAD_{W, LOC=2, PH=2, CO=3, ACT=2}$	2	5.7	25.8	0.7	µg/ft^2	✓	Battelle 2007	h, n
Adjacent Loading – Post Cleaning	$DLOAD_{W, LOC=2, PH=3, CO=3, ACT=2}$	0.8	5.7	31.5	1.1	µg/ft^2	✓	Battelle 2007	h, o
Adjacent Loading – Post Verification	$DLOAD_{W, LOC=2, PH=4, CO=3, ACT=2}$	0.8	4.8	10.9	0.5	µg/ft^2	✓	Battelle 2007	h, o
Rest of Building Loading – Post Work	$DLOAD_{W, LOC=3, PH=2, CO=3, ACT=2}$	1.7	5.9	45.1	1	µg/ft^2	✓	Battelle 2007	i, n
Rest of Building Loading – Post Cleaning	$DLOAD_{W, LOC=3, PH=3, CO=3, ACT=2}$	0.8	2.2	3.9	0.4	µg/ft^2	✓	Battelle 2007	i, o

Exhibit A-7. Inputs for Indoor Dust Calculations – Multiple Activities Example

Input	Dimension Name	Low	Mid	High	CV [a]	Units	In Monte Carlo Analysis?	Sources	Notes
Rest of Building Loading – Post Verification	$DLOAD_{W, LOC=3, PH=4, CO=3, ACT=2}$	0.8	3.5	8.2	0.6	$\mu g/ft^2$	✓	Battelle 2007	i, o
Dependent on Vintage (Independent of Activity Types and Control Options)									
< 1940									
Background Loading	$DLOAD_{W, BG, VIN=1}$	0.1	0.6	5.7	1.4	$\mu g/ft^2$	✓	HUD 2002	k
Load-concentration Intercept	N/A	4.2	5.5	6.9	0.1	unitless	✓	See Appendix C	l
Load-concentration Slope	N/A	N/A	0.5	N/A	N/A	unitless		ICF Professional Judgment	l, m
1940 to 1959									
Background Loading	$DLOAD_{W, BG, VIN=2}$	0.1	0.3	4.1	1.3	$\mu g/ft^2$	✓	HUD 2002	k
Load-concentration Intercept	N/A	3.5	4.9	6.3	0.1	unitless	✓	See Appendix C	l
Load-concentration Slope	N/A	N/A	0.4	N/A	N/A	unitless		ICF Professional Judgment	l, m
1960 to 1979									
Background Loading	$DLOAD_{W, BG, VIN=3}$	0.1	0.2	1.7	0.9	$\mu g/ft^2$	✓	HUD 2002	k
Load-concentration Intercept	N/A	3	4.7	6.4	0.2	unitless	✓	See Appendix C	l
Load-concentration Slope	N/A	N/A	0.4	N/A	N/A	unitless		ICF Professional Judgment	l, m

Notes for Exhibit A-7. Inputs for Indoor Dust Calculations – Multiple Activities Example

a	The CV is equal to the standard deviation divided by the mean. Italicized CV values were pulled from existing data. Un-italicized CV values were calculated from the low, mid, and high values for each input. Bolded CV values were approximated because low and high values were not available. For the un-italicized CV values, either a normal or log-normal distribution was selected for each parameter based on the symmetry between the low, mid, and high input values, with normal better representing symmetric distributions and log-normal better representing highly skewed distributions. For the normal distribution, the mean was approximated as the mid value. Two estimates of the normal standard deviation were obtained by assuming that the low and high values were each two standard deviations from the mean. These two estimates were then averaged to obtain a single estimate of the standard deviation. For the lognormal distribution, the geometric mean was approximated as the mid value. The standard deviation was approximated by first taking the natural log of the low, mid, and high values (to convert to the normal distribution), then two estimates of the normal standard deviation were obtained by assuming that the low and high values were each two standard deviations from the mean. These two estimates were then averaged to obtain a single estimate of the standard deviation (σ). The log normal CV was then calculated using the following equation: CV= sqrt[($e^{(\sigma^2)}$]. For the bolded CV values, a CV could not be calculated because no low and high values were available. These CVs were approximated as 2, which represents a conservative CV estimate. See Appendix D for more details.
b	For the percentage of area that is carpeted, the low value (10%) and high value (90%) were chosen based on ICF professional judgment. The low value represents houses containing minimal or no wall-to-wall carpeting, but some area rugs. The high value represents houses containing wall-to-wall carpeting, except in the bathroom(s) and kitchen. The mid value (72%) was chosen based on personal communications with Michael Hilton, Carpet Buyer's Handbook and Carroll Turner, Carpet & Rug Institute. Turner noted that Floor Covering Weekly estimated the percentage of carpeted area in the home today as 62%. For 1997, Turner found a value of 70%. However, data about the percent carpeting in housing prior to 1978 was not available. Turner provided 72% as his professional best estimate of the percentage carpeted area in housing built prior to 1978.
c	The low, mid, and high cleaning frequencies were set to one cleaning every four weeks, one cleaning per week, and two cleanings per week respectively. These cleaning frequencies were chosen based on the values presented in USEPA (2006b), which is based on Simcox et al. (1995) and the 2000 HUD National Survey of Lead and Allergens in Housing (NSLAH). Based on data from Simcox et al. (1995), the USEPA (2006b) report estimated that 40% of households clean more frequently than weekly, 45% clean weekly, and 15% clean less frequently than weekly. The 2000 NSLAH indicated that 57% of the people in the survey reported cleaning within the past 6 days, 25% had not cleaned in the past 7-13 days, 10% had not cleaned in the past 14-20 days, 3% had not cleaned in the past 21 days, and 5% had not cleaned in the past 28 days. The NSLAH survey data do not necessarily represent the survey respondents' typical cleaning frequencies, but they do suggest that a significant number of homes are cleaned less frequently than once every two weeks.
d	Estimates for the % Area of Building Adjacent room for the Renovating kitchen activity are based on low, mid, and high values calculated from median square footage data for new family homes from National Association of Home Builders (NAHB) (2006) and the HomePlans (2007) Web site. The median house size from the earliest year that NAHB reported data (1970) was 1,385 ft^2, while the median house size in 1978 was 1,655 ft^2. The three smallest house plans (750 ft^2 to 1,000 ft^2) and the two largest house plans were selected from HomePlans (2007) Web site to represent the smaller size of older homes and the size of homes built closer to 1978, respectively. These five blueprints of new family homes from the HomePlans (2007) Web site do not include garages, porches, decks, and attics in the total square footage of the house. Based on this data it was assumed that the range of house sizes before 1979 was 750 ft^2 to 1,750 ft^2. Next the approximate size of the kitchen in the five floor plans was calculated. The percent of the building adjacent to the kitchen was calculated by adding up the areas of any room touching the workroom, except those that were strictly diagonally opposed. From these percentages, the low, mid, and high values were selected for the % Area of Building - Adjacent for the Renovating kitchen activity. This methodology is limited by the quality and representative nature of the floor plan diagrams, especially since the plans are for current day homes rather than pre-1979 homes. In addition, the data on house size does not include multifamily home or apartment data, and it is unclear whether mobile homes are incorporated.

Notes for Exhibit A-7. Inputs for Indoor Dust Calculations – Multiple Activities Example

e	Estimates for the % Area of Building - Workspace (PAW) for the Renovating kitchen activity are based on low, mid, and high values calculated from median square footage data for new family homes from National Association of Home Builders (NAHB) (2006) and the HomePlans (2007) Web site. The median house size from the earliest year that NAHB reported data (1970) was 1,385 ft^2, while the median house size in 1978 was 1,655 ft^2. The three smallest house plans (750 ft^2 to 1,000 ft^2) and the two largest house plans were selected from HomePlans (2007) Web site to represent the smaller size of older homes and the size of homes built closer to 1978, respectively. These five blueprints of new family homes from the HomePlans (2007) Web site do not include garages, porches, decks, and attics in the total square footage of the house. Based on this data it was assumed that the range of house sizes before 1979 was 750 ft^2 to 1,750 ft^2. Next the approximate size of the kitchen in the five floor plans was calculated. Then the percent of the house that was taken up by the kitchen was calculated for each floor plan. From these percentages, the low, mid, and high values were selected for the % Area of Building - Kitchen. This methodology is limited by the quality and representative nature of the floor plan diagrams, especially since the plans are for current day homes rather than pre-1979 homes. In addition, the data on house size does not include multifamily home or apartment data. It is also unclear whether mobile home data is incorporated.
f	Estimates for the % Area of Building - Adjacent are based on low, mid, and high values calculated from median square footage data for new family homes from National Association of Home Builders (NAHB) (2006) and the HomePlans (2007) Web site. The median house size from the earliest year that NAHB reported data (1970) was 1,385 ft^2, while the median house size in 1978 was 1,655 ft^2. The three smallest house plans (750 ft^2 to 1,000 ft^2) and the two largest house plans were selected from HomePlans (2007) Web site to represent the smaller size of older homes and the size of homes built closer to 1978, respectively. These five blueprints of new family homes from the HomePlans (2007) Web site do not include garages, porches, decks, and attics in the total square footage of the house. Based on this data it was assumed that the range of house sizes before 1979 was 750 ft^2 to 1,750 ft^2. Next, the approximate size of the each room in the five floor plans was calculated. The percent of the building adjacent to each room type was calculated by adding up the areas of any room touching the workroom, except those that were strictly diagonally opposed. From these percentages, the low, mid, and high values were selected for the % Area of Building - Adjacent. This methodology is limited by the quality and representative nature of the floor plan diagrams, especially since the plans are for current day homes rather than pre-1979 homes. In addition, the data on house size does not include multifamily home or apartment data, and it is unclear whether mobile homes are incorporated. It is important to note that many of the activities discussed in this document are not specific to one room in the house, so it is necessary to estimate percentages of the house that cover a range of possible rooms in which the work could take place. It is unclear whether these uncertainties would tend to lead to an under- or overestimate of the percentage of building that is a workspace.
g	Estimates for the % Area of Building - Workspace (PAW) was developed are based on low, mid, and high values calculated from median square footage data for new family homes from National Association of Home Builders (NAHB) (2006) and the HomePlans (2007) Web site. The median house size from the earliest year that NAHB reported data (1970) was 1,385 ft^2, while the median house size in 1978 was 1,655 ft^2. The three smallest house plans (750 ft^2 to 1,000 ft^2) and the two largest house plans were selected from HomePlans (2007) Web site to represent the smaller size of older homes and the size of homes built closer to 1979, respectively. These five blueprints of new family homes from the HomePlans (2007) Web site do not include garages, porches, decks, and attics in the total square footage of the house. Based on this data it was assumed that the range of house sizes before 1978 was 750 ft^2 to 1,750 ft^2. Next the approximate size of the each room in the five floor plans was calculated. The percent of each non-activity specific room (i.e., all rooms except the kitchen) to the total square footage of each floor plan was then calculated. From these percentages, the low, mid, and high values were selected for the % Area of Building - Workspace (PAW). This methodology is limited by the quality and representative nature of the floor plan diagrams, especially since the plans are for current day homes rather than pre-1979 homes. In addition, the data on house size does not include multifamily home or apartment data, and it is unclear whether mobile homes are incorporated. It is important to note that many of the activities discussed in this document are not specific to one room in the house, so it is necessary to estimate percentages of the house that cover a range of possible rooms in which the work could take place. It is unclear whether these uncertainties would tend to lead to an under- or overestimate of the percentage of home that is a workspace.
h	Adjacent Loading in the OPPT Dust Study (Battelle 2007) is measured in the Tool Room (an interior room immediately adjacent to the Work Room where workers might place equipment and materials needed for a job). The Post Work, Post Cleaning, and Post Verification sample types from the OPPT Dust Study correspond to different phases used in this approach (see Exhibit A-2).

Notes for Exhibit A-7. Inputs for Indoor Dust Calculations – Multiple Activities Example

i	Rest of Building Loading in the OPPT Dust Study (Battelle 2007) is measured in the Observation Room (an interior room adjacent to the Tool Room but not the Work Room), which represents other areas of the house impacted by RRP work. The Post Work, Post Cleaning, and Post Verification sample types from the OPPT Dust Study correspond to different phases used in this approach (see Exhibit A-2).
j	Workspace Loading in the OPPT Dust Study (Battelle 2007) is measured in the Work Room (where the RRP work was performed). The Post Work, Post Cleaning, and Post Verification sample types from the OPPT Dust Study correspond to different phases used in this approach (see Exhibit A-2).
k	The National Survey of Lead and Allergens in Housing (NSLAH) (HUD 2002) provided the Pb loading data that were used to estimate background indoor dust Pb concentrations. The NSLAH data set was selected from a number of potential studies, which are described in the Risk Analysis to Support Standards for Lead in Paint, Dust, and Soil (USEPA 1998), including the HUD National Survey of Lead-Based Paint in Housing (NSLBPH), HUD Grantees Evaluation of HUD Lead-Based Paint Hazard Control Grant Program ("HUD Grantees"), Lead-Based Paint Abatement and Repair & Maintenance (R&M) Study in Baltimore, and the Rochester Lead-in-Dust Study. The HUD (2002) data set was selected based on a study design that provides data that are representative of all housing groups throughout the U.S. and focused on homes with children (HUD 2002). It is also the largest and most recent survey completed that used wipe samples in accordance with ASTM E1728-95 (USEPA 1998).
l	The Load-concentration Intercept and Load-concentration Slope were determined through ICF analysis. Please see Appendix C for a more detailed discussion of this analysis.
m	There were no low and high values for the Load-concentration Slope, however a CV of 2 was deemed too high. Therefore, the Load-concentration Slope CV was estimated by setting the CV equal to the Load-concentration Intercept CV.
n	Post Work loading represents the total loading which occurs within the course of an activity and is defined by the post-work loading measurements from Battelle (2007). This likely results in an overestimate of exposure during the Renovation exposure period because loading increases as the activity progresses.
o	The Post-Renovation (Routine Cleaning) phase is defined by post cleaning data from the OPPT Dust Study (Battelle 2007) when only baseline cleaning is implemented (i.e., Base Control Option and Control Option 2). When verification cleaning is implemented (i.e., Control Options 1 and 3), the Post-Renovation (Routine Cleaning) phase is defined by the post verification data from the OPPT Dust Study (Battelle 2007).
p	The value for this input variable is the same in both the single activity example and the multiple activities example.

REFERENCES

Battelle. 2007. Draft Final Report on Characterization of Dust Lead Levels after Renovation, Repair, and Painting Activities. Prepared by Battelle (Columbus, OH) for the Office of Pollution, Prevention, and Toxics (Washington, D.C.). January 23.

Choe, K.T.; Trunova, M.; Grinshpuna, S.A.; Willekea, K.; Harneya, J.; Trakumasa, S.; Mainelisa, G.; Bornscheina, R.; Clarka, S.; and Friedmanb, W. 2000. Particle Settling After Lead-Based Paint Abatement Work and Clearance Waiting Period. *American Industrial Hygiene Association.* 61: 798-807.

Hilton Personal Communication. 2007. Personal Communication between A.J. Overton of ICF International and Michael Hilton of the Carpet Buyers Handbook on February 13, 2007.

HomePlans Web site 2007. Floor plans numbered BRF-752, H-7861, B-1611 - Unit C, B-86160, and HDS-99-142. Available via the HomePlans Web site at: www.homeplans.com. Accessed February 21, 2007.

National Association of Home Builders. 2006. Characteristics of New Single Family Homes Completed, 1970 – 2005. Spreadsheet dated June 15, 2006. Available via the NAHB website at http://www.nahb.org/page.aspx/category/sectionID=130. Accessed February 21, 2007.

Simcox, N. J.; Fenske, R.A.; Wolz, S.A.; Lee, I.C.; and Kalman, D.A. 1995. Pesticides in household dust and soil: exposure pathways for children of agricultural families. *Environmental Health Perspectives.* 103 (12): 1126-1134.

Turner Personal Communication. 2007. Personal Communication between A.J. Overton of ICF International and Carroll Turner of the Carpet & Rug Institute on February 14, 2007.

U.S. Dept. of Housing and Urban Development (HUD). 2002. National Survey of Lead and Allergens in Housing: Final Report, Revision 6. Office of Lead Hazard Control. October 31. Available at: http://www.hud.gov/offices/lead/techstudies/survey.cfm#natsurvey.

U.S. Environmental Protection Agency (USEPA). 1998. Risk Analysis to Support Standards for Lead in Paint, Dust, and Soil. Office of Pollution, Prevention, and Toxics. EPA 747-R-97-006.

U.S. Environmental Protection Agency (USEPA). 2000. Economic Analysis of Toxic Substances Control Act Section 403: Lead-Based Paint Hazard Standards. EPA's Office of Pollution Prevention and Toxics. Economics, Exposure, and Technology Division. Economic and Policy Analysis Branch. December 21.

U.S. Environmental Protection Agency (USEPA). 2006a. AirData: Access to Air Pollution Data through the Air Quality Systems (AQS) database. Available at: http://www.epa.gov/air/data.

U.S. Environmental Protection Agency (USEPA). 2006b. Economic Analysis for the Renovation, Repair and Painting Program Proposed Rule. Office of Pollution, Prevention, and Toxics

Appendix B. Development of Routine Cleaning Efficiencies

B. DEVELOPMENT OF ROUTINE CLEANING EFFICIENCIES

The studies cited in the Economic Analysis for the Renovation, Repair and Painting Program Proposed Rule (USEPA 2006) were examined for cleaning efficiency data. Cleaning efficiency results for lead dust varied considerably in these sources. These studies were usually structured to find—and did find—differences between cleaning methods, most only for one cleaning (often referred to as a cleaning iteration). Since the population of interest might use many cleaning methods, the USEPA 2006 analysis used the range of percent lead dust removed from these first cleanings to represent the typical cleaning efficiency removal range. Besides the cleaning ranges due to different cleaning methods, the USEPA 2006 analysis also split the efficiency results by those for hard-surface flooring, e.g., vinyl, hardwood, etc., versus those for carpet. These removal efficiencies were then assumed to be the same for all subsequent cleaning iterations. For example, a cleaning cycle with 90% efficiency would mean that 90% of the original dust loading would be removed by the first cleaning, then 90% of the remainder removed by the next cleaning, etc.

Further examination of the efficiency data sources revealed information to refine the constant-value approach used above. In particular, trends in efficiency differences became apparent that were not due to cleaning method or hard surface/carpet characteristics: newly applied dust from a single event (aka acute dust) had different removal rates compared to in situ (aka chronic) dust, e.g., that from floors contaminated over time, and cleaning efficiencies appeared to be positively correlated to the dust loading, especially so for newly generated/applied dust on hard surfaces. Because of these observations, an attempt was made to select data from those studies whose conditions most closely matched those for dust generated from renovation activities.

This appendix describes the two methodologies that were used to determine routine cleaning efficiencies: the primary methodology and the alternative methodology. This appendix outlines how these methodologies were developed from available empirical data. Detailed discussion of the primary methodology is in Section B.1 below; Section B.2 describes in detail the alternative methodology. Each Section further describes differences in the respective methodologies for hard-surface flooring versus carpet.

B.1. Primary Methodology

B.1.1 Hard Surfaces

For the hard-surface floors, there were two studies where "manufactured" dust had been added, and two studies where lead paint dust was generated from renovation activities. Of the two studies where lead paint dust was generated from renovation activities, the Environmental Field Sampling Study (USEPA 1997) sampled from new hard-surface flooring panels installed next to the work area, whereas the Evaluation of the Clean-up of Lead Paint Dust in Houses by the Canadian Mortgage and Housing Corporation (CMHC 1995) sampled previously contaminated flooring in various conditions—extensively-damaged to good. Since the characteristics of the second study made it impossible to determine dust caused by the renovation activity versus older dust from contamination, and because the variable floor conditions further confounded sampling, those study results were not used.

Of the studies with added dust, A Comparison of Post-Renovation and Remodeling Surface Cleaning Techniques by Clemson Environmental Technologies Laboratory (CETL 2001) used lead paint dust, whereas the Canadian Mortgage and Housing Corporation's Effectiveness of Clean-up Techniques for Leaded Paint Dust (CMHC 1992) used dust from renovation debris—both sets of dust were crushed to pass a 60 mesh sieve, with finer lead stearate dust added to the latter before application to the test floors. The study with the renovation dust, however, acknowledged that the lead stearate had a different particle-size distribution from the rest of the dust, which may have confounded the test results, so results from that study were not used in this review.

For the primary methodology, hard surface cleaning efficiencies were developed based on data presented in the Environmental Field Sampling Study (EFSS), Volume I: Table 8D-3 (USEPA, 1997). Pre-cleanup Pb loadings and associated cleaning efficiencies were extracted from this table and grouped into ranges of pre-cleanup loadings and the associated ranges of cleaning efficiencies. The groupings developed are presented in Exhibit B-1.

Exhibit B-1. Pre-Cleaning Pb Loading and Associated Cleaning Efficiencies for Hard Surfaces [a]

Pre-Cleaning Pb Loading (µg/ft^2)	Range of Estimated Cleaning Efficiencies (%)
94 to 197	-38 to 25%
1,129 to 1,155	25 to 68%
14,200 to 35,000	99%
171,000 to 196,000	> 99%

[a] Data adapted from USEPA (1997).

These data were processed as follows to generate the routine cleaning efficiencies for hard surfaces for the primary methodology (see Exhibit B-2):

- Based on the lowest range of pre-cleaning Pb loadings, routine cleaning efficiencies for loadings between 0 and 200 µg/ft^2 were developed. 0% efficiency was assumed to be the minimum efficiency for this range, 25% was assumed to be the maximum efficiency based on the highest efficiency from U.S. EPA (1997) for this range, and the average of the low and high efficiencies (13%) was assumed to be the mid-range efficiency.

- Based on the gap between the lowest and second lowest ranges of pre-cleaning Pb loadings, routine cleaning efficiencies for loadings between 200 and 1,100 µg/ft^2 were developed. 13% efficiency was assumed to be the minimum efficiency for this range based on the mid-range value for the lower range, 47% was assumed to be the maximum efficiency based on the mid-range value for the next highest range, and the average of the low and high efficiencies (25%) was assumed to be the mid-range efficiency.

- Based on the second lowest range of pre-cleaning Pb loadings, routine cleaning efficiencies for loadings between 1,100 and 1,200 µg/ft^2 were developed. 25% efficiency was assumed to be the minimum efficiency for this range based on the minimum efficiency for this range from U.S. EPA (1997), 68% was assumed to be the maximum efficiency based on the highest efficiency from U.S. EPA (1997) for this range, and the

average of the low and high efficiencies (47%) was assumed to be the mid-range efficiency.

- Based on the gap between the second and third lowest ranges of pre-cleaning Pb loadings, routine cleaning efficiencies for loadings between 1,200 and 14,000 µg/ft^2 were developed. 68% efficiency was assumed to be the minimum efficiency for this range based on the high value for the next lower range, 99% was assumed to be the maximum efficiency based on the value for the next highest range, and the average of the low and high efficiencies (84%) was assumed to be the mid-range efficiency.

- For all Pb loadings greater than 14,000 µg/ft2, it was assumed that the cleaning efficiency was equal to 99% based on the data for the highest loadings from U.S. EPA (1997).

Exhibit B-2. Pb Loading and Associated Cleaning Efficiencies for Hard Surfaces Used in the Primary Methodology [a]

Pb Loading (µg/ft^2)	Absolute Cleaning Efficiency		
	Low	***Mid***	High
< 200	0%	***13%***	25%
200 – 1,100	13%	***25%***	47%
1,100 – 1,200	25%	***47%***	68%
1,200 – 14,000	68%	***84%***	99%
> 14,000	99%	***99%***	99%

[a] Data adapted from USEPA (1997).

The Mid values in Exhibit B-2 (highlighted with bold italics) were used in the primary methodology calculations.

It is important to note that there is significant uncertainty associated with the cleaning efficiencies presented in U.S. EPA (1997). The authors of this study note that while the decreases in Pb loadings from pre- to post-cleaning are statistically significant for samples taken closest to the activity (which represent the highest pre-cleaning loadings), there are few samples taken farther from the activity (which represent the lower end of the pre-cleaning Pb loadings) with statistically significant decreases in Pb loadings. Given that many of the Pb loadings used in this approach are towards the lower end of loadings covered by the U.S. EPA (1997), these estimated cleaning efficiencies must be considered highly uncertain. This is recognized as a limitation of this approach. This approach attempted to address this uncertainty by analyzing the CETL 2001 data mentioned above as a separate alternative methodology which is described in Section B.2 below.

B.1.2 Carpet

The trends in cleaning efficiency mentioned above for hard surface flooring—the apparent differences between efficiencies for newly applied dust versus in situ dust and cleaning efficiencies positively correlated to the dust loading—were not as clear for carpeted flooring. Considering the greater variability of carpet surface area compared to hard surface flooring, this was not unexpected. For this reason, efficiency results from a study with sequential cleanings of

carpets with in situ dust: Cleanup of Lead in Household Carpet and Floor Dust (Ewers et al. 1994) were considered in addition to the added-dust studies (on carpet) of CMHC 1992 and CETL 2001. However, the CMHC study had the previously-mentioned problem of lead stearate of finer particle size than the rest of the dust, so its results were not used in this review.

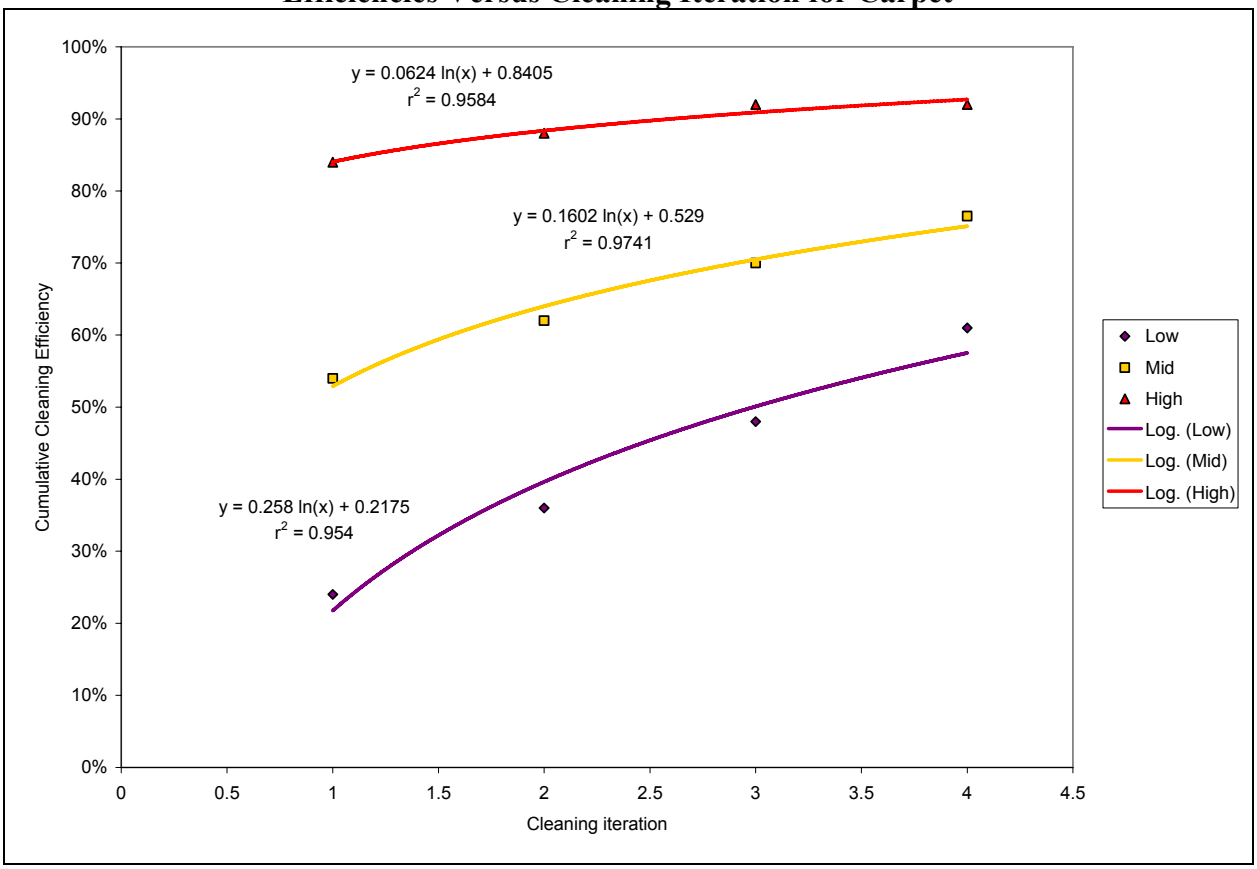
For the primary methodology, carpet cleaning efficiencies were developed based on data presented in two studies: Ewers et al. 1994 and CETL 2001. These studies provide ranges of cumulative cleaning efficiencies for different cleaning iterations, as summarized in Exhibit B-3.

Exhibit B-3. Cleaning Iterations and Associated Cleaning Efficiencies for Carpet Used in the Primary Methodology

Cleaning Iteration	Cumulative Cleaning Efficiency	
	Ewers et al. 1994	CETL 2001
1	24 to 63%	66 to 84%
2	36 to 78%	70 to 88%
3	48 to 85%	75 to 92%
4	61 to 89%	79 to 92%

The study designs were somewhat different, with the Ewers et al. 1994 study focused on the cleaning efficiency of in situ Pb in dust and the CETL (2001) study focused on the cleaning efficiency of added dust. For each cleaning iteration, the lowest cleaning efficiency across the two studies (which was always from Ewers et al. 1994) was used to define low-end efficiencies, the highest cleaning efficiency across the two studies (which was always from CETL 2001) was used to define high-end efficiencies, and the average across the low and high values was used to define the mid-range efficiencies. These three sets of data points (low, mid, and high) were each fit with a lognormal regression to develop a relationship between cleaning efficiencies and cleaning iteration (see Exhibit B-4) to help smooth the progression of efficiencies across cleaning iterations. These regression equations were then used to estimate cumulative cleaning efficiencies for cleaning iterations 1 through 4.

Exhibit B-4. Plot of Low, Mid, and High Cumulative Cleaning Efficiencies Versus Cleaning Iteration for Carpet [a]



[a] Data adapted from Ewers et al. 1994 and CETL (2001).

In order to be used for the primary methodology, these cumulative cleaning efficiencies were then converted to absolute cleaning efficiencies, which are presented in Exhibit B-5. The mid-range values (highlighted in bold italics) were used in the primary methodology calculations.

Exhibit B-5. Cleaning Iterations and Associated Cleaning Efficiencies for Carpets Used in the Primary Methodology[a]

Cleaning Iteration	Absolute Cleaning Efficiency		
	Low	***Mid***	High
1	22%	***53%***	84%
2	23%	***24%***	27%
3	17%	***18%***	22%
4	15%	***16%***	20%

[a]Adapted from Ewers et al. 1994, Figure 3; and CETL 2001.

It is important to note that the difference in design of the two studies, with Ewers et al. 1994 focused on in situ dust and CETL (2001) focused on added dust, likely contributes to the differences in estimated efficiencies for the two studies. In situ dust is more likely to be firmly embedded in the carpet than recently added dust and this may explain why the Ewers et al. efficiencies are consistently lower. In addition, they do not reflect the newly-added (acute) dust circumstances from renovation activities; secondly, the accuracy of the efficiency values are

questionable, since the total amount of lead dust in the carpet is unknown. The cleaning efficiencies developed in the alternative methodology, described below; only considered the CETL (2001) data for this reason.

B.2. Alternative Methodology

B.2.1 Hard Surfaces

For the alternative methodology, cleaning efficiency data for hardwood floors from the 2001 Clemson Environmental Technologies Laboratory (CETL) study were analyzed. These data are presented on page 105 of the CETL (2001) document, in the section titled "Statistical Summary of Carpet Plugs, Carpet Filters, and Hardwood Wipes." The CETL 2001 study measured the change in loadings over four subsequent cleaning iterations for a variety of cleaning methods. The lowest loadings observed in CETL 2001 were generally at least an order of magnitude higher than the lead dust levels in this report, so there was considerable uncertainty in determining representative cleaning efficiencies for the measured dust data. To calculate cleaning efficiencies in the alternative methodology, the arithmetic means of the arithmetic mean, min, and max samples were calculated across the different cleaning methods and cleaning iterations. These data were then used to calculate three lognormal regressions for cleaning efficiency versus Pb loading for the arithmetic mean, min, and max data sets. These regressions (presented below) were then used to predict cleaning efficiency for a given loading.

Arithmetic Mean:

Absolute cleaning efficiency = $0.1154 * ln(Loading) - 0.5822$ **(Eq. B-1)**
($R^2 = 0.9481$)

Minimum:

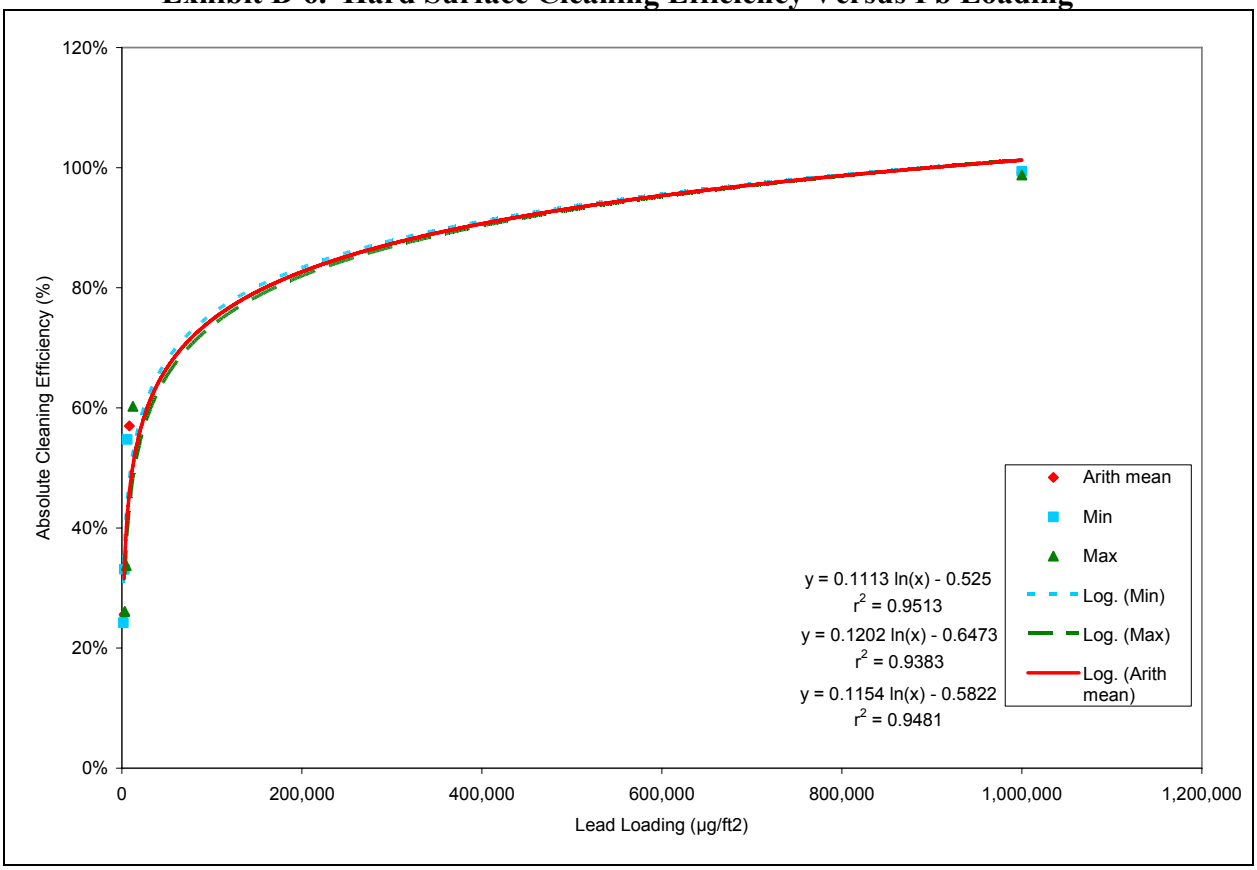
Absolute cleaning efficiency = $0.1113 * \ln(Loading) - 0.525$ **(Eq. B-2)**
($R^2 = 0.9513$)

Maximum:

Absolute cleaning efficiency = $0.1202 * \ln(Loading) - 0.6473$ **(Eq. B-3)**
($R^2 = 0.9383$)

When applying these regressions, a minimum efficiency of 1% and a maximum efficiency of 99% was assumed in order to prevent the regression equation from predicting zero or 100% efficiency. The data points and regression equations are presented in Exhibit B-6.

Exhibit B-6. Hard Surface Cleaning Efficiency Versus Pb Loading [a]



[a] Data adapted from CETL (2001).

There are two primary limitations of these data and the associated regressions. First, the regressions are based on a limited number of data points with a very narrow range of Pb loadings covered. Each experiment performed for this analysis started with approximately the same Pb loading (1,000,000 µg/ft^2), which limits the applicability of this study to other loadings. Second, the exact initial loading data were not available and thus it was assumed that the desired initial loading of 1,000,000 µg/ft^2 was achieved, which appears unlikely given the range of initial loadings measured for the CETL (2001) carpet analysis (described below), which used a similar loading technique.

B.2.2 Carpet

Cleaning efficiency data for carpet presented on page 107 of the CETL (2001) study in the section titled "Statistical Summary of Carpet Plugs, Carpet Filters, and Hardwood Wipes," was analyzed to calculate carpet cleaning efficiencies in the alternative methodology. Carpet cleaning efficiencies were available for both filter and carpet plug samples. Carpet plug samples were selected for this analysis because they were considered to be more reflective of the total Pb loading in the carpet and thus more appropriate for this approach.

To calculate cleaning efficiencies from the carpet plug data, the arithmetic means of the arithmetic mean, min, and max samples were calculated across the different cleaning methods

and cleaning iterations. These data were then used to calculate three lognormal regressions for cleaning efficiency versus cleaning iteration for the arithmetic mean, min, and max data sets. These regressions (presented below) were then used to predict cleaning efficiency for a given cleaning iteration.

Arithmetic Mean:

Absolute cleaning efficiency = -0.4366 * ln(*CleanIteration*) + 0.673 **(Eq. B-4)**
(R^2 = 0.9316)

Minimum:

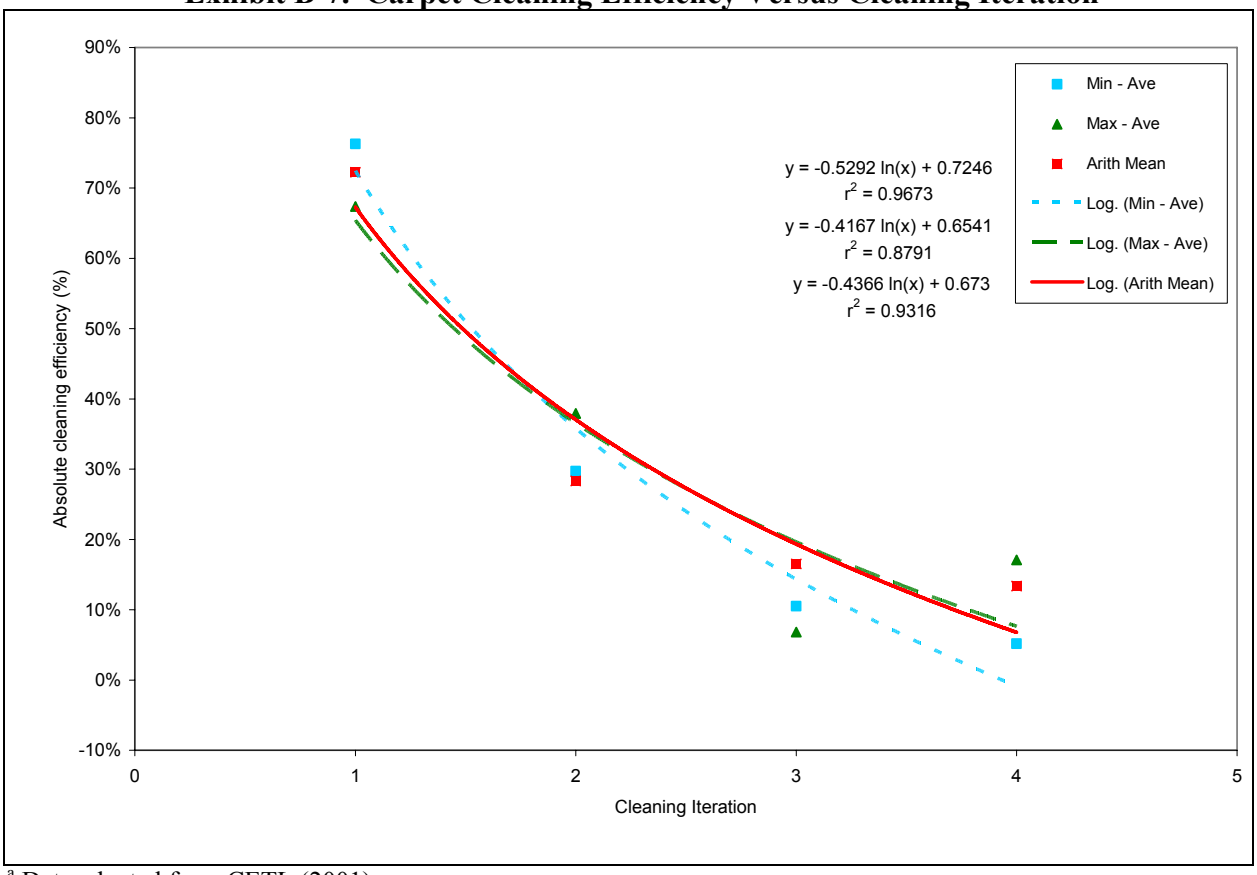
Absolute cleaning efficiency = -0.5292 * ln(*CleanIteration*) + 0.7246 **(Eq. B-5)**
(R^2 = 0.9673)

Maximum:

Absolute cleaning efficiency = -0.4167 * ln(*CleanIteration*) + 0.6541 **(Eq. B-6)**
(R^2 = 0.8791)

When applying these regressions, a minimum efficiency of 1% and a maximum efficiency of 99% was assumed to prevent the regression equation from predicting 0% or 100% efficiency. The data points and regression equations are presented in Exhibit B-7.

Exhibit B-7. Carpet Cleaning Efficiency Versus Cleaning Iteration [a]



[a] Data adapted from CETL (2001).

Fitting a regression for the relationship between carpet cleaning efficiency and Pb loading was also considered (see Exhibit B-8), but the relationship resulted in cleaning efficiencies of zero for fairly high Pb loadings (~100,000 $\mu g/ft^2$), which was not consistent with other data sources reviewed. The relationship between cleaning efficiency and cleaning iteration was more consistent with the available data and was therefore selected for this analysis.

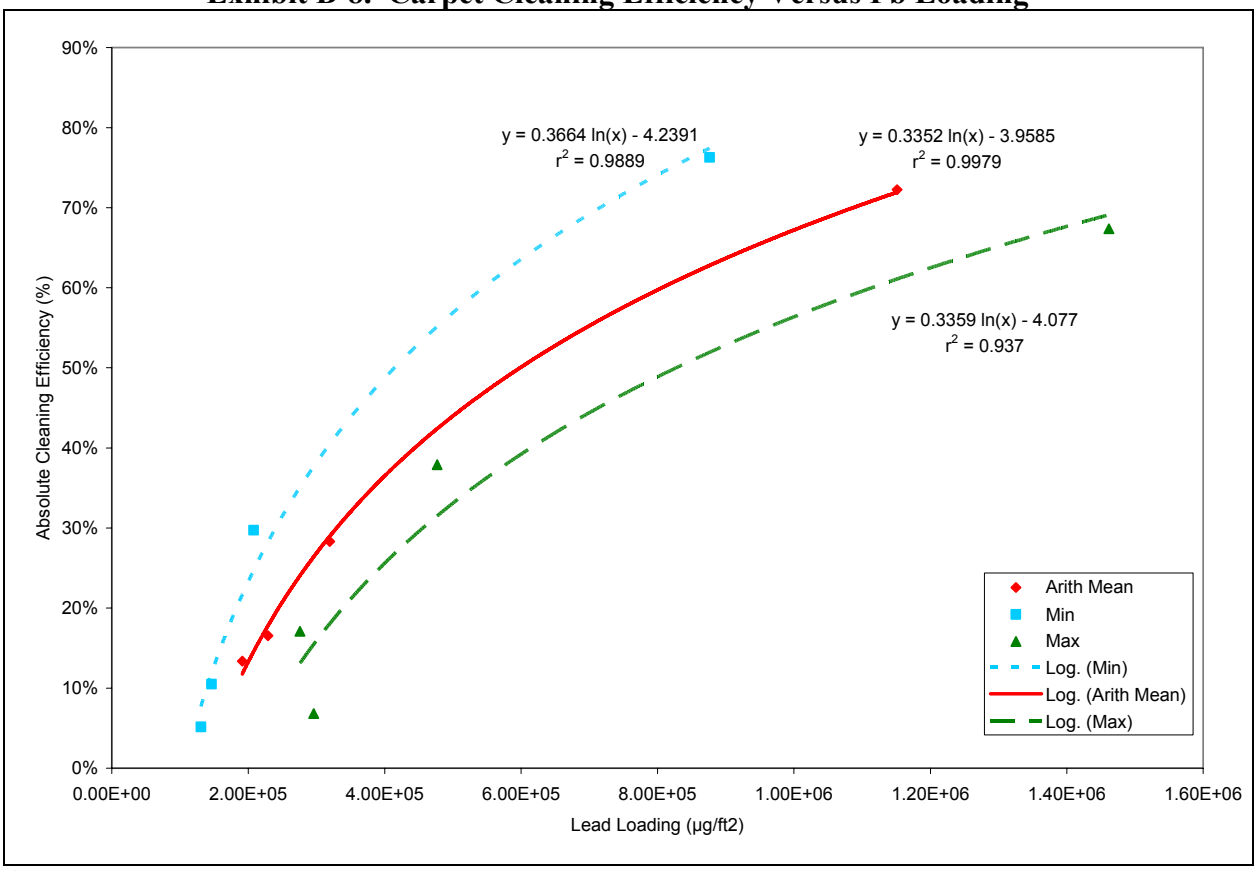
The primary limitation of these data and the associated regressions is that the regressions are based on a limited number of data points with a very narrow range of Pb loadings and cleaning iterations covered. As was the case for the hardwood floor analysis, each experiment performed for the carpet analysis started with approximately the same Pb loading (1,000,000 $\mu g/ft^2$), which limits the applicability of this study to other loadings.

Instead of the range values used previously, this alternative analysis used the average differences in loadings over four subsequent cleaning iterations for a variety of cleaning methods. The lowest loadings reported were generally at least an order of magnitude higher than the lead dust levels in this assessment, so there was considerable uncertainty in determining representative cleaning efficiencies for the measured dust data.

It is important to note that there are very few studies of Pb dust cleaning efficiencies that are appropriate for the purposes of this approach. With this in mind, this approach identified studies that were appropriate, but may have some significant limitations, such as limited data sets and/or significant uncertainties.

The primary methodology and the alternative methodology were compared by performing a sensitivity analysis (see Section E.3).

Exhibit B-8. Carpet Cleaning Efficiency Versus Pb Loading [a]



[a] Data adapted from CETL (2001).

REFERENCES

Canadian Mortgage and Housing Corporation (CMHC). 1992. Effectiveness of Clean-up Techniques for Leaded Paint Dust. Canadian Mortgage and Housing Corporation, Research Division.

Canadian Mortgage and Housing Corporation (CMHC). 1995. Evaluation of the Clean-up of Lead Paint Dust in Houses. Canadian Mortgage and Housing Corporation, Research Division.

Clemson Environmental Technologies Laboratory (CETL). 2001. A Comparison of Post-Renovation and Remodeling Surface Cleaning Techniques. Prepared for EPA's Office of Pollution, Prevention, and Toxics. December 14.

Ewers, L.; Clark, S.; Menrath, W.; Succop, P.; and R. Bornschein. 1994. Clean-up of lead in household carpet and floor dust. *Journal of the American Industrial Hygiene Association*. 55 (7): 650-657. July.

U.S. Environmental Protection Agency (USEPA). 1997. Lead Exposure Associated with Renovation and Remodeling Activities: Environmental Field Sampling Study, Volume I: Technical Report. Prepared by Battelle (Columbus, OH) for the Office of Pollution Prevention and Toxics (Washington, D.C.). EPA 747-R-96-007.

U.S. Environmental Protection Agency (USEPA). 2006. Economic Analysis for the Renovation, Repair and Painting Program Proposed Rule. Office of Pollution, Prevention, and Toxics.

Appendix C. Method Used to Convert Pb Loadings to Concentrations

C. METHOD USED TO CONVERT PB LOADINGS TO CONCENTRATIONS

This appendix describes the method used in this approach to convert Pb loadings to concentrations. Section C.1 describes the data used to derive the dust loading-dust concentration models. Sections C.2 and C.3 describe data and correlation analyses. Section C.4 discusses the types and design of the regression models, and Section C.5 discusses the limitations of the data set used and uncertainties in the dust Pb concentration models. Section C.6 provides detailed regression results.

C.1. Source of Dust Pb Loading and Dust Concentration Data

Data on the relationship between dust Pb loading and concentration were gathered as part of the HUD National Survey of Lead-Based Paint in Housing conducted between November 1989 and 1990 (USEPA 1995). This survey provides the largest data set the document's authors are aware of that used a vacuum sampler, and recorded the mass of collected dust, thus allowing the dust lead levels to be expressed as either dust lead concentrations or dust lead loadings. In addition, the survey was designed to include a nationally representative sample of houses of varying age, and thus could be used to evaluate temporal trends in Pb occurrence and concentration.

The goal of the survey was to obtain information on the presence and condition of LBP, soil, and dust Pb loading, and concentrations as well as other household data, from a representative national sample of 300 private homes and 100 public housing facilities (USEPA 1995). The data used to derive relationships between dust loading and Pb concentration in this approach came from the 284 private households that were ultimately sampled during the survey. The data are tabulated in Appendix C of U.S. EPA's 1998 "Section 403" risk analysis (USEPA 1998). The survey included houses that contained lead-based paint and some that did not. The data elements include:

- Building construction date (vintage) in three ranges (<1940, 1940 to 1959, and 1960 to 1979);
- Vacuum [Blue Nozzle (BN)] floor dust Pb loading, $\mu g/ft^2$;
- Blue nozzle dust Pb concentration, µg/g;
- Vacuum window sill dust loading, $\mu g/ft^2$;
- Average yard soil dust Pb concentration, µg/g; and
- Maximum interior and exterior X-ray fluorescence (XRF) Pb concentration, mg/cm^2.

The data set also included a set of sampling weights developed by U.S. EPA designed for extrapolation of the survey sample results to U.S. private residences as a whole. Floor dust Pb loading and concentration values were household averages, generally of three samples taken at different locations in the sampled household. Prior to HUD's averaging of individual samples from a particular house, samples with either high dust lead concentration (exceeding 100,000 ppm) or high dust loadings (exceeding 2000 $\mu g/ft^2$) were excluded from the data set. Also, the Pb concentration values in samples with low tap weights (dust loading derived using sampling weights) were corrected for systematic bias (USEPA 1995); this correction affected relatively few samples.

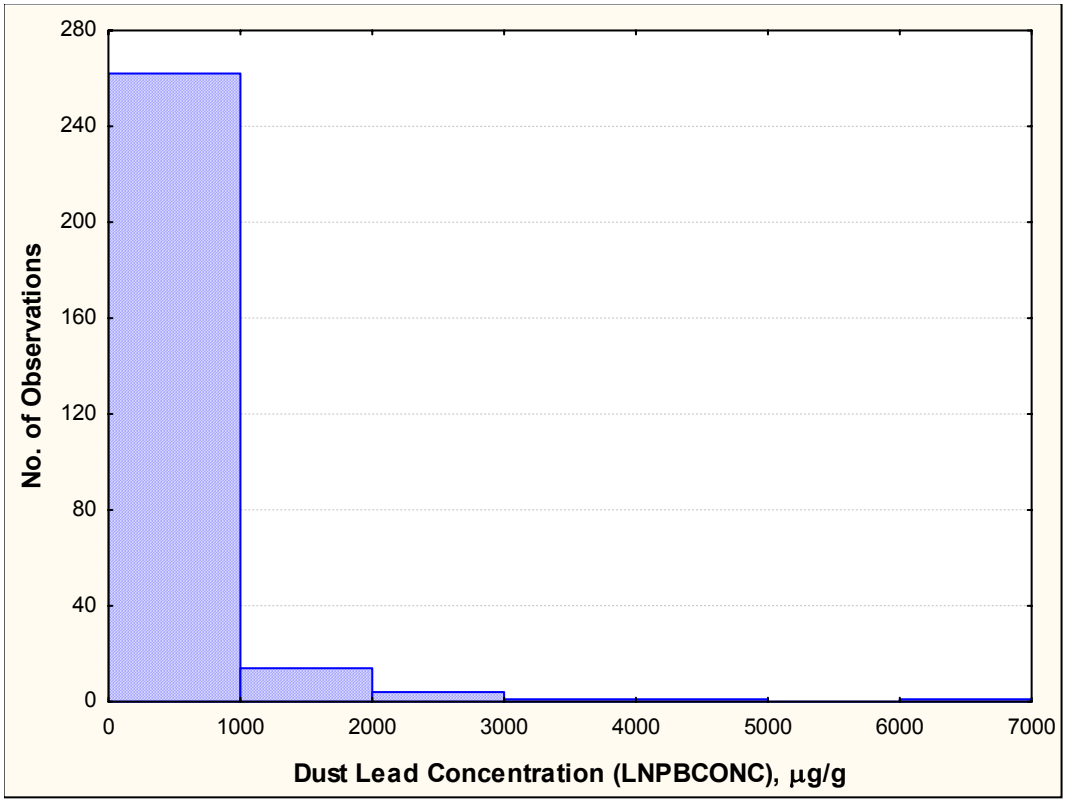
Because wipe samples have become the preferred technique to measure Pb dust loading, EPA also calculated equivalent wipe sample loading estimates for each household based on the vacuum sample results. The conversion was accomplished using regression results derived from several previous studies of relative sampling method performance (USEPA 1997). Owing to the added level of uncertainty introduced by the vacuum-wipe sample conversion, the wipe sample results were not used in this analysis. Instead, as described below, regression models were developed that related the vacuum dust loading results from the HUD National Survey to dust Pb concentrations.

C.2. Preliminary Data Analysis

Data analyses were focused primarily on vacuum dust Pb loading and Pb concentration data, but other variables were also examined for possible correlations with dust Pb concentration. Data from the 1998 Risk Analysis were imported into Excel 2003™ and Statistica™ Version 7. Reported values for individual variables were examined graphically (e.g., histograms, stem-and-leaf plots) for outliers and discrepant values. Probability plots and goodness-of-fit tests were used to test individual variable distributions for normality.

As is commonly the case with environmental sampling data, the distributions of dust Pb loading and Pb concentrations were both highly skewed (Exhibits C-1 and C-2.) Normal probability plots of the log-transformed data appeared to be approximately normal (Exhibits C-3 and C-4), except that there appeared to be outliers in both the low and high "tails" of the log-transformed dust Pb concentration data (Exhibit C-3). As discussed below, the majority of observations in the tails came from houses constructed between 1960 and 1979.

Exhibit C-1. Distribution of Pb Concentration Data, HUD National Housing Survey (USEPA 1995) [a]



[a] Exhibit C-1 omits one data point at 50,400 µg/g.

Goodness-of-fit tests suggested that the log-transformed Pb loading and concentration data from the data set taken as a whole were nearly, but not perfectly, lognormal. The relatively less sensitive single-sample Kolgmorgorov-Smirnov (K-S) test tended to give p-values indicating consistency with the normal distribution of the log-transformed dust loading and Pb concentration data; however, the more sensitive Lilliefors and Shapiro-Wilks W tests gave low p-values, indicating the lack of a good "fit" to the normal distribution (Exhibit C-5, top panels.)

Exhibit C-2. Distribution of Vacuum Dust Pb Loading, HUD National Housing Survey (USEPA 1995)

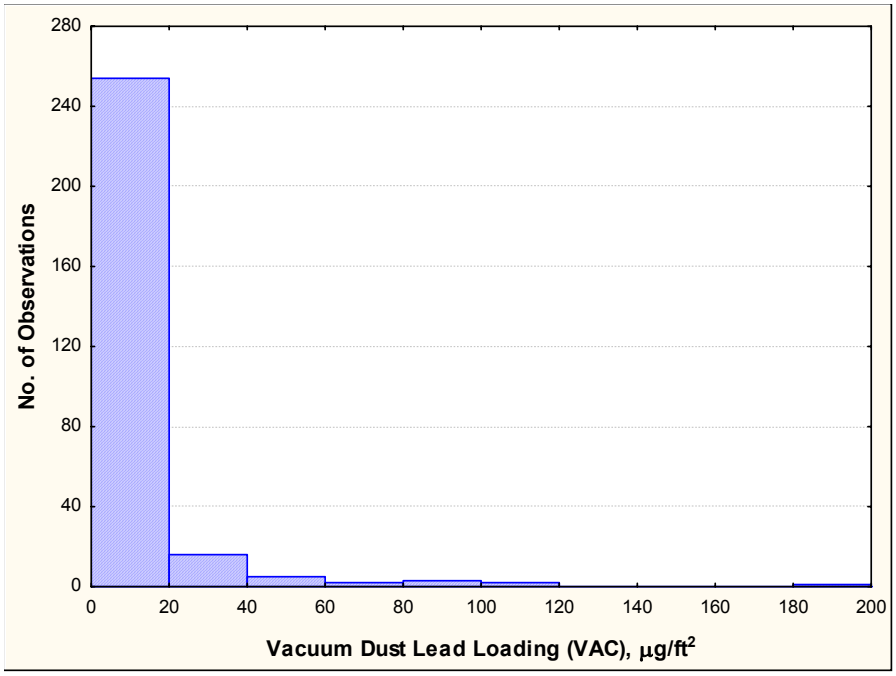


Exhibit C-3. Normal Probability Plot of Log-Transformed Dust Pb Concentration Data

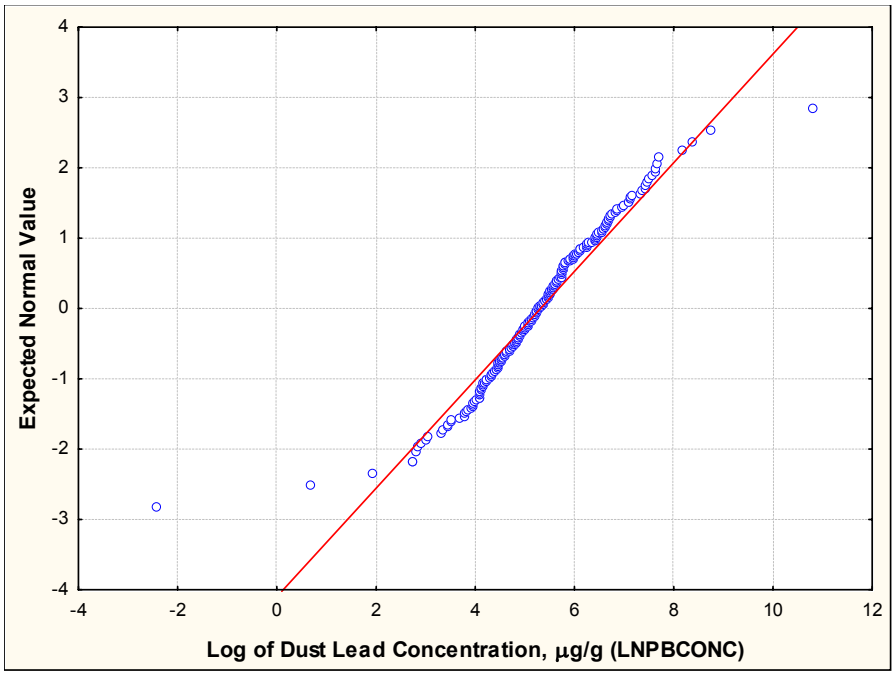
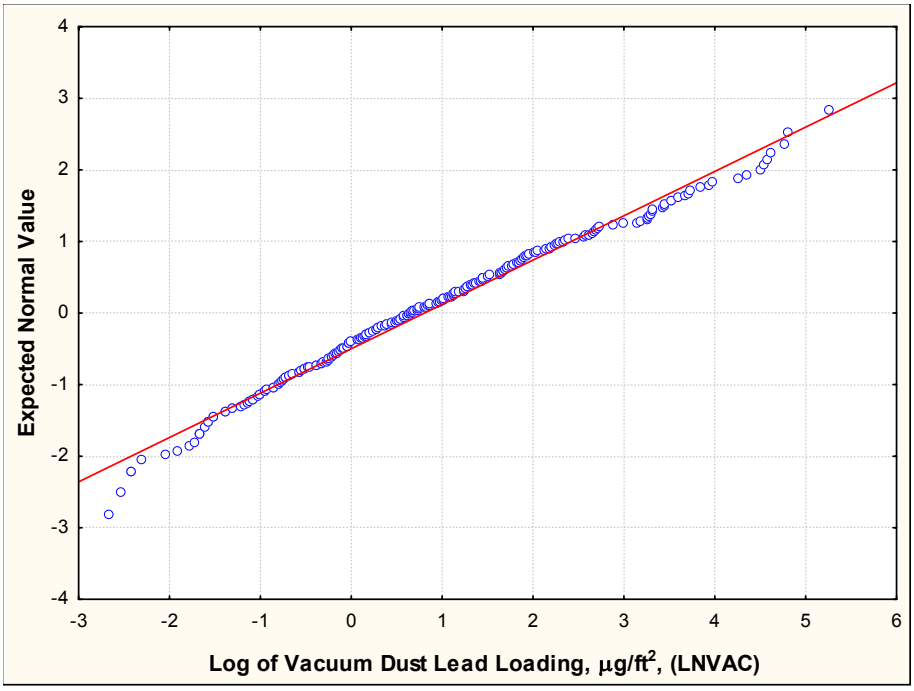


Exhibit C-4. Normal Probability Plot of Log-Transformed Vacuum Dust Pb Loading Data



The distributions of the dust loading and dust concentration data were also evaluated separately by vintage because of the possible differences in the distributions of dust loading and dust concentration data across the three building vintage strata. Of the 284 valid observations, 77 were obtained from houses constructed prior to 1940, 87 came from houses constructed between 1940 and 1959, and 120 came from houses constructed between 1960 and 1979.

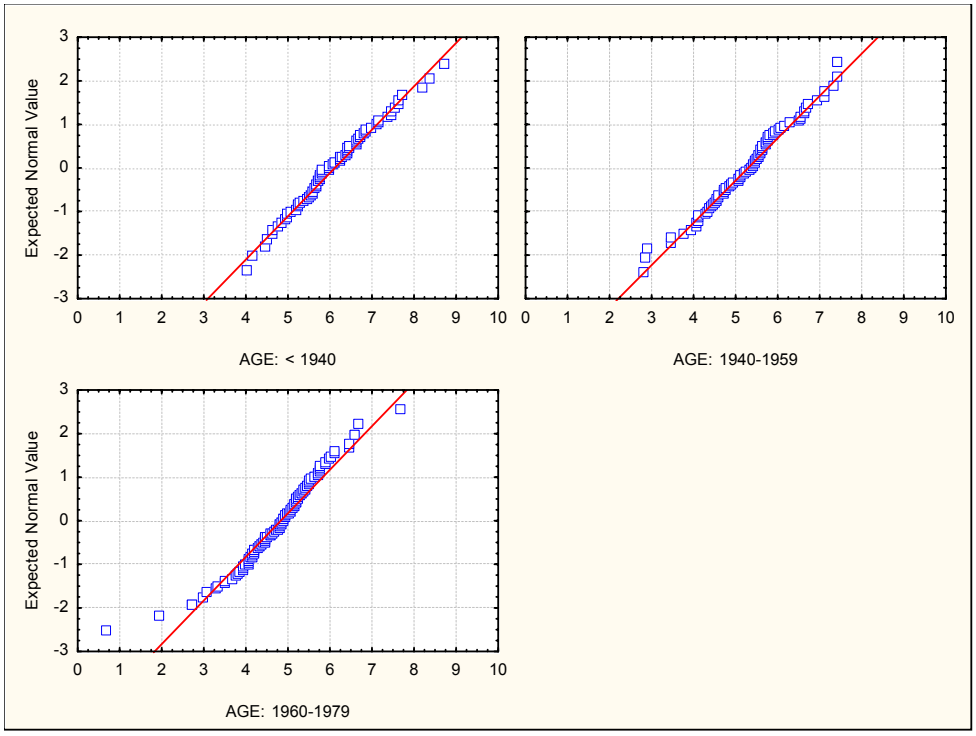
It can be seen from the goodness-of fit test results in the lower panels of Exhibit C-5 that stratifying the data resulted in more nearly normal distributions of both log-transformed dust Pb concentration and dust loading. Some of the apparent improvement is due to the smaller number of observations in the stratified data sets. However, the improvement in normality is also apparent in the increased linearity of the probability plots of the two variables. Removal of the two extreme (outlying) values from the Pb concentration data sets (the very low value from the prior to 1940 data and the very high value from the 1960 to 1979 stratum) also resulted in additional improvements to the normality of the data (Exhibit C-6.) These values, were, however retained in the following evaluation of multivariate correlations.

Exhibit C-5. Goodness-of-Fit Test Results (p-values) for Log-Transformed Dust Loading and Dust Concentration Data [a]

Variable	K-S	Lilliefors	Shapiro-Wilks W
Combined Data			
LNVAC	> 0.20	> 0.20	0.01
LNPBCONC	< 0.10	< 0.01	0.000
Combined Data (minus outlying values)			
LNVAC	> 0.20	> 0.20	0.03
LNPBCONC	< 0.20	< 0.01	0.02
<1940			
LNVAC	> 0.20	> 0.20	0.66
LNPBCONC	< 0.20	< 0.01	0.000
<1940 (minus outlying value)			
LNVAC	> 0.20	> 0.20	0.69
LNPBCONC	> 0.20	> 0.20	0.71
1940 - 1959			
LNVAC	> 0.20	> 0.20	0.75
LNPBCONC	> 0.20	> 0.20	0.35
1960 to 1979			
LNVAC	> 0.20	> 0.20	0.04
LNPBCONC	> 0.20	< 0.01	0.000
1960 to 1979 (minus outlying value)			
LNVAC	> 0.20	> 0.20	0.17
LNPBCONC	> 0.20	< 0.15	0.000

[a] Low p-values indicate poor fit to the normal (Gaussian) distribution.

Exhibit C-6. Probability Plots of Log-Transformed Pb Concentration Data for the Three Building Vintage Strata (Outliers Removed)



Observations on other variables (window sill vacuum dust loading, outdoor soil Pb concentration, and interior and exterior XRF results) also tended to be skewed, and were therefore log-transformed prior to exploration of multivariate correlations.

C.3. Correlation Analysis

In preparation for model building, correlations between potential explanatory variables and dust Pb concentration were examined. While the intent was to construct a model that predicts dust Pb concentrations from dust loading, it is important to know if any other variables in the data are also highly correlated with dust concentration or loading. Exhibit C-7 summarizes the simple product moment correlation coefficients seen in the combined data set with dust Pb concentration and log-transformed dust Pb concentration.

Exhibit C-7. Correlations Between Potential Explanatory Variables, Dust Pb Concentration (PBCONC), and Log-Transformed Dust Concentration (LNPBCONC) [a]

Variable	PBCONC	LNPBCONC
AGEGRP	0.00	-0.34*
LBP	0.05	0.24*
VACLOAD	0.49*	0.54*
LNVAC	0.26*	0.66*
SILLVAC	0.03	0.15*
LNSVAC	0.04	0.32*
YARD	0.03	0.32*
LNYARD	0.03	0.45*
INTXRF	0.02	0.34*
LNINTXRF	-0.02	0.36*
EXTXRF	0.02	0.28*

[a] A* indicates simple correlation coefficients significant at $p < 0.05$. See text for explanations of variable names.

It is clear that a number of variables, in addition to vacuum dust loading (VACLOAD), are highly correlated with dust Pb concentration when the data set is examined as a whole. The correlations are generally much higher when the log-transformed variables are used. This is to be expected, since log-transformation reduces the impact of the skew in the variables as described earlier, and allows underlying relationships to be more clearly seen.

It is important to note that building vintage (AGEGRP) is negatively correlated with dust Pb concentration, as would be expected if the extent of LBP usage decreased, and the overall state of repair improved, with more recent construction. A dummy variable for the observed presence of LBP, log-transformed sill vacuum dust Pb loading (LNSVAC), log-transformed average yard soil Pb concentration (LNYARD), and interior and exterior XRF readings were also found to be correlated with house dust Pb concentration. These latter variables were also highly correlated with housing vintage, raising the question as to whether there was actually an independent effect of building age that was not already captured by differences in sill dust loadings, soil Pb concentrations, and XRF readings.

Omitting the extreme high and low dust Pb concentration values from the data set resulted in a substantial increase in the magnitude of the correlation coefficient between the log-transformed Pb dust concentration (LNPBCONC) and building vintage (AGE GRP) from -0.34 to -0.47. Omitting these outlying values also slightly increased the magnitude of the correlations between LNPBCONC and most of the other variables in Exhibit C-7. The correlation between LNPBCONC and log-transformed vacuum dust loading (LNVAC) remains strong within each of the individual building vintage strata (Exhibit C-8.) Most of the other variables retain their significant correlations to the log-transformed Pb concentration within the individual vintage strata, but the magnitude of the correlations varies. Correlations with LNPBCONC are generally weaker in the 1960 to 1979 data than in the other strata.

Exhibit C-8. Correlations with Log-Transformed Pb Concentration (LNPBCONC) Within Individual Building Vintage Strata [a]

Variable	<1940	1940 to 1959	1960 to 1979
LBP	0.04	0.24*	0.20*
VAC LOAD	0.45*	0.54*	0.58*
LNVAC	0.62*	0.70*	0.57*
SILLVAC	0.16	-0.12	0.08
LNSVAC	0.30*	0.23*	0.25*
YARD	0.24	0.36*	0.15
LNYARD	0.41*	0.45*	0.16
INT XRF	0.30*	0.36*	0.13
LNINTXRF	0.35*	0.27*	0.13
EXT XRF	0.15	0.42*	0.14

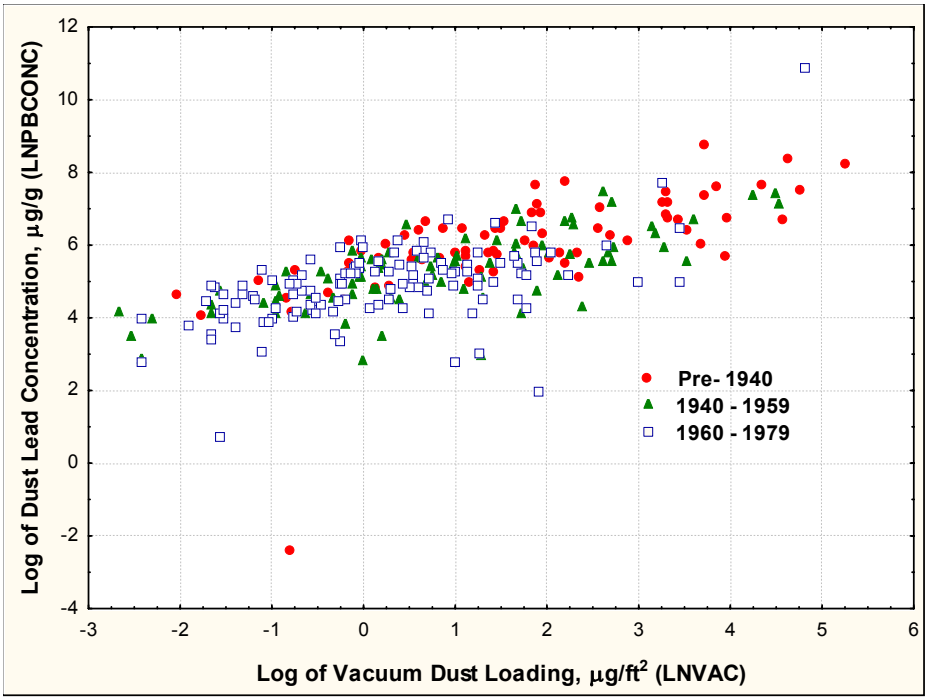
[a] A * indicates simple correlation coefficients significant at $p < 0.05$.

Removing the low value from the <1940 Pb dust concentration data increases the magnitude of the correlation between LNVAC and LNPBCONC (from 0.62 to 0.73). Removing the high Pb concentration value from the 1960 to 1979 data, in contrast, reduces this correlation from 0.57 to 0.49.

C.4. Regression Modeling

A plot of log-transformed dust Pb concentration against log-transformed vacuum dust loading (Exhibit C-9) suggested that a linear regression model (in this case, log-log) might provide a good fit to the data. Data for the three building vintage strata cluster fairly tightly, with data from newer age strata having slightly lower values of both LNPBCONC and LNVAC than the data from <1940 houses. Pb concentration values from the newer houses (1960 to 1979) also appear to be somewhat more variable than the values for the other age strata.

Exhibit C-9. Plot of Log-Transformed Dust Pb Concentration Against Log-Transformed Vacuum Dust Pb Loading



As noted above, it has already been demonstrated that two values in the Pb concentration data set (at the upper right and lower left corners of Exhibit C-9) appear to be "outliers," that is, they seem to fall outside the distribution of the other Pb concentration values. As part of the model development, these (and other) data points were tested to determine if these would be disproportionately influential in determining the results of a linear regression.

In a univariate regression of LNPBCONC on LNVAC, the two outlying data points appeared to be quite influential; Cook's distances[a] for these data points were 0.20 and 0.19, respectively, more than three times the next highest value, compared to a median value across the data points of 0.003. However, these values are not extreme in and of themselves; Cook's distances greater than 1.0 are generally considered to be an indication of undue influence of single data points (Kleinbaum et al. 1998).

When the data are stratified, however, the low and high outlying points are found to be very influential in determining regression results. In a LNPBCONC – LNVAC linear regression for the <1940 data, the Cook's distance for the lowest Pb dust concentration value was 1.05, compared to a next highest value of 0.05. In the univariate regression on the 1960 to 1979 data, the calculated Cook's distance for the highest dust Pb concentration data point was 1.19, compared to a next highest value of 0.19. These results indicate that in both cases the overall result of the regression is being strongly influenced by the outlying values. Thus, these data points are omitted from the regressions discussed below.

[a] Cook's distances reflect the relative influence of individual data points on the results of a regression. In general, it is desirable for Cook's distances to be nearly equal for all data points (Kleinbaum et al. 1998).

C.4.1 Univariate Models

Log-log regression models were first run in which LNPBCONC was fit to LNVAC only. Models were run for the combined data set and for the stratified data sets. Results of the models are summarized in Exhibit C-10. Detailed regression outputs are provided in Section C.6.

Exhibit C-10. Univariate Regression Results: LNPBCONC as a Function of LNVAC [a]

Model Data Set	Variable	Coefficient	SE Coefficient	t-statistic	p-value	F-Statistic, p-level	Adjusted R^2
All Vintages Combined	Intercept	5.37	0.05	111.2	0.000	F(1,272)=230.40 p<0.000	0.46
	LNVAC	0.49	0.03	15.2	0.000		
<1940	Intercept	6.34	0.05	127.4	0.000	F(1,187)=210.06 p<0.000	0.53
	LNVAC	0.45	0.03	14.5	0.000		
1940 to 1959	Intercept	5.30	0.05	104.2	0.000	F(1,189)=175.82 p<0.000	0.48
	LNVAC	0.44	0.03	13.3	0.000		
1960 to 1979	Intercept	4.74	0.05	102.6	0.000	F(1,344)=87.771 p<.000	0.20
	LNVAC	0.35	0.04	9.37	0.000		

[a] Regressions were performed using the national weight values from the HUD survey data (USEPA 1998); LNVAC (log-transformed vacuum Pb loading) values were centered at their means.

In all cases, the regression results (F-statistics) are highly significant. The LNVAC coefficients are likewise significant. Both the intercept and LNVAC coefficients decrease with newer building vintages. The 1960 to 1979 model explains a considerably smaller proportion of the variance in LNPBCONC (R^2 of 0.20) than the models derived from older houses and from the data set as a whole (R^2 on order of 0.5). This suggests a weaker and less consistent relationship between dust loading and concentration in newer houses, perhaps because of a decreased contribution from interior LBP and higher contributions from exterior sources.

C.4.2 Multivariate Models

A number of multivariate models were also tested to determine which, if any, of the other variables in the data set might also explain significant proportions of the variance in the log-transformed dust Pb concentration data. Forward and backward stepwise procedures were used to identify variables for which regression coefficients retained significance in the presence of other covariates, and which appeared to explain appreciable proportions of the variance in LNPBCONC in multivariate models. The results of these analyses are summarized in Exhibit C-11.

Exhibit C-11. Multivariate Regression Results: LNPBCONC as a Function of LNVAC and Other Variables [a]

Model/Data Set	Variable[b]	Coefficient	SE of Coefficient	t-statistic	p-value	F-Statistic, p-level	Adjusted R^2
All Vintages Combined	Intercept	4.43	0.17	26.6	0.00	F(3,257)=108.17 p<0.0000	0.55
	LNALL CNT	0.39	0.03	11.9	0.00		
	LNYARD	0.20	0.04	5.71	0.00		
	LNINTXRF	0.12	0.05	2.30	0.02		
<1940	Intercept	5.00	0.25	20.1	0.00	F(3,177)=132.13 p<0.0000	0.69
	LNV1 CNT	0.45	0.03	17.3	0.00		
	LNYARD	0.19	0.04	4.92	0.00		
	LNINTXRF	0.22	0.03	6.59	0.00		
1940 to 1959	Intercept	4.03	0.19	21.0	0.00	F(2,180)=134.08 p<0.0000	0.59
	LNV2 CNT	0.39	0.03	12.3	0.00		
	LNYARD	0.28	0.04	6.84	0.00		
1960 to 1979	Intercept	4.24	0.17	24.34	0.00	F(2,343)=49.323 p<0.0000	0.22
	LNV3 CNT	0.34	0.04	9.15	0.00		
	LNYARD	0.14	0.05	2.98	0.00		

[a] Regressions were performed using the national weight values from the HUD survey data (USEPA 1998).
[b] Variables: LNALL CNT = centered LNVAC for combined data set, LNYARD = log-transformed average yard soil Pb concentration (μg/g); LNINTXRF = log-transformed interior paint XRF Pb concentration (mg/cm^2); LNV1(2,3) CNT = centered LNVAC for each building vintage stratum.

When analyzing the combined data set, the inclusion of two additional variables (log-transformed yard soil Pb and log-transformed interior XRF Pb concentration) results in an increase in R^2 to 0.55, compared to 0.46 for the model containing vacuum dust loading alone. Similar increases in R^2 are achieved with the inclusion of additional variables into the models for the stratified data. The R^2 value for the <1940 model increases from 0.53 to 0.69 when log-transformed soil Pb and interior XRF readings are included. In the 1940 to 1959 regression, only log-transformed outdoor soil retains significance when LNVAC is also included, resulting in an increase in R^2 from 0.48 to 0.59. Including LNYARD in the regression on the 1960 to 1979 data increases R^2only from 0.20 to 0.22, and no other variable retains significance in this model.

These results are consistent with a situation where both outdoor soil Pb levels and indoor LBP concentrations influence the observed dust Pb concentrations in the HUD survey data, where the influence of indoor LBP concentration is weaker in homes built more recently. As always, however, care should be taken in drawing causal inferences from this type of analysis. The physical mechanisms responsible for the observed correlations cannot be inferred with any degree of certainty based on the regression analysis alone.

C.4.3 Selection of Models for the Prediction of Dust Pb Concentrations

The preceding analyses provide the basis for selecting dust Pb concentration model(s) for this approach. In this approach, exposure estimates are being developed for RRP activities. Data for this approach is available, including information concerning the relationship between exposure factors and building vintage. The availability of these data supports the use of dust Pb concentration models developed for each building vintage stratum from the HUD National

Survey. In the approach outlined in this document, separate dust loading estimates are derived, and separate dust loading-concentration models are applied, to each building vintage where RRP activities are assumed to occur.

The question arises as to whether the univariate (dust loading only) or multivariate models should be used. Arguably, the multivariate models explain a larger proportion of the variance in Pb concentration, and could thus, in theory, provide more reliable and precise predictions. However, to use the multivariate models, it is necessary to have information not only on the dust Pb loading levels associated with each (hypothetical) renovation activity, but also to have values for the other variates (soil Pb concentrations and, for the two older strata, maximum interior XRF readings.) Estimates of these values are not available from the data sources used to derive dust loading estimates in the approach. While it would be defensible to use the mean values of the missing variates (from the HUD survey data) when generating predictions, doing so might (1) introduce additional bias into the dust concentration estimates and/or (2) provide a deceptively precise estimate of dust Pb concentration, since the statistical prediction limits for the multivariate models are narrower than those for the univariate models.

C.4.4 Dust Pb Concentration Model Equations and Prediction Limits

Exhibit C-12 summarizes the prediction equations and their coefficients derived from the HUD National Survey data. The models predict LNPBCONC based solely on LNVAC. For each data set (combined, <1940, 1940 to 1959, and 1959-1970), coefficients are provided for predicting the geometric mean dust Pb concentration and for estimating the upper and lower 95% statistical prediction limits. The prediction limits provide an estimate of the expected precision of the predicted dust Pb concentrations, given the assumptions embodied in the regression models.

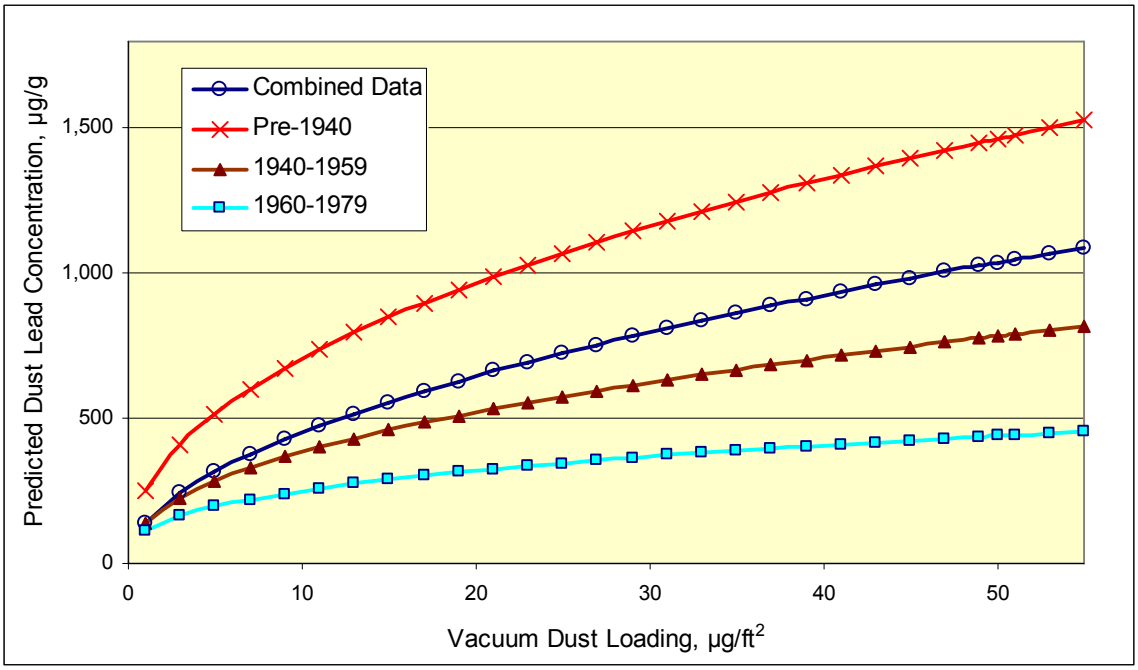
Exhibit C-12. Dust Pb Concentration Prediction Equations and Prediction Limits

Building Vintage	Estimate	Model Coefficients[a]	
		Intercept	Slope
Combined Data Set	Predicted Dust Concentration	4.92	0.52
	95% Upper Prediction Limit	6.58	0.52
	95% Lower Prediction Limit	3.26	0.52
Pre - 1940	Predicted Dust Concentration	5.51	0.45
	95% Upper Prediction Limit	6.87	0.45
	95% Lower Prediction Limit	4.16	0.45
1940 - 1959	Predicted Dust Concentration	4.93	0.44
	95% Upper Prediction Limit	6.33	0.44
	95% Lower Prediction Limit	3.54	0.44
1960 - 1979	Predicted Dust Concentration	4.71	0.35
	95% Upper Prediction Limit	6.40	0.35
	95% Lower Prediction Limit	3.01	0.35

[a] Prediction equation: LNPBCONC, µg/g = Intercept + Slope * LNVAC, µg/ft^2.

While the prediction equations are linear in "log-space," they are not linear in terms of the predicted concentration of dust Pb as a function of dust Pb loading. Exhibit C-13 shows the prediction equations derived from the combined data and from each age stratum.

Exhibit C-13. Predicted Geometric Mean Dust Pb Concentrations as a Function of Dust Pb Loading; Models Derived from Different Building Vintage Strata

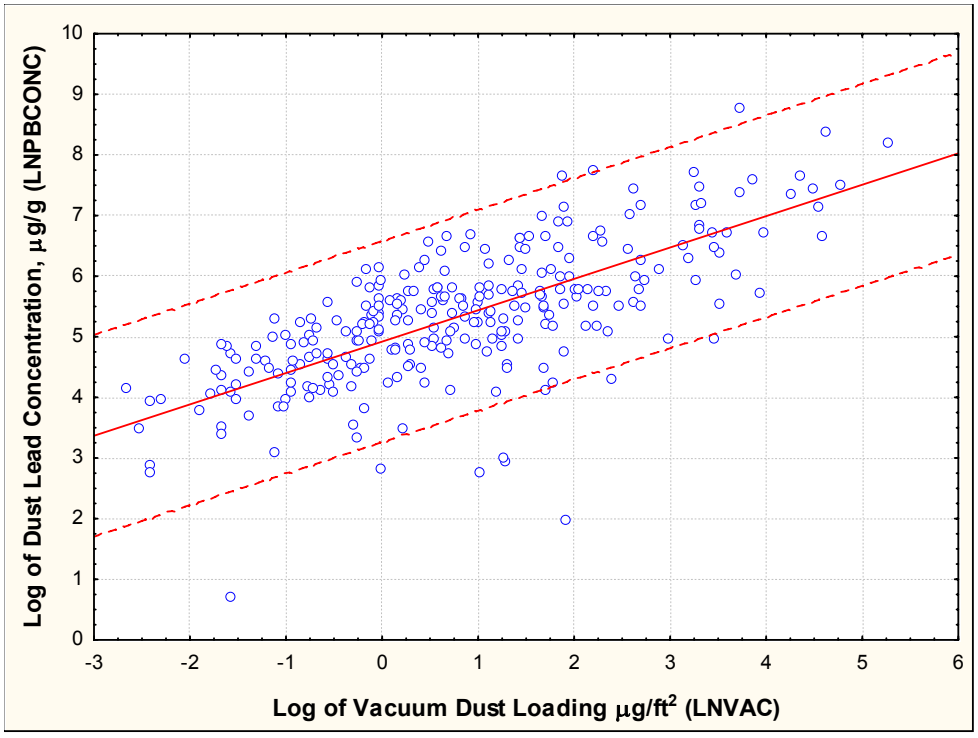


It can be seen that the range of dust Pb concentration predictions generated by the different models becomes increasingly divergent with increasing dust Pb loading. For a dust loading of 5 µg/ ft^2, the predicted dust concentrations range from 195 µg/g (1960 to 1979 data) to 515 µg/g (<1940 data). For a dust loading input of 50 µg/ft^2, the range of predicted dust concentrations is 440 to 1450 µg/g, with the models derived from the newest and oldest subsets of the data again generating the lowest and highest predictions, respectively.

Statistical prediction limits provide another indication of the expected degree of uncertainty associated with the dust Pb concentration estimates.[b] Note that in all cases (Exhibit C-12) the log-transformed models and their prediction limit equations have the same slope, and differ only in their intercepts. That is, the width of the log-transformed prediction limits is constant, as shown in Exhibit C-14. This is equivalent to saying that the ratio of the upper to lower prediction limits remains constant across the range of dust loading inputs.

[b] Prediction limits are the 95 percent normal confidence limits around a predicted LN (dust Pb) concentration at given value of LN (dust loading).

Exhibit C-14. Prediction Equation and Prediction Limits Derived from the Combined HUD Survey Data (USEPA 1995) (Log-Transformed)



Because of the log-transformation of the data, the widths of the predictions limits (upper minus lower limit) vary with the input dust loading concentrations. At low dust loading, the dust Pb concentration limits are relatively narrow, expressed in units of µg/g increasing at higher dust loading (Exhibit C-15.)

Exhibit C-15. Dust Concentration Prediction Limits As a Function of Dust Loading (µg/g)

Data Set	Prediction Limit	Dust Loading, µg/ft^2						
		0.14	0.37	1.0	2.7	7.4	20.1	54.6
All Vintages Combined	Upper	257	416	674	1,096	1,786	2,918	4,780
	Lower	11	18	29	47	76	123	199
<1940	Upper	NA[a]	617	965	1,515	2,384	3,763	5,955
	Lower	NA[a]	40	64	101	159	250	392
1940 to 1959	Upper	232	358	556	866	1,351	2,116	3,325
	Lower	14	22	34	54	84	129	200
1960 to 1979	Upper	298	423	601	858	1,229	1,766	NA[a]
	Lower	10	14	20	29	41	58	NA[a]

[a] NA = insufficient data in this range of dust loading for this model.

These values provide a rough guide for judging the uncertainty associated with estimates of dust concentrations from dust loading. Ratios of the upper to lower prediction limits range from about 15 (<1940 vintage) to approximately 30 (1960 to 1979 vintage), reflecting the varying level of variability in the data used to derive the models. Another way of expressing the width of the prediction limits is to say that the upper and lower limits are within approximately 3.9 to 5.4-fold of the predicted geometric mean dust concentrations depending upon which subset of data are included.

Note that the prediction limits do not capture all of the uncertainty in the dust loading-concentration models. As discussed below, the overall uncertainty in the dust Pb concentration predictions also depends on assumptions regarding the quality and representativeness of the data.

C.5. Limitations and Uncertainty in Dust Pb Concentration Models

C.5.1 Limitations of the Data Set

As noted at the beginning of this appendix, the HUD National Survey provides the largest publicly available data set containing simultaneous measurements of vacuum dust loading and dust Pb concentration, along with other environmental Pb measurements, from a nationally representative sample of private residences. There are enough (284) observations to support the development of dust loading-concentration models both for the data set as a whole and for the individual building vintage strata <1940, 1940 to 1959, and 1960 to 1979 (77, 87, and 120, respectively). Sample collection and analysis techniques were consistent across the survey, and laboratory quality assurance procedures were stringent and fully documented. Potential biases in dust Pb concentration measurements in "low tap weight" samples were identified and suspect samples were eliminated from the data set (USEPA 1996). Nonetheless, the data set has some limitations as the basis for predicting dust Pb concentrations.

Potential uncertainties associated with the representativeness of the data cannot be quantified, but may be substantial. There is no guarantee that the Pb hazard characteristics of building undergoing renovation will necessarily be the same as those in the HUD survey. For example,

the HUD survey was conducted in 1989 to 1990, and the physical characteristics of houses with Pb paint hazards surviving to the present may be different from those surveyed 18 years ago (perhaps a result of better upkeep and maintenance). In addition, there may be other (unknown) reasons why the characteristics of houses currently being renovated are systematically different from those in the 30 counties sampled by HUD. On the other hand, there is no reason to suspect that such differences would substantially bias the relationship between dust Pb loading and concentration.

As noted above, the technical quality of the data set appears to be quite good. The data on the whole are reasonably "well-behaved," in that log-transformation results in symmetric, near-Gaussian distributions for most variables. Two observations, one with a very low dust Pb concentration (0.1 μg/g) and one with a very high value (50,400 μg/kg) were identified as "outliers" and were found to be unduly influential in the regression models for the <1940 and 1960 to 1979 data sets, respectively. These observations were omitted from the regression models, which had the effect (in both cases) of reducing the estimated regression coefficients for LNVAC by about 10 percent, while improving the regularity of the regression residuals.

The issue of potential errors in the measurements of dust loading has been raised in past analyses of dust Pb sampling studies (USEPA 1997). If measurement errors are significant, there is the potential that the estimated regression coefficients and standard errors may be biased and inaccurate. While there are a number of approaches that can be used to address errors in variables, it was not necessary to employ any special methods in this approach. The major justification for not doing so is the assumption that the dust loading inputs for this approach will be subject to roughly the same errors as the loading estimates on which the regression models were based. To the extent that the errors in these two sets of measurements are systematically different, then the regression coefficients may be biased.

C.5.2 Limitations and Uncertainties in Dust Pb Models

The most important choices with regard to model design were the decisions to log-transform the variables and employ log-log regression as the primary analytical technique. As noted above, log-transformation resulted in much more symmetrical, nearly Gaussian distributions for all (non-categorical) variables. The least well-behaved of the important explanatory variables was LNPBCONC, where there appeared to still be a slight deviation from (log) normality in the extreme "tails" of the data.

No other simple model form was found that provided better qualitative or quantitative fits to the dust loading-concentration data than the log-log multiple regression approach. Plots of regression residuals (Section C.6) showed little evidence of deviations from linearity or heteroscedasticity (non-uniformity of residual variance). The coefficient of determination (R^2) values were quite high (>0.46) for all of the univariate regressions except that derived from the 1960 to 1979 subset of the data (0.20).

All of the models are sufficient to develop reasonably reliable estimates of dust concentration from dust loading inputs, although the statistical confidence limits for these predictions are quite wide. A higher degree of scatter in the data from buildings built between 1960 and 1979 is

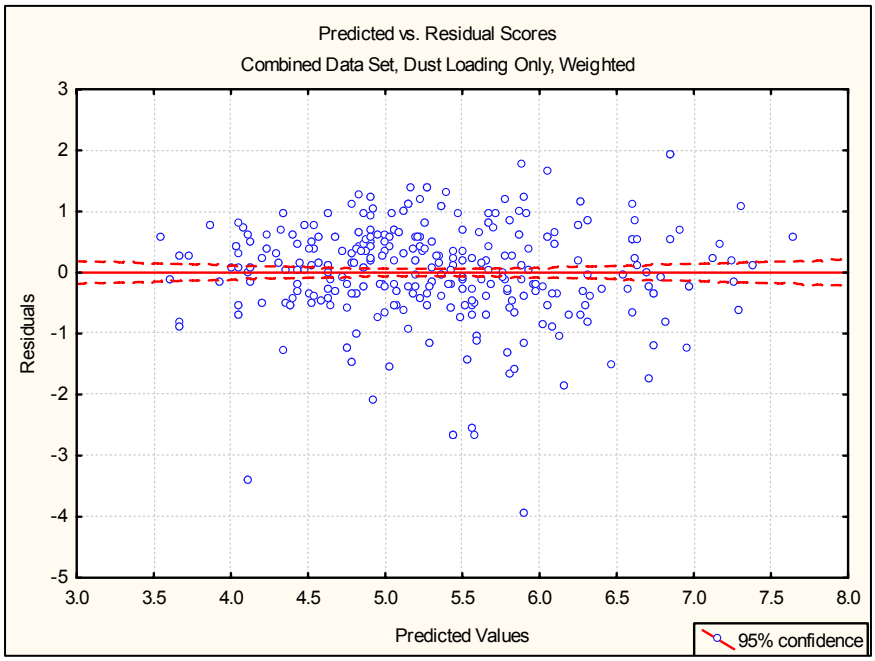
reflected in broader prediction limits for that regression. Also, the statistical confidence limits do not capture the full extent of uncertainty associated with potential non-representativeness of data or other data limitations.

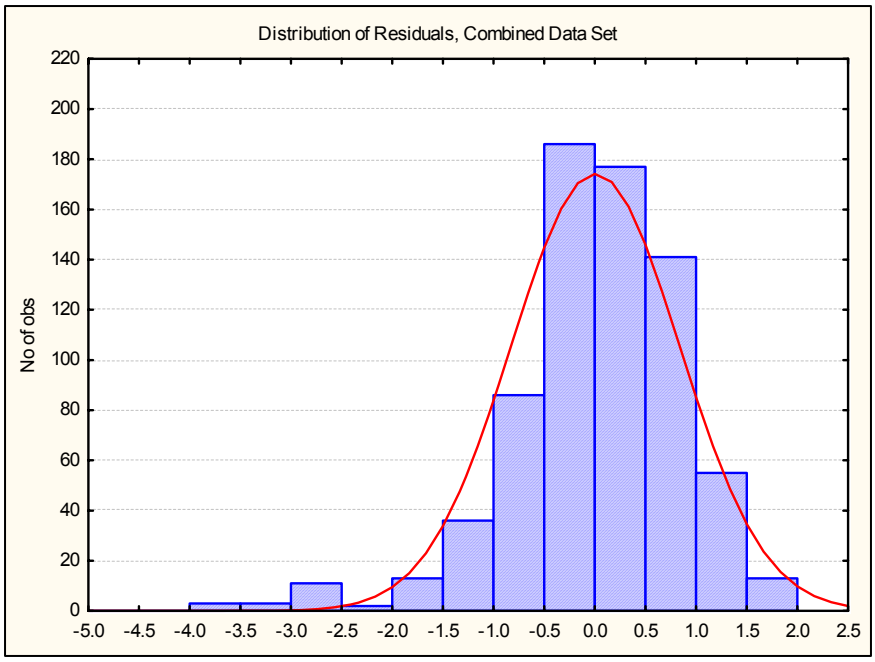
Detailed model outputs and residuals plots are provided in Exhibits C-16 through C-19 in Section C.6.

C.6. Detailed Regression Results

Exhibit C-16. Regression Results for Combined Data Set

Combined Data Set Dust Loading Only, Weighted						
Regression Summary for Dependent Variable: LNPBCONC (New HUD Data With Weights.sta) R = 0.69437119 R²= 0.48215135 Adjusted R² = 0.48143609 F(1,724)=674.09 p<0.0000 SE of estimate: 0.84431						
	Beta	**SE of Beta**	**B**	**SE of B**	**t(280)**	**p-level**
Intercept			4.920573	0.034640	142.0480	0.00
LNVAC	0.694371	0.026744	0.517568	0.019935	25.9633	0.00




Distribution of Residuals, Combined Data Set
No of obs
220
200
180
160
140
120
100
80
60
40
20
0
-5.0
-4.5
-4.0
-3.5
-3.0
-2.5
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
2.5

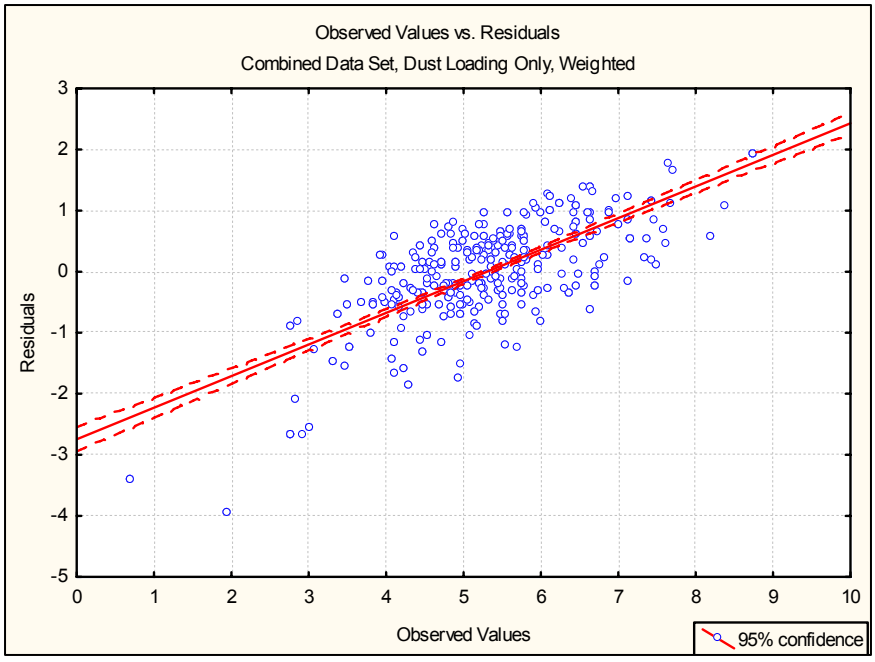
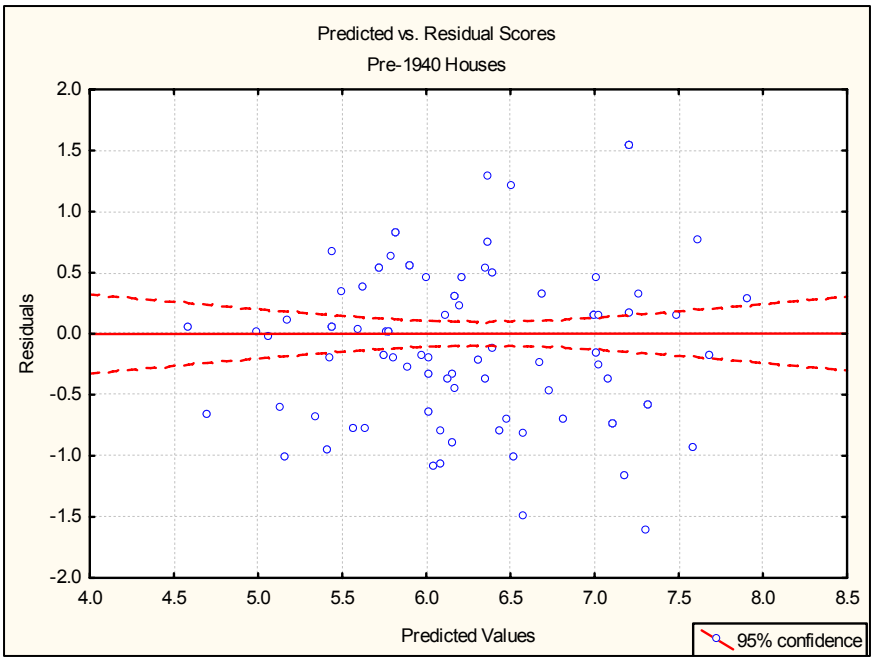
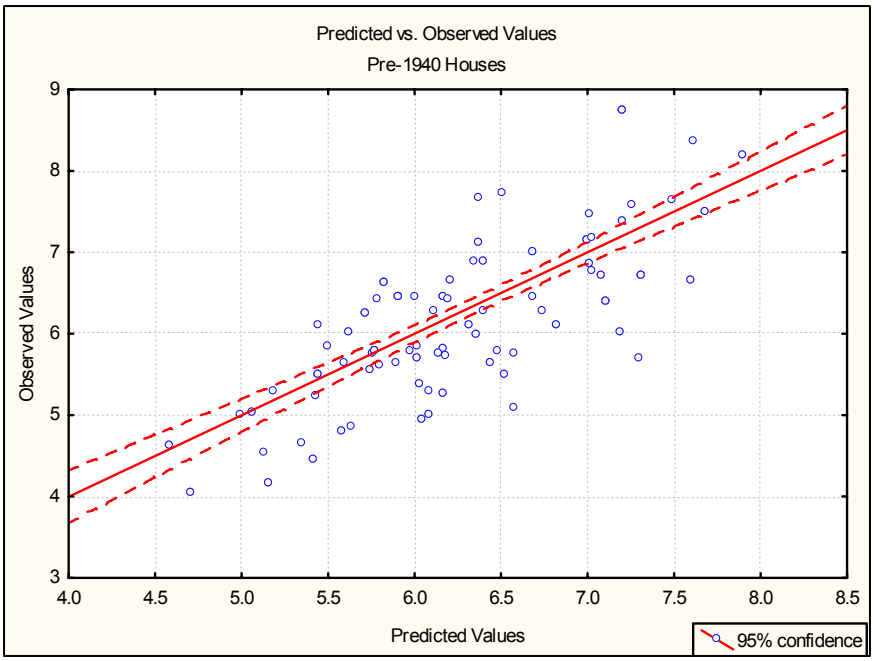

Observed Values vs. Residuals
Combined Data Set, Dust Loading Only, Weighted
Residuals
3
2
1
0
-1
-2
-3
-4
-5
0
1
2
3
4
5
6
7
8
9
10
Observed Values
95% confidence

Exhibit C-17. Regression Results for <1940 Data

<1940 Data, Weighted						
Regression Summary for Dependent Variable: LNPBCONC (New HUD Data With Weights.sta) R = 0.72734822 R² = 0.52903543 Adjusted R² = .52651690 F(1,187) = 210.06 p<0.0000 SE of estimate: 0.68462 Include condition: v2 = 1						
	Beta	**SE of Beta**	**B**	**SE of B**	**t(187)**	**p-level**
Intercept			5.513770	0.075486	73.04334	0.000000
LNVAC	0.727348	0.050185	0.454319	0.031347	14.49336	0.000000




Predicted vs. Observed Values
Pre-1940 Houses
Observed Values
Predicted Values
95% confidence
9
8
7
6
5
4
3
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
8.5

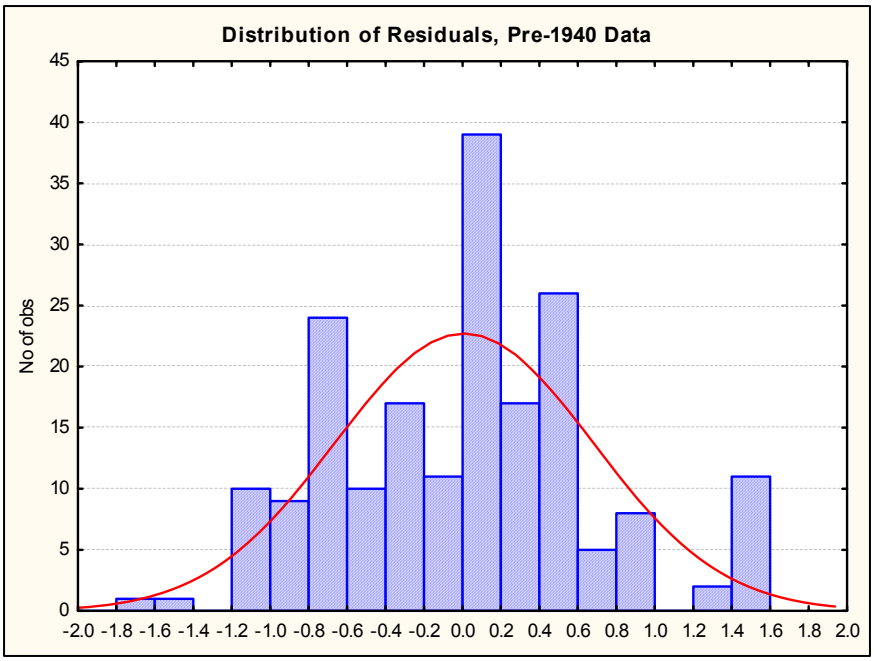
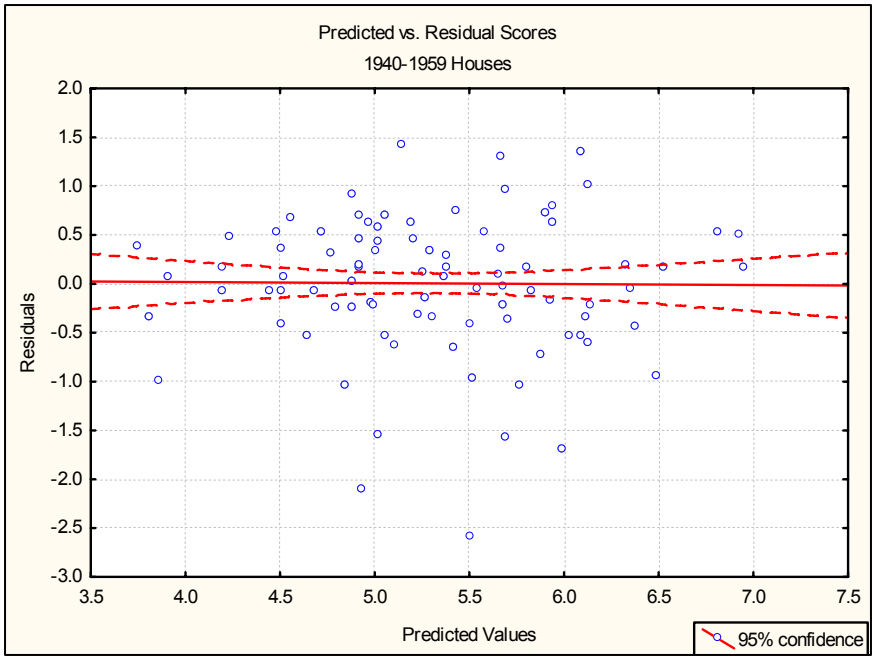
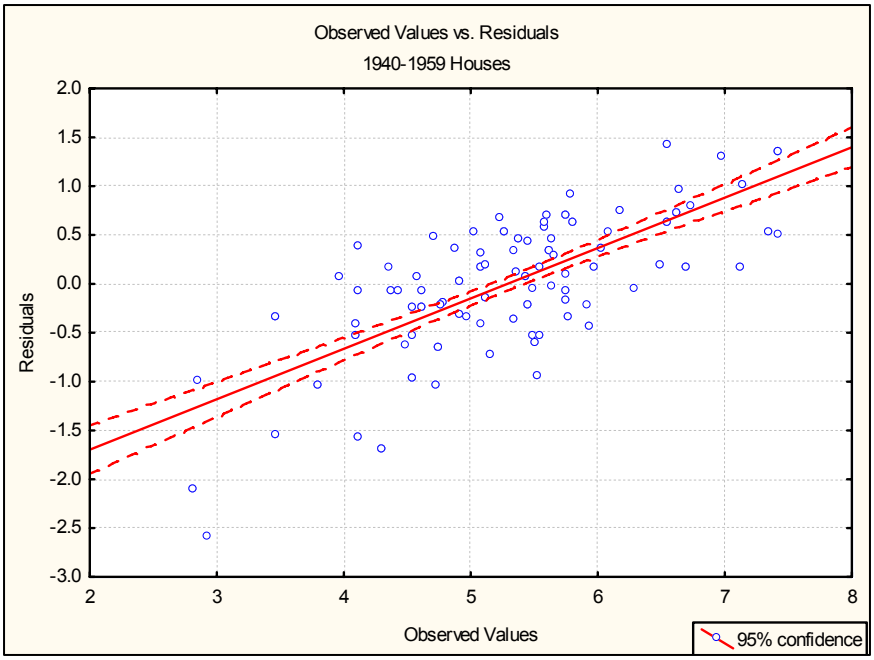

Distribution of Residuals, Pre-1940 Data
No of obs
45
40
35
30
25
20
15
10
5
0
-2.0 -1.8 -1.6 -1.4 -1.2 -1.0 -0.8 -0.6 -0.4 -0.2 0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

Exhibit C-18. Regression Results for Data from 1940 to 1959

1940 to 1959 Data, Weighted						
Regression Summary for Dependent Variable: LNPBCONC (New HUD Data With Weights.sta) R = 0.69421417 R² = 0.48193331 Adjusted R² = 0.47919222 F(1,189) = 175.82 p<0.0000 SE of estimate: 0.70271 Include condition: v2 = 2						
	Beta	**SE of Beta**	**B**	**SE of B**	**t(189)**	**p-level**
Intercept			4.930233	0.058076	84.89214	0.000000
LNVAC	0.694214	0.052355	0.443382	0.033438	13.25963	8.49E-29




Observed Values vs. Residuals
1940-1959 Houses
Residuals
Observed Values
95% confidence
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
2
3
4
5
6
7
8

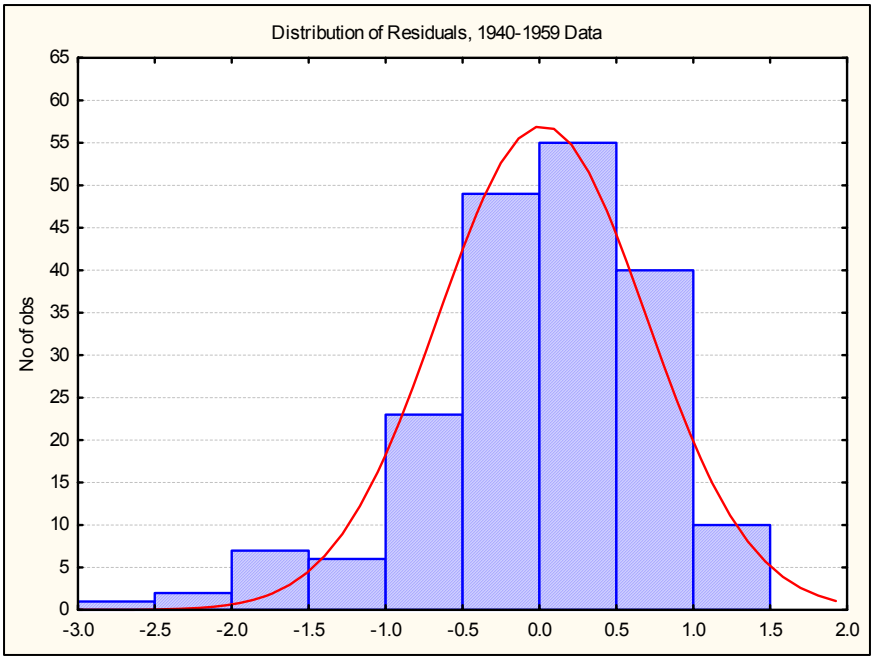
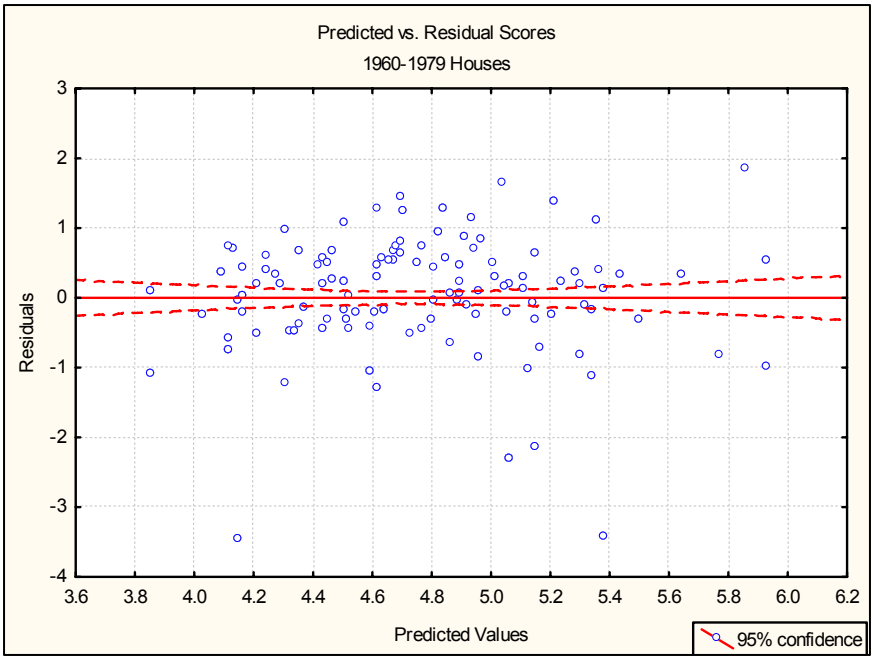
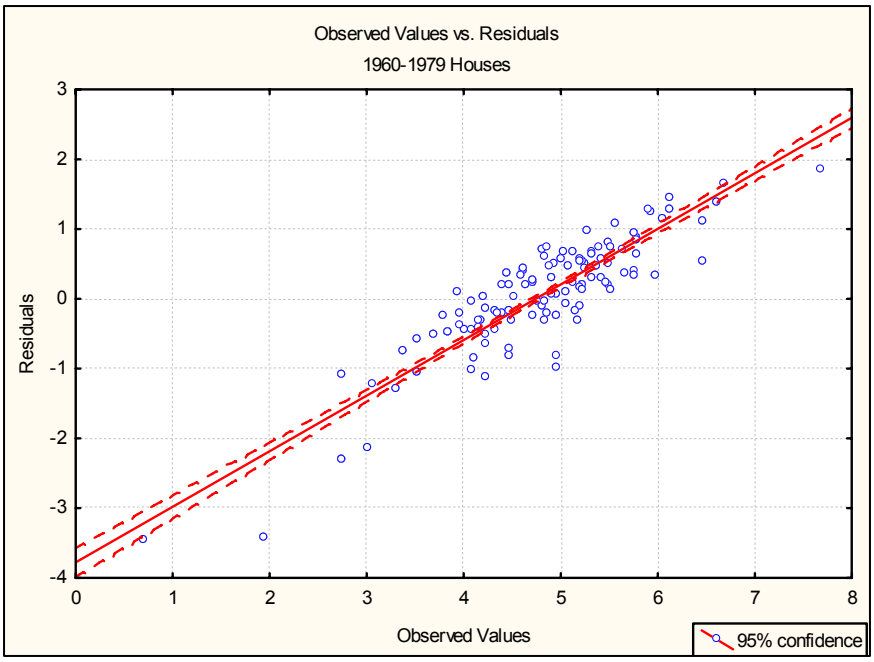
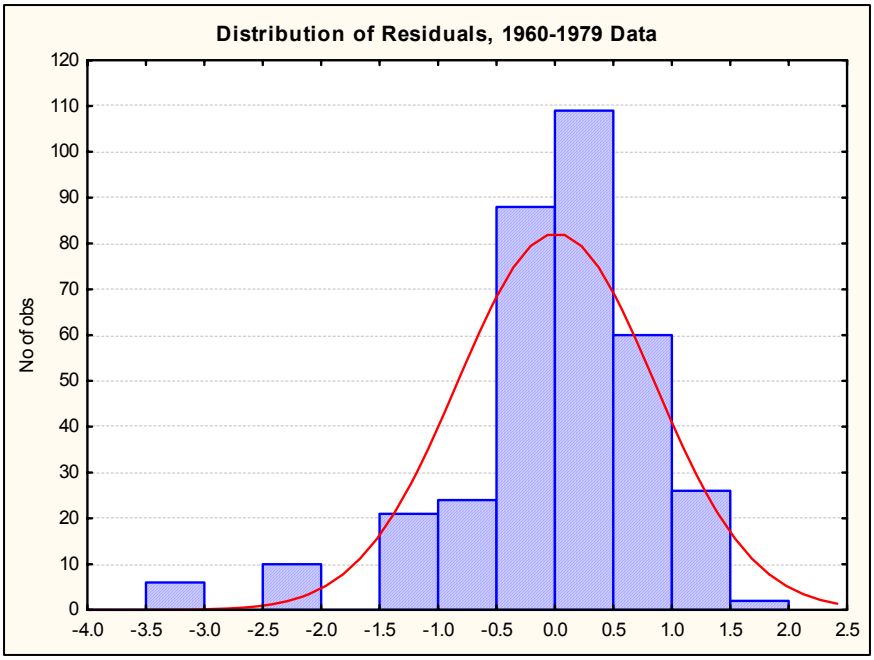

Distribution of Residuals, 1940-1959 Data
No of obs
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-3.0
-2.5
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0

Exhibit C-19. Regression Results from 1960 to 1979 Data

1960 to 1979 Data, Weighted						
Regression Summary for Dependent Variable: LNPBCONC (New HUD Data With Weights.sta) R = 0.45086819 R² = 0.20328213 Adjusted R² = 0.20096609 F(1,344) = 87.771 p<.00000 SE of estimate: 0.86020 Include condition: v2 = 3						
	Beta	**SE of Beta**	**B**	**SE of B**	**t(344)**	**p-level**
Intercept			4.704796	0.046407	101.3816	0.000000
LNVAC	0.450868	0.048125	0.354631	0.037853	9.3686	0.000000




Observed Values vs. Residuals
1960-1979 Houses
Residuals
Observed Values
95% confidence


Distribution of Residuals, 1960-1979 Data
No of obs

REFERENCES

Kleinbaum D.G.; Kupper K.L.; Muller K.E.; and Nizam N. 1998. Applied Regression Methods and Other Multivariate Methods. Duxbury Press, Pacific Grove California, 3rd ed.

U.S. Environmental Protection Agency (USEPA). 1995. Report on the National Survey of Lead-Based Paint in Housing: Appendix I: Design and Methodology. Office of Pollution Prevention and Toxics. EPA 747-R95-004

U.S. Environmental Protection Agency (USEPA). 1996. Adjustments to the HUD National Survey Dust Data for Section 403 Analyses. Office of Pollution, Prevention, and Toxics. EPA 747-R-96-011.

U.S. Environmental Protection Agency (USEPA). 1997. Conversion Equations for Use in Section 403 Rulemaking. Office of Pollution, Prevention, and Toxics. EPA 747-R-96-012.

U.S. Environmental Protection Agency (USEPA). 1998. Risk Analysis to Support Standards for Lead in Paint, Dust, and Soil. Office of Pollution, Prevention, and Toxics. EPA 747-R-97-006.

Appendix D. Description of Monte Carlo Tool

D. DESCRIPTION OF MONTE CARLO TOOL

The Monte Carlo tool was developed for this approach to determine the range of model metric values based on the range of input parameters. The inputs to the Monte Carlo tool include the variables for which distributions are used to generate input values (sampled), the distribution type of these variables (normal, lognormal, or uniform), the mean or geometric mean, the standard deviation or geometric standard deviation, and the upper and lower truncation cutoffs.

D.1. Determination of the Variable Distributions

In order to sample the distribution of each variable, these distributions were first approximated based on the ranges given in the data (see Appendix A for the input data). Exhibit D-1 contains a summary of the terms used to determine the variable distributions.

Exhibit D-1. Summary of Terms for Determining Variable Distributions

Term	Description	Comment
Low Diff	Difference between the mid value and low value	If a normal distribution, Low Diff and High Diff should be approximately equal
High Diff	Difference between the high value and mid value	If a normal distribution, Low Diff and High Diff should be approximately equal
Log Low Diff	Difference between the logarithm of mid value and logarithm of low value	If a lognormal distribution, Log Low Diff and Log High Diff should be approximately equal
Log High Diff	Difference between the logarithm of high value and logarithm of mid value	If a lognormal distribution, Log Low Diff and Log High Diff should be approximately equal
Averaged Diff	Average of two normal differences	Used to calculate Per Diff
Log Averaged Diff	Average of two lognormal differences	Used to calculate Log Per Diff
Per Diff	Percent difference between the High Diff and the Averaged Diff	If small, then variable is approximately symmetric and may represent normal distribution
Log Per Diff	Percent difference between the Log High Diff and the Log Averaged Diff	If small, then variable is skewed and may represent lognormal distribution

Each variable either had a standard deviation specified in the data, had ranges given by low, mid, and high values, or had only a single value with no range. When the standard deviation was given in the data, the variable was assumed to be normal, the mid value became the mean, and the standard deviation was used as given. When low, mid, and high values were given but no standard deviation was provided in the data, the distribution and standard deviation were approximated from these values. The assumption was made that the low and high values were two standard deviations from the mid value, implying that 95% of the variable values drawn from that distribution lie within the low-to-high range. If the variable is normally distributed, the probability density should be symmetric about the mid value, and the difference between the mid and the low value (*Low Diff*) and the difference between the high and mid value (*High Diff)* should be approximately equal. If the variable is lognormal, then the natural logarithm (ln) of the variable is normal. Then, in this case the difference between the logarithm of the mid and the

logarithm of the low values (*Log Low Diff*) and the difference between the logarithm of the high and the logarithm of the mid values (*Log High Diff*) should be approximately equal.

Each of these differences was calculated, and then the two normal differences were averaged (*Averaged Diff*) and the two lognormal differences were averaged (*Log Averaged Diff*). Finally, the percent difference between the *High Diff* and the *Averaged Diff* (*Per Diff*) was calculated and compared to the percent difference between the *Log High Diff* and the *Log Averaged Diff* (*Log Per Diff*). If *Per Diff* is small, it implies that *High Diff* is close to *Low Diff*, the variable is approximately symmetric, and the normal distribution will better represent the variability. If *Log Per Diff* is small, it implies that *Log High Diff* is close to *Log Low Diff*, the variable is skewed (in these cases, toward high values), and the lognormal distribution will better represent the variability. Thus, the distribution was assigned based on which percent difference was smaller. The comparison was strictly numeric.

If the normal distribution was selected, then the mean was approximated as the mid value and the standard deviation was approximated as half the *Averaged Diff* value (since this difference is assumed to represent two standard deviations). If the lognormal distribution was selected, then the geometric mean was approximated as the mid value and the geometric standard deviation was approximated as the exponent of half the *Log Averaged Diff*.

If no low and high values were available, then the variable was assumed to be normally distributed and was assigned a default coefficient of variation of two, representing a conservative estimate of the variability.

The exception to the above approach is the Cleaning Frequency variable. When this variable was sampled as a normal distribution, very low or very high cleaning efficiencies produced physically unrealistic concentrations during the Post-Renovation (Routine Cleaning) modeling phase. Thus, this variable was modified with a uniform distribution, with an equally likely chance that the frequency was 0.25, 0.5, 1, or 2 cleanings per week.

Once the distributions were specified, some distributions were also truncated to ensure the sampled value was physically meaningful. All normal variables were truncated at 1E-14 (i.e., close to zero) to ensure that negative values were not generated. Also, variables that represented decimal percentages were truncated at 1 to ensure no percentages exceeded 100%. These truncations were implemented by specifying upper and lower cutoffs for each variable. If no upper cutoff was required, it was set to 1E+14 (i.e., far into the upper tail of the distribution).

D.2. Monte Carlo Simulations

Once the distribution of each variable was obtained, the Monte Carlo model was implemented using an Excel® Visual Basic for Applications® script. During each iteration of the model, a random number between zero and one was generated for each of the input parameters to be sampled. The Excel function NORMINV or LOGINV was used to obtain the parameter input value from this random number, depending on whether the parameter was assumed to be normal or lognormal. These sampled values were then checked to ensure they did not fall above the

upper cutoff or below the lower cutoff for each variable. In general for the two examples shown here, these corrections occurred rarely and only in the extreme tails of the distributions.

Along with the mid values for all other input parameters, these sampled values were used to calculate the indoor dust time series. This process was repeated 20,000 times to obtain a distribution of indoor dust at each week of the time series based on the underlying distributions of the input parameters. The maximum, 99th percentile, 95th percentile, 75th percentile, mean, median, 25th percentile, 5th percentile, and minimum values were then calculated for each week.

Based on the 20,000 values of the model metrics, the probability density function (*pdf*) was also obtained for the concentrations associated with the Post-Renovation (Routine Cleaning) phase (PH=4) at Week 0 for indoor dust. The cumulative distribution function was first obtained by sorting the values and indicating the probability that a model metric value was less than or equal to a given value. These cumulative distribution function values were then binned and the derivative was calculated to generate the *pdf*. Small scale oscillations in the *pdf* are due to the resolution of the binning, and no smoothing was performed on the final function. The magnitude of the *pdf* values varies from scenario to scenario, because the range of calculated model metric values can vary significantly and the integral under each *pdf* curve over the full range of metric values must be one. The *pdf* values for the single activity example are presented in Exhibit D-2 and Exhibit D-3 for vintages 1940 to 1959 and 1960 to 1979, respectively. The *pdf* values for the multiple activities example are presented in Exhibit D-4 and Exhibit D-5 for vintages 1940 to 1959 and 1960 to 1979, respectively.

Exhibit D-2. Probability Density Functions for Single Activity Example, Vintage 1940 to 1959

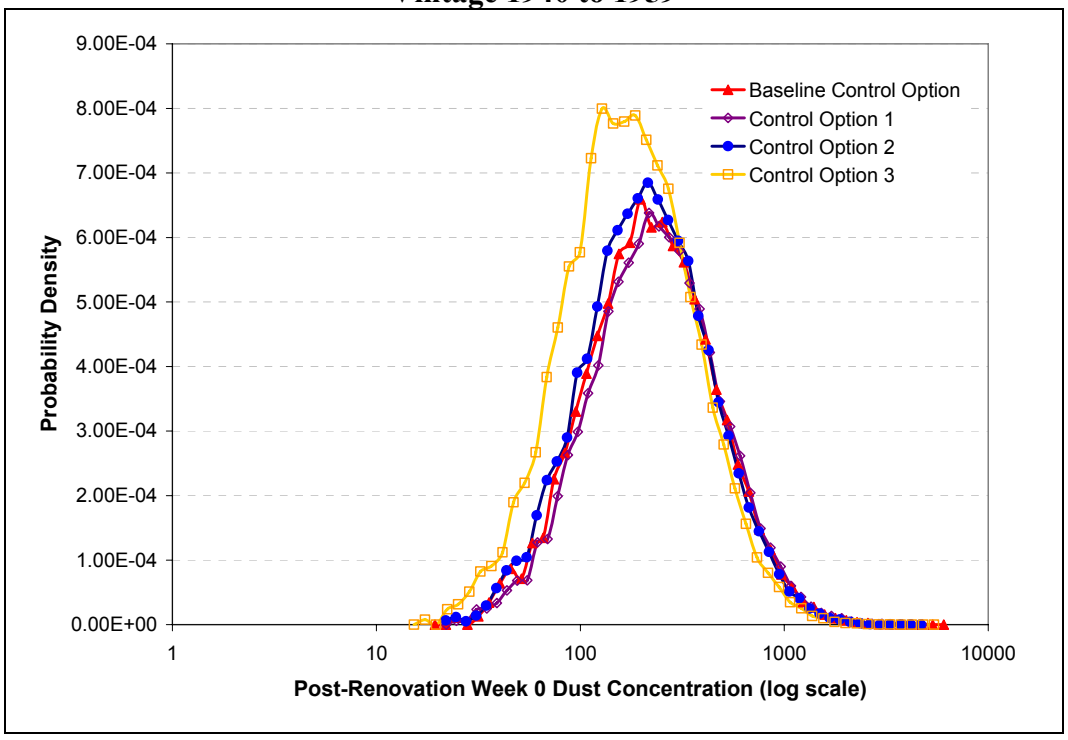


Exhibit D-3. Probability Density Functions for Single Activity Example, Vintage 1960 to 1979

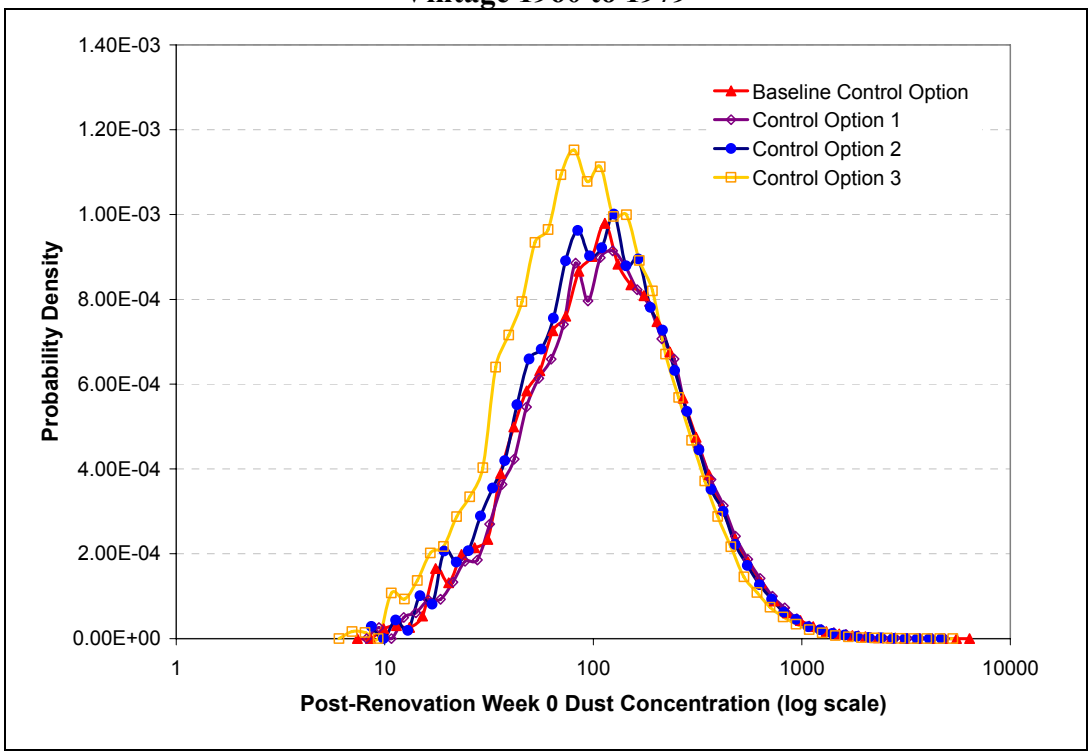


Exhibit D-4. Probability Density Functions for Multiple Activities Example, Vintage 1940 to 1959

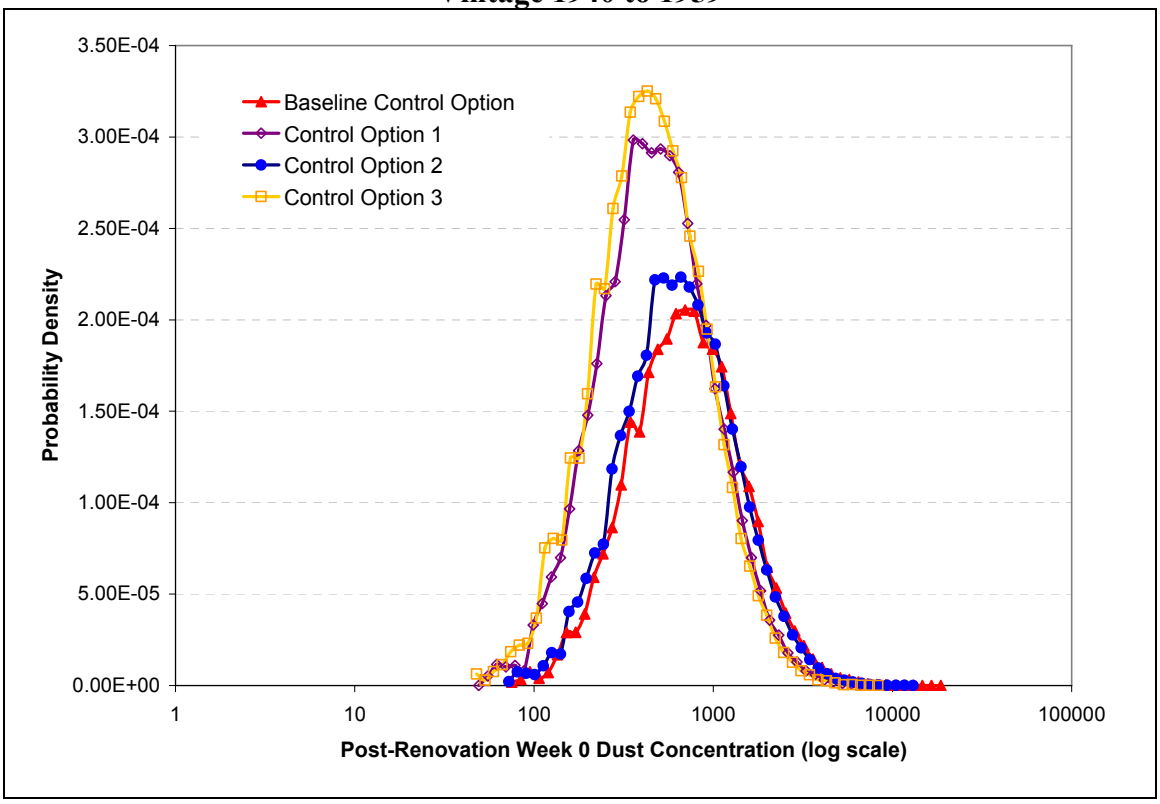
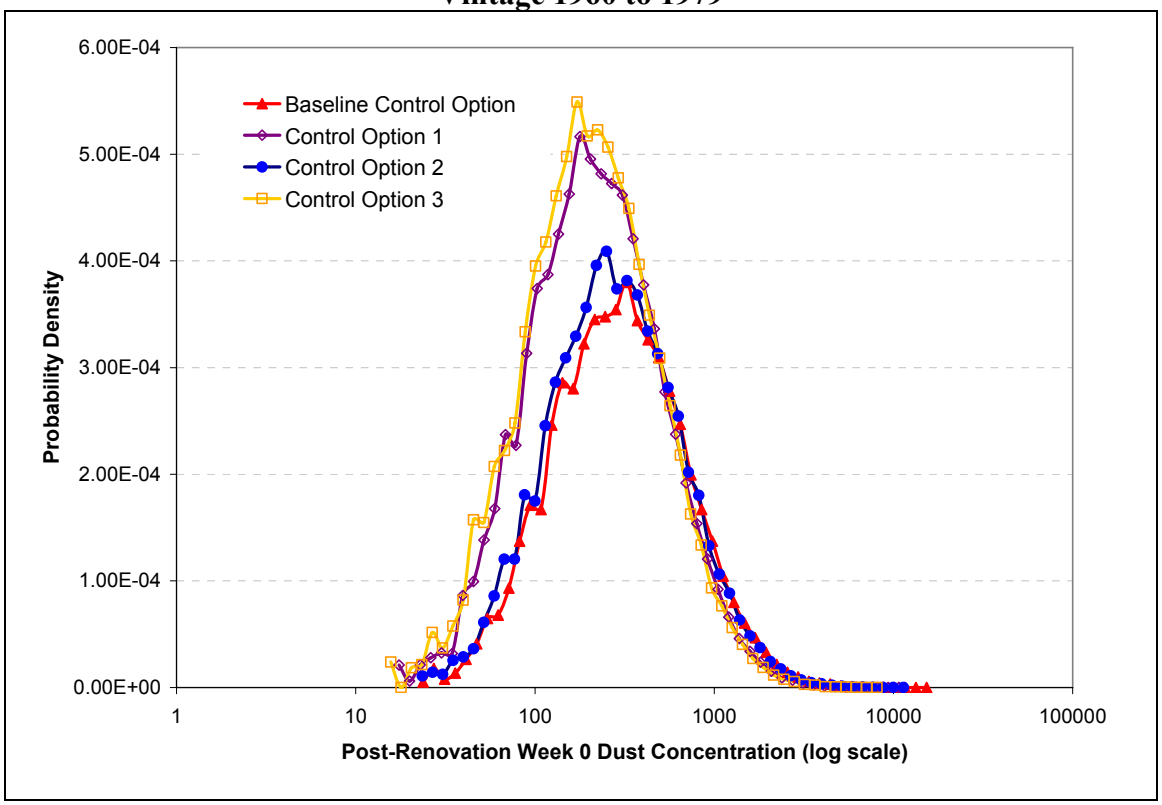


Exhibit D-5. Probability Density Functions for Multiple Activities Example, Vintage 1960 to 1979



Appendix E. Indoor Dust Concentration Results for Examples

E. INDOOR DUST CONCENTRATION RESULTS FOR EXAMPLES

This appendix presents the media concentration results for the single activity example (i.e., window replacement) and the multiple activities example. Section E.1 presents the deterministic indoor dust Pb concentrations for the single activity and the multiple activities examples per building vintage and control options. Section E.2 presents the results of the sensitivity analysis excluding the cleaning efficiency sensitivity analysis results. Sections E.2.1, E.2.2, and E.2.3 present the concentration of Pb in indoor dust, elasticity, and sensitivity scores for the single activity and the multiple activities examples per building vintage and control options, respectively. The cleaning efficiency sensitivity analysis results are described in Section E.3, which includes data on the concentration of Pb in indoor dust and percent change in concentration of Pb in indoor dust the single activity and the multiple activities examples per control option. Monte Carlo results are presented in Section E.4 for the single activity and multiple activities examples per percentile and building vintage.

The crosswalk tables presented in Exhibits E-1 and E-2 provide clarification on the dimension terms used in the rest of the Exhibits. The crosswalk table in Exhibit E-1, presents a crosswalk of the control option names and descriptions used in this approach and the control option names and descriptions used in the U.S. EPA's Office of Pollution Prevention and Toxics (OPPT) Dust Study (Battelle 2007). The second table, Exhibit E-2, presents a crosswalk between the phases modeled in this approach and the associated sample types from the OPPT Dust Study (Battelle 2007).

Exhibit E-1. Crosswalk between the Control Options used in this Approach and the Associated Variables from the OPPT Dust Study

This Approach			OPPT Dust Study	
Control Option (CO) Name	**Description**	**Control Option (CO) ID**	**Phase ID**	**Description**
Indoor				
Base Control Option	No plastic sheeting, Baseline cleaning	0	Phase IV	No plastic and baseline cleaning
Control Option 1	No plastic sheeting, Verification cleaning	1	Phase III	No plastic and rule cleaning
Control Option 2	Plastic sheeting, Baseline cleaning	2	Phase II	Plastic coverings and baseline cleaning
Control Option 3	Plastic sheeting, Verification cleaning	3	Phase I	Plastic coverings and rule cleaning

Exhibit E-2. Crosswalk between the Phases Used in this Approach and the Associated Sample Types from the OPPT Dust Study

This Approach		OPPT Dust Study
Exposure Phase (PH) Name	**Exposure Phase (PH) ID**	**Sample Types** [a]
Indoor Dust		
Pre-Renovation (Background)	1	N/A
Renovation (Dust Generating)	2	Post Work
Renovation (After Baseline Cleaning)	3	Post Cleaning
Post-Renovation (Routine Cleaning)	4	Post Cleaning ***or*** Post Verification [b]
Post-Renovation (Background)	5	N/A
Indoor Air		
Pre-Renovation (Background)	i	N/A
Renovation (Dust Generating)	ii	Post Work
Renovation (Settling)	iii	N/A
Renovation (Background)	iv	N/A
Post-Renovation (Background)	v	N/A
Outdoor Soil		
Pre-Renovation (Background)	A	N/A
Renovation	B	Post Work
Post-Renovation	C	Post Work

[a] These samples form the basis for the concentrations associated with each corresponding phase.
[b] The Post-Renovation (Routine Cleaning) phase is defined by post cleaning data from the OPPT Dust Study (Battelle 2007) when only baseline cleaning is implemented (i.e., Base Control Option and Control Option 2). When verification cleaning is implemented (i.e., Control Options 1 and 3), the Post-Renovation (Routine Cleaning) phase is defined by the post verification data from the OPPT Dust Study (Battelle 2007).

E.1. Deterministic Results

Exhibit E-3. Deterministic Results –Concentrations of Pb in Indoor Dust, Vintage <1940

Activity	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background
	PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10	
Single Activity	673.8	370.0	48	686.4	376.9	49	639.5	351.2	45	524.5	288.0	33
Multiple Activities	2,075.2	918.1	49	3,185.2	1,370.1	60	1,932.5	854.9	47	1,548.5	685.0	42

Exhibit E-4. Deterministic Results – Concentrations of Pb in Indoor Dust, Vintage 1940 to 1959

Activity	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background
	PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10	
Single Activity	361.5	201.4	65	368.3	205.2	66	342.9	191.1	61	280.0	156.0	48
Multiple Activities	1,097.9	495.4	56	1,669.0	732.7	67	1,024.0	462.0	55	824.2	371.9	49

Exhibit E-5. Deterministic Results – Concentrations of Pb in Indoor Dust, Vintage 1960 to 1979

Activity	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background
	PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10	
Single Activity	237.4	148.5	77	241.0	150.8	78	227.4	142.3	73	192.7	120.6	60
Multiple Activities	580.8	306.9	62	812.6	420.1	72	549.2	290.2	60	461.4	243.8	54

E.2. Sensitivity Analysis Results Excluding Cleaning Efficiency

E.2.1 Concentration of Pb in Indoor Dust

Exhibit E-6. Sensitivity Analysis Results – Concentrations of Pb in Indoor Dust, Single Activity (i.e., Window Replacement), Vintage <1940

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Deterministic Results	**673.8**	**370.0**	**48.0**	**686.4**	**376.9**	**49.0**	**639.5**	**351.2**	**45.0**	**524.5**	**288.0**	**33.0**
% Area of Building – Adjacent Room	685.9	376.7	49.0	691.3	379.6	50.0	651.6	357.8	46.0	535.1	293.8	34.0
% Area of Building – Workspace	684.8	376.0	49.0	688.3	378.0	50.0	649.1	356.4	46.0	527.4	289.6	33.0
% Area of Building – Carpet	673.8	367.9	61.0	686.4	374.7	63.0	639.5	349.1	57.0	524.5	286.3	40.0
Adjacent Loading – Post cleaning	687.6	377.6	49.0	686.4	376.9	49.0	653.1	358.6	46.0	524.5	288.0	33.0
Adjacent Loading – Post verification	N/A	N/A	N/A	698.3	383.5	50.0	N/A	N/A	N/A	537.3	295.1	34.0
Background Loading	676.0	371.2	46.0	688.5	378.1	47.0	641.7	352.4	43.0	527.3	289.6	30.0
Cleaning Frequency	673.8	364.1	44.0	686.4	370.9	45.0	639.5	345.5	41.0	524.5	283.4	30.0
Load-concentration Intercept	1,169.6	642.2	48.0	1,191.3	654.2	49.0	1,109.9	609.5	45.0	910.3	499.9	33.0
Load-concentration Slope	744.6	385.1	48.0	759.9	393.0	49.0	703.0	363.6	45.0	565.2	292.3	33.0
Rest of Building Loading – Post cleaning	676.3	371.4	48.0	686.4	376.9	49.0	641.8	352.4	45.0	524.5	288.0	33.0

Exhibit E-6. Sensitivity Analysis Results – Concentrations of Pb in Indoor Dust, Single Activity (i.e., Window Replacement), Vintage <1940

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Rest of Building Loading – Post verification	N/A	N/A	N/A	696.9	382.7	50.0	N/A	N/A	N/A	527.9	289.9	33.0
Workspace Loading – Post cleaning	685.8	376.6	49.0	686.4	376.9	49.0	650.0	356.9	46.0	524.5	288.0	33.0
Workspace Loading – Post verification	N/A	N/A	N/A	692.7	380.4	50.0	N/A	N/A	N/A	528.8	290.4	33.0

Exhibit E-7. Sensitivity Analysis Results – Concentrations of Pb in Indoor Dust, Single Activity (i.e., Window Replacement), Vintage 1940 to 1959

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Deterministic Results	**361.5**	**201.4**	**65.0**	**368.3**	**205.2**	**66.0**	**342.9**	**191.1**	**61.0**	**280.0**	**156.0**	**48.0**
% Area of Building – Adjacent Room	368.1	205.1	66.0	371.0	206.7	66.0	349.5	194.7	62.0	285.9	159.3	50.0
% Area of Building – Workspace	367.4	204.7	66.0	369.4	205.8	66.0	348.1	194.0	62.0	281.6	156.9	49.0
% Area of Building – Carpet	361.5	200.3	83.0	368.3	204.0	85.0	342.9	190.0	79.0	280.0	155.1	61.0
Adjacent Loading – Post cleaning	368.9	205.6	66.0	368.3	205.2	66.0	350.3	195.2	63.0	280.0	156.0	48.0
Adjacent Loading – Post verification	N/A	N/A	N/A	374.7	208.8	67.0	N/A	N/A	N/A	287.1	160.0	50.0
Background Loading	362.2	201.8	62.0	368.9	205.6	63.0	343.6	191.4	59.0	280.9	156.5	46.0
Cleaning Frequency	361.5	198.3	60.0	368.3	202.0	60.0	342.9	188.1	56.0	280.0	153.6	44.0
Load-concentration Intercept	591.9	329.8	65.0	603.0	336.0	66.0	561.4	312.8	61.0	458.5	255.4	48.0
Load-concentration Slope	398.0	209.1	65.0	406.2	213.5	66.0	375.5	197.3	61.0	300.5	157.9	48.0
Rest of Building Loading – Post cleaning	362.9	202.2	65.0	368.3	205.2	66.0	344.2	191.8	61.0	280.0	156.0	48.0
Rest of Building Loading – Post verification	N/A	N/A	N/A	374.0	208.4	67.0	N/A	N/A	N/A	281.9	157.1	49.0

Exhibit E-7. Sensitivity Analysis Results – Concentrations of Pb in Indoor Dust, Single Activity (i.e., Window Replacement), Vintage 1940 to 1959

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Deterministic Results	**361.5**	**201.4**	**65.0**	**368.3**	**205.2**	**66.0**	**342.9**	**191.1**	**61.0**	**280.0**	**156.0**	**48.0**
Workspace Loading – Post cleaning	368.0	205.0	66.0	368.3	205.2	66.0	348.6	194.2	62.0	280.0	156.0	48.0
Workspace Loading – Post verification	N/A	N/A	N/A	371.7	207.1	66.0	N/A	N/A	N/A	282.4	157.4	49.0

Exhibit E-8. Sensitivity Analysis Results – Concentrations of Pb in Indoor Dust, Single Activity (i.e., Window Replacement), Vintage 1960 to 1979

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Deterministic Results	**237.4**	**148.5**	**77.0**	**241.0**	**150.8**	**78.0**	**227.4**	**142.3**	**73.0**	**192.7**	**120.6**	**60.0**
% Area of Building – Adjacent Room	240.8	150.7	78.0	242.4	151.7	78.0	230.9	144.5	74.0	196.0	122.6	61.0
% Area of Building – Workspace	240.5	150.5	78.0	241.5	151.2	78.0	230.2	144.0	74.0	193.6	121.1	60.0
% Area of Building – Carpet	237.4	147.9	99.0	241.0	150.1	101.0	227.4	141.6	95.0	192.7	120.0	77.0
Adjacent Loading – Post cleaning	241.3	151.0	78.0	241.0	150.8	78.0	231.4	144.8	75.0	192.7	120.6	60.0
Adjacent Loading – Post verification	N/A	N/A	N/A	244.4	152.9	79.0	N/A	N/A	N/A	196.7	123.1	62.0
Background Loading	237.6	148.7	74.0	241.2	150.9	75.0	227.6	142.4	71.0	193.0	120.8	58.0
Cleaning Frequency	237.4	146.7	70.0	241.0	148.9	71.0	227.4	140.5	67.0	192.7	119.1	55.0
Load-concentration Intercept	380.0	237.8	77.0	385.8	241.4	78.0	364.0	227.8	73.0	308.4	193.0	60.0
Load-concentration Slope	256.2	153.0	77.0	260.5	155.6	78.0	244.4	145.9	73.0	203.7	121.6	60.0
Rest of Building Loading – Post cleaning	238.1	149.0	77.0	241.0	150.8	78.0	228.1	142.7	73.0	192.7	120.6	60.0

Exhibit E-8. Sensitivity Analysis Results – Concentrations of Pb in Indoor Dust, Single Activity (i.e., Window Replacement), Vintage 1960 to 1979

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Deterministic Results	**237.4**	**148.5**	**77.0**	**241.0**	**150.8**	**78.0**	**227.4**	**142.3**	**73.0**	**192.7**	**120.6**	**60.0**
Rest of Building Loading – Post verification	N/A	N/A	N/A	244.0	152.7	79.0	N/A	N/A	N/A	193.7	121.2	61.0
Workspace Loading – Post cleaning	240.8	150.7	78.0	241.0	150.8	78.0	230.5	144.2	74.0	192.7	120.6	60.0
Workspace Loading – Post verification	N/A	N/A	N/A	242.8	151.9	78.0	N/A	N/A	N/A	194.0	121.4	61.0

Exhibit E-9. Sensitivity Analysis Results – Concentrations of Pb in Indoor Dust, Multiple Activities, Vintage <1940

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Deterministic Results	**2,075.2**	**918.1**	**49.0**	**3,185.2**	**1,370.1**	**60.0**	**1,932.5**	**854.9**	**47.0**	**1,548.5**	**685.0**	**42.0**
% Area of Building – Adjacent Room	2,107.6	932.4	50.0	3,280.2	1,411.0	60.0	1,967.8	870.5	48.0	1,578.5	698.3	42.0
% Area of Building – Workspace	2,107.6	932.4	50.0	3,187.4	1,371.1	60.0	1,961.6	867.8	48.0	1,557.0	688.8	42.0
% Area of Building – Carpet	2,075.2	947.3	60.0	3,185.2	1,422.7	73.0	1,932.5	882.2	58.0	1,548.5	706.9	51.0
Adjacent Loading – Post cleaning	2,116.8	936.4	50.0	3,185.2	1,370.1	60.0	1,974.8	873.7	48.0	1,548.5	685.0	42.0
Adjacent Loading – Post verification	N/A	N/A	N/A	3,294.3	1,417.0	60.0	N/A	N/A	N/A	1,588.3	702.6	42.0
Background Loading	2,075.8	918.3	48.0	3,185.5	1,370.3	58.0	1,933.1	855.2	46.0	1,549.3	685.4	41.0
Cleaning Frequency	2,075.2	918.1	49.0	3,185.2	1,370.1	60.0	1,932.5	854.9	47.0	1,548.5	685.0	42.0
Load-concentration Intercept	3,601.9	1,593.4	49.0	5,528.5	2,378.1	60.0	3,354.2	1,483.8	47.0	2,687.7	1,189.0	42.0
Load-concentration Slope	2,566.3	1,046.4	49.0	4,111.3	1,625.4	60.0	2,372.8	967.5	47.0	1,859.7	758.3	42.0
Rest of Building Loading – Post cleaning	2,088.7	924.0	49.0	3,185.2	1,370.1	60.0	1,943.0	859.6	48.0	1,548.5	685.0	42.0

Exhibit E-9. Sensitivity Analysis Results – Concentrations of Pb in Indoor Dust, Multiple Activities, Vintage <1940

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Rest of Building Loading – Post verification	N/A	N/A	N/A	3,206.9	1,379.4	60.0	N/A	N/A	N/A	1,563.1	691.5	42.0
Workspace Loading – Post cleaning	2,112.9	934.7	50.0	3,185.2	1,370.1	60.0	1,965.8	869.6	48.0	1,548.5	685.0	42.0
Workspace Loading – Post verification	N/A	N/A	N/A	3,196.3	1,374.9	60.0	N/A	N/A	N/A	1,562.9	691.4	42.0

Exhibit E-10. Sensitivity Analysis Results – Concentrations of Pb in Indoor Dust, Multiple Activities, Vintage 1940 to 1959

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Deterministic Results	**1,097.9**	**495.4**	**56.0**	**1,669.0**	**732.7**	**67.0**	**1,024.0**	**462.0**	**55.0**	**824.2**	**371.9**	**49.0**
% Area of Building – Adjacent Room	1,114.7	503.0	57.0	1,717.6	754.1	67.0	1,042.3	470.3	55.0	839.9	379.0	49.0
% Area of Building – Workspace	1,114.7	503.0	57.0	1,670.1	733.2	67.0	1,039.0	468.8	55.0	828.6	373.9	49.0
% Area of Building – Carpet	1,097.9	510.8	69.0	1,669.0	760.2	82.0	1,024.0	476.4	67.0	824.2	383.5	59.0
Adjacent Loading – Post cleaning	1,119.4	505.1	57.0	1,669.0	732.7	67.0	1,045.9	471.9	55.0	824.2	371.9	49.0
Adjacent Loading – Post verification	N/A	N/A	N/A	1,724.8	757.2	67.0	N/A	N/A	N/A	844.9	381.2	50.0
Background Loading	1,098.1	495.5	55.0	1,669.1	732.8	66.0	1,024.1	462.1	53.0	824.4	372.0	48.0
Cleaning Frequency	1,097.9	495.4	56.0	1,669.0	732.7	67.0	1,024.0	462.0	55.0	824.2	371.9	49.0
Load-concentration Intercept	1,797.5	811.1	56.0	2,732.5	1,199.7	67.0	1,676.4	756.4	55.0	1,349.4	608.9	49.0
Load-concentration Slope	1,350.6	562.8	56.0	2,140.9	865.6	67.0	1,250.8	521.2	55.0	985.2	410.5	49.0
Rest of Building Loading – Post cleaning	1,104.9	498.5	57.0	1,669.0	732.7	67.0	1,029.4	464.5	55.0	824.2	371.9	49.0

Exhibit E-10. Sensitivity Analysis Results – Concentrations of Pb in Indoor Dust, Multiple Activities, Vintage 1940 to 1959

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Deterministic Results	**1,097.9**	**495.4**	**56.0**	**1,669.0**	**732.7**	**67.0**	**1,024.0**	**462.0**	**55.0**	**824.2**	**371.9**	**49.0**
Rest of Building Loading – Post verification	N/A	N/A	N/A	1,680.1	737.6	67.0	N/A	N/A	N/A	831.8	375.3	49.0
Workspace Loading – Post cleaning	1,117.4	504.2	57.0	1,669.0	732.7	67.0	1,041.2	469.8	55.0	824.2	371.9	49.0
Workspace Loading – Post verification	N/A	N/A	N/A	1,674.7	735.2	67.0	N/A	N/A	N/A	831.7	375.3	49.0

Exhibit E-11. Sensitivity Analysis Results – Concentrations of Pb in Indoor Dust, Multiple Activities, Vintage 1960 to 1979

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Deterministic Results	**580.8**	**306.9**	**62.0**	**812.6**	**420.1**	**72.0**	**549.2**	**290.2**	**60.0**	**461.4**	**243.8**	**54.0**
% Area of Building – Adjacent Room	587.9	310.7	62.0	831.5	429.9	73.0	557.0	294.4	60.0	468.4	247.5	54.0
% Area of Building – Workspace	587.9	310.7	62.0	813.0	420.3	72.0	555.6	293.7	60.0	463.4	244.9	54.0
% Area of Building – Carpet	580.8	314.6	75.0	812.6	432.7	88.0	549.2	297.4	73.0	461.4	249.9	66.0
Adjacent Loading – Post cleaning	589.9	311.7	62.0	812.6	420.1	72.0	558.6	295.2	60.0	461.4	243.8	54.0
Adjacent Loading – Post verification	N/A	N/A	N/A	834.3	431.3	73.0	N/A	N/A	N/A	470.7	248.7	55.0
Background Loading	580.8	307.0	60.0	812.6	420.1	71.0	549.2	290.3	59.0	461.4	243.9	53.0
Cleaning Frequency	580.8	306.9	62.0	812.6	420.1	72.0	549.2	290.2	60.0	461.4	243.8	54.0
Load-concentration Intercept	929.7	491.3	62.0	1,300.7	672.5	72.0	879.1	464.6	60.0	738.5	390.3	54.0
Load-concentration Slope	685.6	339.9	62.0	992.0	480.1	72.0	644.7	319.7	60.0	532.2	263.9	54.0
Rest of Building Loading – Post cleaning	583.7	308.5	62.0	812.6	420.1	72.0	551.5	291.5	60.0	461.4	243.8	54.0
Rest of Building	N/A	N/A	N/A	816.9	422.4	72.0	N/A	N/A	N/A	464.8	245.6	54.0

Exhibit E-11. Sensitivity Analysis Results – Concentrations of Pb in Indoor Dust, Multiple Activities, Vintage 1960 to 1979

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)			Concentration (µg Pb/g dust)		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Deterministic Results	**580.8**	**306.9**	**62.0**	**812.6**	**420.1**	**72.0**	**549.2**	**290.2**	**60.0**	**461.4**	**243.8**	**54.0**
Loading – Post verification												
Workspace Loading – Post cleaning	589.0	311.3	62.0	812.6	420.1	72.0	556.6	294.1	60.0	461.4	243.8	54.0
Workspace Loading – Post verification	N/A	N/A	N/A	814.8	421.3	72.0	N/A	N/A	N/A	464.7	245.6	54.0

Exhibit E-12. Sensitivity Analysis Results – Elasticity, Indoor Dust, Single Activity, Vintage <1940

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
% Area of Building – Adjacent Room	0.18	0.18	0.21	0.07	0.07	0.20	0.19	0.19	0.22	0.20	0.20	0.30
% Area of Building – Workspace	0.16	0.16	0.21	0.03	0.03	0.20	0.15	0.15	0.22	0.06	0.06	0.00
% Area of Building – Carpet	0.00	-0.06	2.71	0.00	-0.06	2.86	0.00	-0.06	2.67	0.00	-0.06	2.12
Adjacent Loading – Post cleaning	0.20	0.20	0.21	0.00	0.00	0.00	0.21	0.21	0.22	0.00	0.00	0.00
Adjacent Loading – Post verification	0.00	0.00	0.00	0.17	0.17	0.20	0.00	0.00	0.00	0.25	0.25	0.30
Background Loading	0.03	0.03	-0.42	0.03	0.03	-0.41	0.04	0.04	-0.44	0.05	0.05	-0.91
Cleaning Frequency	0.00	-0.16	-0.83	0.00	-0.16	-0.82	0.00	-0.16	-0.89	0.00	-0.16	-0.91
Load-concentration Intercept	7.36	7.36	0.00	7.36	7.36	0.00	7.36	7.36	0.00	7.36	7.36	0.00
Load-concentration Slope	1.05	0.41	0.00	1.07	0.43	0.00	0.99	0.35	0.00	0.78	0.15	0.00
Rest of Building Loading – Post cleaning	0.04	0.04	0.00	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.00	0.00
Rest of Building Loading – Post verification	0.00	0.00	0.00	0.15	0.15	0.20	0.00	0.00	0.00	0.07	0.07	0.00

Exhibit E-12. Sensitivity Analysis Results – Elasticity, Indoor Dust, Single Activity, Vintage <1940

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Workspace Loading – Post cleaning	0.18	0.18	0.21	0.00	0.00	0.00	0.16	0.16	0.22	0.00	0.00	0.00
Workspace Loading – Post verification	0.00	0.00	0.00	0.09	0.09	0.20	0.00	0.00	0.00	0.08	0.08	0.00

Exhibit E-13. Sensitivity Analysis Results – Elasticity, Indoor Dust, Single Activity, Vintage 1940 to 1959

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
% Area of Building – Adjacent Room	0.18	0.18	0.15	0.07	0.07	0.00	0.19	0.19	0.16	0.21	0.21	0.42
% Area of Building – Workspace	0.16	0.16	0.15	0.03	0.03	0.00	0.15	0.15	0.16	0.06	0.06	0.21
% Area of Building – Carpet	0.00	-0.06	2.77	0.00	-0.06	2.88	0.00	-0.06	2.95	0.00	-0.06	2.71
Adjacent Loading – Post cleaning	0.21	0.21	0.15	0.00	0.00	0.00	0.22	0.22	0.33	0.00	0.00	0.00
Adjacent Loading – Post verification	0.00	0.00	0.00	0.17	0.17	0.15	0.00	0.00	0.00	0.25	0.25	0.42
Background Loading	0.02	0.02	-0.46	0.02	0.02	-0.45	0.02	0.02	-0.33	0.03	0.03	-0.42
Cleaning Frequency	0.00	-0.16	-0.77	0.00	-0.16	-0.91	0.00	-0.16	-0.82	0.00	-0.16	-0.83
Load-concentration Intercept	6.37	6.37	0.00	6.37	6.37	0.00	6.37	6.37	0.00	6.37	6.37	0.00
Load-concentration Slope	1.01	0.38	0.00	1.03	0.40	0.00	0.95	0.33	0.00	0.73	0.12	0.00
Rest of Building Loading – Post cleaning	0.04	0.04	0.00	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.00	0.00
Rest of Building Loading – Post verification	0.00	0.00	0.00	0.15	0.15	0.15	0.00	0.00	0.00	0.07	0.07	0.21

Exhibit E-13. Sensitivity Analysis Results – Elasticity, Indoor Dust, Single Activity, Vintage 1940 to 1959

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Workspace Loading – Post cleaning	0.18	0.18	0.15	0.00	0.00	0.00	0.17	0.17	0.16	0.00	0.00	0.00
Workspace Loading – Post verification	0.00	0.00	0.00	0.09	0.09	0.00	0.00	0.00	0.00	0.09	0.09	0.21

Exhibit E-14. Sensitivity Analysis Results – Elasticity, Indoor Dust, Single Activity, Vintage 1960 to 1979

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
% Area of Building – Adjacent Room	0.15	0.15	0.13	0.06	0.06	0.00	0.16	0.16	0.14	0.17	0.17	0.17
% Area of Building – Workspace	0.13	0.13	0.13	0.02	0.02	0.00	0.12	0.12	0.14	0.05	0.05	0.00
% Area of Building – Carpet	0.00	-0.05	2.86	0.00	-0.05	2.95	0.00	-0.05	3.01	0.00	-0.05	2.83
Adjacent Loading – Post cleaning	0.17	0.17	0.13	0.00	0.00	0.00	0.17	0.17	0.27	0.00	0.00	0.00
Adjacent Loading – Post verification	0.00	0.00	0.00	0.14	0.14	0.13	0.00	0.00	0.00	0.21	0.21	0.33
Background Loading	0.01	0.01	-0.39	0.01	0.01	-0.38	0.01	0.01	-0.27	0.02	0.02	-0.33
Cleaning Frequency	0.00	-0.13	-0.91	0.00	-0.13	-0.90	0.00	-0.13	-0.82	0.00	-0.13	-0.83
Load-concentration Intercept	6.01	6.01	0.00	6.01	6.01	0.00	6.01	6.01	0.00	6.01	6.01	0.00
Load-concentration Slope	0.79	0.30	0.00	0.81	0.32	0.00	0.75	0.26	0.00	0.57	0.09	0.00
Rest of Building Loading – Post cleaning	0.03	0.03	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00
Rest of Building Loading – Post verification	0.00	0.00	0.00	0.13	0.13	0.13	0.00	0.00	0.00	0.06	0.06	0.17
Workspace Loading – Post cleaning	0.14	0.14	0.13	0.00	0.00	0.00	0.14	0.14	0.14	0.00	0.00	0.00

Exhibit E-14. Sensitivity Analysis Results – Elasticity, Indoor Dust, Single Activity, Vintage 1960 to 1979

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Workspace Loading – Post verification	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.00	0.07	0.07	0.17

Exhibit E-15. Sensitivity Analysis Results – Elasticity, Indoor Dust, Multiple Activities, Vintage <1940

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
% Area of Building – Adjacent Room	0.16	0.16	0.20	0.30	0.30	0.00	0.18	0.18	0.21	0.19	0.19	0.00
% Area of Building – Workspace	0.16	0.16	0.20	0.01	0.01	0.00	0.15	0.15	0.21	0.05	0.05	0.00
% Area of Building – Carpet	0.00	0.32	2.24	0.00	0.38	2.17	0.00	0.32	2.34	0.00	0.32	2.14
Adjacent Loading – Post cleaning	0.20	0.20	0.20	0.00	0.00	0.00	0.22	0.22	0.21	0.00	0.00	0.00
Adjacent Loading – Post verification	0.00	0.00	0.00	0.34	0.34	0.00	0.00	0.00	0.00	0.26	0.26	0.00
Background Loading	0.00	0.00	-0.20	0.00	0.00	-0.33	0.00	0.00	-0.21	0.01	0.01	-0.24
Cleaning Frequency	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Load-concentration Intercept	7.36	7.36	0.00	7.36	7.36	0.00	7.36	7.36	0.00	7.36	7.36	0.00
Load-concentration Slope	2.37	1.40	0.00	2.91	1.86	0.00	2.28	1.32	0.00	2.01	1.07	0.00
Rest of Building Loading – Post cleaning	0.06	0.06	0.00	0.00	0.00	0.00	0.05	0.05	0.21	0.00	0.00	0.00
Rest of Building Loading – Post verification	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.09	0.09	0.00
Workspace Loading – Post cleaning	0.18	0.18	0.20	0.00	0.00	0.00	0.17	0.17	0.21	0.00	0.00	0.00

Exhibit E-15. Sensitivity Analysis Results – Elasticity, Indoor Dust, Multiple Activities, Vintage <1940

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Workspace Loading – Post verification	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.09	0.09	0.00

Exhibit E-16. Sensitivity Analysis Results – Elasticity, Indoor Dust, Multiple Activities, Vintage 1940 to 1959

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
% Area of Building – Adjacent Room	0.15	0.15	0.18	0.29	0.29	0.00	0.18	0.18	0.00	0.19	0.19	0.00
% Area of Building – Workspace	0.15	0.15	0.18	0.01	0.01	0.00	0.15	0.15	0.00	0.05	0.05	0.00
% Area of Building – Carpet	0.00	0.31	2.32	0.00	0.37	2.24	0.00	0.31	2.18	0.00	0.31	2.04
Adjacent Loading – Post cleaning	0.20	0.20	0.18	0.00	0.00	0.00	0.21	0.21	0.00	0.00	0.00	0.00
Adjacent Loading – Post verification	0.00	0.00	0.00	0.33	0.33	0.00	0.00	0.00	0.00	0.25	0.25	0.20
Background Loading	0.00	0.00	-0.18	0.00	0.00	-0.15	0.00	0.00	-0.36	0.00	0.00	-0.20
Cleaning Frequency	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Load-concentration Intercept	6.37	6.37	0.00	6.37	6.37	0.00	6.37	6.37	0.00	6.37	6.37	0.00
Load-concentration Slope	2.30	1.36	0.00	2.83	1.81	0.00	2.22	1.28	0.00	1.95	1.04	0.00
Rest of Building Loading – Post cleaning	0.06	0.06	0.18	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00
Rest of Building Loading – Post verification	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.09	0.09	0.00
Workspace Loading – Post cleaning	0.18	0.18	0.18	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00

Exhibit E-16. Sensitivity Analysis Results – Elasticity, Indoor Dust, Multiple Activities, Vintage 1940 to 1959

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
Workspace Loading – Post verification	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.09	0.09	0.00

Exhibit E-17. Sensitivity Analysis Results – Elasticity, Indoor Dust, Multiple Activities, Vintage 1960 to 1979

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
% Area of Building – Adjacent Room	0.12	0.12	0.00	0.23	0.23	0.14	0.14	0.14	0.00	0.15	0.15	0.00
% Area of Building – Workspace	0.12	0.12	0.00	0.01	0.01	0.00	0.12	0.12	0.00	0.04	0.04	0.00
% Area of Building – Carpet	0.00	0.25	2.10	0.00	0.30	2.22	0.00	0.25	2.17	0.00	0.25	2.22
Adjacent Loading – Post cleaning	0.16	0.16	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00
Adjacent Loading – Post verification	0.00	0.00	0.00	0.27	0.27	0.14	0.00	0.00	0.00	0.20	0.20	0.19
Background Loading	0.00	0.00	-0.32	0.00	0.00	-0.14	0.00	0.00	-0.17	0.00	0.00	-0.19
Cleaning Frequency	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Load-concentration Intercept	6.01	6.01	0.00	6.01	6.01	0.00	6.01	6.01	0.00	6.01	6.01	0.00
Load-concentration Slope	1.80	1.08	0.00	2.21	1.43	0.00	1.74	1.01	0.00	1.54	0.82	0.00
Rest of Building Loading – Post cleaning	0.05	0.05	0.00	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.00	0.00
Rest of Building Loading – Post verification	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.07	0.07	0.00
Workspace Loading – Post cleaning	0.14	0.14	0.00	0.00	0.00	0.00	0.14	0.14	0.00	0.00	0.00	0.00
Workspace Loading – Post verification	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.07	0.07	0.00

E.2.2 Sensitivity Scores

Exhibit E-18. Sensitivity Analysis Results – Sensitivity Scores, Indoor Dust, Single Activity, Vintage <1940

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
% Area of Building – Adjacent Room	0.07	0.07	0.08	0.03	0.03	0.08	0.07	0.07	0.09	0.08	0.08	0.12
% Area of Building – Workspace	0.07	0.07	0.09	0.01	0.01	0.08	0.06	0.06	0.09	0.02	0.02	0.00
% Area of Building – Carpet	0.00	-0.02	0.75	0.00	-0.02	0.79	0.00	-0.02	0.74	0.00	-0.02	0.59
Adjacent Loading – Post cleaning	0.27	0.27	0.28	0.00	0.00	0.00	0.09	0.09	0.09	0.00	0.00	0.00
Adjacent Loading – Post verification	0.00	0.00	0.00	0.11	0.11	0.12	0.00	0.00	0.00	0.14	0.14	0.17
Background Loading	0.04	0.04	-0.57	0.04	0.04	-0.56	0.05	0.05	-0.61	0.08	0.08	-1.25
Cleaning Frequency	0.00	-0.07	-0.36	0.00	-0.07	-0.36	0.00	-0.07	-0.39	0.00	-0.07	-0.40
Load-concentration Intercept	0.91	0.91	0.00	0.91	0.91	0.00	0.91	0.91	0.00	0.91	0.91	0.00
Load-concentration Slope	0.13	0.05	0.00	0.13	0.05	0.00	0.12	0.04	0.00	0.10	0.02	0.00
Rest of Building Loading – Post cleaning	0.04	0.04	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Rest of Building Loading – Post verification	0.00	0.00	0.00	0.06	0.06	0.08	0.00	0.00	0.00	0.04	0.04	0.00
Workspace Loading – Post cleaning	0.13	0.13	0.15	0.00	0.00	0.00	0.10	0.10	0.13	0.00	0.00	0.00
Workspace Loading – Post verification	0.00	0.00	0.00	0.08	0.08	0.18	0.00	0.00	0.00	0.05	0.05	0.00

Exhibit E-19. Sensitivity Analysis Results – Sensitivity Scores, Indoor Dust, Single Activity, Vintage 1940 to 1959

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
% Area of Building – Adjacent Room	0.07	0.07	0.06	0.03	0.03	0.00	0.07	0.07	0.06	0.08	0.08	0.16
% Area of Building – Workspace	0.07	0.07	0.06	0.01	0.01	0.00	0.06	0.06	0.07	0.02	0.02	0.09
% Area of Building – Carpet	0.00	-0.02	0.77	0.00	-0.02	0.80	0.00	-0.02	0.82	0.00	-0.02	0.75
Adjacent Loading – Post cleaning	0.27	0.27	0.20	0.00	0.00	0.00	0.09	0.09	0.13	0.00	0.00	0.00
Adjacent Loading – Post verification	0.00	0.00	0.00	0.11	0.11	0.09	0.00	0.00	0.00	0.15	0.15	0.24
Background Loading	0.02	0.02	-0.61	0.02	0.02	-0.60	0.03	0.03	-0.43	0.04	0.04	-0.55
Cleaning Frequency	0.00	-0.07	-0.34	0.00	-0.07	-0.40	0.00	-0.07	-0.36	0.00	-0.07	-0.36
Load-concentration Intercept	0.90	0.90	0.00	0.90	0.90	0.00	0.90	0.90	0.00	0.90	0.90	0.00
Load-concentration Slope	0.14	0.05	0.00	0.15	0.06	0.00	0.13	0.05	0.00	0.10	0.02	0.00
Rest of Building Loading – Post cleaning	0.05	0.05	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Rest of Building Loading – Post verification	0.00	0.00	0.00	0.06	0.06	0.06	0.00	0.00	0.00	0.05	0.05	0.14
Workspace Loading – Post cleaning	0.13	0.13	0.11	0.00	0.00	0.00	0.10	0.10	0.09	0.00	0.00	0.00
Workspace Loading – Post verification	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.00	0.05	0.05	0.13

Exhibit E-20. Sensitivity Analysis Results – Sensitivity Scores, Indoor Dust, Single Activity, Vintage 1960 to 1979

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
% Area of Building – Adjacent Room	0.06	0.06	0.05	0.02	0.02	0.00	0.06	0.06	0.05	0.07	0.07	0.07
% Area of Building – Workspace	0.05	0.05	0.05	0.01	0.01	0.00	0.05	0.05	0.06	0.02	0.02	0.00
% Area of Building – Carpet	0.00	-0.01	0.79	0.00	-0.01	0.82	0.00	-0.01	0.84	0.00	-0.01	0.79
Adjacent Loading – Post cleaning	0.22	0.22	0.17	0.00	0.00	0.00	0.07	0.07	0.11	0.00	0.00	0.00
Adjacent Loading – Post verification	0.00	0.00	0.00	0.09	0.09	0.08	0.00	0.00	0.00	0.12	0.12	0.19
Background Loading	0.01	0.01	-0.34	0.01	0.01	-0.33	0.01	0.01	-0.24	0.01	0.01	-0.29
Cleaning Frequency	0.00	-0.05	-0.40	0.00	-0.05	-0.39	0.00	-0.05	-0.36	0.00	-0.05	-0.36
Load-concentration Intercept	1.08	1.08	0.00	1.08	1.08	0.00	1.08	1.08	0.00	1.08	1.08	0.00
Load-concentration Slope	0.14	0.05	0.00	0.15	0.06	0.00	0.14	0.05	0.00	0.10	0.02	0.00
Rest of Building Loading – Post cleaning	0.04	0.04	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Rest of Building Loading – Post verification	0.00	0.00	0.00	0.05	0.05	0.05	0.00	0.00	0.00	0.04	0.04	0.11
Workspace Loading – Post cleaning	0.10	0.10	0.09	0.00	0.00	0.00	0.08	0.08	0.08	0.00	0.00	0.00
Workspace Loading – Post verification	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.04	0.04	0.10

Exhibit E-21. Sensitivity Analysis Results – Sensitivity Scores, Indoor Dust, Multiple Activities, Vintage <1940

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
% Area of Building – Adjacent Room	0.06	0.06	0.08	0.12	0.12	0.00	0.07	0.07	0.08	0.08	0.08	0.00
% Area of Building – Workspace	0.06	0.06	0.08	0.00	0.00	0.00	0.06	0.06	0.09	0.02	0.02	0.00
% Area of Building – Carpet	0.00	0.09	0.62	0.00	0.11	0.60	0.00	0.09	0.65	0.00	0.09	0.60
Adjacent Loading – Post cleaning	0.27	0.27	0.27	0.00	0.00	0.00	0.09	0.09	0.09	0.00	0.00	0.00
Adjacent Loading – Post verification	0.00	0.00	0.00	0.21	0.21	0.00	0.00	0.00	0.00	0.15	0.15	0.00
Background Loading	0.00	0.00	-0.28	0.00	0.00	-0.46	0.00	0.00	-0.29	0.01	0.01	-0.33
Cleaning Frequency	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Load-concentration Intercept	0.91	0.91	0.00	0.91	0.91	0.00	0.91	0.91	0.00	0.91	0.91	0.00
Load-concentration Slope	0.29	0.17	0.00	0.36	0.23	0.00	0.28	0.16	0.00	0.25	0.13	0.00
Rest of Building Loading – Post cleaning	0.08	0.08	0.00	0.00	0.00	0.00	0.01	0.01	0.05	0.00	0.00	0.00
Rest of Building Loading – Post verification	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.06	0.06	0.00
Workspace Loading – Post cleaning	0.13	0.13	0.15	0.00	0.00	0.00	0.10	0.10	0.12	0.00	0.00	0.00
Workspace Loading – Post verification	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.06	0.06	0.00

Exhibit E-22. Sensitivity Analysis Results – Sensitivity Scores, Indoor Dust, Multiple Activities, Vintage 1940 to 1959

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
% Area of Building – Adjacent Room	0.06	0.06	0.07	0.11	0.11	0.00	0.07	0.07	0.00	0.07	0.07	0.00
% Area of Building – Workspace	0.06	0.06	0.07	0.00	0.00	0.00	0.06	0.06	0.00	0.02	0.02	0.00
% Area of Building – Carpet	0.00	0.09	0.64	0.00	0.10	0.62	0.00	0.09	0.61	0.00	0.09	0.57
Adjacent Loading – Post cleaning	0.26	0.26	0.24	0.00	0.00	0.00	0.09	0.09	0.00	0.00	0.00	0.00
Adjacent Loading – Post verification	0.00	0.00	0.00	0.20	0.20	0.00	0.00	0.00	0.00	0.14	0.14	0.12
Background Loading	0.00	0.00	-0.23	0.00	0.00	-0.20	0.00	0.00	-0.48	0.00	0.00	-0.27
Cleaning Frequency	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Load-concentration Intercept	0.90	0.90	0.00	0.90	0.90	0.00	0.90	0.90	0.00	0.90	0.90	0.00
Load-concentration Slope	0.33	0.19	0.00	0.40	0.26	0.00	0.31	0.18	0.00	0.28	0.15	0.00
Rest of Building Loading – Post cleaning	0.08	0.08	0.22	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Rest of Building Loading – Post verification	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.06	0.06	0.00
Workspace Loading – Post cleaning	0.13	0.13	0.13	0.00	0.00	0.00	0.10	0.10	0.00	0.00	0.00	0.00
Workspace Loading – Post verification	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.06	0.06	0.00

Exhibit E-23. Sensitivity Analysis Results – Sensitivity Scores, Indoor Dust, Multiple Activities, Vintage 1960 to 1979

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background	PH=4, Week 0	PH=4, Week 10	Weeks to Background
% Area of Building – Adjacent Room	0.05	0.05	0.00	0.09	0.09	0.05	0.06	0.06	0.00	0.06	0.06	0.00
% Area of Building – Workspace	0.05	0.05	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.02	0.02	0.00
% Area of Building – Carpet	0.00	0.07	0.58	0.00	0.08	0.62	0.00	0.07	0.60	0.00	0.07	0.62
Adjacent Loading – Post cleaning	0.21	0.21	0.00	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.00	0.00
Adjacent Loading – Post verification	0.00	0.00	0.00	0.16	0.16	0.08	0.00	0.00	0.00	0.12	0.12	0.11
Background Loading	0.00	0.00	-0.28	0.00	0.00	-0.12	0.00	0.00	-0.14	0.00	0.00	-0.16
Cleaning Frequency	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Load-concentration Intercept	1.08	1.08	0.00	1.08	1.08	0.00	1.08	1.08	0.00	1.08	1.08	0.00
Load-concentration Slope	0.33	0.19	0.00	0.40	0.26	0.00	0.31	0.18	0.00	0.28	0.15	0.00
Rest of Building Loading – Post cleaning	0.06	0.06	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Rest of Building Loading – Post verification	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.05	0.05	0.00
Workspace Loading – Post cleaning	0.10	0.10	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.00
Workspace Loading – Post verification	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.04	0.04	0.00

E.3. Sensitivity Analysis Results for Cleaning Efficiency

E.3.1 Concentrations of Pb in Indoor Dust

Exhibit E-24. Sensitivity Analysis Results – Routine Cleaning Efficiency, Concentration of Pb in Indoor Dust, Single Activity

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background
	PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10	
Deterministic Results	**196.1**	**148.5**	**77**	**199.1**	**150.8**	**78**	**187.9**	**142.3**	**73**	**159.2**	**120.6**	**46**
Regression using minimum	182.3	153.5	254	185.1	155.9	258	174.6	147.1	242	148.0	124.6	196
Regression using mean	187.2	152.4	252	190.1	154.7	256	179.4	146.0	240	152.0	123.7	193
Regression using maximum	189.0	153.6	254	191.9	155.9	258	181.0	147.1	242	153.4	124.7	196

Exhibit E-25. Sensitivity Analysis Results – Routine Cleaning Efficiency, Concentration of Pb in Indoor Dust, Multiply Activities

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background
	PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10	
Deterministic Results	**442.4**	**306.9**	**62**	**605.5**	**420.1**	**72**	**418.3**	**290.2**	**60**	**351.4**	**243.8**	**54**
Regression using minimum	400.7	362.5	312	558.6	505.2	312	378.9	342.7	312	318.4	287.9	312
Regression using mean	409.8	359.8	312	562.3	493.6	312	387.5	340.2	312	325.5	285.8	312
Regression using maximum	414.4	362.6	312	573.5	501.9	312	391.8	342.9	312	329.2	288.0	312

E.3.2 Percent Change in Concentration of Pb in Indoor Dust

Exhibit E-26. Sensitivity Analysis Results – Routine Cleaning Efficiency, Percent Change in Concentration of Pb in Indoor Dust, Single Activity

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 1	PH=4, Week 10	Weeks to Background	PH=4, Week 1	PH=4, Week 10	Weeks to Background	PH=4, Week 1	PH=4, Week 10	Weeks to Background	PH=4, Week 1	PH=4, Week 10	Weeks to Background
Regression using minimum	-7%	3%	230%	-7%	3%	231%	-7%	3%	232%	-7%	3%	326%
Regression using mean	-5%	3%	227%	-5%	3%	228%	-5%	3%	229%	-5%	3%	320%
Regression using maximum	-4%	3%	230%	-4%	3%	231%	-4%	3%	232%	-4%	3%	326%

Exhibit E-27. Sensitivity Analysis Results – Routine Cleaning Efficiency, Percent Change in Concentration of Pb in Indoor Dust, Single Activity

Input	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	PH=4, Week 1	PH=4, Week 10	Weeks to Background	PH=4, Week 1	PH=4, Week 10	Weeks to Background	PH=4, Week 1	PH=4, Week 10	Weeks to Background	PH=4, Week 1	PH=4, Week 10	Weeks to Background
Regression using minimum	-9%	18%	403%	-8%	20%	333%	-9%	18%	420%	-9%	18%	478%
Regression using mean	-7%	17%	403%	-7%	18%	333%	-7%	17%	420%	-7%	17%	478%
Regression using maximum	-6%	18%	403%	-5%	19%	333%	-6%	18%	420%	-6%	18%	478%

E.4. Monte Carlo Results

Exhibit E-28. Monte Carlo Results – Percentile Distribution of Concentrations of Pb in Indoor Dust, Single Activity (i.e., Window Replacement), Vintage <1940

Percentile	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background
	PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10	
Maximum	12,577	8,706	> 312	10,069	7,325	> 312	9,697	6,324	> 312	11,589	6,617	> 312
99th	3,657	2,193	> 312	3,561	2,156	> 312	3,412	2,052	> 312	2,870	1,798	> 312
95th	2,258	1,362	> 312	2,277	1,360	> 312	2,139	1,276	> 312	1,813	1,125	> 312
75th	1,138	665	121	1,164	677	138	1,077	630	129	906	540	101
50th	705	408	64	723	418	73	666	387	69	559	330	52
Mean	906	531	102	922	540	112	855	503	107	722	434	89
25th	435	250	39	451	258	46	415	238	43	342	200	29
5th	218	122	16	228	126	24	209	117	20	170	98	6
Minimum	33	17	1	38	20	1	37	19	1	26	15	1

Exhibit E-29. Monte Carlo Results – Percentile Distribution of Concentrations of Pb in Indoor Dust, Single Activity (i.e., Window Replacement), Vintage 1940 to 1959

Percentile	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background
	PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10	
Maximum	7,262	5,072	> 312	5,665	4,153	> 312	5,529	3,565	> 312	6,545	3,876	> 312
99th	2,024	1,215	> 312	1,980	1,209	> 312	1,876	1,137	> 312	1,583	965	> 312
95th	1,234	741	> 312	1,243	744	> 312	1,164	695	> 312	982	595	> 312
75th	613	358	153	626	367	170	577	339	160	483	285	131
50th	374	218	81	385	224	90	353	206	86	294	172	69
Mean	487	286	120	497	292	129	460	271	124	385	229	107
25th	228	132	52	237	137	59	217	125	55	179	103	42
5th	113	64	28	118	66	35	107	60	31	88	50	19
Minimum	16	9	1	19	10	1	18	10	1	13	7	1

Exhibit E-30. Monte Carlo Results – Percentile Distribution of Concentrations of Pb in Indoor Dust, Single Activity (i.e., Window Replacement), Vintage 1960 to 1979

Percentile	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background
	PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10	
Maximum	7,903	5,928	> 312	5,919	4,616	> 312	5,715	4,065	> 312	6,584	4,779	> 312
99th	1,808	1,179	> 312	1,773	1,181	> 312	1,692	1,107	> 312	1,463	963	> 312
95th	999	659	> 312	1,009	667	> 312	948	624	> 312	829	546	> 312
75th	435	282	173	445	288	191	415	268	181	356	230	152
50th	243	157	93	248	160	103	232	150	98	198	128	81
Mean	351	229	132	358	233	141	335	218	136	289	188	121
25th	135	86	62	139	90	69	129	83	66	110	71	53
5th	58	37	40	60	38	46	56	35	42	47	30	32
Minimum	6	4	6	7	4	12	7	4	11	5	3	3

Exhibit E-31. Monte Carlo Results – Percentile Distribution of Concentrations of Pb in Indoor Dust, Multiple Activities, Vintage <1940

Percentile	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background
	PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10	
Maximum	39,542	16,343	> 312	111,372	28,056	> 312	27,467	11,445	> 312	33,296	14,341	> 312
99th	11,338	4,960	> 312	23,264	8,425	> 312	10,257	4,488	> 312	8,659	3,886	> 312
95th	7,035	3,061	> 312	13,155	5,031	> 312	6,371	2,815	> 312	5,276	2,317	> 312
75th	3,501	1,539	157	5,908	2,374	193	3,239	1,423	151	2,633	1,162	134
50th	2,195	965	101	3,492	1,440	122	2,024	889	97	1,621	716	86
Mean	2,816	1,233	129	4,837	1,918	150	2,574	1,131	124	2,107	926	112
25th	1,372	596	73	2,084	869	87	1,256	549	69	1,012	444	61
5th	685	298	48	1,007	426	58	636	276	45	507	219	38
Minimum	126	60	11	206	81	16	124	52	3	89	41	2

Exhibit E-32. Monte Carlo Results – Percentile Distribution of Concentrations of Pb in Indoor Dust, Multiple Activities, Vintage 1940 to 1959

Percentile	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background
	PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10	
Maximum	22,162	9,358	> 312	58,312	15,454	> 312	15,377	6,605	> 312	18,286	8,039	> 312
99th	6,229	2,798	> 312	12,346	4,635	> 312	5,628	2,510	> 312	4,757	2,174	> 312
95th	3,807	1,693	> 312	6,974	2,733	> 312	3,470	1,561	> 312	2,868	1,284	> 312
75th	1,872	838	179	3,108	1,281	216	1,732	776	173	1,412	635	156
50th	1,160	520	116	1,828	769	136	1,070	479	111	862	387	100
Mean	1,504	672	144	2,548	1,034	163	1,377	617	139	1,131	507	128
25th	717	318	84	1,082	460	98	658	293	80	531	238	72
5th	352	156	57	513	222	66	326	145	54	262	115	47
Minimum	63	30	18	101	41	23	61	27	18	44	21	4

Exhibit E-33. Monte Carlo Results – Percentile Distribution of Concentrations of Pb in Indoor Dust, Multiple Activities, Vintage 1960 to 1979

Percentile	Base Control Option			Control Option 1			Control Option 2			Control Option 3		
	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background	Concentration (µg Pb/g dust)		Weeks to Background
	PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10		PH=4, Week 0	PH=4, Week 10	
Maximum	18,832	9,437	> 312	39,347	11,374	> 312	13,871	7,138	> 312	13,721	7,061	> 312
99th	4,489	2,364	> 312	7,243	3,372	> 312	4,173	2,193	> 312	3,574	1,870	> 312
95th	2,494	1,309	> 312	3,931	1,886	> 312	2,324	1,223	> 312	1,990	1,041	> 312
75th	1,079	566	195	1,617	794	231	1,014	534	189	858	452	171
50th	608	319	126	881	440	146	569	299	122	480	253	110
Mean	880	461	154	1,326	648	172	819	430	150	699	367	139
25th	339	178	92	479	241	106	319	167	89	268	141	81
5th	146	76	65	202	103	75	138	72	63	115	60	56
Minimum	19	11	33	30	14	38	19	10	32	14	8	25

Appendix F. Blood Pb Modeling Results for Examples

F. BLOOD PB MODELING RESULTS FOR EXAMPLES

This appendix presents the lifetime average blood Pb results for the single activity example (i.e., window replacement) and the multiple activities examples. Section F.1 (Exhibits F-1 to F-18) presents the blood Pb results for a single activity example per building vintage, blood Pb model and control option for six theoretical children who each experience the renovation during a different year of their life. Section F.2 (Exhibits F-19 to F-36) presents the blood Pb results for the multiple activities example per building vintage, blood Pb model and control option for six theoretical children who each experience the renovation during a different year of their life. Four different dust percentiles (i.e., 95th, median, mean, and 5th) are shown.

F.1. Single Activity Example

Exhibit F-1. Summary of Lifetime-Averaged Blood Pb Levels (ug/dL) in the Exposure Year from IEUBK Model, Vintage <1940

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Background, 95th Percentile	7.85	7.85	7.85	7.85	7.85	7.85
Baseline, 95th Percentile	8.75	8.74	8.63	8.52	8.36	8.19
Control Opt 1, 95th Percentile	8.76	8.76	8.64	8.54	8.38	8.21
Control Opt 2, 95th Percentile	8.66	8.67	8.57	8.49	8.35	8.21
Control Opt 3, 95th Percentile	8.37	8.38	8.32	8.27	8.19	8.09
Background, Median	4.54	4.54	4.54	4.54	4.54	4.54
Baseline, Median	4.94	4.94	4.89	4.84	4.76	4.69
Control Opt 1, Median	4.97	4.97	4.91	4.86	4.78	4.70
Control Opt 2, Median	4.93	4.93	4.88	4.84	4.77	4.70
Control Opt 3, Median	4.81	4.81	4.78	4.75	4.70	4.66
Background, Mean	5.03	5.03	5.03	5.03	5.03	5.03
Baseline, Mean	5.50	5.50	5.43	5.38	5.29	5.20
Control Opt 1, Mean	5.52	5.53	5.46	5.40	5.31	5.22
Control Opt 2, Mean	5.48	5.49	5.43	5.38	5.30	5.22
Control Opt 3, Mean	5.33	5.34	5.30	5.27	5.22	5.16
Background, 5th Percentile	3.61	3.61	3.61	3.61	3.61	3.61
Baseline, 5th Percentile	3.74	3.75	3.73	3.71	3.69	3.67
Control Opt 1, 5th Percentile	3.75	3.76	3.74	3.72	3.70	3.67
Control Opt 2, 5th Percentile	3.75	3.76	3.74	3.73	3.70	3.68
Control Opt 3, 5th Percentile	3.72	3.72	3.71	3.70	3.68	3.66

Exhibit F-2. Summary of Lifetime-Averaged Blood Pb Levels (ug/dL) in the Exposure Year from Leggett Model, Vintage <1940

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Background, 95th Percentile	25.34	25.34	25.34	25.34	25.34	25.34
Baseline, 95th Percentile	28.75	28.16	27.70	27.30	26.70	26.25
Control Opt 1, 95th Percentile	28.93	28.30	27.83	27.42	26.80	26.34
Control Opt 2, 95th Percentile	28.82	28.19	27.75	27.40	26.81	26.39
Control Opt 3, 95th Percentile	27.61	27.16	26.88	26.66	26.30	26.06
Background, Median	13.86	13.86	13.86	13.86	13.86	13.86
Baseline, Median	15.40	15.38	15.12	14.87	14.51	14.25
Control Opt 1, Median	15.54	15.51	15.24	14.98	14.58	14.30
Control Opt 2, Median	15.45	15.41	15.16	14.93	14.57	14.33
Control Opt 3, Median	14.93	14.92	14.75	14.59	14.35	14.18
Background, Mean	15.53	15.53	15.53	15.53	15.53	15.53
Baseline, Mean	17.43	17.39	17.07	16.77	16.32	16.32
Control Opt 1, Mean	17.60	17.55	17.21	16.89	16.41	16.41
Control Opt 2, Mean	17.51	17.45	17.14	16.85	16.41	16.41
Control Opt 3, Mean	16.82	16.79	16.59	16.41	16.12	16.12
Background, 5th Percentile	10.77	10.77	10.77	10.77	10.77	10.77
Baseline, 5th Percentile	11.23	11.23	11.16	11.09	10.98	10.91
Control Opt 1, 5th Percentile	11.28	11.28	11.20	11.13	11.01	10.93
Control Opt 2, 5th Percentile	11.28	11.28	11.21	11.14	11.03	10.95
Control Opt 3, 5th Percentile	11.15	11.15	11.09	11.04	10.96	10.91

Exhibit F-3. Summary of Incremental Change in Lifetime-Averaged Blood Pb Levels (ug/dL) Relative to Background in the Exposure Year from IEUBK Model, Vintage <1940

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	0.90	0.89	0.78	0.67	0.51	0.34
Control Opt 1, 95th Percentile	0.91	0.91	0.79	0.69	0.53	0.36
Control Opt 2, 95th Percentile	0.81	0.82	0.72	0.64	0.50	0.36
Control Opt 3, 95th Percentile	0.52	0.53	0.47	0.42	0.34	0.24
Baseline, Median	0.40	0.40	0.34	0.29	0.22	0.14
Control Opt 1, Median	0.42	0.42	0.37	0.32	0.24	0.16
Control Opt 2, Median	0.38	0.39	0.34	0.30	0.23	0.16
Control Opt 3, Median	0.27	0.27	0.24	0.21	0.16	0.11
Baseline, Mean	0.47	0.47	0.40	0.35	0.26	0.17
Control Opt 1, Mean	0.49	0.50	0.43	0.37	0.28	0.19
Control Opt 2, Mean	0.45	0.45	0.40	0.35	0.27	0.19
Control Opt 3, Mean	0.30	0.31	0.27	0.24	0.18	0.13
Baseline, 5th Percentile	0.13	0.13	0.12	0.10	0.08	0.05
Control Opt 1, 5th Percentile	0.14	0.15	0.13	0.11	0.09	0.06
Control Opt 2, 5th Percentile	0.14	0.15	0.13	0.12	0.09	0.07
Control Opt 3, 5th Percentile	0.11	0.11	0.10	0.09	0.07	0.05

Exhibit F-4. Summary of Incremental Change in Lifetime-Averaged Blood Pb Levels (ug/dL) Relative to Background in the Exposure Year from Leggett Model, Vintage <1940

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	3.41	2.82	2.36	1.96	1.36	0.90
Control Opt 1, 95th Percentile	3.59	2.96	2.49	2.08	1.46	0.99
Control Opt 2, 95th Percentile	3.47	2.84	2.41	2.05	1.46	1.05
Control Opt 3, 95th Percentile	2.27	1.82	1.54	1.32	0.95	0.71
Baseline, Median	1.53	1.51	1.26	1.01	0.64	0.38
Control Opt 1, Median	1.68	1.65	1.38	1.11	0.72	0.44
Control Opt 2, Median	1.58	1.55	1.30	1.07	0.71	0.47
Control Opt 3, Median	1.07	1.05	0.89	0.73	0.49	0.32
Baseline, Mean	1.90	1.85	1.54	1.23	0.79	0.79
Control Opt 1, Mean	2.07	2.02	1.68	1.36	0.87	0.87
Control Opt 2, Mean	1.97	1.91	1.60	1.32	0.87	0.87
Control Opt 3, Mean	1.28	1.26	1.05	0.87	0.58	0.58
Baseline, 5th Percentile	0.46	0.46	0.39	0.32	0.22	0.14
Control Opt 1, 5th Percentile	0.51	0.51	0.44	0.36	0.24	0.16
Control Opt 2, 5th Percentile	0.52	0.51	0.44	0.37	0.26	0.19
Control Opt 3, 5th Percentile	0.38	0.38	0.33	0.28	0.20	0.14

Exhibit F-5. Absolute Change in Lifetime-Averaged Blood Pb Levels, Each Control Option Relative to Baseline Control Option from IEUBK Model, Vintage <1940

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	0.01	0.01	0.01	0.02	0.02	0.02
Control Option 2, 95th Percentile	-0.09	-0.07	-0.06	-0.03	-0.01	0.01
Control Option 3, 95th Percentile	-0.38	-0.36	-0.30	-0.25	-0.17	-0.10
Control Option 1, Median	0.03	0.03	0.02	0.02	0.02	0.02
Control Option 2, Median	-0.01	-0.01	0.00	0.00	0.01	0.02
Control Option 3, Median	-0.13	-0.13	-0.11	-0.09	-0.06	-0.03
Control Option 1, Mean	0.03	0.03	0.03	0.03	0.02	0.02
Control Option 2, Mean	-0.02	-0.01	-0.01	0.00	0.01	0.02
Control Option 3, Mean	-0.17	-0.16	-0.13	-0.11	-0.07	-0.04
Control Option 1, 5th Percentile	0.01	0.01	0.01	0.01	0.01	0.01
Control Option 2, 5th Percentile	0.01	0.01	0.01	0.01	0.01	0.02
Control Option 3, 5th Percentile	-0.02	-0.02	-0.02	-0.02	-0.01	0.00

Exhibit F-6. Absolute Change in Lifetime-Averaged Blood Pb Levels, Each Control Option Relative to Baseline Control Option from Leggett Model, Vintage <1940

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	0.18	0.14	0.13	0.13	0.10	0.09
Control Option 2, 95th Percentile	0.07	0.02	0.05	0.10	0.10	0.15
Control Option 3, 95th Percentile	-1.14	-1.01	-0.82	-0.63	-0.41	-0.19
Control Option 1, Median	0.15	0.14	0.12	0.10	0.07	0.06
Control Option 2, Median	0.05	0.04	0.04	0.06	0.07	0.08
Control Option 3, Median	-0.46	-0.46	-0.37	-0.28	-0.16	-0.06
Control Option 1, Mean	0.17	0.16	0.14	0.12	0.09	0.09
Control Option 2, Mean	0.08	0.06	0.07	0.09	0.09	0.09
Control Option 3, Mean	-0.61	-0.60	-0.48	-0.36	-0.21	-0.21
Control Option 1, 5th Percentile	0.05	0.05	0.04	0.04	0.03	0.02
Control Option 2, 5th Percentile	0.05	0.05	0.05	0.05	0.05	0.05
Control Option 3, 5th Percentile	-0.08	-0.08	-0.07	-0.05	-0.02	0.00

Exhibit F-7. Summary of Lifetime-Averaged Blood Pb Levels (ug/dL) in the Exposure Year from IEUBK Model, Vintage 1940 to 1959

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Background, 95th Percentile	3.84	3.84	3.84	3.84	3.84	3.84
Baseline, 95th Percentile	4.73	4.71	4.57	4.45	4.28	4.11
Control Opt 1, 95th Percentile	4.76	4.74	4.60	4.47	4.30	4.13
Control Opt 2, 95th Percentile	4.67	4.66	4.54	4.43	4.28	4.13
Control Opt 3, 95th Percentile	4.39	4.40	4.32	4.25	4.15	4.05
Background, Median	2.19	2.19	2.19	2.19	2.19	2.19
Baseline, Median	2.49	2.49	2.44	2.40	2.35	2.29
Control Opt 1, Median	2.51	2.51	2.46	2.42	2.36	2.30
Control Opt 2, Median	2.49	2.49	2.45	2.41	2.36	2.31
Control Opt 3, Median	2.40	2.41	2.38	2.35	2.31	2.28
Background, Mean	2.43	2.43	2.43	2.43	2.43	2.43
Baseline, Mean	2.81	2.81	2.75	2.70	2.62	2.56
Control Opt 1, Mean	2.83	2.83	2.77	2.72	2.64	2.57
Control Opt 2, Mean	2.80	2.81	2.75	2.71	2.64	2.57
Control Opt 3, Mean	2.69	2.69	2.65	2.62	2.58	2.53
Background, 5th Percentile	1.75	1.75	1.75	1.75	1.75	1.75
Baseline, 5th Percentile	1.84	1.84	1.83	1.82	1.80	1.79
Control Opt 1, 5th Percentile	1.84	1.85	1.83	1.82	1.81	1.79
Control Opt 2, 5th Percentile	1.85	1.85	1.84	1.83	1.82	1.80
Control Opt 3, 5th Percentile	1.82	1.83	1.82	1.81	1.80	1.79

Exhibit F-8. Summary of Lifetime-Averaged Blood Pb Levels (ug/dL) in the Exposure Year from Leggett Model, Vintage 1940 to 1959

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Background, 95th Percentile	11.48	11.48	11.48	11.48	11.48	11.48
Baseline, 95th Percentile	14.91	14.77	14.17	13.60	12.80	12.24
Control Opt 1, 95th Percentile	15.12	14.97	14.34	13.74	12.91	12.33
Control Opt 2, 95th Percentile	14.93	14.80	14.24	13.70	12.91	12.39
Control Opt 3, 95th Percentile	13.74	13.68	13.32	12.98	12.45	12.10
Background, Median	6.29	6.29	6.29	6.29	6.29	6.29
Baseline, Median	7.29	7.27	7.11	6.94	6.71	6.54
Control Opt 1, Median	7.38	7.36	7.18	7.01	6.75	6.57
Control Opt 2, Median	7.33	7.32	7.15	7.00	6.76	6.60
Control Opt 3, Median	7.02	7.01	6.90	6.79	6.62	6.51
Background, Mean	7.00	7.00	7.00	7.00	7.00	7.00
Baseline, Mean	8.34	8.30	8.08	7.86	7.54	7.54
Control Opt 1, Mean	8.45	8.41	8.17	7.94	7.60	7.60
Control Opt 2, Mean	8.39	8.36	8.14	7.93	7.61	7.61
Control Opt 3, Mean	7.94	7.93	7.78	7.64	7.42	7.42
Background, 5th Percentile	4.96	4.96	4.96	4.96	4.96	4.96
Baseline, 5th Percentile	5.24	5.25	5.20	5.17	5.10	5.06
Control Opt 1, 5th Percentile	5.27	5.27	5.23	5.19	5.12	5.07
Control Opt 2, 5th Percentile	5.29	5.29	5.25	5.21	5.15	5.10
Control Opt 3, 5th Percentile	5.22	5.21	5.18	5.15	5.11	5.07

Exhibit F-9. Summary of Incremental Change in Lifetime-Averaged Blood Pb Levels (ug/dL) Relative to Background in the Exposure Year from IEUBK Model, Vintage 1940 to 1959

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	0.89	0.87	0.74	0.61	0.44	0.28
Control Opt 1, 95th Percentile	0.92	0.90	0.76	0.64	0.46	0.30
Control Opt 2, 95th Percentile	0.83	0.82	0.70	0.60	0.44	0.30
Control Opt 3, 95th Percentile	0.56	0.56	0.48	0.42	0.31	0.21
Baseline, Median	0.30	0.30	0.25	0.21	0.15	0.10
Control Opt 1, Median	0.32	0.32	0.27	0.23	0.17	0.11
Control Opt 2, Median	0.29	0.30	0.26	0.22	0.17	0.12
Control Opt 3, Median	0.21	0.21	0.18	0.16	0.12	0.08
Baseline, Mean	0.38	0.38	0.32	0.27	0.19	0.13
Control Opt 1, Mean	0.40	0.40	0.34	0.29	0.21	0.14
Control Opt 2, Mean	0.37	0.38	0.32	0.28	0.21	0.14
Control Opt 3, Mean	0.26	0.26	0.22	0.19	0.15	0.10
Baseline, 5th Percentile	0.09	0.09	0.08	0.07	0.05	0.04
Control Opt 1, 5th Percentile	0.09	0.10	0.08	0.07	0.06	0.04
Control Opt 2, 5th Percentile	0.10	0.10	0.09	0.08	0.07	0.05
Control Opt 3, 5th Percentile	0.07	0.08	0.07	0.06	0.05	0.04

Exhibit F-10. Summary of Incremental Change in Lifetime-Averaged Blood Pb Levels (ug/dL) Relative to Background in the Exposure Year from Leggett Model, Vintage 1940 to 1959

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	3.42	3.29	2.69	2.11	1.32	0.76
Control Opt 1, 95th Percentile	3.64	3.48	2.86	2.26	1.42	0.84
Control Opt 2, 95th Percentile	3.45	3.32	2.75	2.22	1.43	0.90
Control Opt 3, 95th Percentile	2.26	2.20	1.84	1.49	0.97	0.61
Baseline, Median	1.00	0.98	0.82	0.66	0.42	0.25
Control Opt 1, Median	1.09	1.07	0.89	0.72	0.47	0.28
Control Opt 2, Median	1.05	1.03	0.87	0.71	0.48	0.31
Control Opt 3, Median	0.74	0.73	0.61	0.50	0.34	0.22
Baseline, Mean	1.33	1.30	1.07	0.85	0.54	0.54
Control Opt 1, Mean	1.44	1.41	1.16	0.93	0.59	0.59
Control Opt 2, Mean	1.39	1.35	1.13	0.93	0.61	0.61
Control Opt 3, Mean	0.94	0.92	0.77	0.63	0.42	0.42
Baseline, 5th Percentile	0.28	0.28	0.24	0.20	0.14	0.10
Control Opt 1, 5th Percentile	0.31	0.31	0.27	0.23	0.16	0.11
Control Opt 2, 5th Percentile	0.33	0.33	0.29	0.25	0.19	0.14
Control Opt 3, 5th Percentile	0.25	0.25	0.22	0.19	0.14	0.11

Exhibit F-11. Absolute Change in Lifetime-Averaged Blood Pb Levels, Each Control Option Relative to Baseline Control Option from IEUBK Model, Vintage 1940 to 1959

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	0.03	0.03	0.03	0.02	0.02	0.02
Control Option 2, 95th Percentile	-0.06	-0.05	-0.03	-0.02	0.00	0.02
Control Option 3, 95th Percentile	-0.33	-0.31	-0.25	-0.20	-0.13	-0.07
Control Option 1, Median	0.02	0.02	0.02	0.02	0.01	0.01
Control Option 2, Median	0.00	0.00	0.01	0.01	0.01	0.02
Control Option 3, Median	-0.08	-0.08	-0.07	-0.05	-0.03	-0.02
Control Option 1, Mean	0.02	0.02	0.02	0.02	0.02	0.01
Control Option 2, Mean	-0.01	0.00	0.00	0.01	0.01	0.02
Control Option 3, Mean	-0.12	-0.12	-0.10	-0.07	-0.05	-0.02
Control Option 1, 5th Percentile	0.01	0.01	0.01	0.01	0.01	0.00
Control Option 2, 5th Percentile	0.01	0.01	0.01	0.01	0.01	0.01
Control Option 3, 5th Percentile	-0.01	-0.01	-0.01	0.00	0.00	0.00

Exhibit F-12. Absolute Change in Lifetime-Averaged Blood Pb Levels, Each Control Option Relative to Baseline Control Option from Leggett Model, Vintage 1940 to 1959

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	0.21	0.19	0.17	0.15	0.10	0.09
Control Option 2, 95th Percentile	0.03	0.03	0.06	0.10	0.11	0.14
Control Option 3, 95th Percentile	-1.16	-1.09	-0.85	-0.62	-0.35	-0.15
Control Option 1, Median	0.09	0.09	0.08	0.07	0.04	0.03
Control Option 2, Median	0.05	0.05	0.05	0.06	0.05	0.06
Control Option 3, Median	-0.26	-0.26	-0.21	-0.15	-0.08	-0.03
Control Option 1, Mean	0.11	0.11	0.09	0.08	0.05	0.05
Control Option 2, Mean	0.06	0.06	0.06	0.07	0.07	0.07
Control Option 3, Mean	-0.39	-0.38	-0.30	-0.22	-0.12	-0.12
Control Option 1, 5th Percentile	0.03	0.03	0.03	0.02	0.02	0.01
Control Option 2, 5th Percentile	0.05	0.05	0.05	0.05	0.04	0.04
Control Option 3, 5th Percentile	-0.03	-0.03	-0.02	-0.01	0.00	0.01

Exhibit F-13. Summary of Lifetime-Averaged Blood Pb Levels (ug/dL) in the Exposure Year from IEUBK Model, Vintage 1960 to 1979

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Background, 95th Percentile	3.29	3.29	3.29	3.29	3.29	3.29
Baseline, 95th Percentile	4.23	4.19	4.04	3.91	3.73	3.55
Control Opt 1, 95th Percentile	4.26	4.22	4.07	3.93	3.74	3.57
Control Opt 2, 95th Percentile	4.17	4.15	4.01	3.89	3.72	3.56
Control Opt 3, 95th Percentile	3.93	3.91	3.82	3.73	3.61	3.50
Background, Median	1.87	1.87	1.87	1.87	1.87	1.87
Baseline, Median	2.09	2.09	2.06	2.03	1.99	1.95
Control Opt 1, Median	2.11	2.11	2.07	2.04	1.99	1.95
Control Opt 2, Median	2.09	2.10	2.06	2.04	2.00	1.96
Control Opt 3, Median	2.04	2.04	2.02	2.00	1.97	1.94
Background, Mean	2.09	2.09	2.09	2.09	2.09	2.09
Baseline, Mean	2.42	2.42	2.36	2.31	2.25	2.19
Control Opt 1, Mean	2.44	2.43	2.38	2.33	2.26	2.20
Control Opt 2, Mean	2.42	2.41	2.36	2.32	2.26	2.20
Control Opt 3, Mean	2.33	2.33	2.29	2.26	2.21	2.17
Background, 5th Percentile	1.53	1.53	1.53	1.53	1.53	1.53
Baseline, 5th Percentile	1.58	1.59	1.58	1.57	1.57	1.56
Control Opt 1, 5th Percentile	1.59	1.59	1.58	1.58	1.57	1.56
Control Opt 2, 5th Percentile	1.60	1.60	1.59	1.59	1.58	1.57
Control Opt 3, 5th Percentile	1.58	1.58	1.58	1.57	1.57	1.56

Exhibit F-14. Summary of Lifetime-Averaged Blood Pb Levels (ug/dL) in the Exposure Year from Leggett Model, Vintage 1960 to 1979

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Background, 95th Percentile	9.73	9.73	9.73	9.73	9.73	9.73
Baseline, 95th Percentile	13.10	12.94	12.34	11.74	10.96	10.40
Control Opt 1, 95th Percentile	13.25	13.08	12.45	11.84	11.03	10.45
Control Opt 2, 95th Percentile	13.02	12.87	12.29	11.74	10.99	10.47
Control Opt 3, 95th Percentile	12.06	11.98	11.58	11.19	10.65	10.27
Background, Median	5.35	5.35	5.35	5.35	5.35	5.35
Baseline, Median	6.07	6.05	5.93	5.81	5.65	5.53
Control Opt 1, Median	6.11	6.10	5.97	5.85	5.67	5.55
Control Opt 2, Median	6.09	6.07	5.96	5.85	5.69	5.57
Control Opt 3, Median	5.90	5.89	5.80	5.72	5.60	5.52
Background, Mean	5.98	5.98	5.98	5.98	5.98	5.98
Baseline, Mean	7.10	7.06	6.87	6.68	6.42	6.42
Control Opt 1, Mean	7.17	7.13	6.93	6.73	6.46	6.46
Control Opt 2, Mean	7.11	7.07	6.89	6.71	6.46	6.46
Control Opt 3, Mean	6.79	6.77	6.64	6.52	6.34	6.34
Background, 5th Percentile	4.33	4.33	4.33	4.33	4.33	4.33
Baseline, 5th Percentile	4.50	4.50	4.47	4.45	4.42	4.39
Control Opt 1, 5th Percentile	4.52	4.52	4.49	4.47	4.43	4.40
Control Opt 2, 5th Percentile	4.55	4.54	4.52	4.50	4.46	4.44
Control Opt 3, 5th Percentile	4.50	4.49	4.47	4.46	4.43	4.41

Exhibit F-15. Summary of Incremental Change in Lifetime-Averaged Blood Pb Levels (ug/dL) Relative to Background in the Exposure Year from IEUBK Model, Vintage 1960 to 1979

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	0.94	0.90	0.75	0.62	0.43	0.26
Control Opt 1, 95th Percentile	0.97	0.93	0.77	0.64	0.45	0.27
Control Opt 2, 95th Percentile	0.88	0.85	0.72	0.60	0.43	0.27
Control Opt 3, 95th Percentile	0.63	0.62	0.53	0.44	0.32	0.20
Baseline, Median	0.22	0.22	0.19	0.16	0.11	0.07
Control Opt 1, Median	0.24	0.23	0.20	0.17	0.12	0.08
Control Opt 2, Median	0.22	0.22	0.19	0.17	0.13	0.09
Control Opt 3, Median	0.17	0.17	0.14	0.12	0.10	0.07
Baseline, Mean	0.34	0.33	0.28	0.23	0.16	0.10
Control Opt 1, Mean	0.36	0.35	0.29	0.24	0.17	0.11
Control Opt 2, Mean	0.33	0.33	0.28	0.24	0.17	0.12
Control Opt 3, Mean	0.24	0.24	0.21	0.17	0.13	0.09
Baseline, 5th Percentile	0.05	0.05	0.05	0.04	0.03	0.03
Control Opt 1, 5th Percentile	0.06	0.06	0.05	0.05	0.04	0.03
Control Opt 2, 5th Percentile	0.06	0.07	0.06	0.05	0.05	0.04
Control Opt 3, 5th Percentile	0.05	0.05	0.05	0.04	0.04	0.03

Exhibit F-16. Summary of Incremental Change in Lifetime-Averaged Blood Pb Levels (ug/dL) Relative to Background in the Exposure Year from Leggett Model, Vintage 1960 to 1979

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	3.36	3.21	2.60	2.01	1.23	0.67
Control Opt 1, 95th Percentile	3.52	3.34	2.71	2.10	1.29	0.71
Control Opt 2, 95th Percentile	3.28	3.13	2.56	2.01	1.26	0.73
Control Opt 3, 95th Percentile	2.33	2.24	1.84	1.46	0.92	0.54
Baseline, Median	0.72	0.71	0.59	0.47	0.30	0.18
Control Opt 1, Median	0.77	0.75	0.63	0.50	0.33	0.20
Control Opt 2, Median	0.74	0.73	0.61	0.50	0.34	0.23
Control Opt 3, Median	0.55	0.54	0.46	0.37	0.26	0.17
Baseline, Mean	1.11	1.08	0.88	0.69	0.44	0.44
Control Opt 1, Mean	1.19	1.15	0.94	0.74	0.47	0.47
Control Opt 2, Mean	1.13	1.09	0.91	0.73	0.48	0.48
Control Opt 3, Mean	0.81	0.79	0.66	0.53	0.35	0.35
Baseline, 5th Percentile	0.17	0.17	0.15	0.13	0.09	0.07
Control Opt 1, 5th Percentile	0.19	0.19	0.16	0.14	0.10	0.08
Control Opt 2, 5th Percentile	0.22	0.22	0.19	0.17	0.13	0.11
Control Opt 3, 5th Percentile	0.17	0.17	0.15	0.13	0.11	0.09

Exhibit F-17. Absolute Change in Lifetime-Averaged Blood Pb Levels, Each Control Option Relative to Baseline Control Option from IEUBK Model, Vintage 1960 to 1979

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	0.03	0.03	0.02	0.02	0.02	0.01
Control Option 2, 95th Percentile	-0.06	-0.05	-0.03	-0.02	-0.01	0.01
Control Option 3, 95th Percentile	-0.30	-0.28	-0.23	-0.18	-0.12	-0.06
Control Option 1, Median	0.01	0.01	0.01	0.01	0.01	0.01
Control Option 2, Median	0.00	0.00	0.00	0.01	0.01	0.01
Control Option 3, Median	-0.05	-0.05	-0.04	-0.03	-0.02	-0.01
Control Option 1, Mean	0.02	0.02	0.02	0.01	0.01	0.01
Control Option 2, Mean	-0.01	0.00	0.00	0.01	0.01	0.01
Control Option 3, Mean	-0.10	-0.09	-0.07	-0.06	-0.03	-0.01
Control Option 1, 5th Percentile	0.00	0.01	0.00	0.00	0.00	0.00
Control Option 2, 5th Percentile	0.01	0.01	0.01	0.01	0.01	0.01
Control Option 3, 5th Percentile	0.00	0.00	0.00	0.00	0.00	0.01

Exhibit F-18. Absolute Change in Lifetime-Averaged Blood Pb Levels, Each Control Option Relative to Baseline Control Option from Leggett Model, Vintage 1960 to 1979

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	0.16	0.14	0.11	0.09	0.06	0.05
Control Option 2, 95th Percentile	-0.08	-0.08	-0.04	0.00	0.03	0.07
Control Option 3, 95th Percentile	-1.03	-0.97	-0.76	-0.55	-0.31	-0.13
Control Option 1, Median	0.05	0.05	0.04	0.03	0.02	0.02
Control Option 2, Median	0.02	0.02	0.03	0.03	0.04	0.04
Control Option 3, Median	-0.17	-0.16	-0.13	-0.09	-0.05	-0.01
Control Option 1, Mean	0.07	0.07	0.06	0.05	0.03	0.03
Control Option 2, Mean	0.01	0.01	0.02	0.03	0.04	0.04
Control Option 3, Mean	-0.30	-0.29	-0.23	-0.16	-0.09	-0.09
Control Option 1, 5th Percentile	0.02	0.02	0.02	0.01	0.01	0.01
Control Option 2, 5th Percentile	0.05	0.04	0.04	0.04	0.04	0.04
Control Option 3, 5th Percentile	0.00	-0.01	0.00	0.00	0.01	0.02

F.2. Multiple Activities Example

Exhibit F-19. Summary of Lifetime-Averaged Blood Pb Levels (ug/dL) in the Exposure Year from IEUBK Model, Vintage <1940

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Background, 95th Percentile	7.80	7.80	7.80	7.80	7.80	7.80
Baseline, 95th Percentile	10.14	10.42	10.24	10.16	9.81	9.40
Control Opt 1, 95th Percentile	11.43	11.67	11.34	11.11	10.53	9.76
Control Opt 2, 95th Percentile	9.92	10.19	10.03	9.95	9.64	9.27
Control Opt 3, 95th Percentile	9.37	9.59	9.47	9.42	9.18	8.92
Background, Median	4.54	4.54	4.54	4.54	4.54	4.54
Baseline, Median	5.48	5.63	5.54	5.50	5.33	5.18
Control Opt 1, Median	5.70	5.85	5.73	5.67	5.46	5.26
Control Opt 2, Median	5.43	5.57	5.48	5.44	5.29	5.15
Control Opt 3, Median	5.20	5.31	5.24	5.22	5.10	4.99
Background, Mean	5.03	5.03	5.03	5.03	5.03	5.03
Baseline, Mean	6.21	6.38	6.28	6.23	6.03	5.83
Control Opt 1, Mean	6.67	6.83	6.67	6.57	6.29	5.97
Control Opt 2, Mean	6.12	6.28	6.18	6.14	5.96	5.78
Control Opt 3, Mean	5.84	5.97	5.89	5.86	5.72	5.59
Background, 5th Percentile	3.62	3.62	3.62	3.62	3.62	3.62
Baseline, 5th Percentile	3.96	4.01	3.98	3.96	3.90	3.85
Control Opt 1, 5th Percentile	3.99	4.05	4.01	3.99	3.92	3.86
Control Opt 2, 5th Percentile	3.95	4.00	3.97	3.95	3.89	3.85
Control Opt 3, 5th Percentile	3.87	3.91	3.88	3.87	3.82	3.79

Exhibit F-20. Summary of Lifetime-Averaged Blood Pb Levels (ug/dL) in the Exposure Year from Leggett Model, Vintage <1940

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Background, 95th Percentile	25.16	25.16	25.16	25.16	25.16	25.16
Baseline, 95th Percentile	35.29	34.50	33.53	32.65	30.72	29.15
Control Opt 1, 95th Percentile	38.34	37.38	35.93	34.51	31.95	29.54
Control Opt 2, 95th Percentile	34.58	33.81	32.91	32.12	30.33	28.92
Control Opt 3, 95th Percentile	32.43	31.77	31.09	30.54	29.17	28.13
Background, Median	13.83	13.83	13.83	13.83	13.83	13.83
Baseline, Median	18.60	18.58	18.03	17.58	16.54	15.83
Control Opt 1, Median	19.28	19.30	18.66	18.10	16.93	16.01
Control Opt 2, Median	18.48	18.43	17.91	17.47	16.47	15.79
Control Opt 3, Median	17.26	17.31	16.91	16.59	15.80	15.30
Background, Mean	15.53	15.53	15.53	15.53	15.53	15.53
Baseline, Mean	21.62	21.43	20.76	20.19	18.95	18.95
Control Opt 1, Mean	22.96	22.78	21.90	21.11	19.58	19.58
Control Opt 2, Mean	21.29	21.09	20.46	19.93	18.76	18.76
Control Opt 3, Mean	19.90	19.78	19.29	18.89	17.99	17.99
Background, 5th Percentile	10.78	10.78	10.78	10.78	10.78	10.78
Baseline, 5th Percentile	12.24	12.41	12.22	12.07	11.66	11.43
Control Opt 1, 5th Percentile	12.34	12.54	12.33	12.17	11.73	11.46
Control Opt 2, 5th Percentile	12.24	12.39	12.20	12.06	11.67	11.45
Control Opt 3, 5th Percentile	11.86	11.96	11.82	11.72	11.43	11.27

Exhibit F-21. Summary of Incremental Change in Lifetime-Averaged Blood Pb Levels (ug/dL) Relative to Background in the Exposure Year from IEUBK Model, Vintage <1940

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	2.34	2.63	2.45	2.36	2.02	1.60
Control Opt 1, 95th Percentile	3.64	3.87	3.55	3.31	2.74	1.97
Control Opt 2, 95th Percentile	2.12	2.39	2.23	2.16	1.84	1.48
Control Opt 3, 95th Percentile	1.57	1.79	1.67	1.63	1.39	1.12
Baseline, Median	0.95	1.09	1.00	0.96	0.79	0.64
Control Opt 1, Median	1.16	1.31	1.20	1.13	0.93	0.73
Control Opt 2, Median	0.89	1.03	0.94	0.91	0.75	0.61
Control Opt 3, Median	0.67	0.77	0.71	0.68	0.56	0.46
Baseline, Mean	1.18	1.35	1.25	1.20	1.00	0.80
Control Opt 1, Mean	1.63	1.80	1.64	1.54	1.25	0.94
Control Opt 2, Mean	1.09	1.25	1.15	1.11	0.93	0.75
Control Opt 3, Mean	0.81	0.93	0.86	0.83	0.69	0.56
Baseline, 5th Percentile	0.34	0.40	0.36	0.34	0.28	0.23
Control Opt 1, 5th Percentile	0.38	0.43	0.39	0.38	0.31	0.24
Control Opt 2, 5th Percentile	0.33	0.39	0.35	0.34	0.28	0.23
Control Opt 3, 5th Percentile	0.25	0.29	0.26	0.25	0.21	0.17

Exhibit F-22. Summary of Incremental Change in Lifetime-Averaged Blood Pb Levels (ug/dL) Relative to Background in the Exposure Year from Leggett Model, Vintage <1940

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	10.13	9.33	8.37	7.49	5.56	3.99
Control Opt 1, 95th Percentile	13.18	12.22	10.77	9.35	6.79	4.38
Control Opt 2, 95th Percentile	9.42	8.64	7.75	6.96	5.17	3.76
Control Opt 3, 95th Percentile	7.27	6.61	5.93	5.37	4.00	2.97
Baseline, Median	4.77	4.75	4.20	3.75	2.72	2.00
Control Opt 1, Median	5.45	5.47	4.83	4.27	3.10	2.18
Control Opt 2, Median	4.65	4.61	4.08	3.65	2.64	1.97
Control Opt 3, Median	3.43	3.49	3.08	2.76	1.98	1.47
Baseline, Mean	6.09	5.90	5.23	4.66	3.42	3.42
Control Opt 1, Mean	7.43	7.25	6.38	5.59	4.05	4.05
Control Opt 2, Mean	5.76	5.56	4.94	4.40	3.24	3.24
Control Opt 3, Mean	4.38	4.25	3.77	3.37	2.46	2.46
Baseline, 5th Percentile	1.46	1.63	1.44	1.29	0.89	0.66
Control Opt 1, 5th Percentile	1.56	1.76	1.55	1.39	0.95	0.68
Control Opt 2, 5th Percentile	1.46	1.61	1.42	1.28	0.89	0.67
Control Opt 3, 5th Percentile	1.08	1.18	1.04	0.94	0.65	0.49

Exhibit F-23. Absolute Change in Lifetime-Averaged Blood Pb Levels, Each Control Option Relative to Baseline Control Option from IEUBK Model, Vintage <1940

Control Option 1, 95th Percentile	1.30	1.25	1.10	0.95	0.72	0.36
Control Option 2, 95th Percentile	-0.22	-0.24	-0.22	-0.21	-0.17	-0.13
Control Option 3, 95th Percentile	-0.77	-0.83	-0.78	-0.74	-0.63	-0.48
Control Option 1, Median	0.22	0.22	0.20	0.17	0.13	0.08
Control Option 2, Median	-0.05	-0.06	-0.05	-0.05	-0.04	-0.03
Control Option 3, Median	-0.28	-0.32	-0.29	-0.28	-0.23	-0.19
Control Option 1, Mean	0.45	0.45	0.39	0.34	0.26	0.14
Control Option 2, Mean	-0.09	-0.10	-0.09	-0.09	-0.07	-0.05
Control Option 3, Mean	-0.37	-0.42	-0.38	-0.37	-0.31	-0.24
Control Option 1, 5th Percentile	0.04	0.04	0.03	0.03	0.03	0.02
Control Option 2, 5th Percentile	-0.01	-0.01	-0.01	-0.01	0.00	0.00
Control Option 3, 5th Percentile	-0.09	-0.11	-0.10	-0.09	-0.07	-0.06

Exhibit F-24. Absolute Change in Lifetime-Averaged Blood Pb Levels, Each Control Option Relative to Baseline Control Option from Leggett Model, Vintage <1940

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	3.05	2.88	2.41	1.85	1.23	0.39
Control Option 2, 95th Percentile	-0.71	-0.69	-0.62	-0.53	-0.39	-0.24
Control Option 3, 95th Percentile	-2.86	-2.72	-2.44	-2.12	-1.55	-1.02
Control Option 1, Median	0.68	0.72	0.63	0.52	0.38	0.18
Control Option 2, Median	-0.12	-0.14	-0.13	-0.11	-0.07	-0.03
Control Option 3, Median	-1.34	-1.26	-1.12	-0.99	-0.74	-0.53
Control Option 1, Mean	1.34	1.35	1.14	0.93	0.63	0.63
Control Option 2, Mean	-0.33	-0.34	-0.30	-0.26	-0.18	-0.18
Control Option 3, Mean	-1.71	-1.65	-1.47	-1.29	-0.96	-0.96
Control Option 1, 5th Percentile	0.09	0.13	0.11	0.10	0.07	0.03
Control Option 2, 5th Percentile	0.00	-0.02	-0.02	-0.01	0.00	0.01
Control Option 3, 5th Percentile	-0.39	-0.45	-0.40	-0.35	-0.23	-0.17

Exhibit F-25. Summary of Lifetime-Averaged Blood Pb Levels (ug/dL) in the Exposure Year from IEUBK Model, Vintage 1940 to 1959

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Background, 95th Percentile	3.82	3.82	3.82	3.82	3.82	3.82
Baseline, 95th Percentile	5.70	5.91	5.73	5.62	5.29	4.95
Control Opt 1, 95th Percentile	6.66	6.82	6.52	6.29	5.78	5.19
Control Opt 2, 95th Percentile	5.52	5.73	5.57	5.48	5.18	4.87
Control Opt 3, 95th Percentile	5.10	5.27	5.15	5.09	4.86	4.63
Background, Median	2.19	2.19	2.19	2.19	2.19	2.19
Baseline, Median	2.84	2.94	2.87	2.83	2.70	2.59
Control Opt 1, Median	2.98	3.08	2.99	2.93	2.78	2.64
Control Opt 2, Median	2.81	2.90	2.83	2.80	2.68	2.58
Control Opt 3, Median	2.66	2.73	2.67	2.65	2.56	2.48
Background, Mean	2.43	2.43	2.43	2.43	2.43	2.43
Baseline, Mean	3.29	3.41	3.31	3.26	3.10	2.95
Control Opt 1, Mean	3.59	3.70	3.57	3.48	3.26	3.03
Control Opt 2, Mean	3.22	3.33	3.25	3.20	3.06	2.92
Control Opt 3, Mean	3.03	3.12	3.05	3.02	2.90	2.80
Background, 5th Percentile	1.75	1.75	1.75	1.75	1.75	1.75
Baseline, 5th Percentile	1.97	2.00	1.98	1.96	1.92	1.89
Control Opt 1, 5th Percentile	1.99	2.03	2.00	1.98	1.94	1.90
Control Opt 2, 5th Percentile	1.97	2.00	1.97	1.96	1.92	1.89
Control Opt 3, 5th Percentile	1.92	1.94	1.92	1.91	1.88	1.86

Exhibit F-26. Summary of Lifetime-Averaged Blood Pb Levels (ug/dL) in the Exposure Year from Leggett Model, Vintage 1940 to 1959

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Background, 95th Percentile	11.42	11.42	11.42	11.42	11.42	11.42
Baseline, 95th Percentile	20.53	20.45	19.46	18.48	16.51	14.95
Control Opt 1, 95th Percentile	23.38	23.16	21.70	20.22	17.65	15.27
Control Opt 2, 95th Percentile	19.87	19.82	18.90	18.01	16.17	14.75
Control Opt 3, 95th Percentile	17.92	17.94	17.23	16.57	15.12	14.05
Background, Median	6.28	6.28	6.28	6.28	6.28	6.28
Baseline, Median	9.06	9.36	8.99	8.69	7.92	7.46
Control Opt 1, Median	9.42	9.80	9.37	9.01	8.13	7.54
Control Opt 2, Median	9.00	9.27	8.91	8.63	7.89	7.46
Control Opt 3, Median	8.27	8.47	8.21	8.00	7.46	7.14
Background, Mean	7.00	7.00	7.00	7.00	7.00	7.00
Baseline, Mean	10.89	11.17	10.69	10.28	9.26	9.26
Control Opt 1, Mean	11.78	12.16	11.53	10.94	9.65	9.65
Control Opt 2, Mean	10.66	10.93	10.48	10.10	9.14	9.14
Control Opt 3, Mean	9.69	9.94	9.59	9.31	8.58	8.58
Background, 5th Percentile	4.97	4.97	4.97	4.97	4.97	4.97
Baseline, 5th Percentile	5.76	5.86	5.75	5.67	5.46	5.33
Control Opt 1, 5th Percentile	5.82	5.93	5.82	5.73	5.49	5.35
Control Opt 2, 5th Percentile	5.78	5.86	5.76	5.68	5.47	5.35
Control Opt 3, 5th Percentile	5.57	5.63	5.55	5.50	5.34	5.25

Exhibit F-27. Summary of Incremental Change in Lifetime-Averaged Blood Pb Levels (ug/dL) Relative to Background in the Exposure Year from IEUBK Model, Vintage 1940 to 1959

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	1.88	2.09	1.91	1.80	1.47	1.13
Control Opt 1, 95th Percentile	2.84	3.00	2.70	2.47	1.96	1.37
Control Opt 2, 95th Percentile	1.70	1.91	1.75	1.66	1.36	1.05
Control Opt 3, 95th Percentile	1.28	1.45	1.33	1.27	1.04	0.81
Baseline, Median	0.66	0.75	0.68	0.64	0.52	0.41
Control Opt 1, Median	0.79	0.89	0.80	0.75	0.60	0.46
Control Opt 2, Median	0.62	0.72	0.65	0.61	0.50	0.40
Control Opt 3, Median	0.47	0.54	0.49	0.46	0.37	0.30
Baseline, Mean	0.86	0.98	0.88	0.83	0.67	0.52
Control Opt 1, Mean	1.16	1.27	1.14	1.05	0.83	0.60
Control Opt 2, Mean	0.79	0.90	0.82	0.77	0.63	0.49
Control Opt 3, Mean	0.60	0.69	0.62	0.59	0.47	0.37
Baseline, 5th Percentile	0.22	0.25	0.23	0.21	0.17	0.14
Control Opt 1, 5th Percentile	0.24	0.28	0.25	0.23	0.19	0.15
Control Opt 2, 5th Percentile	0.22	0.25	0.22	0.21	0.17	0.14
Control Opt 3, 5th Percentile	0.17	0.19	0.17	0.16	0.13	0.11

Exhibit F-28. Summary of Incremental Change in Lifetime-Averaged Blood Pb Levels (ug/dL) Relative to Background in the Exposure Year from Leggett Model, Vintage 1940 to 1959

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	9.11	9.03	8.03	7.05	5.08	3.52
Control Opt 1, 95th Percentile	11.96	11.73	10.27	8.80	6.22	3.84
Control Opt 2, 95th Percentile	8.45	8.39	7.48	6.58	4.75	3.33
Control Opt 3, 95th Percentile	6.49	6.51	5.81	5.14	3.70	2.63
Baseline, Median	2.78	3.08	2.71	2.41	1.64	1.18
Control Opt 1, Median	3.14	3.52	3.09	2.73	1.85	1.26
Control Opt 2, Median	2.72	2.99	2.63	2.35	1.61	1.18
Control Opt 3, Median	1.99	2.19	1.93	1.72	1.18	0.86
Baseline, Mean	3.89	4.17	3.69	3.28	2.26	2.26
Control Opt 1, Mean	4.77	5.16	4.53	3.94	2.65	2.65
Control Opt 2, Mean	3.66	3.92	3.48	3.10	2.14	2.14
Control Opt 3, Mean	2.69	2.94	2.59	2.31	1.58	1.58
Baseline, 5th Percentile	0.80	0.89	0.79	0.71	0.49	0.37
Control Opt 1, 5th Percentile	0.85	0.96	0.85	0.76	0.53	0.38
Control Opt 2, 5th Percentile	0.81	0.89	0.79	0.71	0.50	0.38
Control Opt 3, 5th Percentile	0.60	0.66	0.59	0.53	0.37	0.29

Exhibit F-29. Absolute Change in Lifetime-Averaged Blood Pb Levels, Each Control Option Relative to Baseline Control Option from IEUBK Model, Vintage 1940 to 1959

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	0.96	0.91	0.79	0.66	0.49	0.24
Control Option 2, 95th Percentile	-0.17	-0.18	-0.16	-0.15	-0.12	-0.08
Control Option 3, 95th Percentile	-0.60	-0.64	-0.58	-0.54	-0.44	-0.32
Control Option 1, Median	0.13	0.14	0.12	0.11	0.08	0.05
Control Option 2, Median	-0.03	-0.04	-0.03	-0.03	-0.02	-0.01
Control Option 3, Median	-0.18	-0.21	-0.19	-0.18	-0.14	-0.11
Control Option 1, Mean	0.30	0.29	0.26	0.22	0.16	0.08
Control Option 2, Mean	-0.07	-0.07	-0.06	-0.06	-0.04	-0.03
Control Option 3, Mean	-0.26	-0.29	-0.26	-0.25	-0.20	-0.15
Control Option 1, 5th Percentile	0.02	0.02	0.02	0.02	0.01	0.01
Control Option 2, 5th Percentile	0.00	0.00	0.00	0.00	0.00	0.00
Control Option 3, 5th Percentile	-0.05	-0.06	-0.06	-0.05	-0.04	-0.03

Exhibit F-30. Absolute Change in Lifetime-Averaged Blood Pb Levels, Each Control Option Relative to Baseline Control Option from Leggett Model, Vintage 1940 to 1959

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	2.85	2.70	2.24	1.74	1.14	0.32
Control Option 2, 95th Percentile	-0.66	-0.64	-0.56	-0.47	-0.33	-0.19
Control Option 3, 95th Percentile	-2.61	-2.51	-2.23	-1.91	-1.39	-0.89
Control Option 1, Median	0.36	0.44	0.38	0.32	0.21	0.08
Control Option 2, Median	-0.06	-0.09	-0.08	-0.06	-0.03	0.00
Control Option 3, Median	-0.79	-0.89	-0.78	-0.69	-0.46	-0.32
Control Option 1, Mean	0.89	0.99	0.84	0.66	0.39	0.39
Control Option 2, Mean	-0.23	-0.24	-0.21	-0.18	-0.12	-0.12
Control Option 3, Mean	-1.19	-1.23	-1.10	-0.97	-0.68	-0.68
Control Option 1, 5th Percentile	0.05	0.07	0.06	0.05	0.04	0.02
Control Option 2, 5th Percentile	0.01	0.00	0.00	0.00	0.01	0.01
Control Option 3, 5th Percentile	-0.19	-0.23	-0.20	-0.18	-0.12	-0.08

Exhibit F-31. Summary of Lifetime-Averaged Blood Pb Levels (ug/dL) in the Exposure Year from IEUBK Model, Vintage 1960 to 1979

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Background, 95th Percentile	3.30	3.30	3.30	3.30	3.30	3.30
Baseline, 95th Percentile	4.79	4.94	4.78	4.68	4.41	4.12
Control Opt 1, 95th Percentile	5.42	5.54	5.29	5.10	4.71	4.27
Control Opt 2, 95th Percentile	4.68	4.83	4.68	4.59	4.33	4.08
Control Opt 3, 95th Percentile	4.38	4.50	4.39	4.32	4.12	3.92
Background, Median	1.87	1.87	1.87	1.87	1.87	1.87
Baseline, Median	2.28	2.34	2.29	2.26	2.18	2.11
Control Opt 1, Median	2.36	2.42	2.36	2.32	2.23	2.14
Control Opt 2, Median	2.26	2.32	2.27	2.24	2.17	2.10
Control Opt 3, Median	2.18	2.22	2.18	2.16	2.10	2.05
Background, Mean	2.09	2.09	2.09	2.09	2.09	2.09
Baseline, Mean	2.69	2.76	2.69	2.65	2.53	2.42
Control Opt 1, Mean	2.88	2.95	2.85	2.78	2.63	2.47
Control Opt 2, Mean	2.65	2.72	2.66	2.62	2.51	2.41
Control Opt 3, Mean	2.52	2.58	2.53	2.50	2.42	2.34
Background, 5th Percentile	1.53	1.53	1.53	1.53	1.53	1.53
Baseline, 5th Percentile	1.64	1.65	1.64	1.63	1.61	1.60
Control Opt 1, 5th Percentile	1.65	1.67	1.65	1.64	1.62	1.60
Control Opt 2, 5th Percentile	1.64	1.65	1.64	1.64	1.62	1.60
Control Opt 3, 5th Percentile	1.62	1.63	1.62	1.61	1.60	1.59

Exhibit F-32. Summary of Lifetime-Averaged Blood Pb Levels (ug/dL) in the Exposure Year from Leggett Model, Vintage 1960 to 1979

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Background, 95th Percentile	9.77	9.77	9.77	9.77	9.77	9.77
Baseline, 95th Percentile	16.42	16.52	15.74	14.97	13.43	12.23
Control Opt 1, 95th Percentile	18.49	18.47	17.37	16.20	14.26	12.52
Control Opt 2, 95th Percentile	15.99	16.11	15.37	14.67	13.21	12.11
Control Opt 3, 95th Percentile	14.59	14.81	14.22	13.68	12.49	11.62
Background, Median	5.35	5.35	5.35	5.35	5.35	5.35
Baseline, Median	6.86	7.03	6.82	6.65	6.23	5.97
Control Opt 1, Median	7.10	7.30	7.06	6.84	6.36	6.02
Control Opt 2, Median	6.82	6.97	6.77	6.61	6.22	5.97
Control Opt 3, Median	6.47	6.59	6.44	6.32	6.01	5.82
Background, Mean	5.99	5.99	5.99	5.99	5.99	5.99
Baseline, Mean	8.33	8.56	8.24	7.96	7.32	7.32
Control Opt 1, Mean	8.90	9.16	8.74	8.35	7.56	7.56
Control Opt 2, Mean	8.20	8.41	8.12	7.86	7.26	7.26
Control Opt 3, Mean	7.68	7.85	7.62	7.43	6.97	6.97
Background, 5th Percentile	4.33	4.33	4.33	4.33	4.33	4.33
Baseline, 5th Percentile	4.69	4.73	4.69	4.65	4.56	4.50
Control Opt 1, 5th Percentile	4.73	4.78	4.73	4.69	4.58	4.51
Control Opt 2, 5th Percentile	4.71	4.74	4.70	4.66	4.57	4.52
Control Opt 3, 5th Percentile	4.62	4.65	4.62	4.59	4.52	4.48

Exhibit F-33. Summary of Incremental Change in Lifetime-Averaged Blood Pb Levels (ug/dL) Relative to Background in the Exposure Year from IEUBK Model, Vintage 1960 to 1979

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	1.49	1.64	1.48	1.38	1.11	0.82
Control Opt 1, 95th Percentile	2.12	2.24	1.99	1.80	1.41	0.97
Control Opt 2, 95th Percentile	1.38	1.53	1.38	1.29	1.03	0.78
Control Opt 3, 95th Percentile	1.08	1.20	1.09	1.02	0.82	0.62
Baseline, Median	0.41	0.46	0.41	0.39	0.31	0.24
Control Opt 1, Median	0.49	0.55	0.49	0.45	0.35	0.26
Control Opt 2, Median	0.39	0.44	0.40	0.37	0.30	0.23
Control Opt 3, Median	0.30	0.35	0.31	0.29	0.23	0.18
Baseline, Mean	0.60	0.67	0.60	0.56	0.44	0.33
Control Opt 1, Mean	0.79	0.86	0.76	0.69	0.54	0.38
Control Opt 2, Mean	0.56	0.63	0.56	0.53	0.42	0.32
Control Opt 3, Mean	0.43	0.49	0.44	0.41	0.33	0.25
Baseline, 5th Percentile	0.10	0.12	0.11	0.10	0.08	0.07
Control Opt 1, 5th Percentile	0.12	0.13	0.12	0.11	0.09	0.07
Control Opt 2, 5th Percentile	0.11	0.12	0.11	0.10	0.09	0.07
Control Opt 3, 5th Percentile	0.08	0.10	0.09	0.08	0.07	0.06

Exhibit F-34. Summary of Incremental Change in Lifetime-Averaged Blood Pb Levels (ug/dL) Relative to Background in the Exposure Year from Leggett Model, Vintage 1960 to 1979

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	6.66	6.76	5.97	5.20	3.66	2.46
Control Opt 1, 95th Percentile	8.72	8.70	7.60	6.43	4.49	2.75
Control Opt 2, 95th Percentile	6.23	6.34	5.61	4.90	3.45	2.34
Control Opt 3, 95th Percentile	4.83	5.04	4.46	3.91	2.72	1.85
Baseline, Median	1.51	1.68	1.47	1.30	0.89	0.62
Control Opt 1, Median	1.75	1.95	1.71	1.49	1.01	0.67
Control Opt 2, Median	1.47	1.62	1.43	1.27	0.87	0.62
Control Opt 3, Median	1.12	1.24	1.09	0.97	0.67	0.48
Baseline, Mean	2.33	2.56	2.24	1.97	1.33	1.33
Control Opt 1, Mean	2.91	3.16	2.75	2.36	1.57	1.57
Control Opt 2, Mean	2.21	2.42	2.12	1.87	1.27	1.27
Control Opt 3, Mean	1.69	1.86	1.63	1.44	0.98	0.98
Baseline, 5th Percentile	0.36	0.40	0.36	0.32	0.23	0.17
Control Opt 1, 5th Percentile	0.40	0.45	0.40	0.36	0.25	0.19
Control Opt 2, 5th Percentile	0.38	0.41	0.37	0.34	0.25	0.19
Control Opt 3, 5th Percentile	0.30	0.32	0.29	0.26	0.19	0.15

Exhibit F-35. Absolute Change in Lifetime-Averaged Blood Pb Levels, Each Control Option Relative to Baseline Control Option from IEUBK Model, Vintage 1960 to 1979

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	0.63	0.60	0.51	0.42	0.30	0.15
Control Option 2, 95th Percentile	-0.11	-0.11	-0.10	-0.09	-0.07	-0.05
Control Option 3, 95th Percentile	-0.41	-0.44	-0.39	-0.36	-0.29	-0.21
Control Option 1, Median	0.09	0.09	0.08	0.06	0.05	0.03
Control Option 2, Median	-0.02	-0.02	-0.02	-0.01	-0.01	0.00
Control Option 3, Median	-0.10	-0.12	-0.11	-0.10	-0.07	-0.06
Control Option 1, Mean	0.19	0.19	0.16	0.13	0.09	0.05
Control Option 2, Mean	-0.04	-0.04	-0.04	-0.03	-0.02	-0.01
Control Option 3, Mean	-0.16	-0.18	-0.16	-0.15	-0.11	-0.08
Control Option 1, 5th Percentile	0.01	0.01	0.01	0.01	0.01	0.01
Control Option 2, 5th Percentile	0.00	0.00	0.00	0.00	0.00	0.01
Control Option 3, 5th Percentile	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01

Exhibit F-36. Absolute Change in Lifetime-Averaged Blood Pb Levels, Each Control Option Relative to Baseline Control Option from Leggett Model, Vintage 1960 to 1979

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	2.06	1.95	1.63	1.23	0.83	0.29
Control Option 2, 95th Percentile	-0.43	-0.42	-0.36	-0.30	-0.21	-0.12
Control Option 3, 95th Percentile	-1.83	-1.72	-1.51	-1.29	-0.94	-0.61
Control Option 1, Median	0.24	0.27	0.24	0.19	0.13	0.05
Control Option 2, Median	-0.04	-0.06	-0.05	-0.04	-0.02	0.00
Control Option 3, Median	-0.39	-0.44	-0.38	-0.33	-0.22	-0.14
Control Option 1, Mean	0.58	0.60	0.50	0.39	0.24	0.24
Control Option 2, Mean	-0.12	-0.14	-0.12	-0.10	-0.06	-0.06
Control Option 3, Mean	-0.65	-0.71	-0.61	-0.53	-0.35	-0.35
Control Option 1, 5th Percentile	0.04	0.05	0.04	0.03	0.02	0.01
Control Option 2, 5th Percentile	0.02	0.01	0.01	0.01	0.02	0.02
Control Option 3, 5th Percentile	-0.07	-0.08	-0.07	-0.06	-0.04	-0.02

Appendix G. IQ Change Modeling Results for Examples

G. IQ CHANGE MODELING RESULTS FOR EXAMPLES

This appendix presents the IQ loss estimates for the single activity example (i.e., window replacement) and the multiple activities examples. Section G.1 (Exhibits G-1 to G-42) presents IQ loss estimates for a single activity example per building vintage, blood Pb model, regression and control option for six theoretical children who each experience the renovation during a different year of their life. Section G.2 (Exhibits G-43 to G-84) presents the IQ loss estimates for the multiple activities example per building vintage, blood Pb model, regression and control option for six theoretical children who each experience the renovation during a different year of their life. Four different dust percentiles (i.e., 95th, median, mean, and 5th) are shown.

G.1. Single Activity Example (Window Replacement)

G.1.1 Summary

Exhibit G-1. IQ Changes Based on Lifetime Average Blood Pb Levels when Exposure Occurs in Year 2 – IEUBK

Case & Control Option	Log Linear			Piecewise Linear		
	Pre40	1940 to 1959	1960 to 1979	Pre40	1940 to 1959	1960 to 1979
Baseline, 95th Percentile	-6.59	-4.71	-4.36	-6.20	-2.97	-2.55
Control Option 1, 95th Percentile	-6.60	-4.73	-4.38	-6.21	-2.99	-2.58
Control Option 2, 95th Percentile	-6.57	-4.68	-4.32	-6.14	-2.93	-2.52
Control Option 3, 95th Percentile	-6.46	-4.50	-4.15	-5.91	-2.72	-2.33
Baseline, Median	-4.86	-2.77	-2.24	-3.15	-1.19	-0.87
Control Option 1, Median	-4.87	-2.80	-2.26	-3.17	-1.21	-0.88
Control Option 2, Median	-4.85	-2.77	-2.25	-3.15	-1.19	-0.88
Control Option 3, Median	-4.78	-2.67	-2.17	-3.05	-1.12	-0.83
Baseline, Mean	-5.18	-3.14	-2.68	-3.60	-1.45	-1.13
Control Option 1, Mean	-5.20	-3.17	-2.71	-3.62	-1.47	-1.15
Control Option 2, Mean	-5.17	-3.14	-2.68	-3.59	-1.44	-1.13
Control Option 3, Mean	-5.09	-3.01	-2.57	-3.47	-1.35	-1.06
Baseline, 5th Percentile	-4.01	-1.85	-1.40	-2.20	-0.67	-0.47
Control Option 1, 5th Percentile	-4.02	-1.86	-1.41	-2.21	-0.68	-0.47
Control Option 2, 5th Percentile	-4.02	-1.87	-1.43	-2.21	-0.68	-0.48
Control Option 3, 5th Percentile	-4.00	-1.83	-1.40	-2.18	-0.66	-0.47

Exhibit G-2. IQ Changes Based on Lifetime Average Blood Pb Levels when Exposure Occurs in Year 2 – Leggett

Case & Control Option	Log Linear			Piecewise Linear		
	Pre40	1940 to 1959	1960 to 1979	Pre40	1940 to 1959	1960 to 1979
Baseline, 95th Percentile	-10.15	-8.19	-7.78	-9.56	-7.82	-7.58
Control Option 1, 95th Percentile	-10.16	-8.23	-7.82	-9.58	-7.85	-7.60
Control Option 2, 95th Percentile	-10.15	-8.19	-7.77	-9.56	-7.82	-7.57
Control Option 3, 95th Percentile	-10.04	-7.95	-7.55	-9.43	-7.68	-7.46
Baseline, Median	-8.31	-6.03	-5.47	-7.90	-5.02	-4.04
Control Option 1, Median	-8.33	-6.07	-5.50	-7.92	-5.09	-4.08
Control Option 2, Median	-8.31	-6.05	-5.48	-7.90	-5.05	-4.06
Control Option 3, Median	-8.22	-5.92	-5.39	-7.84	-4.81	-3.91
Baseline, Mean	-8.68	-6.43	-5.94	-8.16	-5.84	-4.85
Control Option 1, Mean	-8.71	-6.47	-5.97	-8.18	-5.93	-4.90
Control Option 2, Mean	-8.69	-6.45	-5.95	-8.17	-5.89	-4.86
Control Option 3, Mean	-8.57	-6.29	-5.81	-8.08	-5.54	-4.62
Baseline, 5th Percentile	-7.35	-5.04	-4.57	-7.36	-3.40	-2.80
Control Option 1, 5th Percentile	-7.37	-5.06	-4.58	-7.37	-3.42	-2.81
Control Option 2, 5th Percentile	-7.37	-5.07	-4.60	-7.37	-3.43	-2.83
Control Option 3, 5th Percentile	-7.33	-5.02	-4.57	-7.35	-3.37	-2.79

Exhibit G-3. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels when Exposure Occurs in Year 2 – IEUBK

Case & Control Option	Log Linear			Piecewise Linear		
	Pre40	1940 to 1959	1960 to 1979	Pre40	1940 to 1959	1960 to 1979
Baseline, 95th Percentile	-0.33	-0.62	-0.73	-0.72	-0.70	-0.72
Control Option 1, 95th Percentile	-0.33	-0.64	-0.75	-0.73	-0.72	-0.74
Control Option 2, 95th Percentile	-0.30	-0.59	-0.70	-0.66	-0.66	-0.68
Control Option 3, 95th Percentile	-0.20	-0.41	-0.52	-0.43	-0.45	-0.50
Baseline, Median	-0.26	-0.39	-0.34	-0.32	-0.24	-0.18
Control Option 1, Median	-0.27	-0.41	-0.36	-0.34	-0.25	-0.19
Control Option 2, Median	-0.25	-0.39	-0.34	-0.31	-0.24	-0.18
Control Option 3, Median	-0.18	-0.28	-0.26	-0.22	-0.17	-0.13
Baseline, Mean	-0.27	-0.44	-0.45	-0.37	-0.30	-0.26
Control Option 1, Mean	-0.29	-0.47	-0.47	-0.40	-0.32	-0.28
Control Option 2, Mean	-0.26	-0.44	-0.44	-0.36	-0.30	-0.26
Control Option 3, Mean	-0.18	-0.31	-0.33	-0.24	-0.21	-0.19
Baseline, 5th Percentile	-0.11	-0.15	-0.11	-0.11	-0.07	-0.04
Control Option 1, 5th Percentile	-0.12	-0.16	-0.12	-0.12	-0.08	-0.05
Control Option 2, 5th Percentile	-0.12	-0.17	-0.13	-0.12	-0.08	-0.05
Control Option 3, 5th Percentile	-0.09	-0.13	-0.10	-0.09	-0.06	-0.04

Exhibit G-4. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels when Exposure Occurs in Year 2 – Leggett

Case & Control Option	Log Linear			Piecewise Linear		
	Pre40	1940 to 1959	1960 to 1979	Pre40	1940 to 1959	1960 to 1979
Baseline, 95th Percentile	-0.32	-0.77	-0.87	-0.37	-0.43	-0.60
Control Option 1, 95th Percentile	-0.34	-0.81	-0.90	-0.39	-0.45	-0.61
Control Option 2, 95th Percentile	-0.32	-0.77	-0.85	-0.37	-0.43	-0.59
Control Option 3, 95th Percentile	-0.21	-0.53	-0.63	-0.24	-0.29	-0.47
Baseline, Median	-0.31	-0.44	-0.38	-0.34	-0.52	-0.50
Control Option 1, Median	-0.34	-0.48	-0.40	-0.21	-0.86	-0.60
Control Option 2, Median	-0.32	-0.46	-0.39	-0.20	-0.82	-0.58
Control Option 3, Median	-0.22	-0.33	-0.29	-0.14	-0.58	-0.43
Baseline, Mean	-0.34	-0.52	-0.50	-0.24	-1.04	-0.86
Control Option 1, Mean	-0.37	-0.56	-0.53	-0.26	-1.12	-0.92
Control Option 2, Mean	-0.35	-0.54	-0.51	-0.25	-1.08	-0.87
Control Option 3, Mean	-0.24	-0.38	-0.38	-0.16	-0.74	-0.63
Baseline, 5th Percentile	-0.13	-0.17	-0.12	-0.06	-0.23	-0.14
Control Option 1, 5th Percentile	-0.14	-0.18	-0.13	-0.07	-0.25	-0.15
Control Option 2, 5th Percentile	-0.14	-0.19	-0.15	-0.07	-0.26	-0.17
Control Option 3, 5th Percentile	-0.11	-0.15	-0.11	-0.05	-0.20	-0.13

Exhibit G-5. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels when Exposure Occurs in Year 2 – IEUBK

	Log Linear			Piecewise Linear		
Case & Control Option	Pre40	1940-1959	1960-1979	Pre40	1940-1959	1960-1979
Control Option 1, 95th Percentile	0.00	-0.02	-0.02	-0.01	-0.02	-0.02
Control Option 2, 95th Percentile	0.03	0.03	0.03	0.06	0.04	0.04
Control Option 3, 95th Percentile	0.13	0.21	0.21	0.29	0.25	0.22
Control Option 1, Median	-0.02	-0.03	-0.02	-0.02	-0.02	-0.01
Control Option 2, Median	0.01	0.00	-0.01	0.01	0.00	0.00
Control Option 3, Median	0.08	0.10	0.08	0.10	0.07	0.04
Control Option 1, Mean	-0.02	-0.03	-0.02	-0.02	-0.02	-0.01
Control Option 2, Mean	0.01	0.00	0.00	0.01	0.00	0.00
Control Option 3, Mean	0.09	0.13	0.12	0.13	0.09	0.07
Control Option 1, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	0.00
Control Option 2, 5th Percentile	-0.01	-0.02	-0.03	-0.01	-0.01	-0.01
Control Option 3, 5th Percentile	0.02	0.02	0.01	0.02	0.01	0.00

Exhibit G-6. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels when Exposure Occurs in Year 2 – Leggett

	Log Linear			Piecewise Linear		
Case & Control Option	Pre40	1940-1959	1960-1979	Pre40	1940-1959	1960-1979
Control Option 1, 95th Percentile	-0.02	0.40	0.33	0.35	0.33	0.22
Control Option 2, 95th Percentile	0.00	0.30	0.20	0.16	0.71	0.35
Control Option 3, 95th Percentile	0.11	0.35	0.26	0.21	0.20	0.57
Control Option 1, Median	-0.03	0.12	0.05	0.06	0.18	0.06
Control Option 2, Median	-0.01	-0.02	-0.01	0.00	-0.04	-0.02
Control Option 3, Median	0.09	0.11	0.08	0.06	0.21	0.13
Control Option 1, Mean	-0.03	-0.04	-0.03	-0.02	-0.09	-0.06
Control Option 2, Mean	-0.01	-0.02	-0.01	-0.01	-0.05	-0.01
Control Option 3, Mean	0.11	0.14	0.13	0.08	0.30	0.23
Control Option 1, 5th Percentile	-0.01	-0.02	-0.01	-0.01	-0.02	-0.01
Control Option 2, 5th Percentile	-0.01	-0.03	-0.03	-0.01	-0.04	-0.03
Control Option 3, 5th Percentile	0.02	0.02	0.00	0.01	0.03	0.00

G.1.2 Single Activity Example

Exhibit G-7. IQ Changes Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage <1940, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-6.59	-6.59	-6.55	-6.51	-6.45	-6.39	-6.26
Control Option 1, 95th Percentile	-6.60	-6.60	-6.56	-6.52	-6.46	-6.40	-6.26
Control Option 2, 95th Percentile	-6.56	-6.57	-6.53	-6.50	-6.45	-6.40	-6.26
Control Option 3, 95th Percentile	-6.46	-6.46	-6.44	-6.42	-6.39	-6.36	-6.26
Baseline, Median	-4.86	-4.86	-4.82	-4.79	-4.74	-4.70	-4.60
Control Option 1, Median	-4.87	-4.87	-4.84	-4.81	-4.76	-4.71	-4.60
Control Option 2, Median	-4.85	-4.85	-4.82	-4.79	-4.75	-4.71	-4.60
Control Option 3, Median	-4.78	-4.78	-4.76	-4.74	-4.71	-4.68	-4.60
Baseline, Mean	-5.18	-5.18	-5.15	-5.11	-5.06	-5.01	-4.91
Control Option 1, Mean	-5.20	-5.20	-5.16	-5.13	-5.08	-5.02	-4.91
Control Option 2, Mean	-5.17	-5.17	-5.14	-5.12	-5.07	-5.02	-4.91
Control Option 3, Mean	-5.09	-5.09	-5.07	-5.05	-5.02	-4.99	-4.91
Baseline, 5th Percentile	-4.01	-4.01	-4.00	-3.99	-3.97	-3.95	-3.90
Control Option 1, 5th Percentile	-4.02	-4.02	-4.01	-4.00	-3.98	-3.96	-3.90
Control Option 2, 5th Percentile	-4.02	-4.02	-4.01	-4.00	-3.98	-3.96	-3.90
Control Option 3, 5th Percentile	-3.99	-4.00	-3.98	-3.98	-3.96	-3.95	-3.90

Exhibit G-8. IQ Changes Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage <1940, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-10.21	-10.15	-10.10	-10.05	-9.99	-9.93	-9.83
Control Option 1, 95th Percentile	-10.23	-10.16	-10.11	-10.07	-10.00	-9.94	-9.83
Control Option 2, 95th Percentile	-10.22	-10.15	-10.10	-10.06	-10.00	-9.95	-9.83
Control Option 3, 95th Percentile	-10.09	-10.04	-10.01	-9.98	-9.94	-9.91	-9.83
Baseline, Median	-8.31	-8.31	-8.26	-8.21	-8.13	-8.08	-7.99
Control Option 1, Median	-8.34	-8.33	-8.28	-8.23	-8.15	-8.09	-7.99
Control Option 2, Median	-8.32	-8.31	-8.27	-8.22	-8.14	-8.09	-7.99
Control Option 3, Median	-8.22	-8.22	-8.18	-8.15	-8.10	-8.06	-7.99
Baseline, Mean	-8.69	-8.68	-8.63	-8.57	-8.49	-8.43	-8.34
Control Option 1, Mean	-8.72	-8.71	-8.65	-8.59	-8.51	-8.44	-8.34
Control Option 2, Mean	-8.70	-8.69	-8.64	-8.59	-8.51	-8.45	-8.34
Control Option 3, Mean	-8.58	-8.57	-8.54	-8.50	-8.45	-8.41	-8.34
Baseline, 5th Percentile	-7.35	-7.35	-7.33	-7.31	-7.28	-7.26	-7.22
Control Option 1, 5th Percentile	-7.37	-7.37	-7.34	-7.32	-7.29	-7.27	-7.22
Control Option 2, 5th Percentile	-7.37	-7.37	-7.35	-7.33	-7.30	-7.28	-7.22
Control Option 3, 5th Percentile	-7.33	-7.33	-7.31	-7.30	-7.28	-7.26	-7.22

Exhibit G-9. IQ Changes Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage <1940, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-6.20	-6.20	-6.10	-6.02	-5.89	-5.75	-5.48
Control Option 1, 95th Percentile	-6.20	-6.21	-6.11	-6.03	-5.90	-5.77	-5.48
Control Option 2, 95th Percentile	-6.13	-6.14	-6.06	-5.99	-5.88	-5.77	-5.48
Control Option 3, 95th Percentile	-5.89	-5.91	-5.86	-5.82	-5.75	-5.68	-5.48
Baseline, Median	-3.15	-3.15	-3.11	-3.07	-3.01	-2.95	-2.83
Control Option 1, Median	-3.17	-3.17	-3.13	-3.09	-3.02	-2.96	-2.83
Control Option 2, Median	-3.14	-3.15	-3.11	-3.07	-3.02	-2.96	-2.83
Control Option 3, Median	-3.05	-3.05	-3.02	-3.00	-2.96	-2.93	-2.83
Baseline, Mean	-3.60	-3.60	-3.55	-3.50	-3.43	-3.36	-3.23
Control Option 1, Mean	-3.62	-3.62	-3.57	-3.52	-3.45	-3.38	-3.23
Control Option 2, Mean	-3.58	-3.59	-3.54	-3.50	-3.44	-3.38	-3.23
Control Option 3, Mean	-3.46	-3.47	-3.44	-3.42	-3.37	-3.33	-3.23
Baseline, 5th Percentile	-2.19	-2.20	-2.18	-2.17	-2.15	-2.13	-2.09
Control Option 1, 5th Percentile	-2.20	-2.21	-2.19	-2.18	-2.16	-2.14	-2.09
Control Option 2, 5th Percentile	-2.20	-2.21	-2.19	-2.18	-2.16	-2.15	-2.09
Control Option 3, 5th Percentile	-2.18	-2.18	-2.17	-2.16	-2.14	-2.13	-2.09

Exhibit G-10. IQ Changes Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage <1940, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-9.64	-9.56	-9.50	-9.45	-9.37	-9.31	-9.19
Control Option 1, 95th Percentile	-9.66	-9.58	-9.52	-9.47	-9.38	-9.32	-9.19
Control Option 2, 95th Percentile	-9.65	-9.56	-9.51	-9.46	-9.38	-9.33	-9.19
Control Option 3, 95th Percentile	-9.49	-9.43	-9.39	-9.37	-9.32	-9.29	-9.19
Baseline, Median	-7.90	-7.90	-7.87	-7.83	-7.79	-7.75	-7.70
Control Option 1, Median	-7.92	-7.92	-7.88	-7.85	-7.80	-7.76	-7.70
Control Option 2, Median	-7.91	-7.90	-7.87	-7.84	-7.79	-7.76	-7.70
Control Option 3, Median	-7.84	-7.84	-7.82	-7.80	-7.77	-7.74	-7.70
Baseline, Mean	-8.17	-8.16	-8.12	-8.08	-8.02	-7.98	-7.92
Control Option 1, Mean	-8.19	-8.18	-8.14	-8.10	-8.03	-7.99	-7.92
Control Option 2, Mean	-8.18	-8.17	-8.13	-8.09	-8.03	-8.00	-7.92
Control Option 3, Mean	-8.09	-8.08	-8.06	-8.03	-7.99	-7.97	-7.92
Baseline, 5th Percentile	-7.36	-7.36	-7.35	-7.34	-7.33	-7.32	-7.30
Control Option 1, 5th Percentile	-7.37	-7.37	-7.36	-7.35	-7.33	-7.32	-7.30
Control Option 2, 5th Percentile	-7.37	-7.37	-7.36	-7.35	-7.33	-7.32	-7.30
Control Option 3, 5th Percentile	-7.35	-7.35	-7.34	-7.34	-7.33	-7.32	-7.30

Exhibit G-11. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage <1940, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-0.33	-0.33	-0.29	-0.25	-0.19	-0.13
Control Option 1, 95th Percentile	-0.33	-0.33	-0.29	-0.26	-0.20	-0.14
Control Option 2, 95th Percentile	-0.30	-0.30	-0.27	-0.24	-0.19	-0.14
Control Option 3, 95th Percentile	-0.19	-0.20	-0.18	-0.16	-0.13	-0.09
Baseline, Median	-0.25	-0.26	-0.22	-0.19	-0.14	-0.09
Control Option 1, Median	-0.27	-0.27	-0.24	-0.20	-0.15	-0.10
Control Option 2, Median	-0.25	-0.25	-0.22	-0.19	-0.15	-0.11
Control Option 3, Median	-0.17	-0.18	-0.15	-0.14	-0.11	-0.08
Baseline, Mean	-0.27	-0.27	-0.23	-0.20	-0.15	-0.10
Control Option 1, Mean	-0.28	-0.29	-0.25	-0.22	-0.16	-0.11
Control Option 2, Mean	-0.26	-0.26	-0.23	-0.20	-0.16	-0.11
Control Option 3, Mean	-0.18	-0.18	-0.16	-0.14	-0.11	-0.08
Baseline, 5th Percentile	-0.11	-0.11	-0.10	-0.08	-0.06	-0.05
Control Option 1, 5th Percentile	-0.12	-0.12	-0.11	-0.09	-0.07	-0.05
Control Option 2, 5th Percentile	-0.12	-0.12	-0.11	-0.10	-0.08	-0.06
Control Option 3, 5th Percentile	-0.09	-0.09	-0.08	-0.07	-0.06	-0.04

Exhibit G-12. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage <1940, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-0.38	-0.32	-0.27	-0.23	-0.16	-0.11
Control Option 1, 95th Percentile	-0.40	-0.34	-0.28	-0.24	-0.17	-0.12
Control Option 2, 95th Percentile	-0.39	-0.32	-0.28	-0.24	-0.17	-0.12
Control Option 3, 95th Percentile	-0.26	-0.21	-0.18	-0.15	-0.11	-0.08
Baseline, Median	-0.32	-0.31	-0.26	-0.21	-0.14	-0.08
Control Option 1, Median	-0.35	-0.34	-0.29	-0.24	-0.15	-0.09
Control Option 2, Median	-0.33	-0.32	-0.27	-0.23	-0.15	-0.10
Control Option 3, Median	-0.23	-0.22	-0.19	-0.16	-0.10	-0.07
Baseline, Mean	-0.35	-0.34	-0.29	-0.23	-0.15	-0.09
Control Option 1, Mean	-0.38	-0.37	-0.31	-0.25	-0.17	-0.10
Control Option 2, Mean	-0.36	-0.35	-0.30	-0.25	-0.17	-0.11
Control Option 3, Mean	-0.24	-0.24	-0.20	-0.17	-0.11	-0.08
Baseline, 5th Percentile	-0.13	-0.13	-0.11	-0.09	-0.06	-0.04
Control Option 1, 5th Percentile	-0.14	-0.14	-0.12	-0.10	-0.07	-0.05
Control Option 2, 5th Percentile	-0.14	-0.14	-0.12	-0.10	-0.07	-0.05
Control Option 3, 5th Percentile	-0.11	-0.11	-0.09	-0.08	-0.06	-0.04

Exhibit G-13. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage <1940, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-0.72	-0.72	-0.62	-0.54	-0.41	-0.27
Control Option 1, 95th Percentile	-0.72	-0.73	-0.63	-0.55	-0.42	-0.29
Control Option 2, 95th Percentile	-0.65	-0.66	-0.58	-0.51	-0.40	-0.29
Control Option 3, 95th Percentile	-0.41	-0.43	-0.38	-0.34	-0.27	-0.20
Baseline, Median	-0.32	-0.32	-0.27	-0.24	-0.17	-0.11
Control Option 1, Median	-0.34	-0.34	-0.29	-0.25	-0.19	-0.13
Control Option 2, Median	-0.31	-0.31	-0.27	-0.24	-0.18	-0.13
Control Option 3, Median	-0.21	-0.22	-0.19	-0.17	-0.13	-0.09
Baseline, Mean	-0.37	-0.37	-0.32	-0.28	-0.21	-0.14
Control Option 1, Mean	-0.39	-0.40	-0.34	-0.30	-0.22	-0.15
Control Option 2, Mean	-0.36	-0.36	-0.32	-0.28	-0.21	-0.15
Control Option 3, Mean	-0.24	-0.24	-0.21	-0.19	-0.15	-0.11
Baseline, 5th Percentile	-0.10	-0.11	-0.09	-0.08	-0.06	-0.04
Control Option 1, 5th Percentile	-0.11	-0.12	-0.10	-0.09	-0.07	-0.05
Control Option 2, 5th Percentile	-0.11	-0.12	-0.10	-0.09	-0.07	-0.06
Control Option 3, 5th Percentile	-0.09	-0.09	-0.08	-0.07	-0.06	-0.04

Exhibit G-14. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage <1940, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-0.44	-0.37	-0.31	-0.25	-0.18	-0.12
Control Option 1, 95th Percentile	-0.47	-0.39	-0.32	-0.27	-0.19	-0.13
Control Option 2, 95th Percentile	-0.45	-0.37	-0.31	-0.27	-0.19	-0.14
Control Option 3, 95th Percentile	-0.29	-0.24	-0.20	-0.17	-0.12	-0.09
Baseline, Median	-0.20	-0.20	-0.16	-0.13	-0.08	-0.05
Control Option 1, Median	-0.22	-0.21	-0.18	-0.14	-0.09	-0.06
Control Option 2, Median	-0.21	-0.20	-0.17	-0.14	-0.09	-0.06
Control Option 3, Median	-0.14	-0.14	-0.12	-0.10	-0.06	-0.04
Baseline, Mean	-0.25	-0.24	-0.20	-0.16	-0.10	-0.06
Control Option 1, Mean	-0.27	-0.26	-0.22	-0.18	-0.11	-0.07
Control Option 2, Mean	-0.26	-0.25	-0.21	-0.17	-0.11	-0.08
Control Option 3, Mean	-0.17	-0.16	-0.14	-0.11	-0.08	-0.05
Baseline, 5th Percentile	-0.06	-0.06	-0.05	-0.04	-0.03	-0.02
Control Option 1, 5th Percentile	-0.07	-0.07	-0.06	-0.05	-0.03	-0.02
Control Option 2, 5th Percentile	-0.07	-0.07	-0.06	-0.05	-0.03	-0.02
Control Option 3, 5th Percentile	-0.05	-0.05	-0.04	-0.04	-0.03	-0.02

Exhibit G-15. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage <1940, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	0.00	0.11	0.09	0.07	0.05	0.02
Control Option 2, 95th Percentile	0.03	0.09	0.08	0.06	0.03	0.01
Control Option 3, 95th Percentile	0.13	0.11	0.09	0.07	0.04	0.02
Control Option 1, Median	-0.02	-0.02	-0.02	-0.01	-0.01	-0.01
Control Option 2, Median	0.01	0.01	0.00	0.00	-0.01	-0.01
Control Option 3, Median	0.08	0.08	0.07	0.05	0.04	0.02
Control Option 1, Mean	-0.01	-0.02	-0.01	-0.01	-0.01	-0.01
Control Option 2, Mean	0.01	0.01	0.00	0.00	-0.01	-0.01
Control Option 3, Mean	0.09	0.09	0.08	0.06	0.04	0.02
Control Option 1, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 2, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 3, 5th Percentile	0.02	0.02	0.02	0.01	0.01	0.00

Exhibit G-16. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage <1940, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.02	0.11	0.09	0.07	0.05	0.02
Control Option 2, 95th Percentile	-0.01	0.09	0.08	0.06	0.03	0.01
Control Option 3, 95th Percentile	0.12	0.11	0.09	0.07	0.04	0.02
Control Option 1, Median	-0.03	-0.03	-0.02	-0.02	-0.02	-0.01
Control Option 2, Median	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02
Control Option 3, Median	0.09	0.09	0.08	0.06	0.03	0.01
Control Option 1, Mean	-0.03	-0.03	-0.02	-0.02	-0.02	-0.01
Control Option 2, Mean	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02
Control Option 3, Mean	0.11	0.11	0.09	0.07	0.04	0.02
Control Option 1, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 2, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 3, 5th Percentile	0.02	0.02	0.02	0.01	0.01	0.00

Exhibit G-17. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage <1940, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.01	0.13	0.11	0.08	0.05	0.02
Control Option 2, 95th Percentile	0.07	0.06	0.05	0.04	0.02	0.01
Control Option 3, 95th Percentile	0.30	0.08	0.06	0.05	0.03	0.01
Control Option 1, Median	-0.02	0.01	0.01	0.01	0.00	0.00
Control Option 2, Median	0.01	0.01	0.00	0.00	-0.01	-0.01
Control Option 3, Median	0.10	0.10	0.08	0.07	0.05	0.02
Control Option 1, Mean	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01
Control Option 2, Mean	0.02	0.01	0.00	0.00	-0.01	-0.02
Control Option 3, Mean	0.13	0.13	0.11	0.09	0.06	0.03
Control Option 1, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 2, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 3, 5th Percentile	0.02	0.02	0.02	0.01	0.01	0.00

Exhibit G-18. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from Leggett Model,Vintage <1940, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.02	0.13	0.11	0.08	0.05	0.02
Control Option 2, 95th Percentile	-0.01	0.06	0.05	0.04	0.02	0.01
Control Option 3, 95th Percentile	0.15	0.08	0.06	0.05	0.03	0.01
Control Option 1, Median	-0.02	0.01	0.01	0.01	0.00	0.00
Control Option 2, Median	-0.01	0.00	-0.01	-0.01	-0.01	-0.01
Control Option 3, Median	0.06	0.06	0.05	0.04	0.02	0.01
Control Option 1, Mean	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01
Control Option 2, Mean	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 3, Mean	0.08	0.08	0.06	0.05	0.03	0.01
Control Option 1, 5th Percentile	-0.01	-0.01	-0.01	0.00	0.00	0.00
Control Option 2, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 3, 5th Percentile	0.01	0.01	0.01	0.01	0.00	0.00

Exhibit G-19. IQ Changes Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1940 to 1959, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-4.72	-4.71	-4.62	-4.54	-4.42	-4.30	-4.09
Control Option 1, 95th Percentile	-4.74	-4.73	-4.64	-4.55	-4.43	-4.31	-4.09
Control Option 2, 95th Percentile	-4.68	-4.68	-4.60	-4.53	-4.42	-4.31	-4.09
Control Option 3, 95th Percentile	-4.50	-4.50	-4.45	-4.40	-4.32	-4.25	-4.09
Baseline, Median	-2.77	-2.77	-2.72	-2.67	-2.59	-2.52	-2.39
Control Option 1, Median	-2.79	-2.80	-2.74	-2.69	-2.61	-2.54	-2.39
Control Option 2, Median	-2.77	-2.77	-2.72	-2.68	-2.61	-2.54	-2.39
Control Option 3, Median	-2.66	-2.67	-2.63	-2.60	-2.55	-2.50	-2.39
Baseline, Mean	-3.14	-3.14	-3.08	-3.02	-2.93	-2.85	-2.70
Control Option 1, Mean	-3.17	-3.17	-3.10	-3.04	-2.95	-2.87	-2.70
Control Option 2, Mean	-3.13	-3.14	-3.08	-3.03	-2.95	-2.87	-2.70
Control Option 3, Mean	-3.01	-3.01	-2.97	-2.93	-2.88	-2.82	-2.70
Baseline, 5th Percentile	-1.85	-1.85	-1.83	-1.82	-1.79	-1.77	-1.70
Control Option 1, 5th Percentile	-1.86	-1.86	-1.84	-1.83	-1.80	-1.78	-1.70
Control Option 2, 5th Percentile	-1.87	-1.87	-1.85	-1.84	-1.82	-1.79	-1.70
Control Option 3, 5th Percentile	-1.83	-1.83	-1.82	-1.81	-1.79	-1.77	-1.70

Exhibit G-20. IQ Changes Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1940 to 1959, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-8.21	-8.19	-8.06	-7.93	-7.75	-7.62	-7.42
Control Option 1, 95th Percentile	-8.26	-8.23	-8.10	-7.97	-7.78	-7.64	-7.42
Control Option 2, 95th Percentile	-8.22	-8.19	-8.07	-7.96	-7.78	-7.65	-7.42
Control Option 3, 95th Percentile	-7.97	-7.95	-7.87	-7.79	-7.67	-7.58	-7.42
Baseline, Median	-6.04	-6.03	-5.96	-5.89	-5.79	-5.71	-5.59
Control Option 1, Median	-6.07	-6.07	-5.99	-5.92	-5.81	-5.72	-5.59
Control Option 2, Median	-6.06	-6.05	-5.98	-5.92	-5.81	-5.74	-5.59
Control Option 3, Median	-5.93	-5.92	-5.87	-5.82	-5.75	-5.69	-5.59
Baseline, Mean	-6.45	-6.43	-6.35	-6.27	-6.14	-6.05	-5.92
Control Option 1, Mean	-6.49	-6.47	-6.38	-6.30	-6.16	-6.07	-5.92
Control Option 2, Mean	-6.47	-6.45	-6.37	-6.29	-6.17	-6.08	-5.92
Control Option 3, Mean	-6.30	-6.29	-6.24	-6.18	-6.09	-6.03	-5.92
Baseline, 5th Percentile	-5.04	-5.04	-5.01	-4.99	-4.96	-4.93	-4.87
Control Option 1, 5th Percentile	-5.05	-5.06	-5.03	-5.01	-4.97	-4.94	-4.87
Control Option 2, 5th Percentile	-5.07	-5.07	-5.04	-5.02	-4.98	-4.96	-4.87
Control Option 3, 5th Percentile	-5.02	-5.02	-5.00	-4.98	-4.96	-4.94	-4.87

Exhibit G-21. IQ Changes Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1940 to 1959, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-2.98	-2.97	-2.86	-2.76	-2.62	-2.49	-2.27
Control Option 1, 95th Percentile	-3.01	-2.99	-2.88	-2.78	-2.64	-2.51	-2.27
Control Option 2, 95th Percentile	-2.93	-2.93	-2.83	-2.75	-2.62	-2.51	-2.27
Control Option 3, 95th Percentile	-2.72	-2.72	-2.66	-2.60	-2.52	-2.44	-2.27
Baseline, Median	-1.19	-1.19	-1.15	-1.12	-1.08	-1.03	-0.95
Control Option 1, Median	-1.21	-1.21	-1.17	-1.14	-1.09	-1.04	-0.95
Control Option 2, Median	-1.19	-1.19	-1.16	-1.13	-1.09	-1.05	-0.95
Control Option 3, Median	-1.12	-1.12	-1.10	-1.08	-1.05	-1.02	-0.95
Baseline, Mean	-1.45	-1.45	-1.40	-1.36	-1.30	-1.24	-1.14
Control Option 1, Mean	-1.47	-1.47	-1.42	-1.38	-1.31	-1.25	-1.14
Control Option 2, Mean	-1.44	-1.44	-1.40	-1.37	-1.31	-1.26	-1.14
Control Option 3, Mean	-1.35	-1.35	-1.32	-1.30	-1.26	-1.23	-1.14
Baseline, 5th Percentile	-0.67	-0.67	-0.66	-0.65	-0.64	-0.63	-0.60
Control Option 1, 5th Percentile	-0.68	-0.68	-0.67	-0.66	-0.65	-0.63	-0.60
Control Option 2, 5th Percentile	-0.68	-0.68	-0.67	-0.67	-0.65	-0.64	-0.60
Control Option 3, 5th Percentile	-0.66	-0.66	-0.66	-0.65	-0.64	-0.63	-0.60

Exhibit G-22. IQ Changes Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1940 to 1959, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-7.84	-7.82	-7.74	-7.67	-7.56	-7.49	-7.39
Control Option 1, 95th Percentile	-7.87	-7.85	-7.76	-7.69	-7.58	-7.50	-7.39
Control Option 2, 95th Percentile	-7.84	-7.82	-7.75	-7.68	-7.58	-7.51	-7.39
Control Option 3, 95th Percentile	-7.69	-7.68	-7.63	-7.59	-7.52	-7.47	-7.39
Baseline, Median	-5.03	-5.02	-4.88	-4.75	-4.57	-4.43	-4.23
Control Option 1, Median	-5.10	-5.09	-4.94	-4.81	-4.60	-4.46	-4.23
Control Option 2, Median	-5.07	-5.05	-4.92	-4.80	-4.61	-4.48	-4.23
Control Option 3, Median	-4.82	-4.81	-4.72	-4.63	-4.50	-4.41	-4.23
Baseline, Mean	-5.87	-5.84	-5.66	-5.48	-5.23	-5.06	-4.80
Control Option 1, Mean	-5.96	-5.93	-5.74	-5.55	-5.28	-5.09	-4.80
Control Option 2, Mean	-5.91	-5.89	-5.71	-5.54	-5.29	-5.12	-4.80
Control Option 3, Mean	-5.56	-5.54	-5.42	-5.31	-5.14	-5.02	-4.80
Baseline, 5th Percentile	-3.40	-3.40	-3.36	-3.33	-3.28	-3.25	-3.17
Control Option 1, 5th Percentile	-3.42	-3.42	-3.38	-3.35	-3.30	-3.26	-3.17
Control Option 2, 5th Percentile	-3.44	-3.43	-3.40	-3.37	-3.32	-3.28	-3.17
Control Option 3, 5th Percentile	-3.37	-3.37	-3.35	-3.32	-3.28	-3.26	-3.17

Exhibit G-23. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1940 to 1959, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-0.64	-0.62	-0.53	-0.45	-0.33	-0.21
Control Option 1, 95th Percentile	-0.65	-0.64	-0.55	-0.47	-0.34	-0.23
Control Option 2, 95th Percentile	-0.59	-0.59	-0.51	-0.44	-0.33	-0.23
Control Option 3, 95th Percentile	-0.41	-0.41	-0.36	-0.31	-0.24	-0.16
Baseline, Median	-0.38	-0.39	-0.33	-0.28	-0.21	-0.14
Control Option 1, Median	-0.41	-0.41	-0.35	-0.30	-0.22	-0.15
Control Option 2, Median	-0.38	-0.39	-0.34	-0.29	-0.22	-0.16
Control Option 3, Median	-0.28	-0.28	-0.24	-0.21	-0.16	-0.12
Baseline, Mean	-0.44	-0.44	-0.38	-0.32	-0.23	-0.15
Control Option 1, Mean	-0.47	-0.47	-0.40	-0.34	-0.25	-0.17
Control Option 2, Mean	-0.43	-0.44	-0.38	-0.33	-0.25	-0.17
Control Option 3, Mean	-0.31	-0.31	-0.27	-0.23	-0.18	-0.13
Baseline, 5th Percentile	-0.15	-0.15	-0.13	-0.12	-0.09	-0.07
Control Option 1, 5th Percentile	-0.16	-0.16	-0.14	-0.13	-0.10	-0.07
Control Option 2, 5th Percentile	-0.16	-0.17	-0.15	-0.14	-0.11	-0.09
Control Option 3, 5th Percentile	-0.13	-0.13	-0.12	-0.11	-0.09	-0.07

Exhibit G-24. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1940 to 1959, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-0.79	-0.77	-0.64	-0.51	-0.33	-0.19
Control Option 1, 95th Percentile	-0.84	-0.81	-0.68	-0.55	-0.35	-0.22
Control Option 2, 95th Percentile	-0.80	-0.77	-0.65	-0.54	-0.36	-0.23
Control Option 3, 95th Percentile	-0.55	-0.53	-0.45	-0.37	-0.25	-0.16
Baseline, Median	-0.45	-0.44	-0.37	-0.30	-0.20	-0.12
Control Option 1, Median	-0.49	-0.48	-0.40	-0.33	-0.22	-0.13
Control Option 2, Median	-0.47	-0.46	-0.39	-0.33	-0.22	-0.15
Control Option 3, Median	-0.34	-0.33	-0.28	-0.23	-0.16	-0.11
Baseline, Mean	-0.53	-0.52	-0.43	-0.35	-0.23	-0.14
Control Option 1, Mean	-0.57	-0.56	-0.47	-0.38	-0.25	-0.15
Control Option 2, Mean	-0.55	-0.54	-0.46	-0.38	-0.25	-0.17
Control Option 3, Mean	-0.38	-0.38	-0.32	-0.26	-0.18	-0.12
Baseline, 5th Percentile	-0.17	-0.17	-0.14	-0.12	-0.09	-0.06
Control Option 1, 5th Percentile	-0.18	-0.18	-0.16	-0.14	-0.10	-0.07
Control Option 2, 5th Percentile	-0.20	-0.19	-0.17	-0.15	-0.11	-0.08
Control Option 3, 5th Percentile	-0.15	-0.15	-0.13	-0.11	-0.09	-0.07

Exhibit G-25. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1940 to 1959, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-0.71	-0.70	-0.59	-0.49	-0.35	-0.22
Control Option 1, 95th Percentile	-0.74	-0.72	-0.61	-0.51	-0.37	-0.24
Control Option 2, 95th Percentile	-0.66	-0.66	-0.56	-0.48	-0.35	-0.24
Control Option 3, 95th Percentile	-0.45	-0.45	-0.39	-0.33	-0.25	-0.17
Baseline, Median	-0.24	-0.24	-0.20	-0.17	-0.12	-0.08
Control Option 1, Median	-0.25	-0.25	-0.22	-0.18	-0.13	-0.09
Control Option 2, Median	-0.23	-0.24	-0.21	-0.18	-0.13	-0.09
Control Option 3, Median	-0.17	-0.17	-0.15	-0.13	-0.10	-0.07
Baseline, Mean	-0.31	-0.30	-0.26	-0.22	-0.16	-0.10
Control Option 1, Mean	-0.32	-0.32	-0.27	-0.23	-0.17	-0.11
Control Option 2, Mean	-0.30	-0.30	-0.26	-0.22	-0.17	-0.11
Control Option 3, Mean	-0.21	-0.21	-0.18	-0.16	-0.12	-0.08
Baseline, 5th Percentile	-0.07	-0.07	-0.06	-0.05	-0.04	-0.03
Control Option 1, 5th Percentile	-0.08	-0.08	-0.07	-0.06	-0.05	-0.03
Control Option 2, 5th Percentile	-0.08	-0.08	-0.07	-0.07	-0.05	-0.04
Control Option 3, 5th Percentile	-0.06	-0.06	-0.06	-0.05	-0.04	-0.03

Exhibit G-26. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1940 to 1959, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-0.44	-0.43	-0.35	-0.27	-0.17	-0.10
Control Option 1, 95th Percentile	-0.47	-0.45	-0.37	-0.29	-0.18	-0.11
Control Option 2, 95th Percentile	-0.45	-0.43	-0.36	-0.29	-0.19	-0.12
Control Option 3, 95th Percentile	-0.29	-0.29	-0.24	-0.19	-0.13	-0.08
Baseline, Median	-0.80	-0.79	-0.66	-0.52	-0.34	-0.20
Control Option 1, Median	-0.87	-0.86	-0.72	-0.58	-0.37	-0.23
Control Option 2, Median	-0.84	-0.82	-0.69	-0.57	-0.38	-0.25
Control Option 3, Median	-0.59	-0.58	-0.49	-0.40	-0.27	-0.18
Baseline, Mean	-1.07	-1.04	-0.86	-0.68	-0.43	-0.25
Control Option 1, Mean	-1.15	-1.12	-0.93	-0.75	-0.48	-0.29
Control Option 2, Mean	-1.11	-1.08	-0.91	-0.74	-0.49	-0.32
Control Option 3, Mean	-0.75	-0.74	-0.62	-0.51	-0.34	-0.22
Baseline, 5th Percentile	-0.22	-0.23	-0.19	-0.16	-0.11	-0.08
Control Option 1, 5th Percentile	-0.25	-0.25	-0.21	-0.18	-0.13	-0.09
Control Option 2, 5th Percentile	-0.26	-0.26	-0.23	-0.20	-0.15	-0.11
Control Option 3, 5th Percentile	-0.20	-0.20	-0.17	-0.15	-0.11	-0.09

Exhibit G-27. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1940 to 1959, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.02	0.11	0.09	0.07	0.05	0.02
Control Option 2, 95th Percentile	0.04	0.09	0.08	0.06	0.03	0.01
Control Option 3, 95th Percentile	0.22	0.11	0.09	0.07	0.04	0.02
Control Option 1, Median	-0.03	-0.03	-0.02	-0.02	-0.02	-0.01
Control Option 2, Median	0.00	0.00	-0.01	-0.01	-0.02	-0.02
Control Option 3, Median	0.10	0.10	0.08	0.07	0.04	0.02
Control Option 1, Mean	-0.02	-0.03	-0.02	-0.02	-0.02	-0.01
Control Option 2, Mean	0.01	0.00	0.00	-0.01	-0.01	-0.02
Control Option 3, Mean	0.14	0.13	0.11	0.09	0.06	0.03
Control Option 1, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 2, 5th Percentile	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Control Option 3, 5th Percentile	0.02	0.02	0.01	0.01	0.00	0.00

Exhibit G-28. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1940 to 1959, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.04	0.11	0.09	0.07	0.05	0.02
Control Option 2, 95th Percentile	-0.01	0.09	0.08	0.06	0.03	0.01
Control Option 3, 95th Percentile	0.25	0.11	0.09	0.07	0.04	0.02
Control Option 1, Median	-0.04	-0.04	-0.03	-0.03	-0.02	-0.02
Control Option 2, Median	-0.02	-0.02	-0.02	-0.02	-0.02	-0.03
Control Option 3, Median	0.11	0.11	0.09	0.07	0.04	0.01
Control Option 1, Mean	-0.04	-0.04	-0.04	-0.03	-0.02	-0.02
Control Option 2, Mean	-0.02	-0.02	-0.02	-0.03	-0.03	-0.03
Control Option 3, Mean	0.15	0.14	0.11	0.09	0.05	0.02
Control Option 1, 5th Percentile	-0.02	-0.02	-0.02	-0.01	-0.01	-0.01
Control Option 2, 5th Percentile	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Control Option 3, 5th Percentile	0.02	0.02	0.01	0.01	0.00	-0.01

Exhibit G-29. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1940 to 1959, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.02	0.13	0.11	0.08	0.05	0.02
Control Option 2, 95th Percentile	0.05	0.06	0.05	0.04	0.02	0.01
Control Option 3, 95th Percentile	0.27	0.08	0.06	0.05	0.03	0.01
Control Option 1, Median	-0.02	0.01	0.01	0.01	0.00	0.00
Control Option 2, Median	0.00	0.00	0.00	-0.01	-0.01	-0.01
Control Option 3, Median	0.07	0.07	0.05	0.04	0.03	0.01
Control Option 1, Mean	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01
Control Option 2, Mean	0.01	0.00	0.00	-0.01	-0.01	-0.01
Control Option 3, Mean	0.10	0.09	0.08	0.06	0.04	0.02
Control Option 1, 5th Percentile	-0.01	-0.01	-0.01	-0.01	0.00	0.00
Control Option 2, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 3, 5th Percentile	0.01	0.01	0.01	0.00	0.00	0.00

Exhibit G-30. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1940 to 1959, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.03	0.13	0.11	0.08	0.05	0.02
Control Option 2, 95th Percentile	0.00	0.06	0.05	0.04	0.02	0.01
Control Option 3, 95th Percentile	0.15	0.08	0.06	0.05	0.03	0.01
Control Option 1, Median	-0.07	0.01	0.01	0.01	0.00	0.00
Control Option 2, Median	-0.04	-0.04	-0.04	-0.05	-0.04	-0.05
Control Option 3, Median	0.21	0.21	0.17	0.12	0.07	0.02
Control Option 1, Mean	-0.09	-0.09	-0.07	-0.06	-0.04	-0.03
Control Option 2, Mean	-0.04	-0.05	-0.05	-0.06	-0.05	-0.06
Control Option 3, Mean	0.31	0.30	0.24	0.17	0.10	0.03
Control Option 1, 5th Percentile	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01
Control Option 2, 5th Percentile	-0.04	-0.04	-0.04	-0.04	-0.04	-0.03
Control Option 3, 5th Percentile	0.02	0.03	0.02	0.01	0.00	-0.01

Exhibit G-31. IQ Changes Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1960 to 1979, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-4.38	-4.36	-4.25	-4.14	-4.00	-3.86	-3.62
Control Option 1, 95th Percentile	-4.40	-4.38	-4.27	-4.16	-4.01	-3.87	-3.62
Control Option 2, 95th Percentile	-4.34	-4.32	-4.22	-4.13	-3.99	-3.86	-3.62
Control Option 3, 95th Percentile	-4.16	-4.15	-4.07	-4.00	-3.90	-3.81	-3.62
Baseline, Median	-2.25	-2.24	-2.19	-2.15	-2.09	-2.02	-1.91
Control Option 1, Median	-2.27	-2.26	-2.21	-2.17	-2.10	-2.03	-1.91
Control Option 2, Median	-2.25	-2.25	-2.20	-2.16	-2.10	-2.05	-1.91
Control Option 3, Median	-2.17	-2.17	-2.13	-2.10	-2.06	-2.01	-1.91
Baseline, Mean	-2.69	-2.68	-2.62	-2.55	-2.46	-2.38	-2.23
Control Option 1, Mean	-2.71	-2.71	-2.64	-2.57	-2.48	-2.39	-2.23
Control Option 2, Mean	-2.68	-2.68	-2.62	-2.56	-2.48	-2.40	-2.23
Control Option 3, Mean	-2.57	-2.57	-2.52	-2.48	-2.41	-2.36	-2.23
Baseline, 5th Percentile	-1.40	-1.40	-1.39	-1.38	-1.36	-1.35	-1.30
Control Option 1, 5th Percentile	-1.41	-1.41	-1.40	-1.39	-1.37	-1.35	-1.30
Control Option 2, 5th Percentile	-1.42	-1.43	-1.41	-1.40	-1.39	-1.37	-1.30
Control Option 3, 5th Percentile	-1.39	-1.40	-1.39	-1.38	-1.37	-1.36	-1.30

Exhibit G-32. IQ Changes Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1960 to 1979, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-7.82	-7.78	-7.64	-7.49	-7.28	-7.12	-6.92
Control Option 1, 95th Percentile	-7.86	-7.82	-7.67	-7.51	-7.30	-7.13	-6.92
Control Option 2, 95th Percentile	-7.80	-7.77	-7.63	-7.49	-7.29	-7.14	-6.92
Control Option 3, 95th Percentile	-7.57	-7.55	-7.45	-7.34	-7.19	-7.08	-6.92
Baseline, Median	-5.48	-5.47	-5.41	-5.35	-5.26	-5.20	-5.10
Control Option 1, Median	-5.50	-5.50	-5.43	-5.37	-5.28	-5.21	-5.10
Control Option 2, Median	-5.49	-5.48	-5.43	-5.37	-5.28	-5.22	-5.10
Control Option 3, Median	-5.40	-5.39	-5.34	-5.30	-5.24	-5.19	-5.10
Baseline, Mean	-5.96	-5.94	-5.86	-5.77	-5.65	-5.56	-5.44
Control Option 1, Mean	-5.99	-5.97	-5.88	-5.79	-5.67	-5.58	-5.44
Control Option 2, Mean	-5.96	-5.95	-5.87	-5.79	-5.67	-5.59	-5.44
Control Option 3, Mean	-5.82	-5.81	-5.76	-5.70	-5.61	-5.55	-5.44
Baseline, 5th Percentile	-4.57	-4.57	-4.56	-4.54	-4.52	-4.50	-4.45
Control Option 1, 5th Percentile	-4.58	-4.58	-4.57	-4.55	-4.53	-4.51	-4.45
Control Option 2, 5th Percentile	-4.60	-4.60	-4.58	-4.57	-4.55	-4.53	-4.45
Control Option 3, 5th Percentile	-4.57	-4.57	-4.55	-4.54	-4.53	-4.51	-4.45

Exhibit G-33. IQ Changes Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1960 to 1979, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-2.58	-2.55	-2.44	-2.33	-2.18	-2.04	-1.83
Control Option 1, 95th Percentile	-2.61	-2.58	-2.45	-2.34	-2.19	-2.05	-1.83
Control Option 2, 95th Percentile	-2.54	-2.52	-2.41	-2.31	-2.18	-2.05	-1.83
Control Option 3, 95th Percentile	-2.34	-2.33	-2.26	-2.19	-2.09	-2.00	-1.83
Baseline, Median	-0.88	-0.87	-0.85	-0.82	-0.79	-0.76	-0.70
Control Option 1, Median	-0.89	-0.88	-0.86	-0.83	-0.80	-0.76	-0.70
Control Option 2, Median	-0.88	-0.88	-0.85	-0.83	-0.80	-0.77	-0.70
Control Option 3, Median	-0.83	-0.83	-0.81	-0.80	-0.77	-0.75	-0.70
Baseline, Mean	-1.14	-1.13	-1.09	-1.05	-1.00	-0.95	-0.87
Control Option 1, Mean	-1.15	-1.15	-1.10	-1.06	-1.01	-0.96	-0.87
Control Option 2, Mean	-1.13	-1.13	-1.09	-1.06	-1.01	-0.96	-0.87
Control Option 3, Mean	-1.06	-1.06	-1.03	-1.01	-0.97	-0.94	-0.87
Baseline, 5th Percentile	-0.47	-0.47	-0.46	-0.46	-0.45	-0.45	-0.43
Control Option 1, 5th Percentile	-0.47	-0.47	-0.47	-0.46	-0.46	-0.45	-0.43
Control Option 2, 5th Percentile	-0.48	-0.48	-0.47	-0.47	-0.46	-0.46	-0.43
Control Option 3, 5th Percentile	-0.46	-0.47	-0.46	-0.46	-0.46	-0.45	-0.43

Exhibit G-34. IQ Changes Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1960 to 1979, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-7.60	-7.58	-7.50	-7.43	-7.33	-7.25	-6.99
Control Option 1, 95th Percentile	-7.62	-7.60	-7.52	-7.44	-7.33	-7.26	-6.99
Control Option 2, 95th Percentile	-7.59	-7.57	-7.50	-7.43	-7.33	-7.26	-6.99
Control Option 3, 95th Percentile	-7.47	-7.46	-7.41	-7.35	-7.28	-7.24	-6.99
Baseline, Median	-4.05	-4.04	-3.95	-3.85	-3.72	-3.62	-3.48
Control Option 1, Median	-4.09	-4.08	-3.98	-3.88	-3.74	-3.64	-3.48
Control Option 2, Median	-4.07	-4.06	-3.97	-3.88	-3.75	-3.66	-3.48
Control Option 3, Median	-3.92	-3.91	-3.84	-3.78	-3.68	-3.61	-3.48
Baseline, Mean	-4.88	-4.85	-4.69	-4.54	-4.34	-4.19	-3.99
Control Option 1, Mean	-4.94	-4.90	-4.74	-4.58	-4.36	-4.21	-3.99
Control Option 2, Mean	-4.89	-4.86	-4.71	-4.57	-4.37	-4.23	-3.99
Control Option 3, Mean	-4.64	-4.62	-4.51	-4.41	-4.27	-4.17	-3.99
Baseline, 5th Percentile	-2.80	-2.80	-2.78	-2.76	-2.74	-2.72	-2.66
Control Option 1, 5th Percentile	-2.81	-2.81	-2.79	-2.77	-2.75	-2.72	-2.66
Control Option 2, 5th Percentile	-2.84	-2.83	-2.81	-2.80	-2.77	-2.75	-2.66
Control Option 3, 5th Percentile	-2.80	-2.79	-2.78	-2.77	-2.75	-2.73	-2.66

Exhibit G-35. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1960 to 1979, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-0.76	-0.73	-0.62	-0.52	-0.38	-0.23
Control Option 1, 95th Percentile	-0.78	-0.75	-0.64	-0.54	-0.39	-0.24
Control Option 2, 95th Percentile	-0.72	-0.70	-0.60	-0.51	-0.37	-0.24
Control Option 3, 95th Percentile	-0.54	-0.52	-0.45	-0.38	-0.28	-0.18
Baseline, Median	-0.34	-0.34	-0.29	-0.25	-0.18	-0.12
Control Option 1, Median	-0.36	-0.36	-0.31	-0.26	-0.19	-0.13
Control Option 2, Median	-0.34	-0.34	-0.30	-0.26	-0.20	-0.14
Control Option 3, Median	-0.26	-0.26	-0.23	-0.20	-0.15	-0.11
Baseline, Mean	-0.46	-0.45	-0.38	-0.32	-0.23	-0.14
Control Option 1, Mean	-0.48	-0.47	-0.40	-0.34	-0.24	-0.16
Control Option 2, Mean	-0.45	-0.44	-0.38	-0.33	-0.24	-0.16
Control Option 3, Mean	-0.33	-0.33	-0.29	-0.24	-0.18	-0.12
Baseline, 5th Percentile	-0.10	-0.11	-0.09	-0.08	-0.07	-0.05
Control Option 1, 5th Percentile	-0.11	-0.12	-0.10	-0.09	-0.07	-0.06
Control Option 2, 5th Percentile	-0.13	-0.13	-0.12	-0.11	-0.09	-0.08
Control Option 3, 5th Percentile	-0.10	-0.10	-0.09	-0.08	-0.07	-0.06

Exhibit G-36. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from Leggett Model Vintage 1960 to 1979, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-0.90	-0.87	-0.72	-0.57	-0.36	-0.20
Control Option 1, 95th Percentile	-0.94	-0.90	-0.75	-0.59	-0.38	-0.22
Control Option 2, 95th Percentile	-0.88	-0.85	-0.71	-0.57	-0.37	-0.22
Control Option 3, 95th Percentile	-0.65	-0.63	-0.53	-0.42	-0.27	-0.16
Baseline, Median	-0.38	-0.38	-0.32	-0.26	-0.17	-0.10
Control Option 1, Median	-0.41	-0.40	-0.34	-0.27	-0.18	-0.11
Control Option 2, Median	-0.40	-0.39	-0.33	-0.27	-0.19	-0.13
Control Option 3, Median	-0.30	-0.29	-0.25	-0.21	-0.14	-0.10
Baseline, Mean	-0.52	-0.50	-0.42	-0.33	-0.21	-0.12
Control Option 1, Mean	-0.55	-0.53	-0.44	-0.36	-0.23	-0.14
Control Option 2, Mean	-0.52	-0.51	-0.43	-0.35	-0.23	-0.15
Control Option 3, Mean	-0.39	-0.38	-0.32	-0.26	-0.17	-0.11
Baseline, 5th Percentile	-0.12	-0.12	-0.10	-0.09	-0.06	-0.05
Control Option 1, 5th Percentile	-0.13	-0.13	-0.11	-0.10	-0.07	-0.05
Control Option 2, 5th Percentile	-0.15	-0.15	-0.13	-0.12	-0.09	-0.08
Control Option 3, 5th Percentile	-0.12	-0.11	-0.10	-0.09	-0.07	-0.06

Exhibit G-37. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1960 to 1979, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-0.75	-0.72	-0.60	-0.49	-0.35	-0.21
Control Option 1, 95th Percentile	-0.77	-0.74	-0.62	-0.51	-0.36	-0.22
Control Option 2, 95th Percentile	-0.70	-0.68	-0.57	-0.48	-0.34	-0.22
Control Option 3, 95th Percentile	-0.51	-0.50	-0.42	-0.35	-0.25	-0.16
Baseline, Median	-0.18	-0.18	-0.15	-0.13	-0.09	-0.06
Control Option 1, Median	-0.19	-0.19	-0.16	-0.13	-0.10	-0.06
Control Option 2, Median	-0.18	-0.18	-0.15	-0.13	-0.10	-0.07
Control Option 3, Median	-0.14	-0.13	-0.12	-0.10	-0.08	-0.05
Baseline, Mean	-0.27	-0.26	-0.22	-0.18	-0.13	-0.08
Control Option 1, Mean	-0.29	-0.28	-0.24	-0.20	-0.14	-0.09
Control Option 2, Mean	-0.27	-0.26	-0.22	-0.19	-0.14	-0.09
Control Option 3, Mean	-0.19	-0.19	-0.16	-0.14	-0.10	-0.07
Baseline, 5th Percentile	-0.04	-0.04	-0.04	-0.03	-0.03	-0.02
Control Option 1, 5th Percentile	-0.05	-0.05	-0.04	-0.04	-0.03	-0.02
Control Option 2, 5th Percentile	-0.05	-0.05	-0.05	-0.04	-0.04	-0.03
Control Option 3, 5th Percentile	-0.04	-0.04	-0.04	-0.03	-0.03	-0.02

Exhibit G-38. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1960 to 1979, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-0.62	-0.60	-0.52	-0.44	-0.34	-0.27
Control Option 1, 95th Percentile	-0.64	-0.61	-0.53	-0.45	-0.35	-0.27
Control Option 2, 95th Percentile	-0.61	-0.59	-0.51	-0.44	-0.34	-0.27
Control Option 3, 95th Percentile	-0.48	-0.47	-0.42	-0.37	-0.30	-0.25
Baseline, Median	-0.58	-0.56	-0.47	-0.37	-0.24	-0.14
Control Option 1, Median	-0.61	-0.60	-0.50	-0.40	-0.26	-0.16
Control Option 2, Median	-0.59	-0.58	-0.49	-0.40	-0.27	-0.18
Control Option 3, Median	-0.44	-0.43	-0.36	-0.30	-0.20	-0.14
Baseline, Mean	-0.89	-0.86	-0.71	-0.55	-0.35	-0.20
Control Option 1, Mean	-0.95	-0.92	-0.75	-0.59	-0.38	-0.22
Control Option 2, Mean	-0.90	-0.87	-0.72	-0.58	-0.38	-0.24
Control Option 3, Mean	-0.65	-0.63	-0.53	-0.43	-0.28	-0.18
Baseline, 5th Percentile	-0.14	-0.14	-0.12	-0.10	-0.07	-0.05
Control Option 1, 5th Percentile	-0.15	-0.15	-0.13	-0.11	-0.08	-0.06
Control Option 2, 5th Percentile	-0.18	-0.17	-0.15	-0.14	-0.11	-0.09
Control Option 3, 5th Percentile	-0.14	-0.13	-0.12	-0.10	-0.08	-0.07

Exhibit G-39. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1960 to 1979, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.02	0.11	0.09	0.07	0.05	0.02
Control Option 2, 95th Percentile	0.04	0.09	0.08	0.06	0.03	0.01
Control Option 3, 95th Percentile	0.22	0.11	0.09	0.07	0.04	0.02
Control Option 1, Median	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01
Control Option 2, Median	0.00	-0.01	-0.01	-0.01	-0.02	-0.02
Control Option 3, Median	0.08	0.08	0.06	0.05	0.03	0.01
Control Option 1, Mean	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01
Control Option 2, Mean	0.01	0.00	0.00	-0.01	-0.01	-0.02
Control Option 3, Mean	0.13	0.12	0.10	0.07	0.05	0.02
Control Option 1, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 2, 5th Percentile	-0.02	-0.03	-0.02	-0.03	-0.03	-0.03
Control Option 3, 5th Percentile	0.01	0.01	0.00	0.00	-0.01	-0.01

Exhibit G-40. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1960 to 1979, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.04	0.11	0.09	0.07	0.05	0.02
Control Option 2, 95th Percentile	0.02	0.09	0.08	0.06	0.03	0.01
Control Option 3, 95th Percentile	0.25	0.11	0.09	0.07	0.04	0.02
Control Option 1, Median	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01
Control Option 2, Median	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02
Control Option 3, Median	0.08	0.08	0.07	0.05	0.03	0.01
Control Option 1, Mean	-0.03	-0.03	-0.03	-0.02	-0.02	-0.01
Control Option 2, Mean	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02
Control Option 3, Mean	0.13	0.13	0.10	0.07	0.04	0.01
Control Option 1, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 2, 5th Percentile	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Control Option 3, 5th Percentile	0.00	0.00	0.00	0.00	-0.01	-0.01

Exhibit G-41. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1960 to 1979, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.02	0.13	0.11	0.08	0.05	0.02
Control Option 2, 95th Percentile	0.04	0.06	0.05	0.04	0.02	0.01
Control Option 3, 95th Percentile	0.24	0.08	0.06	0.05	0.03	0.01
Control Option 1, Median	-0.01	0.01	0.01	0.01	0.00	0.00
Control Option 2, Median	0.00	0.00	0.00	-0.01	-0.01	-0.01
Control Option 3, Median	0.04	0.04	0.03	0.03	0.02	0.01
Control Option 1, Mean	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 2, Mean	0.01	0.00	0.00	0.00	-0.01	-0.01
Control Option 3, Mean	0.08	0.07	0.06	0.05	0.03	0.01
Control Option 1, 5th Percentile	0.00	0.00	0.00	0.00	0.00	0.00
Control Option 2, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 3, 5th Percentile	0.00	0.00	0.00	0.00	0.00	0.00

Exhibit G-42. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1960 to 1979, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.02	0.13	0.11	0.08	0.05	0.02
Control Option 2, 95th Percentile	0.01	0.06	0.05	0.04	0.02	0.01
Control Option 3, 95th Percentile	0.13	0.08	0.06	0.05	0.03	0.01
Control Option 1, Median	-0.04	0.01	0.01	0.01	0.00	0.00
Control Option 2, Median	-0.02	-0.02	-0.02	-0.03	-0.03	-0.04
Control Option 3, Median	0.13	0.13	0.10	0.08	0.04	0.01
Control Option 1, Mean	-0.06	-0.06	-0.05	-0.04	-0.03	-0.02
Control Option 2, Mean	-0.01	-0.01	-0.02	-0.03	-0.03	-0.04
Control Option 3, Mean	0.24	0.23	0.18	0.13	0.07	0.02
Control Option 1, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 2, 5th Percentile	-0.04	-0.03	-0.03	-0.03	-0.03	-0.03
Control Option 3, 5th Percentile	0.00	0.00	0.00	0.00	-0.01	-0.01

G.2. Multiple Activities Example

G.2.1 Summary (Multiple Activities)

Exhibit G-43. IQ Changes Based on Lifetime Average Blood Pb Levels when Exposure Occurs in Year 2 – IEUBK

Case & Control Option	Log Linear			Piecewise Linear		
	Pre40	1940 to 1959	1960 to 1979	Pre40	1940 to 1959	1960 to 1979
Baseline, 95th Percentile	-7.13	-5.40	-4.86	-7.25	-3.93	-3.15
Control Option 1, 95th Percentile	-7.47	-5.84	-5.20	-7.42	-4.66	-3.63
Control Option 2, 95th Percentile	-7.06	-5.31	-4.79	-7.22	-3.78	-3.06
Control Option 3, 95th Percentile	-6.87	-5.05	-4.58	-6.87	-3.42	-2.80
Baseline, Median	-5.25	-3.28	-2.58	-3.70	-1.55	-1.07
Control Option 1, Median	-5.37	-3.42	-2.69	-3.88	-1.66	-1.14
Control Option 2, Median	-5.22	-3.24	-2.55	-3.65	-1.52	-1.05
Control Option 3, Median	-5.07	-3.05	-2.42	-3.45	-1.38	-0.97
Baseline, Mean	-5.64	-3.73	-3.09	-4.31	-1.92	-1.41
Control Option 1, Mean	-5.84	-3.98	-3.29	-4.67	-2.16	-1.56
Control Option 2, Mean	-5.59	-3.66	-3.04	-4.22	-1.87	-1.38
Control Option 3, Mean	-5.43	-3.45	-2.88	-3.97	-1.69	-1.27
Baseline, 5th Percentile	-4.23	-2.11	-1.53	-2.41	-0.80	-0.52
Control Option 1, 5th Percentile	-4.25	-2.15	-1.55	-2.44	-0.82	-0.53
Control Option 2, 5th Percentile	-4.22	-2.10	-1.53	-2.40	-0.80	-0.52
Control Option 3, 5th Percentile	-4.14	-2.01	-1.48	-2.33	-0.75	-0.50

Exhibit G-44. IQ Changes Based on Lifetime Average Blood Pb Levels when Exposure Occurs in Year 2 – Leggett

Case & Control Option	Log Linear			Piecewise Linear		
	Pre40	1940 to 1959	1960 to 1979	Pre40	1940 to 1959	1960 to 1979
Baseline, 95th Percentile	-10.76	-9.18	-8.53	-10.38	-8.56	-8.05
Control Option 1, 95th Percentile	-11.01	-9.55	-8.86	-10.76	-8.91	-8.30
Control Option 2, 95th Percentile	-10.70	-9.08	-8.45	-10.29	-8.48	-7.99
Control Option 3, 95th Percentile	-10.51	-8.78	-8.19	-10.03	-8.23	-7.82
Baseline, Median	-8.88	-6.80	-5.93	-8.32	-6.69	-4.82
Control Option 1, Median	-9.00	-6.94	-6.04	-8.41	-7.04	-5.04
Control Option 2, Median	-8.86	-6.77	-5.90	-8.30	-6.61	-4.78
Control Option 3, Median	-8.67	-6.49	-5.73	-8.15	-5.97	-4.47
Baseline, Mean	-9.32	-7.34	-6.53	-8.69	-7.35	-6.05
Control Option 1, Mean	-9.50	-7.59	-6.73	-8.86	-7.48	-6.53
Control Option 2, Mean	-9.27	-7.27	-6.47	-8.64	-7.32	-5.93
Control Option 3, Mean	-9.07	-6.98	-6.26	-8.47	-7.15	-5.48
Baseline, 5th Percentile	-7.66	-5.37	-4.72	-7.51	-3.89	-2.98
Control Option 1, 5th Percentile	-7.69	-5.41	-4.75	-7.53	-3.94	-3.02
Control Option 2, 5th Percentile	-7.65	-5.37	-4.73	-7.51	-3.89	-2.99
Control Option 3, 5th Percentile	-7.54	-5.25	-4.67	-7.46	-3.70	-2.92

Exhibit G-45. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels when Exposure Occurs in Year 2 – IEUBK

Case & Control Option	Log Linear			Piecewise Linear		
	Pre40	1940 to 1959	1960 to 1979	Pre40	1940 to 1959	1960 to 1979
Baseline, 95th Percentile	-0.88	-1.33	-1.23	-1.82	-1.67	-1.31
Control Option 1, 95th Percentile	-1.23	-1.76	-1.57	-1.98	-2.40	-1.79
Control Option 2, 95th Percentile	-0.81	-1.23	-1.16	-1.79	-1.53	-1.22
Control Option 3, 95th Percentile	-0.63	-0.98	-0.95	-1.43	-1.16	-0.96
Baseline, Median	-0.65	-0.90	-0.67	-0.87	-0.60	-0.37
Control Option 1, Median	-0.77	-1.04	-0.78	-1.05	-0.71	-0.44
Control Option 2, Median	-0.62	-0.86	-0.65	-0.82	-0.57	-0.36
Control Option 3, Median	-0.48	-0.68	-0.51	-0.62	-0.43	-0.28
Baseline, Mean	-0.72	-1.03	-0.85	-1.08	-0.78	-0.54
Control Option 1, Mean	-0.93	-1.28	-1.04	-1.44	-1.02	-0.69
Control Option 2, Mean	-0.67	-0.96	-0.80	-1.00	-0.72	-0.50
Control Option 3, Mean	-0.52	-0.75	-0.64	-0.62	-0.43	-0.28
Baseline, 5th Percentile	-0.32	-0.41	-0.23	-0.32	-0.20	-0.10
Control Option 1, 5th Percentile	-0.34	-0.45	-0.26	-0.35	-0.22	-0.11
Control Option 2, 5th Percentile	-0.31	-0.40	-0.23	-0.31	-0.20	-0.10
Control Option 3, 5th Percentile	-0.23	-0.31	-0.18	-0.23	-0.15	-0.08

Exhibit G-46. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels when Exposure Occurs in Year 2 - Leggett

Case & Control Option	Log Linear			Piecewise Linear		
	Pre40	1940 to 1959	1960 to 1979	Pre40	1940 to 1959	1960 to 1979
Baseline, 95th Percentile	-0.96	-1.77	-1.60	-1.21	-1.17	-1.04
Control Option 1, 95th Percentile	-1.20	-2.15	-1.94	-1.59	-1.53	-1.29
Control Option 2, 95th Percentile	-0.90	-1.67	-1.52	-1.12	-1.09	-0.98
Control Option 3, 95th Percentile	-0.71	-1.37	-1.26	-0.86	-0.85	-0.81
Baseline, Median	-0.90	-1.21	-0.83	-0.62	-2.46	-1.34
Control Option 1, Median	-1.01	-1.35	-0.94	-0.71	-2.81	-1.56
Control Option 2, Median	-0.87	-1.18	-0.81	-0.60	-2.39	-1.30
Control Option 3, Median	-0.68	-0.91	-0.63	-0.45	-1.75	-0.99
Baseline, Mean	-0.98	-1.42	-1.08	-0.77	-2.55	-2.05
Control Option 1, Mean	-1.16	-1.68	-1.29	-0.94	-2.68	-2.53
Control Option 2, Mean	-0.93	-1.35	-1.03	-0.72	-2.52	-1.94
Control Option 3, Mean	-0.74	-1.06	-0.82	-0.45	-1.75	-0.99
Baseline, 5th Percentile	-0.43	-0.50	-0.27	-0.21	-0.71	-0.32
Control Option 1, 5th Percentile	-0.46	-0.54	-0.30	-0.23	-0.77	-0.36
Control Option 2, 5th Percentile	-0.42	-0.50	-0.28	-0.21	-0.71	-0.33
Control Option 3, 5th Percentile	-0.32	-0.38	-0.22	-0.15	-0.53	-0.26

Exhibit G-47. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels when Exposure Occurs in Year 2 – IEUBK

	Log Linear			Piecewise Linear		
Case & Control Option	Pre40	1940-1959	1960-1979	Pre40	1940-1959	1960-1979
Control Option 1, 95th Percentile	-0.34	-0.44	-0.35	-0.16	-0.73	-0.48
Control Option 2, 95th Percentile	0.07	0.09	0.07	0.03	0.14	0.09
Control Option 3, 95th Percentile	0.25	0.35	0.28	0.39	0.51	0.35
Control Option 1, Median	-0.12	-0.14	-0.11	-0.18	-0.11	-0.07
Control Option 2, Median	0.03	0.04	0.02	0.05	0.03	0.02
Control Option 3, Median	0.18	0.23	0.16	0.26	0.17	0.09
Control Option 1, Mean	-0.21	-0.25	-0.20	-0.36	-0.24	-0.15
Control Option 2, Mean	0.05	0.06	0.05	0.08	0.06	0.03
Control Option 3, Mean	0.21	0.27	0.21	0.33	0.23	0.14
Control Option 1, 5th Percentile	-0.03	-0.04	-0.03	-0.03	-0.02	-0.01
Control Option 2, 5th Percentile	0.01	0.01	0.00	0.01	0.00	0.00
Control Option 3, 5th Percentile	0.08	0.10	0.05	0.09	0.05	0.02

Exhibit G-48. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels when Exposure Occurs in Year 2 - Leggett

	Log Linear			Piecewise Linear		
Case & Control Option	Pre40	1940-1959	1960-1979	Pre40	1940-1959	1960-1979
Control Option 1, 95th Percentile	-0.24	0.40	0.33	0.35	0.33	0.22
Control Option 2, 95th Percentile	0.06	0.30	0.20	0.16	0.71	0.35
Control Option 3, 95th Percentile	0.25	0.35	0.26	0.21	0.20	0.57
Control Option 1, Median	-0.12	0.12	0.05	0.06	0.18	0.06
Control Option 2, Median	0.02	0.03	0.02	0.02	0.07	0.04
Control Option 3, Median	0.21	0.30	0.20	0.16	0.71	0.35
Control Option 1, Mean	-0.19	-0.26	-0.21	-0.18	-0.13	-0.48
Control Option 2, Mean	0.05	0.07	0.05	0.04	0.03	0.11
Control Option 3, Mean	0.24	0.35	0.26	0.21	0.20	0.57
Control Option 1, 5th Percentile	-0.03	-0.04	-0.03	-0.02	-0.06	-0.04
Control Option 2, 5th Percentile	0.01	0.00	-0.01	0.00	0.00	-0.01
Control Option 3, 5th Percentile	0.11	0.12	0.05	0.06	0.18	0.06

G.2.2 Multiple Activities Example

Exhibit G-49. IQ Changes Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage <1940, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-7.04	-7.13	-7.07	-7.05	-6.94	-6.81	-6.24
Control Option 1, 95th Percentile	-7.41	-7.47	-7.38	-7.32	-7.16	-6.93	-6.24
Control Option 2, 95th Percentile	-6.97	-7.06	-7.01	-6.99	-6.89	-6.77	-6.24
Control Option 3, 95th Percentile	-6.80	-6.87	-6.83	-6.82	-6.74	-6.65	-6.24
Baseline, Median	-5.17	-5.25	-5.20	-5.18	-5.09	-5.00	-4.60
Control Option 1, Median	-5.29	-5.37	-5.31	-5.27	-5.16	-5.05	-4.60
Control Option 2, Median	-5.14	-5.22	-5.17	-5.15	-5.06	-4.98	-4.60
Control Option 3, Median	-5.01	-5.07	-5.04	-5.02	-4.95	-4.89	-4.60
Baseline, Mean	-5.55	-5.64	-5.58	-5.56	-5.46	-5.36	-4.91
Control Option 1, Mean	-5.77	-5.84	-5.77	-5.72	-5.59	-5.43	-4.91
Control Option 2, Mean	-5.51	-5.59	-5.54	-5.52	-5.43	-5.33	-4.91
Control Option 3, Mean	-5.37	-5.43	-5.39	-5.38	-5.30	-5.23	-4.91
Baseline, 5th Percentile	-4.18	-4.23	-4.20	-4.19	-4.14	-4.10	-3.91
Control Option 1, 5th Percentile	-4.21	-4.25	-4.22	-4.21	-4.16	-4.11	-3.91
Control Option 2, 5th Percentile	-4.17	-4.22	-4.19	-4.18	-4.13	-4.09	-3.91
Control Option 3, 5th Percentile	-4.11	-4.14	-4.12	-4.11	-4.08	-4.05	-3.91

Exhibit G-50. IQ Changes Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage <1940, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-10.83	-10.76	-10.68	-10.60	-10.41	-10.25	-9.81
Control Option 1, 95th Percentile	-11.09	-11.01	-10.89	-10.77	-10.53	-10.29	-9.81
Control Option 2, 95th Percentile	-10.77	-10.70	-10.62	-10.55	-10.37	-10.23	-9.81
Control Option 3, 95th Percentile	-10.58	-10.51	-10.45	-10.39	-10.25	-10.14	-9.81
Baseline, Median	-8.89	-8.88	-8.79	-8.71	-8.53	-8.40	-7.99
Control Option 1, Median	-9.00	-9.00	-8.90	-8.80	-8.60	-8.43	-7.99
Control Option 2, Median	-8.87	-8.86	-8.77	-8.70	-8.52	-8.39	-7.99
Control Option 3, Median	-8.66	-8.67	-8.60	-8.54	-8.39	-8.29	-7.99
Baseline, Mean	-9.34	-9.32	-9.22	-9.14	-8.94	-8.79	-8.34
Control Option 1, Mean	-9.53	-9.50	-9.38	-9.27	-9.04	-8.83	-8.34
Control Option 2, Mean	-9.30	-9.27	-9.18	-9.10	-8.91	-8.77	-8.34
Control Option 3, Mean	-9.09	-9.07	-9.00	-8.93	-8.78	-8.68	-8.34
Baseline, 5th Percentile	-7.61	-7.66	-7.61	-7.57	-7.47	-7.41	-7.23
Control Option 1, 5th Percentile	-7.64	-7.69	-7.64	-7.60	-7.48	-7.41	-7.23
Control Option 2, 5th Percentile	-7.61	-7.65	-7.60	-7.57	-7.47	-7.41	-7.23
Control Option 3, 5th Percentile	-7.52	-7.54	-7.51	-7.48	-7.41	-7.36	-7.23

Exhibit G-51. IQ Changes Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage <1940, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-7.22	-7.25	-7.23	-7.22	-7.05	-6.72	-5.44
Control Option 1, 95th Percentile	-7.39	-7.42	-7.37	-7.34	-7.27	-7.01	-5.44
Control Option 2, 95th Percentile	-7.13	-7.22	-7.20	-7.16	-6.91	-6.62	-5.44
Control Option 3, 95th Percentile	-6.69	-6.87	-6.77	-6.74	-6.55	-6.33	-5.44
Baseline, Median	-3.59	-3.70	-3.63	-3.60	-3.46	-3.34	-2.83
Control Option 1, Median	-3.76	-3.88	-3.79	-3.74	-3.57	-3.41	-2.83
Control Option 2, Median	-3.55	-3.65	-3.59	-3.56	-3.43	-3.32	-2.83
Control Option 3, Median	-3.36	-3.45	-3.40	-3.37	-3.28	-3.19	-2.83
Baseline, Mean	-4.17	-4.31	-4.22	-4.18	-4.02	-3.87	-3.23
Control Option 1, Mean	-4.53	-4.67	-4.54	-4.45	-4.23	-3.98	-3.23
Control Option 2, Mean	-4.09	-4.22	-4.15	-4.11	-3.97	-3.82	-3.23
Control Option 3, Mean	-3.87	-3.97	-3.91	-3.89	-3.78	-3.67	-3.23
Baseline, 5th Percentile	-2.37	-2.41	-2.38	-2.37	-2.32	-2.28	-2.09
Control Option 1, 5th Percentile	-2.39	-2.44	-2.41	-2.40	-2.34	-2.29	-2.09
Control Option 2, 5th Percentile	-2.36	-2.40	-2.37	-2.36	-2.32	-2.28	-2.09
Control Option 3, 5th Percentile	-2.29	-2.33	-2.31	-2.30	-2.26	-2.23	-2.09

Exhibit G-52. IQ Changes Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage <1940, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-10.49	-10.38	-10.26	-10.15	-9.89	-9.69	-9.17
Control Option 1, 95th Percentile	-10.88	-10.76	-10.57	-10.39	-10.05	-9.74	-9.17
Control Option 2, 95th Percentile	-10.40	-10.29	-10.18	-10.08	-9.84	-9.66	-9.17
Control Option 3, 95th Percentile	-10.12	-10.03	-9.94	-9.87	-9.69	-9.56	-9.17
Baseline, Median	-8.32	-8.32	-8.24	-8.19	-8.05	-7.96	-7.70
Control Option 1, Median	-8.41	-8.41	-8.33	-8.25	-8.10	-7.98	-7.70
Control Option 2, Median	-8.30	-8.30	-8.23	-8.17	-8.04	-7.95	-7.70
Control Option 3, Median	-8.14	-8.15	-8.10	-8.06	-7.95	-7.89	-7.70
Baseline, Mean	-8.71	-8.69	-8.60	-8.52	-8.36	-8.24	-7.92
Control Option 1, Mean	-8.88	-8.86	-8.75	-8.64	-8.44	-8.27	-7.92
Control Option 2, Mean	-8.67	-8.64	-8.56	-8.49	-8.34	-8.23	-7.92
Control Option 3, Mean	-8.49	-8.47	-8.41	-8.36	-8.24	-8.16	-7.92
Baseline, 5th Percentile	-7.49	-7.51	-7.49	-7.47	-7.42	-7.39	-7.30
Control Option 1, 5th Percentile	-7.50	-7.53	-7.50	-7.48	-7.42	-7.39	-7.30
Control Option 2, 5th Percentile	-7.49	-7.51	-7.49	-7.47	-7.42	-7.39	-7.30
Control Option 3, 5th Percentile	-7.44	-7.46	-7.44	-7.42	-7.39	-7.36	-7.30

Exhibit G-53. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage <1940, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-0.80	-0.88	-0.83	-0.81	-0.70	-0.57
Control Option 1, 95th Percentile	-1.16	-1.23	-1.14	-1.08	-0.91	-0.68
Control Option 2, 95th Percentile	-0.73	-0.81	-0.77	-0.74	-0.65	-0.53
Control Option 3, 95th Percentile	-0.56	-0.63	-0.59	-0.58	-0.50	-0.41
Baseline, Median	-0.58	-0.65	-0.60	-0.58	-0.49	-0.40
Control Option 1, Median	-0.69	-0.77	-0.71	-0.68	-0.56	-0.45
Control Option 2, Median	-0.55	-0.62	-0.57	-0.55	-0.47	-0.39
Control Option 3, Median	-0.42	-0.48	-0.44	-0.42	-0.35	-0.29
Baseline, Mean	-0.64	-0.72	-0.67	-0.65	-0.55	-0.45
Control Option 1, Mean	-0.85	-0.93	-0.86	-0.81	-0.68	-0.52
Control Option 2, Mean	-0.59	-0.67	-0.63	-0.60	-0.51	-0.42
Control Option 3, Mean	-0.45	-0.52	-0.48	-0.46	-0.39	-0.32
Baseline, 5th Percentile	-0.27	-0.32	-0.29	-0.28	-0.23	-0.19
Control Option 1, 5th Percentile	-0.30	-0.34	-0.31	-0.30	-0.25	-0.20
Control Option 2, 5th Percentile	-0.27	-0.31	-0.28	-0.27	-0.22	-0.18
Control Option 3, 5th Percentile	-0.20	-0.23	-0.21	-0.20	-0.17	-0.14

Exhibit G-54. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage <1940, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-1.03	-0.96	-0.87	-0.79	-0.61	-0.45
Control Option 1, 95th Percentile	-1.28	-1.20	-1.08	-0.96	-0.73	-0.49
Control Option 2, 95th Percentile	-0.97	-0.90	-0.82	-0.74	-0.57	-0.42
Control Option 3, 95th Percentile	-0.77	-0.71	-0.64	-0.59	-0.45	-0.34
Baseline, Median	-0.90	-0.90	-0.81	-0.73	-0.55	-0.41
Control Option 1, Median	-1.01	-1.01	-0.91	-0.82	-0.62	-0.44
Control Option 2, Median	-0.88	-0.87	-0.79	-0.71	-0.53	-0.40
Control Option 3, Median	-0.67	-0.68	-0.61	-0.55	-0.41	-0.31
Baseline, Mean	-1.01	-0.98	-0.88	-0.80	-0.61	-0.45
Control Option 1, Mean	-1.19	-1.16	-1.05	-0.93	-0.70	-0.49
Control Option 2, Mean	-0.96	-0.93	-0.84	-0.76	-0.58	-0.43
Control Option 3, Mean	-0.75	-0.74	-0.66	-0.60	-0.45	-0.34
Baseline, 5th Percentile	-0.39	-0.43	-0.38	-0.34	-0.24	-0.18
Control Option 1, 5th Percentile	-0.41	-0.46	-0.41	-0.37	-0.26	-0.19
Control Option 2, 5th Percentile	-0.39	-0.42	-0.38	-0.34	-0.24	-0.18
Control Option 3, 5th Percentile	-0.29	-0.32	-0.28	-0.25	-0.18	-0.13

Exhibit G-55. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage <1940, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-1.78	-1.82	-1.80	-1.78	-1.61	-1.28
Control Option 1, 95th Percentile	-1.95	-1.98	-1.94	-1.91	-1.83	-1.57
Control Option 2, 95th Percentile	-1.70	-1.79	-1.77	-1.73	-1.47	-1.18
Control Option 3, 95th Percentile	-1.26	-1.43	-1.34	-1.30	-1.11	-0.90
Baseline, Median	-0.76	-0.87	-0.80	-0.77	-0.63	-0.51
Control Option 1, Median	-0.93	-1.05	-0.96	-0.90	-0.74	-0.58
Control Option 2, Median	-0.71	-0.82	-0.75	-0.73	-0.60	-0.49
Control Option 3, Median	-0.53	-0.62	-0.56	-0.54	-0.45	-0.36
Baseline, Mean	-0.94	-1.08	-1.00	-0.96	-0.80	-0.64
Control Option 1, Mean	-1.31	-1.44	-1.31	-1.23	-1.00	-0.75
Control Option 2, Mean	-0.87	-1.00	-0.92	-0.89	-0.74	-0.60
Control Option 3, Mean	-0.65	-0.75	-0.69	-0.66	-0.55	-0.45
Baseline, 5th Percentile	-0.27	-0.32	-0.29	-0.28	-0.22	-0.18
Control Option 1, 5th Percentile	-0.30	-0.35	-0.32	-0.30	-0.24	-0.20
Control Option 2, 5th Percentile	-0.26	-0.31	-0.28	-0.27	-0.22	-0.18
Control Option 3, 5th Percentile	-0.20	-0.23	-0.21	-0.20	-0.17	-0.14

Exhibit G-56. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage <1940, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-1.32	-1.21	-1.09	-0.97	-0.72	-0.52
Control Option 1, 95th Percentile	-1.71	-1.59	-1.40	-1.21	-0.88	-0.57
Control Option 2, 95th Percentile	-1.22	-1.12	-1.01	-0.90	-0.67	-0.49
Control Option 3, 95th Percentile	-0.95	-0.86	-0.77	-0.70	-0.52	-0.39
Baseline, Median	-0.62	-0.62	-0.55	-0.49	-0.35	-0.26
Control Option 1, Median	-0.71	-0.71	-0.63	-0.55	-0.40	-0.28
Control Option 2, Median	-0.60	-0.60	-0.53	-0.47	-0.34	-0.26
Control Option 3, Median	-0.45	-0.45	-0.40	-0.36	-0.26	-0.19
Baseline, Mean	-0.79	-0.77	-0.68	-0.61	-0.44	-0.32
Control Option 1, Mean	-0.97	-0.94	-0.83	-0.73	-0.53	-0.35
Control Option 2, Mean	-0.75	-0.72	-0.64	-0.57	-0.42	-0.31
Control Option 3, Mean	-0.57	-0.55	-0.49	-0.44	-0.32	-0.24
Baseline, 5th Percentile	-0.19	-0.21	-0.19	-0.17	-0.12	-0.09
Control Option 1, 5th Percentile	-0.20	-0.23	-0.20	-0.18	-0.12	-0.09
Control Option 2, 5th Percentile	-0.19	-0.21	-0.18	-0.17	-0.12	-0.09
Control Option 3, 5th Percentile	-0.14	-0.15	-0.14	-0.12	-0.08	-0.06

Exhibit G-57. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage <1940, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.37	0.11	0.09	0.07	0.05	0.02
Control Option 2, 95th Percentile	0.07	0.09	0.08	0.06	0.03	0.01
Control Option 3, 95th Percentile	0.24	0.11	0.09	0.07	0.04	0.02
Control Option 1, Median	-0.12	-0.12	-0.11	-0.09	-0.08	-0.05
Control Option 2, Median	0.03	0.03	0.03	0.03	0.02	0.02
Control Option 3, Median	0.16	0.18	0.17	0.16	0.14	0.11
Control Option 1, Mean	-0.21	-0.21	-0.19	-0.16	-0.13	-0.07
Control Option 2, Mean	0.05	0.05	0.05	0.04	0.04	0.03
Control Option 3, Mean	0.19	0.21	0.19	0.18	0.16	0.13
Control Option 1, 5th Percentile	-0.03	-0.03	-0.03	-0.02	-0.02	-0.01
Control Option 2, 5th Percentile	0.01	0.01	0.01	0.01	0.00	0.00
Control Option 3, 5th Percentile	0.07	0.08	0.07	0.07	0.06	0.05

Exhibit G-58. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage <1940, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.25	0.11	0.09	0.07	0.05	0.02
Control Option 2, 95th Percentile	0.06	0.09	0.08	0.06	0.03	0.01
Control Option 3, 95th Percentile	0.26	0.11	0.09	0.07	0.04	0.02
Control Option 1, Median	-0.11	-0.12	-0.10	-0.09	-0.07	-0.03
Control Option 2, Median	0.02	0.02	0.02	0.02	0.01	0.01
Control Option 3, Median	0.23	0.21	0.20	0.18	0.14	0.10
Control Option 1, Mean	-0.18	-0.19	-0.16	-0.14	-0.10	-0.04
Control Option 2, Mean	0.05	0.05	0.04	0.04	0.03	0.02
Control Option 3, Mean	0.25	0.24	0.22	0.20	0.16	0.11
Control Option 1, 5th Percentile	-0.02	-0.03	-0.03	-0.02	-0.02	-0.01
Control Option 2, 5th Percentile	0.00	0.01	0.00	0.00	0.00	0.00
Control Option 3, 5th Percentile	0.10	0.11	0.10	0.09	0.06	0.04

Exhibit G-59. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage <1940, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.17	0.13	0.11	0.08	0.05	0.02
Control Option 2, 95th Percentile	0.08	0.06	0.05	0.04	0.02	0.01
Control Option 3, 95th Percentile	0.53	0.08	0.06	0.05	0.03	0.01
Control Option 1, Median	-0.17	0.01	0.01	0.01	0.00	0.00
Control Option 2, Median	0.04	0.05	0.04	0.04	0.03	0.02
Control Option 3, Median	0.23	0.26	0.23	0.22	0.19	0.15
Control Option 1, Mean	-0.36	-0.36	-0.32	-0.27	-0.20	-0.11
Control Option 2, Mean	0.08	0.08	0.08	0.07	0.06	0.04
Control Option 3, Mean	0.30	0.33	0.31	0.29	0.25	0.19
Control Option 1, 5th Percentile	-0.03	-0.03	-0.03	-0.03	-0.02	-0.01
Control Option 2, 5th Percentile	0.01	0.01	0.01	0.01	0.00	0.00
Control Option 3, 5th Percentile	0.07	0.09	0.08	0.07	0.06	0.05

Exhibit G-60. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage <1940, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.40	0.13	0.11	0.08	0.05	0.02
Control Option 2, 95th Percentile	0.09	0.06	0.05	0.04	0.02	0.01
Control Option 3, 95th Percentile	0.37	0.08	0.06	0.05	0.03	0.01
Control Option 1, Median	-0.09	0.01	0.01	0.01	0.00	0.00
Control Option 2, Median	0.02	0.02	0.02	0.01	0.01	0.00
Control Option 3, Median	0.17	0.16	0.15	0.13	0.10	0.07
Control Option 1, Mean	-0.17	-0.18	-0.15	-0.12	-0.08	-0.03
Control Option 2, Mean	0.04	0.04	0.04	0.03	0.02	0.01
Control Option 3, Mean	0.22	0.21	0.19	0.17	0.12	0.09
Control Option 1, 5th Percentile	-0.01	-0.02	-0.01	-0.01	-0.01	0.00
Control Option 2, 5th Percentile	0.00	0.00	0.00	0.00	0.00	0.00
Control Option 3, 5th Percentile	0.05	0.06	0.05	0.05	0.03	0.02

Exhibit G-61. IQ Changes Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1940 to 1959, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-5.29	-5.40	-5.31	-5.25	-5.07	-4.86	-4.07
Control Option 1, 95th Percentile	-5.76	-5.84	-5.70	-5.59	-5.33	-5.00	-4.07
Control Option 2, 95th Percentile	-5.20	-5.31	-5.22	-5.17	-5.00	-4.81	-4.07
Control Option 3, 95th Percentile	-4.95	-5.05	-4.98	-4.94	-4.80	-4.66	-4.07
Baseline, Median	-3.18	-3.28	-3.20	-3.16	-3.02	-2.90	-2.38
Control Option 1, Median	-3.32	-3.42	-3.33	-3.27	-3.11	-2.95	-2.38
Control Option 2, Median	-3.14	-3.24	-3.17	-3.13	-3.00	-2.88	-2.38
Control Option 3, Median	-2.97	-3.05	-2.99	-2.96	-2.85	-2.76	-2.38
Baseline, Mean	-3.62	-3.73	-3.64	-3.59	-3.44	-3.29	-2.70
Control Option 1, Mean	-3.88	-3.98	-3.87	-3.79	-3.59	-3.38	-2.70
Control Option 2, Mean	-3.56	-3.66	-3.58	-3.54	-3.40	-3.26	-2.70
Control Option 3, Mean	-3.37	-3.45	-3.39	-3.36	-3.24	-3.13	-2.70
Baseline, 5th Percentile	-2.06	-2.11	-2.07	-2.05	-1.99	-1.93	-1.70
Control Option 1, 5th Percentile	-2.09	-2.15	-2.10	-2.08	-2.01	-1.95	-1.70
Control Option 2, 5th Percentile	-2.05	-2.10	-2.07	-2.05	-1.99	-1.94	-1.70
Control Option 3, 5th Percentile	-1.98	-2.01	-1.98	-1.97	-1.92	-1.88	-1.70

Exhibit G-62. IQ Changes Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1940 to 1959, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-9.19	-9.18	-9.02	-8.87	-8.52	-8.22	-7.40
Control Option 1, 95th Percentile	-9.58	-9.55	-9.35	-9.14	-8.73	-8.29	-7.40
Control Option 2, 95th Percentile	-9.09	-9.08	-8.94	-8.79	-8.46	-8.18	-7.40
Control Option 3, 95th Percentile	-8.77	-8.78	-8.65	-8.53	-8.26	-8.03	-7.40
Baseline, Median	-6.70	-6.80	-6.68	-6.57	-6.29	-6.11	-5.58
Control Option 1, Median	-6.82	-6.94	-6.80	-6.68	-6.37	-6.14	-5.58
Control Option 2, Median	-6.68	-6.77	-6.65	-6.55	-6.28	-6.11	-5.58
Control Option 3, Median	-6.42	-6.49	-6.40	-6.32	-6.11	-5.98	-5.58
Baseline, Mean	-7.26	-7.34	-7.20	-7.08	-6.77	-6.55	-5.92
Control Option 1, Mean	-7.50	-7.59	-7.43	-7.27	-6.89	-6.59	-5.92
Control Option 2, Mean	-7.19	-7.27	-7.14	-7.03	-6.73	-6.52	-5.92
Control Option 3, Mean	-6.91	-6.98	-6.87	-6.78	-6.54	-6.38	-5.92
Baseline, 5th Percentile	-5.33	-5.37	-5.32	-5.28	-5.16	-5.09	-4.87
Control Option 1, 5th Percentile	-5.35	-5.41	-5.35	-5.31	-5.18	-5.10	-4.87
Control Option 2, 5th Percentile	-5.33	-5.37	-5.32	-5.28	-5.16	-5.10	-4.87
Control Option 3, 5th Percentile	-5.22	-5.25	-5.21	-5.18	-5.09	-5.04	-4.87

Exhibit G-63. IQ Changes Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1940 to 1959, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-3.76	-3.93	-3.78	-3.70	-3.44	-3.16	-2.26
Control Option 1, 95th Percentile	-4.53	-4.66	-4.42	-4.23	-3.83	-3.35	-2.26
Control Option 2, 95th Percentile	-3.62	-3.78	-3.66	-3.58	-3.34	-3.09	-2.26
Control Option 3, 95th Percentile	-3.28	-3.42	-3.32	-3.27	-3.09	-2.90	-2.26
Baseline, Median	-1.47	-1.55	-1.49	-1.46	-1.36	-1.27	-0.95
Control Option 1, Median	-1.58	-1.66	-1.59	-1.55	-1.43	-1.31	-0.95
Control Option 2, Median	-1.45	-1.52	-1.47	-1.44	-1.34	-1.26	-0.95
Control Option 3, Median	-1.33	-1.38	-1.34	-1.32	-1.25	-1.19	-0.95
Baseline, Mean	-1.83	-1.92	-1.85	-1.81	-1.68	-1.56	-1.14
Control Option 1, Mean	-2.07	-2.16	-2.05	-1.98	-1.81	-1.63	-1.14
Control Option 2, Mean	-1.78	-1.87	-1.80	-1.76	-1.65	-1.54	-1.14
Control Option 3, Mean	-1.62	-1.69	-1.64	-1.61	-1.52	-1.44	-1.14
Baseline, 5th Percentile	-0.77	-0.80	-0.78	-0.77	-0.74	-0.71	-0.60
Control Option 1, 5th Percentile	-0.79	-0.82	-0.80	-0.79	-0.75	-0.72	-0.60
Control Option 2, 5th Percentile	-0.77	-0.80	-0.78	-0.77	-0.74	-0.71	-0.60
Control Option 3, 5th Percentile	-0.73	-0.75	-0.74	-0.73	-0.70	-0.68	-0.60

Exhibit G-64. IQ Changes Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1940 to 1959, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-8.57	-8.56	-8.43	-8.30	-8.05	-7.84	-7.39
Control Option 1, 95th Percentile	-8.94	-8.91	-8.72	-8.53	-8.19	-7.88	-7.39
Control Option 2, 95th Percentile	-8.48	-8.48	-8.36	-8.24	-8.00	-7.82	-7.39
Control Option 3, 95th Percentile	-8.23	-8.23	-8.14	-8.05	-7.87	-7.73	-7.39
Baseline, Median	-6.45	-6.69	-6.39	-6.15	-5.54	-5.17	-4.22
Control Option 1, Median	-6.74	-7.04	-6.70	-6.41	-5.70	-5.23	-4.22
Control Option 2, Median	-6.40	-6.61	-6.33	-6.10	-5.51	-5.17	-4.22
Control Option 3, Median	-5.82	-5.97	-5.76	-5.60	-5.17	-4.91	-4.22
Baseline, Mean	-7.32	-7.35	-7.29	-7.24	-6.61	-6.09	-4.80
Control Option 1, Mean	-7.43	-7.48	-7.40	-7.32	-6.92	-6.19	-4.80
Control Option 2, Mean	-7.29	-7.32	-7.26	-7.21	-6.51	-6.04	-4.80
Control Option 3, Mean	-6.95	-7.15	-6.87	-6.65	-6.07	-5.72	-4.80
Baseline, 5th Percentile	-3.81	-3.89	-3.80	-3.74	-3.57	-3.47	-3.17
Control Option 1, 5th Percentile	-3.85	-3.94	-3.85	-3.78	-3.60	-3.48	-3.17
Control Option 2, 5th Percentile	-3.82	-3.89	-3.80	-3.74	-3.57	-3.48	-3.17
Control Option 3, 5th Percentile	-3.66	-3.70	-3.64	-3.60	-3.47	-3.40	-3.17

Exhibit G-65. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1940 to 1959, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-1.22	-1.33	-1.23	-1.17	-0.99	-0.79
Control Option 1, 95th Percentile	-1.69	-1.76	-1.63	-1.51	-1.26	-0.93
Control Option 2, 95th Percentile	-1.12	-1.23	-1.15	-1.09	-0.92	-0.74
Control Option 3, 95th Percentile	-0.88	-0.98	-0.91	-0.87	-0.73	-0.58
Baseline, Median	-0.80	-0.90	-0.82	-0.78	-0.64	-0.52
Control Option 1, Median	-0.94	-1.04	-0.95	-0.90	-0.73	-0.58
Control Option 2, Median	-0.76	-0.86	-0.79	-0.75	-0.62	-0.51
Control Option 3, Median	-0.67	-0.75	-0.69	-0.66	-0.54	-0.44
Baseline, Mean	-0.92	-1.03	-0.94	-0.89	-0.74	-0.59
Control Option 1, Mean	-1.18	-1.28	-1.17	-1.09	-0.89	-0.68
Control Option 2, Mean	-0.86	-0.96	-0.88	-0.84	-0.70	-0.56
Control Option 3, Mean	-0.67	-0.75	-0.69	-0.66	-0.54	-0.44
Baseline, 5th Percentile	-0.36	-0.41	-0.37	-0.35	-0.28	-0.23
Control Option 1, 5th Percentile	-0.39	-0.45	-0.40	-0.38	-0.31	-0.25
Control Option 2, 5th Percentile	-0.35	-0.40	-0.37	-0.35	-0.29	-0.23
Control Option 3, 5th Percentile	-0.27	-0.31	-0.28	-0.27	-0.22	-0.18

Exhibit G-66. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1940 to 1959, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-1.78	-1.77	-1.62	-1.46	-1.12	-0.82
Control Option 1, 95th Percentile	-2.18	-2.15	-1.95	-1.74	-1.32	-0.88
Control Option 2, 95th Percentile	-1.68	-1.67	-1.53	-1.38	-1.06	-0.78
Control Option 3, 95th Percentile	-1.37	-1.37	-1.25	-1.13	-0.85	-0.63
Baseline, Median	-1.12	-1.21	-1.09	-0.99	-0.71	-0.52
Control Option 1, Median	-1.23	-1.35	-1.22	-1.10	-0.78	-0.56
Control Option 2, Median	-1.10	-1.18	-1.06	-0.97	-0.69	-0.52
Control Option 3, Median	-0.99	-1.06	-0.96	-0.87	-0.62	-0.46
Baseline, Mean	-1.34	-1.42	-1.29	-1.17	-0.85	-0.63
Control Option 1, Mean	-1.58	-1.68	-1.52	-1.36	-0.97	-0.67
Control Option 2, Mean	-1.28	-1.35	-1.23	-1.11	-0.81	-0.61
Control Option 3, Mean	-0.99	-1.06	-0.96	-0.87	-0.62	-0.46
Baseline, 5th Percentile	-0.45	-0.50	-0.45	-0.41	-0.29	-0.22
Control Option 1, 5th Percentile	-0.48	-0.54	-0.48	-0.43	-0.31	-0.22
Control Option 2, 5th Percentile	-0.46	-0.50	-0.45	-0.41	-0.29	-0.22
Control Option 3, 5th Percentile	-0.35	-0.38	-0.34	-0.31	-0.22	-0.17

Exhibit G-67. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1940 to 1959, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-1.50	-1.67	-1.53	-1.44	-1.18	-0.90
Control Option 1, 95th Percentile	-2.27	-2.40	-2.16	-1.97	-1.57	-1.09
Control Option 2, 95th Percentile	-1.36	-1.53	-1.40	-1.32	-1.09	-0.84
Control Option 3, 95th Percentile	-1.02	-1.16	-1.07	-1.01	-0.83	-0.65
Baseline, Median	-0.53	-0.60	-0.54	-0.51	-0.41	-0.33
Control Option 1, Median	-0.63	-0.71	-0.64	-0.60	-0.48	-0.37
Control Option 2, Median	-0.50	-0.57	-0.52	-0.49	-0.40	-0.32
Control Option 3, Median	-0.38	-0.43	-0.39	-0.37	-0.30	-0.24
Baseline, Mean	-0.69	-0.78	-0.71	-0.67	-0.54	-0.42
Control Option 1, Mean	-0.93	-1.02	-0.91	-0.84	-0.66	-0.48
Control Option 2, Mean	-0.63	-0.72	-0.66	-0.62	-0.50	-0.40
Control Option 3, Mean	-0.48	-0.55	-0.50	-0.47	-0.38	-0.30
Baseline, 5th Percentile	-0.17	-0.20	-0.18	-0.17	-0.14	-0.11
Control Option 1, 5th Percentile	-0.19	-0.22	-0.20	-0.19	-0.15	-0.12
Control Option 2, 5th Percentile	-0.17	-0.20	-0.18	-0.17	-0.14	-0.11
Control Option 3, 5th Percentile	-0.13	-0.15	-0.14	-0.13	-0.10	-0.08

Exhibit G-68. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1940 to 1959, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-1.18	-1.17	-1.04	-0.92	-0.66	-0.46
Control Option 1, 95th Percentile	-1.55	-1.53	-1.34	-1.14	-0.81	-0.50
Control Option 2, 95th Percentile	-1.10	-1.09	-0.97	-0.86	-0.62	-0.43
Control Option 3, 95th Percentile	-0.84	-0.85	-0.76	-0.67	-0.48	-0.34
Baseline, Median	-2.23	-2.46	-2.17	-1.93	-1.31	-0.95
Control Option 1, Median	-2.52	-2.81	-2.47	-2.18	-1.48	-1.01
Control Option 2, Median	-2.18	-2.39	-2.11	-1.88	-1.29	-0.94
Control Option 3, Median	-1.60	-1.75	-1.54	-1.38	-0.94	-0.69
Baseline, Mean	-2.51	-2.55	-2.49	-2.43	-1.81	-1.29
Control Option 1, Mean	-2.63	-2.68	-2.60	-2.52	-2.12	-1.38
Control Option 2, Mean	-2.48	-2.52	-2.46	-2.41	-1.71	-1.24
Control Option 3, Mean	-2.15	-2.35	-2.07	-1.84	-1.26	-0.92
Baseline, 5th Percentile	-0.64	-0.71	-0.63	-0.57	-0.39	-0.29
Control Option 1, 5th Percentile	-0.68	-0.77	-0.68	-0.61	-0.42	-0.31
Control Option 2, 5th Percentile	-0.65	-0.71	-0.63	-0.57	-0.40	-0.30
Control Option 3, 5th Percentile	-0.48	-0.53	-0.47	-0.42	-0.30	-0.23

Exhibit G-69. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1940 to 1959, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.47	0.11	0.09	0.07	0.05	0.02
Control Option 2, 95th Percentile	0.09	0.09	0.08	0.06	0.03	0.01
Control Option 3, 95th Percentile	0.34	0.11	0.09	0.07	0.04	0.02
Control Option 1, Median	-0.14	-0.14	-0.13	-0.11	-0.09	-0.06
Control Option 2, Median	0.04	0.04	0.04	0.03	0.02	0.02
Control Option 3, Median	0.20	0.23	0.21	0.20	0.17	0.13
Control Option 1, Mean	-0.27	-0.25	-0.23	-0.19	-0.15	-0.08
Control Option 2, Mean	0.06	0.06	0.06	0.05	0.04	0.03
Control Option 3, Mean	0.25	0.27	0.25	0.24	0.20	0.16
Control Option 1, 5th Percentile	-0.03	-0.04	-0.03	-0.03	-0.02	-0.02
Control Option 2, 5th Percentile	0.00	0.01	0.00	0.00	0.00	0.00
Control Option 3, 5th Percentile	0.08	0.10	0.09	0.08	0.07	0.05

Exhibit G-70. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1940 to 1959, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.40	0.11	0.09	0.07	0.05	0.02
Control Option 2, 95th Percentile	0.10	0.09	0.08	0.06	0.03	0.01
Control Option 3, 95th Percentile	0.41	0.11	0.09	0.07	0.04	0.02
Control Option 1, Median	-0.12	-0.14	-0.13	-0.11	-0.08	-0.03
Control Option 2, Median	0.02	0.03	0.03	0.02	0.01	0.00
Control Option 3, Median	0.28	0.30	0.28	0.25	0.18	0.13
Control Option 1, Mean	-0.24	-0.26	-0.23	-0.19	-0.12	-0.04
Control Option 2, Mean	0.06	0.07	0.06	0.05	0.04	0.02
Control Option 3, Mean	0.35	0.35	0.33	0.30	0.23	0.17
Control Option 1, 5th Percentile	-0.03	-0.04	-0.03	-0.03	-0.02	-0.01
Control Option 2, 5th Percentile	-0.01	0.00	0.00	0.00	-0.01	-0.01
Control Option 3, 5th Percentile	0.10	0.12	0.11	0.10	0.07	0.05

Exhibit G-71. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1940 to 1959, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.77	0.13	0.11	0.08	0.05	0.02
Control Option 2, 95th Percentile	0.14	0.06	0.05	0.04	0.02	0.01
Control Option 3, 95th Percentile	0.48	0.08	0.06	0.05	0.03	0.01
Control Option 1, Median	-0.11	0.01	0.01	0.01	0.00	0.00
Control Option 2, Median	0.03	0.03	0.03	0.02	0.02	0.01
Control Option 3, Median	0.15	0.17	0.15	0.14	0.11	0.09
Control Option 1, Mean	-0.24	-0.24	-0.20	-0.17	-0.13	-0.07
Control Option 2, Mean	0.05	0.06	0.05	0.05	0.03	0.02
Control Option 3, Mean	0.21	0.23	0.21	0.20	0.16	0.12
Control Option 1, 5th Percentile	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01
Control Option 2, 5th Percentile	0.00	0.00	0.00	0.00	0.00	0.00
Control Option 3, 5th Percentile	0.04	0.05	0.05	0.04	0.03	0.03

Exhibit G-72. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1940 to 1959, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.37	0.13	0.11	0.08	0.05	0.02
Control Option 2, 95th Percentile	0.09	0.06	0.05	0.04	0.02	0.01
Control Option 3, 95th Percentile	0.34	0.08	0.06	0.05	0.03	0.01
Control Option 1, Median	-0.29	0.01	0.01	0.01	0.00	0.00
Control Option 2, Median	0.05	0.07	0.06	0.05	0.02	0.00
Control Option 3, Median	0.63	0.71	0.63	0.55	0.37	0.26
Control Option 1, Mean	-0.12	-0.13	-0.11	-0.09	-0.31	-0.10
Control Option 2, Mean	0.03	0.03	0.03	0.02	0.10	0.05
Control Option 3, Mean	0.36	0.20	0.42	0.59	0.54	0.37
Control Option 1, 5th Percentile	-0.04	-0.06	-0.05	-0.04	-0.03	-0.01
Control Option 2, 5th Percentile	-0.01	0.00	0.00	0.00	-0.01	-0.01
Control Option 3, 5th Percentile	0.15	0.18	0.16	0.14	0.09	0.06

Exhibit G-73. IQ Changes Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1960 to 1979, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-4.76	-4.86	-4.76	-4.69	-4.51	-4.31	-3.63
Control Option 1, 95th Percentile	-5.14	-5.20	-5.07	-4.95	-4.71	-4.41	-3.63
Control Option 2, 95th Percentile	-4.69	-4.79	-4.69	-4.63	-4.46	-4.27	-3.63
Control Option 3, 95th Percentile	-4.49	-4.58	-4.50	-4.45	-4.30	-4.15	-3.63
Baseline, Median	-2.50	-2.58	-2.51	-2.48	-2.37	-2.27	-1.91
Control Option 1, Median	-2.62	-2.69	-2.61	-2.56	-2.43	-2.31	-1.91
Control Option 2, Median	-2.48	-2.55	-2.49	-2.46	-2.35	-2.26	-1.91
Control Option 3, Median	-2.36	-2.42	-2.37	-2.34	-2.26	-2.19	-1.91
Baseline, Mean	-3.01	-3.09	-3.01	-2.96	-2.82	-2.69	-2.24
Control Option 1, Mean	-3.22	-3.29	-3.19	-3.11	-2.94	-2.75	-2.24
Control Option 2, Mean	-2.96	-3.04	-2.97	-2.93	-2.80	-2.68	-2.24
Control Option 3, Mean	-2.82	-2.88	-2.83	-2.79	-2.68	-2.59	-2.24
Baseline, 5th Percentile	-1.50	-1.53	-1.50	-1.49	-1.46	-1.42	-1.30
Control Option 1, 5th Percentile	-1.52	-1.55	-1.53	-1.51	-1.47	-1.44	-1.30
Control Option 2, 5th Percentile	-1.50	-1.53	-1.51	-1.50	-1.46	-1.43	-1.30
Control Option 3, 5th Percentile	-1.46	-1.48	-1.46	-1.45	-1.43	-1.41	-1.30

Exhibit G-74. IQ Changes Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1960 to 1979, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-8.51	-8.53	-8.38	-8.23	-7.90	-7.61	-6.93
Control Option 1, 95th Percentile	-8.87	-8.86	-8.68	-8.47	-8.08	-7.68	-6.93
Control Option 2, 95th Percentile	-8.43	-8.45	-8.31	-8.16	-7.85	-7.58	-6.93
Control Option 3, 95th Percentile	-8.15	-8.19	-8.07	-7.95	-7.68	-7.46	-6.93
Baseline, Median	-5.85	-5.93	-5.84	-5.76	-5.56	-5.43	-5.10
Control Option 1, Median	-5.96	-6.04	-5.94	-5.85	-5.62	-5.46	-5.10
Control Option 2, Median	-5.84	-5.90	-5.82	-5.74	-5.55	-5.43	-5.10
Control Option 3, Median	-5.68	-5.73	-5.66	-5.60	-5.45	-5.36	-5.10
Baseline, Mean	-6.44	-6.53	-6.41	-6.31	-6.05	-5.87	-5.44
Control Option 1, Mean	-6.65	-6.73	-6.59	-6.45	-6.15	-5.91	-5.44
Control Option 2, Mean	-6.40	-6.47	-6.37	-6.27	-6.03	-5.86	-5.44
Control Option 3, Mean	-6.20	-6.26	-6.18	-6.10	-5.90	-5.77	-5.44
Baseline, 5th Percentile	-4.70	-4.72	-4.69	-4.67	-4.61	-4.57	-4.45
Control Option 1, 5th Percentile	-4.72	-4.75	-4.72	-4.70	-4.63	-4.58	-4.45
Control Option 2, 5th Percentile	-4.71	-4.73	-4.70	-4.68	-4.62	-4.59	-4.45
Control Option 3, 5th Percentile	-4.65	-4.67	-4.65	-4.63	-4.59	-4.56	-4.45

Exhibit G-75. IQ Changes Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1960 to 1979, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-3.03	-3.15	-3.03	-2.94	-2.72	-2.50	-1.84
Control Option 1, 95th Percentile	-3.54	-3.63	-3.44	-3.28	-2.97	-2.61	-1.84
Control Option 2, 95th Percentile	-2.95	-3.06	-2.95	-2.87	-2.67	-2.46	-1.84
Control Option 3, 95th Percentile	-2.70	-2.80	-2.71	-2.65	-2.49	-2.33	-1.84
Baseline, Median	-1.02	-1.07	-1.03	-1.01	-0.94	-0.89	-0.70
Control Option 1, Median	-1.09	-1.14	-1.09	-1.06	-0.98	-0.91	-0.70
Control Option 2, Median	-1.01	-1.05	-1.02	-1.00	-0.93	-0.88	-0.70
Control Option 3, Median	-0.94	-0.97	-0.94	-0.93	-0.88	-0.84	-0.70
Baseline, Mean	-1.35	-1.41	-1.35	-1.32	-1.23	-1.14	-0.87
Control Option 1, Mean	-1.51	-1.56	-1.48	-1.43	-1.30	-1.18	-0.87
Control Option 2, Mean	-1.32	-1.38	-1.33	-1.29	-1.21	-1.13	-0.87
Control Option 3, Mean	-1.22	-1.27	-1.23	-1.20	-1.13	-1.07	-0.87
Baseline, 5th Percentile	-0.51	-0.52	-0.51	-0.51	-0.49	-0.48	-0.43
Control Option 1, 5th Percentile	-0.52	-0.53	-0.52	-0.52	-0.50	-0.48	-0.43
Control Option 2, 5th Percentile	-0.51	-0.52	-0.51	-0.51	-0.50	-0.48	-0.43
Control Option 3, 5th Percentile	-0.49	-0.50	-0.49	-0.49	-0.48	-0.47	-0.43

Exhibit G-76. IQ Changes Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1960 to 1979, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6	Background
Baseline, 95th Percentile	-8.04	-8.05	-7.95	-7.85	-7.65	-7.49	-7.01
Control Option 1, 95th Percentile	-8.30	-8.30	-8.16	-8.01	-7.75	-7.53	-7.01
Control Option 2, 95th Percentile	-7.98	-7.99	-7.90	-7.81	-7.62	-7.47	-7.01
Control Option 3, 95th Percentile	-7.80	-7.82	-7.75	-7.68	-7.52	-7.41	-7.01
Baseline, Median	-4.69	-4.82	-4.66	-4.52	-4.19	-3.98	-3.48
Control Option 1, Median	-4.88	-5.04	-4.84	-4.67	-4.29	-4.01	-3.48
Control Option 2, Median	-4.65	-4.78	-4.62	-4.49	-4.17	-3.97	-3.48
Control Option 3, Median	-4.38	-4.47	-4.35	-4.25	-4.01	-3.86	-3.48
Baseline, Mean	-5.86	-6.05	-5.79	-5.57	-5.06	-4.72	-3.99
Control Option 1, Mean	-6.32	-6.53	-6.19	-5.88	-5.25	-4.78	-3.99
Control Option 2, Mean	-5.76	-5.93	-5.69	-5.49	-5.01	-4.70	-3.99
Control Option 3, Mean	-5.35	-5.48	-5.30	-5.15	-4.78	-4.54	-3.99
Baseline, 5th Percentile	-2.95	-2.98	-2.95	-2.92	-2.85	-2.80	-2.66
Control Option 1, 5th Percentile	-2.98	-3.02	-2.98	-2.95	-2.87	-2.81	-2.66
Control Option 2, 5th Percentile	-2.96	-2.99	-2.96	-2.93	-2.86	-2.82	-2.66
Control Option 3, 5th Percentile	-2.90	-2.92	-2.89	-2.87	-2.82	-2.78	-2.66

Exhibit G-77. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1960 to 1979, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-1.13	-1.23	-1.13	-1.06	-0.88	-0.68
Control Option 1, 95th Percentile	-1.51	-1.57	-1.44	-1.32	-1.08	-0.78
Control Option 2, 95th Percentile	-1.06	-1.16	-1.06	-1.00	-0.83	-0.64
Control Option 3, 95th Percentile	-0.86	-0.95	-0.87	-0.82	-0.67	-0.52
Baseline, Median	-0.60	-0.67	-0.61	-0.57	-0.46	-0.36
Control Option 1, Median	-0.71	-0.78	-0.71	-0.66	-0.53	-0.40
Control Option 2, Median	-0.58	-0.65	-0.59	-0.55	-0.45	-0.35
Control Option 3, Median	-0.57	-0.64	-0.58	-0.55	-0.44	-0.34
Baseline, Mean	-0.76	-0.85	-0.77	-0.72	-0.58	-0.45
Control Option 1, Mean	-0.98	-1.04	-0.94	-0.87	-0.69	-0.51
Control Option 2, Mean	-0.72	-0.80	-0.73	-0.68	-0.55	-0.43
Control Option 3, Mean	-0.57	-0.64	-0.58	-0.55	-0.44	-0.34
Baseline, 5th Percentile	-0.20	-0.23	-0.21	-0.19	-0.16	-0.13
Control Option 1, 5th Percentile	-0.23	-0.26	-0.23	-0.22	-0.18	-0.14
Control Option 2, 5th Percentile	-0.20	-0.23	-0.21	-0.20	-0.17	-0.14
Control Option 3, 5th Percentile	-0.16	-0.18	-0.17	-0.16	-0.13	-0.11

Exhibit G-78. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1960 to 1979, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-1.58	-1.60	-1.45	-1.30	-0.97	-0.68
Control Option 1, 95th Percentile	-1.94	-1.94	-1.75	-1.54	-1.15	-0.75
Control Option 2, 95th Percentile	-1.50	-1.52	-1.38	-1.24	-0.92	-0.65
Control Option 3, 95th Percentile	-1.22	-1.26	-1.14	-1.02	-0.75	-0.53
Baseline, Median	-0.76	-0.83	-0.74	-0.66	-0.47	-0.33
Control Option 1, Median	-0.86	-0.94	-0.84	-0.75	-0.53	-0.36
Control Option 2, Median	-0.74	-0.81	-0.72	-0.65	-0.46	-0.33
Control Option 3, Median	-0.75	-0.82	-0.73	-0.65	-0.46	-0.33
Baseline, Mean	-1.00	-1.08	-0.97	-0.86	-0.61	-0.43
Control Option 1, Mean	-1.20	-1.29	-1.15	-1.01	-0.71	-0.46
Control Option 2, Mean	-0.95	-1.03	-0.92	-0.83	-0.58	-0.42
Control Option 3, Mean	-0.75	-0.82	-0.73	-0.65	-0.46	-0.33
Baseline, 5th Percentile	-0.24	-0.27	-0.24	-0.22	-0.16	-0.12
Control Option 1, 5th Percentile	-0.27	-0.30	-0.27	-0.24	-0.17	-0.13
Control Option 2, 5th Percentile	-0.25	-0.28	-0.25	-0.23	-0.17	-0.13
Control Option 3, 5th Percentile	-0.20	-0.22	-0.20	-0.18	-0.13	-0.10

Exhibit G-79. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1960 to 1979, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-1.19	-1.31	-1.19	-1.10	-0.88	-0.66
Control Option 1, 95th Percentile	-1.70	-1.79	-1.60	-1.44	-1.13	-0.77
Control Option 2, 95th Percentile	-1.11	-1.22	-1.11	-1.03	-0.83	-0.62
Control Option 3, 95th Percentile	-0.86	-0.96	-0.87	-0.81	-0.65	-0.49
Baseline, Median	-0.33	-0.37	-0.33	-0.31	-0.24	-0.19
Control Option 1, Median	-0.39	-0.44	-0.39	-0.36	-0.28	-0.21
Control Option 2, Median	-0.31	-0.36	-0.32	-0.30	-0.24	-0.19
Control Option 3, Median	-0.24	-0.28	-0.25	-0.23	-0.18	-0.14
Baseline, Mean	-0.48	-0.54	-0.48	-0.45	-0.35	-0.27
Control Option 1, Mean	-0.63	-0.69	-0.61	-0.55	-0.43	-0.30
Control Option 2, Mean	-0.45	-0.50	-0.45	-0.42	-0.33	-0.26
Control Option 3, Mean	-0.35	-0.39	-0.35	-0.33	-0.26	-0.20
Baseline, 5th Percentile	-0.08	-0.10	-0.09	-0.08	-0.07	-0.05
Control Option 1, 5th Percentile	-0.09	-0.11	-0.10	-0.09	-0.07	-0.06
Control Option 2, 5th Percentile	-0.09	-0.10	-0.09	-0.08	-0.07	-0.06
Control Option 3, 5th Percentile	-0.07	-0.08	-0.07	-0.07	-0.06	-0.05

Exhibit G-80. Incremental IQ Changes Compared to Background Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1960 to 1979, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Baseline, 95th Percentile	-1.02	-1.04	-0.93	-0.83	-0.63	-0.48
Control Option 1, 95th Percentile	-1.29	-1.29	-1.14	-0.99	-0.74	-0.51
Control Option 2, 95th Percentile	-0.97	-0.98	-0.89	-0.79	-0.60	-0.46
Control Option 3, 95th Percentile	-0.78	-0.81	-0.74	-0.67	-0.51	-0.40
Baseline, Median	-1.21	-1.34	-1.18	-1.04	-0.71	-0.50
Control Option 1, Median	-1.40	-1.56	-1.37	-1.19	-0.81	-0.54
Control Option 2, Median	-1.18	-1.30	-1.14	-1.01	-0.69	-0.50
Control Option 3, Median	-0.90	-0.99	-0.87	-0.77	-0.53	-0.38
Baseline, Mean	-1.87	-2.05	-1.80	-1.58	-1.06	-0.72
Control Option 1, Mean	-2.33	-2.53	-2.20	-1.89	-1.25	-0.79
Control Option 2, Mean	-1.77	-1.94	-1.70	-1.50	-1.02	-0.71
Control Option 3, Mean	-1.35	-1.48	-1.30	-1.15	-0.78	-0.55
Baseline, 5th Percentile	-0.29	-0.32	-0.29	-0.26	-0.18	-0.14
Control Option 1, 5th Percentile	-0.32	-0.36	-0.32	-0.29	-0.20	-0.15
Control Option 2, 5th Percentile	-0.30	-0.33	-0.30	-0.27	-0.20	-0.15
Control Option 3, 5th Percentile	-0.24	-0.26	-0.23	-0.21	-0.15	-0.12

Exhibit G-81. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1960 to 1979, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.38	0.11	0.09	0.07	0.05	0.02
Control Option 2, 95th Percentile	0.07	0.09	0.08	0.06	0.03	0.01
Control Option 3, 95th Percentile	0.27	0.11	0.09	0.07	0.04	0.02
Control Option 1, Median	-0.11	-0.11	-0.10	-0.09	-0.07	-0.04
Control Option 2, Median	0.02	0.02	0.02	0.02	0.01	0.01
Control Option 3, Median	0.14	0.16	0.14	0.13	0.11	0.08
Control Option 1, Mean	-0.21	-0.20	-0.18	-0.15	-0.11	-0.06
Control Option 2, Mean	0.04	0.05	0.04	0.04	0.03	0.02
Control Option 3, Mean	0.19	0.21	0.19	0.17	0.14	0.10
Control Option 1, 5th Percentile	-0.03	-0.03	-0.02	-0.02	-0.02	-0.01
Control Option 2, 5th Percentile	0.00	0.00	-0.01	-0.01	-0.01	-0.01
Control Option 3, 5th Percentile	0.04	0.05	0.04	0.04	0.03	0.02

Exhibit G-82. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1960 to 1979, LOG LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.36	0.11	0.09	0.07	0.05	0.02
Control Option 2, 95th Percentile	0.08	0.09	0.08	0.06	0.03	0.01
Control Option 3, 95th Percentile	0.36	0.11	0.09	0.07	0.04	0.02
Control Option 1, Median	-0.10	-0.12	-0.10	-0.09	-0.06	-0.02
Control Option 2, Median	0.02	0.02	0.02	0.02	0.01	0.00
Control Option 3, Median	0.18	0.20	0.18	0.16	0.11	0.07
Control Option 1, Mean	-0.20	-0.21	-0.18	-0.14	-0.10	-0.04
Control Option 2, Mean	0.05	0.05	0.04	0.04	0.02	0.01
Control Option 3, Mean	0.25	0.26	0.24	0.21	0.15	0.10
Control Option 1, 5th Percentile	-0.02	-0.03	-0.03	-0.02	-0.02	-0.01
Control Option 2, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 3, 5th Percentile	0.04	0.05	0.05	0.04	0.03	0.02

Exhibit G-83. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from IEUBK Model, Vintage 1960 to 1979, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.50	0.13	0.11	0.08	0.05	0.02
Control Option 2, 95th Percentile	0.09	0.06	0.05	0.04	0.02	0.01
Control Option 3, 95th Percentile	0.33	0.08	0.06	0.05	0.03	0.01
Control Option 1, Median	-0.07	0.01	0.01	0.01	0.00	0.00
Control Option 2, Median	0.01	0.02	0.01	0.01	0.01	0.00
Control Option 3, Median	0.08	0.09	0.08	0.08	0.06	0.04
Control Option 1, Mean	-0.16	-0.15	-0.13	-0.11	-0.08	-0.04
Control Option 2, Mean	0.03	0.03	0.03	0.03	0.02	0.01
Control Option 3, Mean	0.13	0.14	0.13	0.12	0.09	0.07
Control Option 1, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 2, 5th Percentile	0.00	0.00	0.00	0.00	0.00	0.00
Control Option 3, 5th Percentile	0.02	0.02	0.02	0.02	0.01	0.01

Exhibit G-84. IQ Changes For Each Control Option Relative to the Baseline Based on Lifetime Average Blood Pb Levels from Leggett Model, Vintage 1960 to 1979, PIECEWISE LINEAR

Case & Control Option	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
Control Option 1, 95th Percentile	-0.27	0.13	0.11	0.08	0.05	0.02
Control Option 2, 95th Percentile	0.06	0.06	0.05	0.04	0.02	0.01
Control Option 3, 95th Percentile	0.24	0.08	0.06	0.05	0.03	0.01
Control Option 1, Median	-0.19	0.01	0.01	0.01	0.00	0.00
Control Option 2, Median	0.03	0.04	0.04	0.03	0.01	0.00
Control Option 3, Median	0.31	0.35	0.31	0.27	0.18	0.12
Control Option 1, Mean	-0.46	-0.48	-0.40	-0.31	-0.19	-0.06
Control Option 2, Mean	0.10	0.11	0.10	0.08	0.04	0.02
Control Option 3, Mean	0.52	0.57	0.49	0.42	0.28	0.18
Control Option 1, 5th Percentile	-0.03	-0.04	-0.03	-0.03	-0.02	-0.01
Control Option 2, 5th Percentile	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Control Option 3, 5th Percentile	0.05	0.06	0.06	0.05	0.03	0.02