



# WEST SILVER VALLEY WOODSTOVE AND OPEN BURNING SURVEY

*Report of Results*  
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**COLLEGE OF ENGINEERING**

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## BACKGROUND

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The West Silver Valley (WSV) in northern Idaho—encompassing the communities of Pinehurst, Smeltonville, Kellogg, Wardner and Kingston—was designated as nonattainment for the 2012 Annual PM<sub>2.5</sub> National Ambient Air Quality Standard (NAAQS) of 12 micrograms per cubic meter. Primary emissions sources contributing to PM<sub>2.5</sub> nonattainment are prescribed fires, wood waste slash burning on large and small wooded properties, open burning of yard wastes, and home heating with wood-burning devices—woodstoves, pellet stoves, and fireplaces.

A woodstove survey was completed in spring 1991 to identify what local residents were using for home heating. A second woodstove survey was completed 2003 to assess any changes in home heating practices since the previous survey. Several woodstove buyout programs were conducted to provide residents financial assistance for older woodstove replacement with EPA-certified, low emission woodstoves or pellet stoves.

## MOTIVATION AND GOALS

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The Idaho Department of Environmental Quality (IDEQ) identified the need for better understanding home heating practices in order to develop emissions control strategies for the WSV including: equipment used, wood condition prior to burning, amount of wood burned, and wood burning methods. Primary home heating equipment in which IDEQ was interested included free-standing woodstoves and woodstove inserts. IDEQ further identified the need to better understand what percentage of WSV residents burn wood as the sole fuel source or who view switching to an alternative fuel source an economic hardship. Also included in developing effective control strategies is understanding residents' open yard wastes burning, wood waste slash burning, and other outdoor open burning practices.

The IDEQ contracted with Boise State University (BSU) to achieve the following goals relative to home heating and outdoor open burning practices in the WSV:

- **Goal 1:** Develop a survey instrument targeted to acquire local information about home heating devices, fuel condition, annual fuel use, home heating practices, and outdoor open burning practices.
- **Goal 2:** Determine most effective survey implementation method—by mail, in person, phone, or computer.
- **Goal 3:** Implement the woodstove/open burning survey.
- **Goal 4:** Compile and report woodstove/open burning survey results into a useable format for IDEQ personnel to develop emission control strategies.

## SURVEY DEVELOPMENT, IMPLEMENTATION, RESPONSE RATES

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Personnel from IDEQ worked with BSU through fall 2015 to develop the survey instrument (*Goal 1*). Postal zip codes (see Table 1) were used to determine residents' location in the WSV. It was determined that a local resident conducting a telephonic survey (interviewer) was the most effective implementation method (*Goal 2*).

**Table 1:** Postal zip codes with corresponding primary community.

Postal zip code	Primary community	Urban or Rural
83837	Kellogg/Wardner	Urban
83839	Kingston	Rural
83850	Pinehurst	Rural
83868	Smelterville	Rural

IDEQ personnel obtained a list of WSV residents' telephone numbers from a commercial vendor. The final survey instrument (see Appendix A) was programmed into Qualtrics© survey software for interviewer direct input of responses. The interviewer made calls at random and maintained a master list of residents' telephone numbers. The list of residents surveyed was not tracked with survey responses ensuring total respondent anonymity. The survey was conducted between January 5, 2016 and January 24, 2016 during the afternoon and evening hours (*Goal 3*). A total of 260 calls were completed, 31 of which were invalidated and excluded from further analysis (see Table 2). This resulted in 229 valid responses or 88.1% survey response rate. This high response rate may be attributed to three factors: (1) the interviewer's connection within local communities; (2) public service announcements (PSAs) made by IDEQ personnel; and (3) community members interested in being good citizens. Valid responses were not evenly distributed by postal zip code because the interviewer made calls to telephone numbers selected at random (see Table 3)

**Table 2:** Invalidation reasons and number of responses excluded.

Invalidation reason	Number of responses excluded
Refused survey participation	22
Survey incomplete/aborted	5
Did not give postal zip code	3
Gave postal zip code not within WSV	1
<b>Total</b>	<b>31</b>

**Table 3:** Number and percent of total valid responses by postal zip code.

Postal zip code	Number valid responses	Percent valid responses
83837	74	32.3%
83839	56	24.5%
83850	85	37.1%
83868	14	6.1%
<b>Total</b>	<b>229</b>	<b>100%</b>

Overall survey margin of error (MOE) was determined based on respondents who reported owning a free-standing woodstove or woodstove insert presence—observed as 34.5% (79 out of 229 valid responses)—because these were the home heating equipment in which IDEQ was primarily interested. A  $\pm 6.2\%$  overall survey MOE at the 95% confidence limit was determined for the 229 valid responses from WSV households. It was determined that 347 valid responses—or 394 calls based on assumed further 88.1% survey response rate—were necessary to achieve a  $\pm 5\%$  overall survey MOE at the 95% confidence limit (see Appendix B). Personnel from IDEQ decided that the achieved overall survey MOE was adequate and attempting an additional 134

calls was not a sufficient statistical trade-off in the essence of time. The survey was concluded on January 24, 2016.

## SURVEY RESPONDENT DEMOGRAPHIC CHARACTERISTICS

Survey respondents were asked a series of demographic characteristic questions—a standard part of surveys—once primary survey questions were completed. Responses to these questions were intended to aid in evaluation of citizens’ need for hardship exemption from any wood burning ordinances and to determine the most effective method to disperse information. Survey demographic characteristics are summarized in Table 4 (*Goal 4*).

**Table 4:** Survey respondent demographic characteristics.

Demographic	Count Yes	Percent Yes
<b><i>Own or rent home (n = 229)</i></b>		
Own	214	93.4%
Rent	15	6.6%
<b><i>Years in home (n = 229)</i></b>		
Average ± standard deviation	28.0 ± 16.7	
Minimum	0.50	
Maximum	76.0	
<b><i>Age (n = 228)<sup>a</sup></i></b>		
25 to 34	3	1.3%
35 to 44	7	3.1%
45 to 54	14	6.1%
55 to 64	65	25.5%
65 to 74	73	32.0%
75 to 84	53	23.2%
85 or older	13	5.7%
<b><i>Level of education (n = 226)<sup>b</sup></i></b>		
Kindergarten through 11 <sup>th</sup> grade	11	4.9%
High school	90	39.8%
Some college/Associate’s degree	75	33.2%
Technical/vocational certification	12	5.3%
Bachelor’s degree	26	11.5%
Graduate/professional degree	12	5.3%
<b><i>2015 Annual household income (n = 209)<sup>c</sup></i></b>		
< \$30K	111	53.1%
\$30K to < \$50K	50	23.9%
\$50K to < \$70K	21	10.0%
\$70K to < \$90K	14	6.7%
> \$90K	13	6.3%

<sup>a</sup> One respondent preferred not to answer. <sup>b</sup> Three respondents preferred not to answer. <sup>c</sup> One respondent did not know, 19 respondents preferred not to answer.

## SURVEY RESULTS

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The following sections are a compilation of survey results for IDEQ personnel to develop emission control strategies (*Goal 4*). Survey results are reported by postal zip code with corresponding evaluation of statistical differences using either a chi-square test—for testing similarity of observed and expected proportions—or Wilcoxon rank-sum test—for testing similarity of medians. Initial review of survey responses reported for postal zip code 83837 (Kellogg/Wardner)—more urbanized—suggested *statistically different* responses for the other three postal zip codes—more rural. Statistical analyses were performed at the 95% confidence limit ( $p = 0.05$ ) using Microsoft® Excel® comparing responses for postal zip code 83837 (Kellogg/Wardner) to combined responses for the other three postal zip codes—83839 (Kingston), 83850 (Pinehurst), and 83868 (Smelterville). All raw data, descriptive statistics, and statistical analyses can be found electronically in the following Microsoft® Excel® workbook: “*West Silver Valley Woodstove Survey–January 2016–ANALYSIS FINAL–LOCKED–08Aug16.xlsx*”.

### Executive Summary

- Over one-third of all respondents—34.5%—reported owning a free-standing woodstove or woodstove insert. Ownership for postal zip code 83837 (Kellogg/Wardner)—18.9%—was *statistically lower* ( $p = 0.00061$ ) than for the other three combined postal zip codes—41.9%. Seasonal burning for postal zip code 83837 (Kellogg/Wardner) was *statistically similar* in fall ( $p = 0.62$ ), winter ( $p = 0.23$ ), and spring ( $p = 0.99$ ) to the other three combined postal zip codes.
- Only 16.2% of all respondents reported using a free-standing woodstove or woodstove insert as their primary home heating device. This was *statistically lower* ( $p = 0.022$ ) for postal zip code 83837 (Kellogg/Wardner)—8.1%—than for the other three combined postal zip codes—20.0%. Primary home heating device for postal zip code 83837 (Kellogg/Wardner) was a gas/propane furnace—93.2%—compared to 61.3% for the other three combined postal zip codes.
- The primary species of wood burned—Douglas fir, 43.8%—for postal zip code 83837 (Kellogg/Wardner) was *statistically similar* ( $p = 0.063$ ) to the other three combined postal zip codes. The median number of wood cords burned annually for postal zip code 83837 (Kellogg/Wardner)—4 cords—was *statically similar* ( $p = 0.22$ ) to the other three combined postal zip codes—3.5 cords.
- Only seven of 229 respondents—3.1%—reported owning a free-standing pellet stove or pellet stove insert. Ownership for postal zip code 83837 (Kellogg/Wardner)—2.7%—was *statistically similar* to the other three combined postal zip codes—3.2%. Only two of 229 respondents—0.87%—reported using a free-standing pellet stove or pellet stove insert as their primary home heating device.
- Nearly one quarter—22.3%—of all respondents reported having outdoor recreational or warming fires. This was *statistically similar* ( $p = 0.063$ ) for postal zip code 83837 (Kellogg/Wardner) compared to the other three combined postal zip codes. Seasonal burning was also *statistically similar* in fall ( $p = 0.40$ ), winter ( $p = 0.17$ ), spring ( $p = 0.80$ ), and summer ( $p = 0.99$ ) for postal zip code 83837 (Kellogg/Wardner) compared to the other three

combined postal zip codes. Respondents reported having outdoor recreational or warming fires on weekends—mostly in summer—which were *statistically similar* ( $p = 0.46$ ) for postal zip code 83837 (Kellogg/Wardner) compared to the other three combined postal zip codes.

- More than one quarter—26.2%—of all respondents reported having outdoor yard waste fires. This was *statistically lower* ( $p = 0.000069$ ) for postal zip code 83837 (Kellogg/Wardner)—9.5%—than for the other three combined postal zip codes—34.2%. Seasonal burning was *statistically similar* in fall ( $p = 0.70$ ), winter ( $p = 0.45$ ), spring ( $p = 0.16$ ), and summer ( $p = 0.31$ ) for postal zip code 83837 (Kellogg/Wardner) compared to the other three combined postal zip codes. Respondents reported having outdoor yard waste fires on weekends, which was *statistically similar* ( $p = 0.32$ ) for postal zip code 83837 (Kellogg/Wardner) compared to the other three combined postal zip codes.

## Qualtrics Coding Errors

It was discovered—after the survey was concluded and initial results analysis began—that several survey questions were not asked due to errors in how the final survey script (see Appendix A) was coded into Qualtrics Survey Software. Summarized below are the affected questions. Subsequent analysis and discussion has been excluded.

**Q6. *How many wood-burning fireplaces do you have (without woodstove insert)?***

A total of 21 respondents reported having one wood-burning fireplace without a woodstove insert. It was determined that responses to this question were not coded to link with subsequent wood-burning fireplace questions—Q44 through Q55. It was confirmed in a follow-up discussion with the interviewer that these questions were never prompted or asked. It was deduced from respondents' answers to Q6 and to other heating device questions that wood-burning fireplaces were not used a primary heating source.

**Q14. *Did you purchase, cut your own, or both the wood used to heat your home over the last 12 months?***

It was determined that there were no responses to this questions. It was confirmed in a follow-up discussion with the interviewer that this question was never prompted or asked.

**Q31. *What time(s) of day do you typically start a fire in this free-standing woodstove or woodstove insert? [CHECK ALL THAT APPLY]***

**Q42. *What time(s) of day do you typically start a fire in this free-standing pellet stove or pellet stove insert? [CHECK ALL THAT APPLY]***

These questions were intended to allow for multiple inputs for each respondent. It is typical behavior—for example—to start a fire in the morning and then again in the evening. This capability was not properly coded and each respondent reported only one time. It was confirmed in a follow-up discussion with the interviewer that a single input was prompted for this question.

**Q67. *What time of day do you typically start outdoor warming or recreation fires on your property?***

**Q74. *What time of day do you typically start burning yard waste or other combustible material on your property?***

**Q80. *What time of day do you typically start burning slash on your property?***

These questions were intended to allow for multiple inputs for each respondent. It was confirmed in a follow-up discussion with the interviewer that a single input was prompted for this question.

## Initial Questions

All respondents were first asked a series of questions to determine type and number of each wood-burning home heating device, and cords of wood burned. Responses to these questions were coded to link with subsequent device questions. Results are summarized in Table 5.

**Table 5:** Wood-burning home heating devices and cords of wood burned.

Device	Count Yes	Percent Yes
<b>Free-standing woodstove/woodstove insert</b>		
83837 (n = 74) <sup>a</sup>	14 <sup>a</sup>	18.9% <sup>a</sup>
83839 (n = 56)	24	42.9%
83850 (n = 85)	36	42.4%
83868 (n = 14)	5	35.7%
<b>Total (n = 229)</b>	<b>79</b>	<b>34.5%</b>
<b>Free-standing pellet stove/pellet stove insert</b>		
83837 (n = 74) <sup>b</sup>	2 <sup>b</sup>	2.7% <sup>b</sup>
83839 (n = 56)	2	3.6%
83850 (n = 85)	3	3.5%
83868 (n = 14)	0	0.0%
<b>Total (n = 229)</b>	<b>7</b>	<b>3.1%</b>
<b>Wood-burning fireplace w/o insert</b>		
83837 (n = 74)	6	8.1%
83839 (n = 56)	5	8.9%
83850 (n = 85) <sup>c</sup>	10 <sup>c</sup>	11.8% <sup>c</sup>
83868 (n = 14)	0	0.0%
<b>Total (n = 229)</b>	<b>21</b>	<b>9.2%</b>
Wood burned	Median	Average
<b>Cords</b>		
83837 (n = 24) <sup>d, e</sup>	4 <sup>e</sup>	3.8 <sup>e</sup>
83839 (n = 24)	3.5	2.9
83850 (n = 35)	3	3.2
83868 (n = 5)	4	3.3
<b>Total (n = 78)</b>	<b>3.5</b>	<b>3.2</b>

<sup>a</sup> Statistically lower ( $p = 0.00061$ ) than for the other three combined postal zip codes. <sup>b</sup> Statistically similar ( $p = 0.830$ ) than for the other three combined postal zip codes. <sup>c</sup> Statistically similar ( $p = 0.30$ ) to the other three combined postal zip codes. <sup>d</sup> Only one respondent reported burning anything other than wood or artificial logs—cardboard. <sup>e</sup> Statistically similar ( $p = 0.22$ ) to the other three combined postal zip codes

The primary species of wood burned—Douglas fir, 43.8%—in postal zip code 83837 (Kellogg/Wardner) was *statistically similar* ( $p = 0.063$ ) to the other three combined postal zip codes. This was followed by Western white pine—22.0% ( $p = 0.28$ )—and Western larch—20.9% ( $p = 0.35$ ). Respondents who reported owning a free-standing pellet stove or pellet stove insert burned an average 2.2 tons of pellets.

### Free-Standing Woodstove/Woodstove Insert

Respondents who reported ownership were asked a series of questions specific to free-standing woodstove or woodstove insert characteristics (see Table 6) and operations (see Table 7 and Table 8).

**Table 6:** Free-standing woodstove or woodstove insert characteristics.

Characteristic	Count Yes	Percent Yes
<b>Primary heat source</b>		
83837 (n = 74) <sup>a</sup>	6 <sup>a</sup>	8.1% <sup>a</sup>
83839 (n = 56)	12	21.4%
83850 (n = 85)	16	18.8%
83868 (n = 14)	3	21.4%
<b>Total (n = 229)</b>	<b>37</b>	<b>16.2%</b>
<b>Purchased pre-1990</b>		
83837 (n = 74) <sup>b</sup>	10 <sup>b</sup>	13.5% <sup>b</sup>
83839 (n = 56)	13	23.2%
83850 (n = 85)	15	17.6%
83868 (n = 14)	3	21.4%
<b>Total (n = 229)</b>	<b>41</b>	<b>17.9%</b>
<b>Purchased post-1990</b>		
83837 (n = 74) <sup>c</sup>	4 <sup>c</sup>	5.4% <sup>c</sup>
83839 (n = 56)	11	19.6%
83850 (n = 52)	21	24.7%
83868 (n = 14)	1	7.1%
<b>Total (n = 229)</b>	<b>37</b>	<b>16.2%</b>
<b>Catalytic</b>		
83837 (n = 74) <sup>d</sup>	1 <sup>d</sup>	1.4% <sup>d</sup>
83839 (n = 56) <sup>e</sup>	7 <sup>e</sup>	12.5% <sup>e</sup>
83850 (n = 52)	12	14.1%
83868 (n = 14)	0	0%
<b>Total (n = 229)</b>	<b>20</b>	<b>8.7%</b>

<sup>a</sup> Statistically lower (p = 0.022) than for the other three combined postal zip codes. <sup>b</sup> Statistically similar (p = 0.23) to the other three combined postal zip codes. <sup>c</sup> Statistically lower (p = 0.0023) than for the other three combined postal zip codes. <sup>d</sup> Statistically lower (p = 0.0063) than for the other three combined postal zip codes. <sup>e</sup> Only one respondent reported replacing catalyst.

Nearly one-third—31.1%—of all respondents reported owning a Blaze King free-standing woodstove or woodstove insert, which was *statistically similar* (p = 0.10) for postal zip code 83837 (Kellogg/Wardner) compared to the other three combined postal zip codes. Only five respondents—11.1%—reported owning a homemade free-standing woodstove or woodstove insert, which was *statistically similar* (p = 0.31) for postal zip code 83837 (Kellogg/Wardner) compared to the other three combined postal zip codes.

**Table 7:** Free-standing woodstove or woodstove insert operations.

Operation	Count Yes	Percent Yes
<i>Used when home had power in last 12 months</i>		
83837 (n = 14) <sup>a</sup>	11 <sup>a</sup>	78.6% <sup>a</sup>
83839 (n = 24)	19	79.2%
83850 (n = 36)	31	86.1%
83868 (n = 5)	3	60.0%
<b>Total (n = 79)</b>	<b>64</b>	<b>81.0%</b>
<i>Used when home did not have power in last 12 months</i>		
83837 (n = 14) <sup>b</sup>	11 <sup>b</sup>	78.6% <sup>b</sup>
83839 (n = 24)	19	79.2%
83850 (n = 36)	31	86.1%
83868 (n = 5)	4	80.0%
<b>Total (n = 79)</b>	<b>65</b>	<b>82.3%</b>
<i>Use typical in last 12 months</i>		
83837 (n = 14) <sup>c</sup>	14 <sup>c</sup>	100% <sup>c</sup>
83839 (n = 24)	24	100%
83850 (n = 36)	34	94.4%
83868 (n = 5)	5	100%
<b>Total (n = 79)</b>	<b>77</b>	<b>97.5%</b>

<sup>a</sup> Statistically similar (p = 0.80) to the other three combined postal zip codes. <sup>b</sup> Statistically similar (p = 0.69) to the other three combined postal zip codes. <sup>c</sup> Statistically similar (p = 0.51) to the other three combined postal zip codes.

**Table 8:** Free-standing woodstove or woodstove insert seasonal operations.

Seasonal Operations	Count Yes	Percent Yes	Median Days per Week
<b>Fall use</b>			
83837 (n = 14) <sup>a, b</sup>	8 <sup>a</sup>	57.1% <sup>a</sup>	4 <sup>b</sup>
83839 (n = 24)	14	58.3%	4
83850 (n = 36)	21	58.5%	4
83868 (n = 5)	3	60.0%	3
<b>Total (n = 79)</b>	<b>46</b>	<b>58.2%</b>	<b>4</b>
<b>Winter use</b>			
83837 (n = 14) <sup>c, d</sup>	12 <sup>c</sup>	85.7% <sup>c</sup>	7 <sup>d</sup>
83839 (n = 24)	18	75.0%	7
83850 (n = 36)	31	86.1%	6
83868 (n = 5)	3	60.0%	7
<b>Total (n = 79)</b>	<b>64</b>	<b>81.0%</b>	<b>7</b>
<b>Spring use</b>			
83837 (n = 14) <sup>e, f</sup>	8 <sup>e</sup>	57.1% <sup>e</sup>	4 <sup>f</sup>
83839 (n = 24)	14	58.3%	4
83850 (n = 36)	20	55.6%	4
83868 (n = 5)	3	60.0%	3
<b>Total (n = 79)</b>	<b>77</b>	<b>57.0%</b>	<b>4</b>

<sup>a</sup> Statistically similar (p = 0.93) to the other three combined postal zip codes. <sup>b</sup> Statistically similar (p = 0.33) to the other three combined postal zip codes. <sup>c</sup> Statistically similar (p = 0.62) to the other three combined postal zip codes. <sup>d</sup> Statistically similar (p = 0.685) to the other three combined postal zip codes. <sup>e</sup> Statistically similar (p = 0.99) to the other three combined postal zip codes. <sup>f</sup> Statistically similar (p = 0.31) to the other three combined postal zip codes.

## Non-Wood-Burning Heating Devices

All respondents were asked a series of questions to assess ownership of non-wood-burning home heating devices (see Table 9), and attitudes toward non-wood-burning home heating devices (see Table 10).

**Table 9:** Non-wood-burning home heating devices and primary source for home heating.

Device	Ownership		Primary Source	
	Count Yes	Percent Yes	Count Yes	Percent Yes
<b>Gas/propane furnace</b>				
83837 (n = 74) <sup>a, b</sup>	69 <sup>a</sup>	93.2% <sup>a</sup>	64 <sup>b</sup>	86.5% <sup>b</sup>
83839 (n = 56)	36	64.3%	31	55.4%
83850 (n = 85)	51	60.0%	48	56.5%
83868 (n = 14)	8	57.1%	7	50.0%
<b>Total (n = 229)</b>	<b>164</b>	<b>71.6%</b>	<b>150</b>	<b>65.5%</b>
<b>Electric furnace</b>				
83837 (n = 74) <sup>c, d</sup>	2 <sup>c</sup>	2.7% <sup>c</sup>	2 <sup>d</sup>	2.7% <sup>d</sup>
83839 (n = 56)	12	21.4%	6	10.7%
83850 (n = 85)	22	25.9%	14	16.5%
83868 (n = 14)	3	21.4%	3	21.4%
<b>Total (n = 229)</b>	<b>39</b>	<b>17.0%</b>	<b>25</b>	<b>16.2%</b>
<b>Electric space heater</b>				
83837 (n = 74)	1	1.4%	0	0%
83839 (n = 56)	1	1.8%	0	0%
83850 (n = 52) <sup>e, f</sup>	7 <sup>e</sup>	8.2% <sup>e</sup>	2 <sup>f</sup>	2.4% <sup>f</sup>
83868 (n = 14)	1	7.1%	0	0%
<b>Total (n = 229)</b>	<b>10</b>	<b>4.4%</b>	<b>2</b>	<b>0.87%</b>
<b>Other devices (all postal zip codes, n = 229)</b>				
Gas/propane fireplace	3	1.3%	2	0.87%
Gas/propane stove	4	1.8%	4	1.8%
Oil furnace	6	2.6%	5	2.2%
Electric heat pump	1	0.44%	1	0.44%
In-floor natural gas heater	1	0.44%	0	0%

<sup>a</sup> Statistically higher ( $p = 5.5 \times 10^{-7}$ ) than for the other three combined postal zip codes. <sup>b</sup> Statistically higher ( $p = 3.9 \times 10^{-6}$ ) than for other three combined postal zip codes. <sup>c</sup> Statistically lower ( $p = 6.7 \times 10^{-5}$ ) than for the other three combined postal zip codes. <sup>d</sup> Statistically lower ( $p = 0.0059$ ) than for other three combined postal zip codes.

<sup>e</sup> Statistically higher ( $p = 0.028$ ) than for other three combined postal zip codes. <sup>f</sup> Statistically similar ( $p = 0.065$ ) to the other three combined postal zip codes.

**Table 10:** Attitudes toward non-wood-burning home heating devices.

Attitude	Count Yes	Percent Yes
<b><i>Can be used during burn ban</i></b>		
Total (n = 229)	219	95.6%
<b><i>Can meet home heating needs as primary source</i></b>		
Total (n = 229)	60	26.2%
<b><i>Barriers to use as primary source (n = 70)</i></b>		
Cost	31	44.3%
Heat output	27	38.6%
Independence of burning wood	11	15.7%
Other <sup>a</sup>	1 <sup>a</sup>	1.4% <sup>a</sup>
<b><i>What makes cost prohibitive (n = 31)</i></b>		
Installation	2	6.4%
Fuel	14	45.2%
Both	14	45.2%
I don't know	1	3.2

<sup>a</sup> Attributes better health to burning wood.

All respondents were asked their most likely information source about wood-burning home heating devices and air quality issues (see Table 11). The top three most likely information sources were: (1) community flyers, 79.5%, (2) newspapers, 70.7%, and (3) internet, 59.4%.

**Table 11:** Information sources.

Source	Very Unlikely	Unlikely	Likely	Very Likely
<b>Count (n = 229)</b>				
Television	125	18	56	30
Newspapers	61	6	14	148
Community flyers	38	9	43	139
Radio	182	22	14	11
Friends	109	15	70	35
Family	108	18	70	33
Internet	87	6	14	122
Books and magazines	203	9	12	5
Some other source	219	2	3	5
<b>Percent</b>				
Television	54.6%	7.9%	24.5%	13.1%
Newspapers	26.6%	2.6%	6.1%	64.6%
Flyers in community	16.6%	3.9%	18.8%	60.7%
Radio	79.5%	9.6%	6.1%	4.8%
Friends	47.6%	6.6%	30.6%	15.3%
Family	47.2%	7.9%	30.6%	14.4%
Internet	38.0%	2.6%	6.1%	53.3%
Books and magazines	88.6%	3.9%	5.2%	2.2%
Some other source	95.6%	0.87%	1.3%	2.2%

## Outdoor Burning

All respondents were asked a series of questions to assess outdoor burning practices, which included: (1) warming or recreation fires, (2) yard waste or other combustible material burning, and (3) slash burning (see Table 12, Table 13, and Table 14). Only one respondent reported logging operations and burning slash on property.

**Table 12:** Outdoor burning operations.

Operation	Count Yes	Percent Yes
<b><i>Warming or recreation fires</i></b>		
83837 (n = 74) <sup>a</sup>	11 <sup>a</sup>	14.9%
83839 (n = 56)	15	26.8%
83850 (n = 85)	22	25.9%
83868 (n = 14)	3	21.4%
<b>Total (n = 229)</b>	<b>51</b>	<b>22.3%</b>
<b><i>Yard waste or other combustible material burning</i></b>		
83837 (n = 74) <sup>b</sup>	7 <sup>b</sup>	9.5% <sup>b</sup>
83839 (n = 56)	26	46.4%
83850 (n = 85)	25	29.4%
83868 (n = 14)	2	14.3%
<b>Total (n = 229)</b>	<b>60</b>	<b>26.2%</b>

<sup>a</sup> Statistically similar (p = 0.063) to the other three combined postal zip codes. <sup>b</sup> Statistically similar (p = 0.69) to the other three combined postal zip codes. <sup>c</sup> Statistically lower (p = 6.9×10<sup>-5</sup>) than for the other three combined postal zip codes.

**Table 13:** Warming or recreation fires seasonal operations.

Seasonal Operations	Count Yes	Percent Yes	Average Days per Week
<b>Fall use</b>			
83837 (n = 11) <sup>a</sup>	1 <sup>a</sup>	9.1% <sup>a</sup>	1.0
83839 (n = 15)	1	6.7%	0.0
83850 (n = 22)	6	27.3%	0.50
83868 (n = 3)	1	33.3%	1.0
<b>Total (n = 51)</b>	<b>9</b>	<b>17.6%</b>	<b>0.56</b>
<b>Winter use</b>			
83837 (n = 11) <sup>b</sup>	0 <sup>b</sup>	0% <sup>b</sup>	0.0
83839 (n = 15)	1	6.7%	0.0
83850 (n = 22)	4	18.2%	1.3
83868 (n = 3)	1	33.3%	1.0
<b>Total (n = 51)</b>	<b>6</b>	<b>11.8%</b>	<b>1.0</b>
<b>Spring use</b>			
83837 (n = 11) <sup>c</sup>	2 <sup>c</sup>	18.2% <sup>c</sup>	1.0
83839 (n = 15)	1	6.7%	0.0
83850 (n = 22)	4	18.2%	0.0
83868 (n = 3)	1	33.3%	1.0
<b>Total (n = 51)</b>	<b>8</b>	<b>15.7%</b>	<b>0.38</b>
<b>Summer use</b>			
83837 (n = 11) <sup>d</sup>	8 <sup>d</sup>	72.7% <sup>d</sup>	0.63
83839 (n = 15)	14	93.3%	0.43
83850 (n = 22)	12	54.5%	0.50
83868 (n = 3)	3	100.0%	0.33
<b>Total (n = 51)</b>	<b>37</b>	<b>72.5%</b>	<b>0.27</b>

<sup>a</sup> Statistically similar (p = 0.40) to the other three combined postal zip codes. <sup>b</sup> Statistically similar (p = 0.17) to the other three combined postal zip codes. <sup>c</sup> Statistically similar (p = 0.80) to the other three combined postal zip codes. <sup>d</sup> Statistically similar (p = 0.99) to the other three combined postal zip codes.

**Table 14:** Yard waste or other combustible material burning seasonal operations.

Seasonal Operations	Count Yes	Percent Yes	Average Days per Week
<b>Fall use</b>			
83837 (n = 7) <sup>a</sup>	2 <sup>a</sup>	28.6% <sup>a</sup>	0.0
83839 (n = 26)	7	26.9%	0.14
83850 (n = 25)	11	44.0%	0.45
83868 (n = 2)	1	50.0%	0.0
<b>Total (n = 60)</b>	<b>21</b>	<b>35.0%</b>	<b>0.30</b>
<b>Winter use</b>			
83837 (n = 7) <sup>b</sup>	0 <sup>b</sup>	0% <sup>b</sup>	0.0
83839 (n = 26)	1	3.8%	0.0
83850 (n = 25)	2	8.0%	2.5
83868 (n = 2)	1	50.0%	0.0
<b>Total (n = 60)</b>	<b>4</b>	<b>6.7%</b>	<b>1.3</b>
<b>Spring use</b>			
83837 (n = 7) <sup>c</sup>	7 <sup>c</sup>	100.0% <sup>c</sup>	0.14
83839 (n = 26)	23	88.5%	0.0
83850 (n = 25)	16	64.0%	0.38
83868 (n = 2)	2	100.0%	0.0
<b>Total (n = 60)</b>	<b>48</b>	<b>80.0%</b>	<b>0.15</b>
<b>Summer use</b>			
83837 (n = 7) <sup>d</sup>	0 <sup>d</sup>	0% <sup>d</sup>	0.0
83839 (n = 26)	2	7.7%	0.43
83850 (n = 25)	4	16.0%	1.3
83868 (n = 2)	1	50.0%	0.0
<b>Total (n = 60)</b>	<b>7</b>	<b>11.7%</b>	<b>0.71</b>

<sup>a</sup> Statistically similar (p = 0.70) to the other three combined postal zip codes. <sup>b</sup> Statistically similar (p = 0.45) to the other three combined postal zip codes. <sup>c</sup> Statistically similar (p = 0.16) to the other three combined postal zip codes. <sup>d</sup> Statistically similar (p = 0.31) to the other three combined postal zip codes.

Nearly all—91.7%—respondents reported burning the same type yard waste or other combustible material. This included brush, leaves, grass, and weeds and was *statistically similar* (p = 0.40) for postal zip code 83837 (Kellogg/Wardner) compared to the other three combined postal zip codes.

## APPENDIX A: FINAL SURVEY SCRIPT

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### INTRODUCTION

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Hello, my name is \_\_\_\_\_. I am calling on behalf of the Idaho Department of Environmental Quality (IDEQ) and Boise State University (BSU). I am not selling anything. We are conducting a brief survey of West Silver Valley residents about home heating and outdoor burning. Your survey responses will help with our research of determining what is contributing to decreased air quality in the West Silver Valley. Your participation is completely voluntary and will last no longer than the 5 to 10 minutes it takes to answer this survey. There are no risks of harm or penalty for your participation in this survey. We foresee that this survey will cause no unreasonable discomfort to you. Your participation in this survey will help us to better understand woodstove use in the area and improve the current woodstove swap-out assistance program.

If you have any questions or concerns about your participation in this survey, you may contact the BSU principal investigator, Sondra Miller, by calling (208) 426-2894. If you have questions about your rights as a research participant, you may contact the BSU Institutional Review Board (IRB), which is concerned with the protection of volunteers in research projects. You may reach the IRB office between 8:00 AM and 5:00 PM, Monday through Friday, by calling (208) 426-5401.

May I first ask a few quick questions to make sure your home qualifies for our study?

1. Yes—subject agrees to participate
2. No—subject refuses to participate

**Q81.** *Are you the person in your household who operates any heating devices more often than any other household member?*

1. Yes
2. No [ASK TO SPEAK WITH THAT HOUSEHOLD MEMBER]
98. Don't know [DO NOT READ—ASK TO SPEAK WITH THAT HOUSEHOLD MEMBER]
99. Refused [DO NOT READ—ASK TO SPEAK WITH THAT HOUSEHOLD MEMBER]

**Q82.** *I first need to verify that you live within the boundaries of this survey. What is the zip code of your home's physical address?*

1. 83837
2. 83839
3. 83850
4. 83868
98. Don't know [DO NOT READ—END SURVEY]
99. Refused [DO NOT READ—END SURVEY]
999. None of the above

**[IF Q2 ≠ 83837, 83839, 83850, 83868—END SURVEY]**

I am sorry, it looks like your home is not within the area we are surveying. Thank you for your time and willingness to complete our survey. Good-bye.

**[IF Q2 = 83837, 83839, 83850, 83868]**

## **INITIAL QUESTIONS**

---

**Q83. Do you have any of the following heating devices in your home?**

- a. A free-standing woodstove or woodstove insert?
  - b. A free-standing pellet stove or pellet insert?
  - c. A wood-burning fireplace (without woodstove insert)?
  - d. Any other indoor wood-burning devices? [DEFINITION, IF NECESSARY: "Like a homemade woodstove?"]
- 
- 1. Yes
  - 2. No
  - 98. Don't know [DO NOT READ]
  - 99. Refused [DO NOT READ]
  - 5. ABORT SURVEY [DO NOT READ]

**[IF Q3 = 2 FOR A THROUGH D, GOTO Q56]**

**[IF Q3A = 1, GOTO Q4]**

**[IF Q3B = 1, GOTO Q5]**

**[IF Q3C = 1, GOTO Q6]**

**[IF Q3D = 1, GOTO Q9]**

**Q84. How many free-standing woodstoves or woodstove inserts do you have?**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
  - 99. Refused [DO NOT READ]
  - 4. ABORT SURVEY [DO NOT READ]

**Q85. How many free-standing pellet stoves or pellet inserts do you have?**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
  - 99. Refused [DO NOT READ]
  - 4. ABORT SURVEY [DO NOT READ]

**Q6. How many wood-burning fireplaces do you have (without woodstove insert)?**

- \_\_\_\_\_ [ENTER VERBATIM]  
98. Don't know [DO NOT READ]  
99. Refused [DO NOT READ]  
4. ABORT SURVEY [DO NOT READ]

**[IF Q6 = 98, NEXT QUESTIONS DIFFERENTIATE WOOD-BURNING FIREPLACES AND WOODSTOVE INSERTS]**

**Q6a. Does this wood-burning fireplace have an all-metal door (may have a glass window) that opens from one side, with a latch?**

1. Yes  
2. No  
98. Don't know [DO NOT READ]  
99. Refused [DO NOT READ]  
5. ABORT SURVEY [DO NOT READ]

**[IF Q6A = 1]**

**Q6a1. This is a woodstove insert; I will ask about this later.**

[CORRECT Q3A = 1] and [CORRECT Q6A1 = 1] and  
[CORRECT Q6 = 0]

[INTERVIEWER NOTE: IF THE WOOD-BURNING FIREPLACE HAS AN ALL METAL DOOR (MAY HAVE GLASS WINDOW) THAT OPENS FROM ONE SIDE WITH A LATCH, IT IS A WOODSTOVE IN A FIREPLACE BOX CALLED BOTH A "WOODSTOVE INSERT AND "FIREPLACE INSERT".]

**[IF Q6A = 2 OR Q6A = 98 OR Q6A = 99]**

**Q6b. Does this wood-burning fireplace have an all-glass door with no metal frame?**

1. Yes  
2. No  
98. Don't know [DO NOT READ]  
99. Refused [DO NOT READ]  
5. ABORT SURVEY [DO NOT READ]

**[IF Q6B = 1]**

This is a wood-burning fireplace [CORRECT Q6 = 1]

**[IF Q6B = 2 OR Q6B = 98 OR Q6B = 99]**

**Q6c. Does this wood-burning fireplace have a glass door with metal frame?**

1. Yes  
2. No  
98. Don't know [DO NOT READ]  
99. Refused [DO NOT READ]  
5. ABORT SURVEY [DO NOT READ]

**[IF Q6C = 1]**

**Q6d. Does this wood-burning fireplace have folding (bi-fold or accordion) doors?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY

**[IF Q6D = 1 AND Q6 = 1]**

This is a wood-burning fireplace [CORRECT Q6 = 1]

**[IF Q6 > 1]**

ASK ABOUT NEXT WOOD-BURNING FIREPLACE.

CALCULATE NUMBER OF WOODSTOVE INSERTS = **Q7 = Q4 + Q6A1**

**Q6e. It looks like you actually have a total of <Q7> free-standing woodstoves or woodstove inserts.**

CALCULATE NUMBER OF WOOD-BURNING FIREPLACES = **Q8**

**Q6f. It looks like you actually have a total of <Q8> wood-burning fireplaces.**

**Q9. What kind of other wood-burning device(s) do you have?**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 4. ABORT SURVEY

**[IF Q7 > 1]**

**Q10. You said you had <Q7> free-standing woodstoves or woodstove inserts. Do you typically use more than one free-standing woodstove or woodstove insert at a time?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY

**[IF Q5 > 1]**

**Q11. You said you had <Q5> pellet stoves or pellet inserts. Do you typically use more than one pellet stove or pellet insert at a time?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY

**[IF Q8 > 1]**

**Q12. You said you had <Q8> wood-burning fireplaces. Do you typically use more than one wood-burning fireplace without insert at a time?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY

**[IF Q9 > 1]**

**Q13. You said you had <Q9> other wood-burning devices. Do you typically use more than one other wood-burning device at a time?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q14. Did you purchase, cut your own, or both the wood used to heat your home over the last 12 months?**

- 1. Purchased
- 2. Cut own
- 3. Both
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 6. ABORT SURVEY [DO NOT READ]

**Q15. How much wood was burned in total over the last 12 months to heat your home? Please estimate the number of cords, the number of bundles (as typically sold at a grocery store), and the number of artificial logs you burned. [DEFINITION, IF NECESSARY: a cord is a 4 foot by 4 foot by 8 foot stack of wood]**

_____	Cords	[ENTER VERBATIM]
_____	Bundles	[ENTER VERBATIM]
_____	Artificial logs	[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
6.	ABORT SURVEY	[DO NOT READ]

**Q16. What was the primary species of wood you burned in total over the last 12 months to heat your home? [DO NOT READ INITIALLY—OKAY TO READ IF PROMPT REQUIRED. PROBE FOR BEST SINGLE RESPONSE.]**

1.	Western larch	
2.	Douglas fir	
3.	Western white pine	
4.	Grand fir	
5.	Western hemlock	
6.	Ponderosa pine	
7.	Artificial logs (like Presto Logs, Homefire logs, etc.)	
8.	Other _____	[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
10.	ABORT SURVEY	[DO NOT READ]

## WOODSTOVE QUESTIONS

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[ASK Q17 THROUGH Q32 FOR EACH FREE-STANDING WOODSTOVE OR WOODSTOVE INSERT]

**[IF Q7 > 1]**

You said you have <Q7> free-standing woodstoves or woodstove inserts. Please answer the next few questions just about the first free-standing woodstove or woodstove insert.

**[IF Q7 = 1]**

The next few questions are about your free-standing woodstove or woodstove insert.

**Q17. Would you say this free-standing woodstove or woodstove insert is used mainly as:**

- 1. A primary heating source
- 2. A supplemental heating source
- 3. For pleasure or aesthetics
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 6. ABORT SURVEY [DO NOT READ]

**Q18. Was this free-standing woodstove or woodstove insert purchased new before or after 1990?**

- 1. Before 1990
- 2. After 1990
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**[IF Q18 = 2 OR Q18 = 98 OR Q18 = 99]**

**Q19. Does this free-standing woodstove or woodstove insert have a glass panel in the door?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q20. What is the brand and model of this free-standing woodstove or woodstove insert?**

\_\_\_\_\_ Brand [ENTER VERBATIM]

\_\_\_\_\_ Model [ENTER VERBATIM]

98. Don't know [DO NOT READ]

99. Refused [DO NOT READ]

5. ABORT SURVEY [DO NOT READ]

**[IF Q20 = 98]**

**Q20a. Is this a homemade free-standing woodstove or woodstove insert?**

1. Yes

2. No

98. Don't know [DO NOT READ]

99. Refused [DO NOT READ]

5. ABORT SURVEY [DO NOT READ]

**Q21. Is this free-standing woodstove or woodstove insert catalytic? [DEFINITION, IF NECESSARY, PART 1: "It has a block of ceramic material inside the firebox and before the stovepipe, often looking like a honeycomb, with a catalyst coating the surface of the material." DEFINITION, IF NECESSARY, PART 2: "It is basically like the catalytic converter on your vehicle in that it reduces emissions if maintained properly."]**

1. Yes

2. No

98. Don't know [DO NOT READ]

99. Refused [DO NOT READ]

5. ABORT SURVEY [DO NOT READ]

**[IF Q21 = 1]**

**Q22. In what year—if ever—did you last replace the catalyst in this free-standing woodstove or woodstove insert?**

\_\_\_\_\_ Year [ENTER VERBATIM]

3. Never [DO NOT READ]

98. Don't know [DO NOT READ]

99. Refused [DO NOT READ]

6. ABORT SURVEY [DO NOT READ]

**Q23. Did you use this free-standing woodstove or woodstove insert in the last 12 months when your home had power?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY

**Q23a. Did you use this free-standing woodstove or woodstove insert in the last 12 months when your home did not have power?**

- 1. Yes
- 2. No
- 3. N/A—Never lost power in the last 12 months [DO NOT READ]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 6. ABORT SURVEY [DO NOT READ]

**Q24. Did your use of this free-standing woodstove or woodstove insert in the last 12 months reflect its use during a typical year?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**[IF Q24 = 2]**

**Q24a. How did your use of this free-standing woodstove or woodstove insert in the last 12 months differ from how you typically use this device? Would you say you used it:**

- 1. A lot less
- 2. Somewhat less
- 3. Somewhat more
- 4. A lot more
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 7. ABORT SURVEY [DO NOT READ]

**Q25. You said you burned <Q15a cords or Q15b bundles or Q15c artificial logs> in total over the last 12 months to heat your home? What percentage was used in this free-standing woodstove or woodstove insert?**

_____	Percentage	[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**Q26. Did you burn anything other than wood or artificial logs in this free-standing woodstove or woodstove insert?**

1.	Yes	
2.	No	
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
5.	ABORT SURVEY	[DO NOT READ]

**[IF Q26 = 1]**

**Q27. What types of materials other than wood or artificial logs did you burn in this free-standing woodstove or woodstove insert in the last 12 months?**

_____		[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**Q28. Did you use this free-standing woodstove or woodstove insert in any of the following seasons in the last 12 months:**

**Q28a. Fall (September through November)**

1.	Yes	
2.	No	
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
5.	ABORT SURVEY	[DO NOT READ]

**Q28b. Winter (December through February)**

1.	Yes	
2.	No	
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
5.	ABORT SURVEY	[DO NOT READ]

**Q28d. Spring (March through May)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q28e. Summer (June through August)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q29. About how many days per week did you use this free-standing woodstove or woodstove insert for each of the following seasons:**

**[IF Q28A = 1]**

**Q29a. Number of days per week in the fall (September through November)**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 4. ABORT SURVEY [DO NOT READ]

**[IF Q28B = 1]**

**Q29b. Number of days per week in winter (December through February)**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 4. ABORT SURVEY [DO NOT READ]

**[IF Q28C = 1]**

**Q29c. Number of days per week in spring (March through May)**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 4. ABORT SURVEY [DO NOT READ]

**[IF Q28D = 1]**

**Q29d. Number of days per week in summer (June through August)**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 4. ABORT SURVEY [DO NOT READ]

**Q30. Do you typically use this free-standing woodstove or woodstove insert on weekdays, weekends, and/or holidays? [DO NOT READ—CHECK ALL THAT APPLY]**

- 1. Weekdays
- 2. Weekends
- 3. Holidays
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 6. ABORT SURVEY [DO NOT READ]

**Q31. What time(s) of day do you typically start a fire in this free-standing woodstove or woodstove insert? [CHECK ALL THAT APPLY]**

- 1. Early morning (5:00 AM to 8:00 AM)
- 2. Morning (8:00 AM to 12:00 PM)
- 3. Afternoon (12:00 PM to 4:00 PM)
- 4. Early evening (4:00 PM to 8:00 PM)
- 5. Evening (8:00 PM to 12:00 AM)
- 6. Overnight (12:00 AM to 5:00 AM)
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 7. ABORT SURVEY [DO NOT READ]

**Q32. How long do you typically keep a fire burning in this free-standing woodstove or woodstove insert?**

- \_\_\_\_\_ Hours [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 4. ABORT SURVEY [DO NOT READ]

**[IF Q7 > 1, LOOP BACK THROUGH Q17 THROUGH Q32 FOR THE OTHER FREE-STANDING WOODSTOVES OR WOODSTOVE INSERTS]**

Now, thinking about your second (third, fourth ...) free-standing woodstove ...

## PELLET STOVE QUESTIONS

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[ASK Q33 THROUGH Q43 FOR EACH FREE-STANDING PELLET STOVE OR PELLET INSERT]

**[IF Q5 > 1]**

You said you have <Q5> free-standing pellet stoves or pellet inserts. Please answer the next few questions about just the first pellet stove or pellet insert.

**[IF Q5 = 1]**

The next few questions are about your free-standing pellet stove or pellet insert.

**Q33. Would you say this free-standing pellet stove or pellet insert is used mainly as:**

- 1. A primary heating source
- 2. A supplemental heating source
- 3. For pleasure or aesthetics
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 6. ABORT SURVEY [DO NOT READ]

**Q34. Does this free-standing pellet stove or pellet insert have a back-up option to run the auger? [DEFINITION, IF NECESSARY: "The auger delivers pellets from where they are stored within the stove to the burning chamber. It is what feeds fuel to the fire."]**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q35. Did you use this free-standing pellet stove or pellet insert in the last 12 months during periods when your home had power?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q36. Did you use this free-standing pellet stove or pellet insert in the last 12 months during periods when your home did not have power?**

- 1. Yes
- 2. No
- 3. N/A—Never lost power in the last 12 months [DO NOT READ]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 6. ABORT SURVEY [DO NOT READ]

**Q37. Did your use of this free-standing pellet stove or pellet insert in the last 12 months reflect its use during a typical year?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**[IF Q37 = 2]**

**Q37a. How did your use of this free-standing pellet stove or pellet insert in the last 12 months differ from how you typically use this device? Would you say you used it:**

- 1. A lot less
- 2. Somewhat less
- 3. Somewhat more
- 4. A lot more
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 100. ABORT SURVEY [DO NOT READ]

**Q38. About how many bags or tons of pellets did you burn in the last 12 months?**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 100. ABORT SURVEY [DO NOT READ]

**Q39. Did you use this free-standing pellet stove or pellet insert in any of the following seasons in the last 12 months:**

**Q39a. Fall (September through November)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q39b. Winter (December through February)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q39c. Spring (March through May)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q39d. Summer (June through August)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q40. About how many days per week did you use this free-standing pellet stove or pellet insert for each of the following seasons:**

**[IF Q39A = 1]**

**Q40a. Number of days per week in the fall (September through November)**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 4. ABORT SURVEY [DO NOT READ]

**[IF Q39B = 1]**

**Q40b. Number of days per week in winter (December through February)**

_____		[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**[IF Q39C = 1]**

**Q40c. Number of days per week in spring (March through May)**

_____		[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**[IF Q39D = 1]**

**Q40d. Number of days per week in summer (June through August)**

_____		[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**Q41. Do you typically use this free-standing pellet stove or pellet insert on weekdays, weekends, and/or holidays? [DO NOT READ—CHECK ALL THAT APPLY]**

1.	Weekdays	
2.	Weekends	
3.	Holidays	
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
6.	ABORT SURVEY	[DO NOT READ]

**Q42. What time(s) of day do you typically start a fire in this free-standing pellet stove or pellet insert? [CHECK ALL THAT APPLY]**

1.	Early morning (5:00 AM to 8:00 AM)	
2.	Morning (8:00 AM to 12:00 PM)	
3.	Afternoon (12:00 PM to 4:00 PM)	
4.	Early evening (4:00 PM to 8:00 PM)	
5.	Evening (8:00 PM to 12:00 AM)	
6.	Overnight (12:00 AM to 5:00 AM)	
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
7.	ABORT SURVEY	[DO NOT READ]

**Q43. How long do you typically keep a fire burning in this free-standing pellet stove or pellet insert?**

- |                 |                  |
|-----------------|------------------|
| _____ Hours     | [ENTER VERBATIM] |
| 98. Don't know  | [DO NOT READ]    |
| 99. Refused     | [DO NOT READ]    |
| 4. ABORT SURVEY | [DO NOT READ]    |

***[IF Q5 > 1, LOOP BACK THROUGH Q33 THROUGH Q43 FOR THE OTHER FREE-STANDING PELLETT STOVES OR PELLETT INSERTS]***

Now, thinking about your second (third, fourth ...) pellet stove ...

## WOOD-BURNING FIREPLACE QUESTIONS

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[ASK Q44 THROUGH Q55 FOR EACH WOOD-BURNING FIREPLACE]

**[IF Q8 > 1]**

You said you have <Q8> wood-burning fireplaces. Please answer the next few questions about just the first wood-burning fireplace.

**[IF Q8 = 1]**

The next few questions are about your wood-burning fireplace.

**Q44. Would you say this wood-burning fireplace is used mainly as:**

- 1. A primary heating source
- 2. A supplemental heating source
- 3. For pleasure or aesthetics
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 6. ABORT SURVEY [DO NOT READ]

**Q45. Did you use this wood-burning fireplace in the last 12 months during periods when your home had power?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q46. Did you use this wood-burning fireplace in the last 12 months during periods when your home did not have power?**

- 1. Yes
- 2. No
- 3. N/A—Never lost power in the last 12 months [DO NOT READ]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 6. ABORT SURVEY [DO NOT READ]

**Q47. Did your use of this wood-burning fireplace in the last 12 months reflect its use during a typical year?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**[IF Q47 = 2]**

**Q47a. How did your use of this wood-burning fireplace in the last 12 months differ from how you typically use this device? Would you say you used it:**

- 1. A lot less
- 2. Somewhat less
- 3. Somewhat more
- 4. A lot more
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 7. ABORT SURVEY [DO NOT READ]

**Q48. You said you burned <Q15a cords or Q15b bundles or Q15c artificial logs> in total over the last 12 months to heat your home? What percentage was used in this wood-burning fireplace?**

- | _____ | Percentage   | [ENTER VERBATIM] |
|-------|--------------|------------------|
| 98.   | Don't know   | [DO NOT READ]    |
| 99.   | Refused      | [DO NOT READ]    |
| 4.    | ABORT SURVEY | [DO NOT READ]    |

**Q49. Did you burn anything other than wood or artificial logs in this wood-burning?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**[IF Q49 = 1]**

**Q50. What types of materials other than wood or artificial logs did you burn in this wood-burning fireplace the last 12 months?**

- | _____ | [ENTER VERBATIM]           |
|-------|----------------------------|
| 98.   | Don't know [DO NOT READ]   |
| 99.   | Refused [DO NOT READ]      |
| 4.    | ABORT SURVEY [DO NOT READ] |

**Q51. Did you use this wood-burning fireplace in any of the following seasons in the last 12 months:**

**Q51a. Fall (September through November)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q51b. Winter (December through February)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q51c. Spring (March through May)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q51d. Summer (June through August)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q52. About how many days per week did you use this wood-burning fireplace for each of the following seasons:**

**[IF Q51A = 1]**

**Q52a. Number of days per week in the fall (September through November)**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 4. ABORT SURVEY [DO NOT READ]

**[IF Q51B = 1]**

**Q52b. Number of days per week in winter (December through February)**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 4. ABORT SURVEY [DO NOT READ]

**[IF Q51C = 1]**

**Q52c. Number of days per week in spring (March through May)**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 4. ABORT SURVEY [DO NOT READ]

**[IF Q51D = 1]**

**Q52d. Number of days per week in summer (June through August)**

- |       |              |                  |
|-------|--------------|------------------|
| _____ |              | [ENTER VERBATIM] |
| 98.   | Don't know   | [DO NOT READ]    |
| 99.   | Refused      | [DO NOT READ]    |
| 4.    | ABORT SURVEY | [DO NOT READ]    |

**Q53. Do you typically use this wood-burning fireplace on weekdays, weekends, and/or holidays? [DO NOT READ—CHECK ALL THAT APPLY]**

- |     |              |               |
|-----|--------------|---------------|
| 1.  | Weekdays     |               |
| 2.  | Weekends     |               |
| 3.  | Holidays     |               |
| 98. | Don't know   | [DO NOT READ] |
| 99. | Refused      | [DO NOT READ] |
| 6.  | ABORT SURVEY | [DO NOT READ] |

**Q54. What time(s) of day do you typically start a fire in this wood-burning fireplace? [CHECK ALL THAT APPLY]**

- |     |                                    |               |
|-----|------------------------------------|---------------|
| 1.  | Early morning (5:00 AM to 8:00 AM) |               |
| 2.  | Morning (8:00 AM to 12:00 PM)      |               |
| 3.  | Afternoon (12:00 PM to 4:00 PM)    |               |
| 4.  | Early evening (4:00 PM to 8:00 PM) |               |
| 5.  | Evening (8:00 PM to 12:00 AM)      |               |
| 6.  | Overnight (12:00 AM to 5:00 AM)    |               |
| 98. | Don't know                         | [DO NOT READ] |
| 99. | Refused                            | [DO NOT READ] |
| 7.  | ABORT SURVEY                       | [DO NOT READ] |

**Q55. How long do you typically keep a fire burning in this wood-burning fireplace?**

- |       |              |                  |
|-------|--------------|------------------|
| _____ | Hours        | [ENTER VERBATIM] |
| 98.   | Don't know   | [DO NOT READ]    |
| 99.   | Refused      | [DO NOT READ]    |
| 4.    | ABORT SURVEY | [DO NOT READ]    |

**[IF Q8 > 1, LOOP BACK THROUGH Q44 THROUGH Q55 FOR THE OTHER WOOD-BURNING FIREPLACES]**

Now, thinking about your second (third, fourth ...) wood-burning fireplace ...

## OTHER QUESTIONS

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**Q56. Which—if any—of these following heat sources do you use in your home? Do you have ... [ROTATE A THROUGH H, ALWAYS ASK I LAST]**

- a. Gas or propane furnace
- b. Electric furnace
- c. Electric space heater
- d. Masonry heater
- e. Gas or propane fireplace
- f. Gas or propane stove
- g. Oil furnace
- h. Electric heat pump
- i. Other, not wood/pellet \_\_\_\_\_ [ENTER VERBATIM]

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 10. ABORT SURVEY [DO NOT READ]

**Q57. Can this secondary heating source be used for a short time to heat your home during a burn ban?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**[IF Q17 = 2 OR HIGHER, AND Q33 = 2 OR HIGHER, AND Q44 = 2 OR HIGHER]**

**Q59. Which of these is your primary heating system? [ONLY VALID OPTIONS ARE CATEGORIES WITH A "YES" RESPONSE FROM Q56. DO NOT READ OPTIONS INITIALLY. IF NECESSARY, READ ONLY THOSE WITH A "YES" RESPONSE FROM Q56]**

1. Gas or propane furnace
2. Electric furnace
3. Electric space heater
4. Masonry heater
5. Gas or propane fireplace
6. Gas or propane stove
7. Oil furnace
8. Electric heat pump
9. [READ VERBATIM RESPONSE FROM Q56]
98. Don't know [DO NOT READ]
99. Refused [DO NOT READ]
10. ABORT SURVEY [DO NOT READ]

**[IF Q3A = 1 OR Q3B = 1 OR Q3C = 1 OR Q3D = 1]**

**Q60. Do you think a gas or propane furnace, electric furnace, electric space heater, masonry heater, gas or propane fireplace, gas or propane stove, oil furnace, or electric heat pump could meet your heating needs as well as your free-standing woodstove, woodstove insert, free-standing pellet stove, pellet insert, or wood-burning fireplace?**

1. Yes
2. No
98. Don't know [DO NOT READ]
99. Refused [DO NOT READ]
5. ABORT SURVEY [DO NOT READ]

**[IF Q60 = 2]**

**Q61. Why do you think a gas or propane furnace, electric furnace, electric space heater, masonry heater, gas or propane fireplace, gas or propane stove, oil furnace, or electric heat pump could not meet your heating needs as well as your free-standing woodstove, woodstove insert, free-standing pellet stove, pellet insert, or wood-burning fireplace would not meet your heating needs? [DO NOT READ, CHECK ALL THAT APPLY]**

1. Cost
2. Heat output
3. Visual aesthetics
4. Like smell of burning wood
5. Like independence of burning wood
6. Other \_\_\_\_\_ [ENTER VERBATIM]
98. Don't know [DO NOT READ]
99. Refused [DO NOT READ]
7. ABORT SURVEY [DO NOT READ]

**[IF Q61 = 1]**

**Q61a. Why do you think cost is prohibitive to not meet your heating needs?  
Would you say:**

1. Cost of installation
2. Cost of fuel
3. Both
98. Don't know [DO NOT READ]
99. Refused [DO NOT READ]
6. ABORT SURVEY [DO NOT READ]

**Q62. If you wanted information about wood-burning devices and air quality issues, which of the following sources would you be most likely to use? Would you be very likely, somewhat likely, somewhat unlikely, or very unlikely to use ... [ROTATE A THROUGH H, ALWAYS ASK I LAST]**

- a. Television
  - b. Newspapers
  - c. Flyers in the community
  - d. Radio
  - e. Friends
  - f. Family
  - g. Internet
  - h. Books and magazines
  - i. Some other source
- 
- 4. Very likely
  - 3. Somewhat likely
  - 2. Somewhat unlikely
  - 1. Very unlikely
  - 98. Don't know [DO NOT READ]
  - 99. Refused [DO NOT READ]
  - 11. ABORT SURVEY [DO NOT READ]

## OUTDOOR BURNING QUESTIONS

---

**Q63. Do you have outdoor warming or recreation fires on your property?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**[IF Q63 = 1]**

**Q64. Did you have outdoor warming or recreation fires on your property in any of the following seasons in the last 12 months:**

**Q64a. Fall (September through November)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q64b. Winter (December through February)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q64c. Spring (March through May)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q64d. Summer (June through August)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q65. About how many days per week did you have outdoor warming or recreation fires on your property for each of the following seasons:**

**[IF Q64A = 1]**

**Q65a. Number of days per week in the fall (September through November)**

_____		[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**[IF Q64B = 1]**

**Q65b. Number of days per week in winter (December through February)**

_____		[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**[IF Q64C = 1]**

**Q65c. Number of days per week in spring (March through May)**

_____		[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**[IF Q64D = 1]**

**Q65d. Number of days per week in summer (June through August)**

_____		[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**Q66. Do you typically have outdoor warming or recreation fires on your property on weekdays, weekends, and/or holidays? [DO NOT READ—CHECK ALL THAT APPLY]**

1.	Weekdays	
2.	Weekends	
3.	Holidays	
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
6.	ABORT SURVEY	[DO NOT READ]

**Q67. What time of day do you typically start outdoor warming or recreation fires on your property?**

- 1. Early morning (5:00 AM to 8:00 AM)
- 2. Morning (8:00 AM to 12:00 PM)
- 3. Afternoon (12:00 PM to 4:00 PM)
- 4. Early evening (4:00 PM to 8:00 PM)
- 5. Evening (8:00 PM to 12:00 AM)
- 6. Overnight (12:00 AM to 5:00 AM)
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 7. ABORT SURVEY [DO NOT READ]

**Q68. How long do you typically keep outdoor warming or recreation fires burning on your property?**

- \_\_\_\_\_ Hours [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
  - 99. Refused [DO NOT READ]
  - 4. ABORT SURVEY [DO NOT READ]

**Q69. Do you burn yard waste or other combustible material on your property?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**[IF Q69 = 1]**

**Q70. What type of yard waste or other combustible material did you burn on your property?**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
  - 99. Refused [DO NOT READ]
  - 4. ABORT SURVEY [DO NOT READ]

**Q71. Did you burn yard waste or other combustible material on your property in any of the following seasons in the last 12 months:**

**Q71a. Fall (September through November)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q71b. Winter (December through February)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q71c. Spring (March through May)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q71d. Summer (June through August)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q72. About how many days per week did you burn yard waste or other combustible material on your property for each of the following seasons:**

**[IF Q71A = 1]**

**Q72a. Number of days per week in the fall (September through November)**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 4. ABORT SURVEY [DO NOT READ]

**[IF Q71B = 1]**

**Q72b. Number of days per week in winter (December through February)**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 4. ABORT SURVEY [DO NOT READ]

**[IF Q71C = 1]**

**Q72c. Number of days per week in spring (March through May)**

_____		[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**[IF Q71D = 1]**

**Q72d. Number of days per week in summer (June through August)**

_____		[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**Q73. Do you typically burn yard waste or other combustible material on your property on weekdays, weekends, and/or holidays? [DO NOT READ—CHECK ALL THAT APPLY]**

1.	Weekdays	
2.	Weekends	
3.	Holidays	
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
6.	ABORT SURVEY	[DO NOT READ]

**Q74. What time of day do you typically start burning yard waste or other combustible material on your property?**

1.	Early morning (5:00 AM to 8:00 AM)	
2.	Morning (8:00 AM to 12:00 PM)	
3.	Afternoon (12:00 PM to 4:00 PM)	
4.	Early evening (4:00 PM to 8:00 PM)	
5.	Evening (8:00 PM to 12:00 AM)	
6.	Overnight (12:00 AM to 5:00 AM)	
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
7.	ABORT SURVEY	[DO NOT READ]

**Q75. How long do you typically burn yard waste or other combustible material on your property?**

_____	Hours	[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**Q76. Do you log your property?**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**[IF Q76 = 1]**

**Q77. Did you burn slash on your property in any of the following seasons in the last 12 months:**

**Q77a. Fall (September through November)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q77b. Winter (December through February)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q77c. Spring (March through May)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q77d. Summer (June through August)**

- 1. Yes
- 2. No
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q78. About how many days per week did you burn slash on your property for each of the following seasons:**

**[IF Q77A = 1]**

**Q78a. Number of days per week in the fall (September through November)**

_____		[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**[IF Q77B = 1]**

**Q78b. Number of days per week in winter (December through February)**

_____		[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**[IF Q77C = 1]**

**Q78c. Number of days per week in spring (March through May)**

_____		[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**[IF Q77D = 1]**

**Q78d. Number of days per week in summer (June through August)**

_____		[ENTER VERBATIM]
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
4.	ABORT SURVEY	[DO NOT READ]

**Q79. Do you typically burn slash on your property on weekdays, weekends, and/or holidays? [DO NOT READ—CHECK ALL THAT APPLY]**

1.	Weekdays	
2.	Weekends	
3.	Holidays	
98.	Don't know	[DO NOT READ]
99.	Refused	[DO NOT READ]
6.	ABORT SURVEY	[DO NOT READ]

**Q80. What time of day do you typically start burning slash on your property?**

- 1. Early morning (5:00 AM to 8:00 AM)
- 2. Morning (8:00 AM to 12:00 PM)
- 3. Afternoon (12:00 PM to 4:00 PM)
- 4. Early evening (4:00 PM to 8:00 PM)
- 5. Evening (8:00 PM to 12:00 AM)
- 6. Overnight (12:00 AM to 5:00 AM)
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 7. ABORT SURVEY [DO NOT READ]

**Q81. How long do you typically burn slash on your property?**

- \_\_\_\_\_ Hours [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
  - 99. Refused [DO NOT READ]
  - 4. ABORT SURVEY [DO NOT READ]

## DEMOGRAPHIC QUESTIONS

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**Q82. Do you own or rent your home:**

- 1. Own
- 2. Rent
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 5. ABORT SURVEY [DO NOT READ]

**Q83. How many years have you live in this home? [0 = LESS THAN ONE YEAR]**

- \_\_\_\_\_ [ENTER VERBATIM]
- 98. Don't know [DO NOT READ]
  - 99. Refused [DO NOT READ]
  - 4. ABORT SURVEY [DO NOT READ]

**Q84. Which of the following categories includes your age? Please stop me when I reach the right category. [READ LIST]**

- 1. 18 to 24
- 2. 25 to 34
- 3. 35 to 44
- 4. 45 to 54
- 5. 55 to 64
- 6. 65 to 74
- 7. 75 to 84
- 8. 85 or older
- 99. Refused [DO NOT READ]
- 10. ABORT SURVEY [DO NOT READ]

**Q85. Which of the following categories best describes the formal education you have completed? Please stop me when I reach the right category. [READ LIST]**

- 1. 0 to 11 years, no diploma
- 2. High school graduate
- 3. Some college, no degree or associates degree
- 4. Technical training
- 5. Bachelor's degree
- 6. Graduate or professional degree
- 99. Refused [DO NOT READ]
- 8. ABORT SURVEY [DO NOT READ]

**Q86. Which of the following categories best describes your household's anticipated total income before taxes for this year? Please include income from all sources for all individuals living in your household. Please stop me when I reach the right category. [READ LIST]**

- 1. Less than \$30,000
- 2. \$30,000 to less than \$50,000
- 3. \$50,000 to less than \$70,000
- 4. \$70,000 to less than \$90,000
- 5. \$90,000 or more
- 98. Don't know [DO NOT READ]
- 99. Refused [DO NOT READ]
- 8. ABORT SURVEY [DO NOT READ]

Those are all the questions I have. Thank you for your time.

**Q87. RECORD GENDER [DO NOT ASK]**

- 1. FEMALE
- 2. MALE

## APPENDIX B: MARGIN OF ERROR

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*Actual overall survey margin of error:*

$$MOE = z \sqrt{\frac{p(1-p)}{n}}$$

where:  $z = 1.96$  (at 95% confidence limit)

$p = 0.345$  (34.5% of respondents with woodstove or woodstove insert)

$n = 229$  (valid responses)

$$MOE = (1.96) \sqrt{\frac{0.345(1-0.345)}{229}} \rightarrow MOE = 0.064 \rightarrow \underline{MOE = 6.2\%}$$

*Sample size necessary to achieve 5% overall survey margin of error:*

$$n = \frac{p(1-p)}{\left(\frac{MOE}{z}\right)^2}$$

where:  $MOE = 0.05$

$$n = \frac{0.345(1-0.345)}{\left(\frac{0.05}{1.96}\right)^2} \rightarrow \underline{n = 347 \text{ valid responses}}$$

*Calls necessary to achieve 5% margin of error:*

$$n^* = \frac{n}{RR}$$

where:  $RR = 88.1\%$  response rate

$$n^* = \frac{369}{0.881} \rightarrow \underline{n^* = 394 \text{ calls}}$$