



Final Report

2014 Check Before You Burn: Perceptions, Awareness and Compliance

Submitted by:

Joseph Hanson

8/12/2014

For



2012 H Street, Sacramento, CA 95811

www.metaresearch.us

(916)325-1224

Contents

Executive Summary.....	3
Wood Burning Activity.....	3
‘Burners’	3
Awareness of the Check Before You Burn Program	3
Compliance With Check Before You Burn	4
Project Details.....	5
Background	5
Objectives	6
Methodology	6
Analysis and Reporting	6
Statistical Significance	7
Results and Conclusions	8
Wood Burning Activity	8
Summary.....	8
Device Ownership	8
Frequency of Burning.....	9
Reasons for Burning Less.....	10
Verbatim Reasons for Burning Less	11
“Burner” Profile.....	12
Awareness of the Check Before You Burn Program	14
Summary.....	14
Perceptions of Residential Burning Healthfulness.....	14
General / Unaided Awareness	15
General Awareness and Behavior	17
Specific Awareness / Perceived Familiarity	17
Actual Familiarity	19
Verbatim Knowledge of Program	20
Source of Familiarity	21
Awareness of Responsibility to Check Before You Burn	22
Familiarity After Description	24
Overall Awareness	24
Awareness of Different Levels of the Program	25
Awareness of Complaint Line	27
Compliance with Check Before You Burn	29

Summary.....	30
Compliance with Stage 1: 'No Burning Unless Exempt'	29
Compliance with Stage 1: Manufactured Logs	30
Compliance with Stage 2: 'All Burning Prohibited"	30
Compliance Comparison: 2014 vs. 2009	31
Group Differences	32
Stage 1 Compliance Among Burners.....	32
Stage 2 Compliance Among Burners.....	33
Conclusion	35
Appendix A: Demographics	37
Appendix B: Questionnaire	39

Executive Summary

Wood Burning Activity

- ✚ The most commonly owned device is an indoor fireplace, owned by 73% of all respondents. Respondent ownership of fireplace inserts (14%), stoves (8%), outdoor fire pits (11%) and chimineas (5%) is much less prevalent.
- ✚ Just over half of respondents (55%) burned less this winter than they do during typical winters.
- ✚ This percentage of respondents burning less is significantly greater than the 45% of respondents in 2009 that burned less that winter.
- ✚ The most commonly stated reason (20% of respondents) for burning less this past winter is having no need to burn, most often because it was not cold enough.
- ✚ Burn bans (11%), health concerns (7%), and air quality (7%) constitute a combined 25% of other reasons why respondents burned less this past winter.
- ✚ Over half (56%) of respondents did not use their device at all this past winter.

'Burners'

- ✚ Burners (respondents who used their device this winter) in 2014 are similar to those in 2009, but can be identified by additional demographic indicators. Specifically burners (burned at least once this winter; first percentage) compared to non-burners (did not burn at all; second percentage) are significantly more likely to:
 - have household earnings of \$100,000 or more (33% vs 23%),
 - have more than one person living in their house (14% vs 23%),
 - consider residential wood burning to be not at all unhealthy (43% vs 28%),
 - consider themselves to be very familiar with the Check Before You Burn Program (51% vs 35%),
 - be aware of their responsibility to check before they burn (73% vs 60%),
 - have burned less because the weather was warm or they found no need (30% vs 13%),
 - have an EPA certified device (24% vs 13%),
 - have a wood or pellet stove in addition to an indoor fireplace (11% vs 6%) and,
 - receive information about the program from a source other than T.V. (49% vs 68%).

Awareness of the Check Before You Burn Program

- ✚ Residential wood burning is not considered to be the unhealthiest contributor to wintertime air pollution.
- ✚ Respondents who did not burn at all were most likely to consider residential wood burning to be very unhealthy, suggesting that messaging is working for some of the population.
- ✚ Just under three-quarters (74%) of respondents remember reading, seeing or hearing messaging telling them not to burn.
- ✚ Younger respondents (25-34) with a full household (4+ people) are significantly least likely to recall this messaging.
- ✚ 33% of all respondents reduced wood burning because of program messaging.

- + Respondents who state they are very familiar with the program are significantly more likely to have reduced their burning because they read, saw or heard a message.
- + Nearly three-quarters (72%) of respondents in 2014 are at least somewhat familiar with Check Before You Burn, meaning that the messaging is penetrating.
- + However, only 36% can provide some accurate details.
- + The vast majority of respondents are receiving information about Check Before You Burn from television (50%) and the newspaper (33%).
- + The messaging is being received: two-thirds of respondents (66%) are aware of their responsibility to check before they burn.
- + Burners and purposeful reducers are more likely to be aware of their responsibility to check than non-burners, non-reducers, and those who never burn.
- + When responses are combined, nearly all respondents (92%) are aware of the program.
- + The majority of respondents aware of the program in 2014 are at least somewhat familiar with Stage 1 (59% combined 'somewhat' and 'very' familiar) and Stage 2 (78% combined 'somewhat' and 'very' familiar) burn bans.
- + 43% of respondents who completed the survey said that they are aware of the complaint line.

Compliance With Check Before You Burn





- + The vast majority of respondents aware of no burn days claim to never burn during Stage 1 bans (87%) and Stage 2 bans (91%).
- + Compliance rates are significantly but only trivially better for Stage 1 in 2014 compared to 2009.
- + The best way to describe a complier is as a general Sacramento County resident.
- + Data suggest message recipients are reducing because of messaging and not just offering a socially desirable response.
- + Of the 146 respondents who used their device, are aware of CBYB and are familiar with Stage 1 (or are included as a non-complier for being completely unaware of restrictions), 77% complied with all Stage 1 no burn days. This translates conservatively into a total of 51% burners who complied with every Stage 1 ban.
- + Of the 183 respondents who use their device, are familiar with Check Before You Burn and Stage 2 (or are included as a non-complier for being completely unaware of restrictions), 74% complied with every Stage 2 no burn day. This translates conservatively into a total of 61% of burners who complied with every Stage 2 ban.

Project Details

Background

The mission of the Sacramento Metropolitan Air Quality Management District (SMAQMD) is to achieve clean air goals by leading the Sacramento region in protecting public health and the environment through innovative and effective programs, dedicated staff, community involvement and public education. The District's winter "Check Before You Burn" program is designed to reduce the amount of fine particulate matter (PM) pollution that results from burning solid fuels in fireplaces, woodstoves, and outside fire pits and chimineas.

The winter season program runs from November through February and has been in place since 2007. Residents are expected to daily check the legality of burning during the winter season before they consider burning wood, pellets, or manufactured logs or any other solid fuel. The program consists of four categories:

Program Category	Description	# of Days in 2013-14 Season ¹
	Burning of <u>any</u> solid fuel, including wood, manufactured logs, and pellets is prohibited.	35
	Burning is prohibited unless EPA-certified wood burning or pellet devices are used and they do not emit visible smoke. Manufactured fire logs are banned from use.	10
	Residents are requested to voluntarily not burn and the burning of manufactured logs is acceptable.	19
	The public is allowed to burn and the burning of manufactured logs is acceptable.	56

¹ <http://www.sparetheair.com/burncheck.cfm>

Objectives

The current study was designed to survey a representative sample of Sacramento County residents who own an indoor or outdoor wood or pellet burning device to assess public awareness, perceptions and compliance. Specifically, the objectives of the current study are to:

- Assess wood burning activity,
- Measure awareness of the Check Before You Burn program,
- Measure awareness of the program's stages,
- Estimate the effectiveness of the current program,
- Describe Sacramento County residents who use their device,
- Assess compliance, and,
- Compare to the 2009 survey (when possible).

Methodology

For this study, Random-digit dialed (RDD) Telephone interviews were completed with a sample of 500 Sacramento County residents who owned a wood or pellet burning device (other than an outdoor barbeque) either inside or outside their home.

The margin of error associated with a sample of 500 completed interviews is +/- 4.4% at the 95% confidence level. That is, we are 95% sure that the true population parameters lie within +/- 4.4% of the sample statistics. For example, if a response category to a question were chosen by 50% of sample respondents, we would be 95% sure that, if the entire County population were surveyed, that same response category would be selected by 45.6%-54.4% of all residents (50% +/- 4.4%).

Meta Research (Meta) was contracted to conduct this research. Using the 2009 survey as a draft, Meta designed the questionnaire to address the study objectives. Most of the questions were asked in a closed-ended format, with emphasis on interval or ratio-level scales when possible. Two questions were asked open-ended. Verbatim responses were captured and categorized for quantitative analysis. The questionnaire was programmed for a CATI (Computer Assisted Telephone Interviewing) system. Interviews took approximately 12 minutes on average to administer. Respondents were screened for age (18+), ownership of a wood burning device, and to confirm residency in Sacramento County. Interviewing took place between April 3 and April 22, 2014.

Unless otherwise noted, frequency percentages cited in this document represent adjusted frequencies, meaning that percentages have been adjusted to account for any non-responses (refusals to answer) or non-qualified responses (questions not answered due to answers to previous questions).

Analysis and Reporting

Results were analyzed using univariate, bivariate, and in some cases multivariate operations. The type of test was determined by the complexity of the variables involved. All frequencies

represent adjusted frequencies unless otherwise noted. Scales have been adjusted to reflect the intended scale. Any 'don't know' or refusal was removed from calculations².

Because most items were measured using nominal or ordinal level data, Chi Square statistics were employed frequently to determine if differences in responses exist between subpopulations. Other items that recorded interval or ratio level responses were analyzed using Analysis of Variance (ANOVA). Infrequently, specialized tests are used due to the sample sizes of subpopulations involved in an analysis. These are the Z-test and Fischer's Exact Test. Each of these tests is used under different circumstances to determine if the variance in the distribution of responses to one survey item is significantly different between subpopulations within the sample (e.g. education level, ethnicity, or income) such that it cannot be accounted for by chance alone. If this is the case, a significant difference is declared. This is explained further in the next section.

Statistical Significance

The level of significance for each test was set to a p value of less than .05, which equates to at least 95% assurance in the integrity of an identified significant relationship. That is, a significant relationship is one that cannot be accounted for by chance alone. Because the relationship cannot be accounted for by chance alone it is instead likely due to differences in the subpopulations being compared. It is assumed this relationship holds for members of the population who are not a part of the sample, but who share the quality being used to compare subpopulations. For example, it may be determined that a significant difference arises in the compliance rates of self-identified Caucasians and Asian/Pacific Islanders such that Caucasians are less likely to comply with burn bans than Asian/Pacific Islanders. This means researchers are 95% sure that a difference in reported compliance between Caucasians and Asian/Pacific Islanders is due to their ethnicity, and not to chance.

In this report, if a difference between subpopulations is noted, then it is significant. There are a few cases where a difference is noted that did not reach significance but still warranted reporting. This is stated clearly in the text describing that relationship so as not to confuse it with a statistically significant relationship.

² Because of this, some calculations using data from 2009 are not exact to the 2009 report where scales were not adjusted in this way to the same extent they are currently.

Results and Conclusions

Wood Burning Activity

Summary

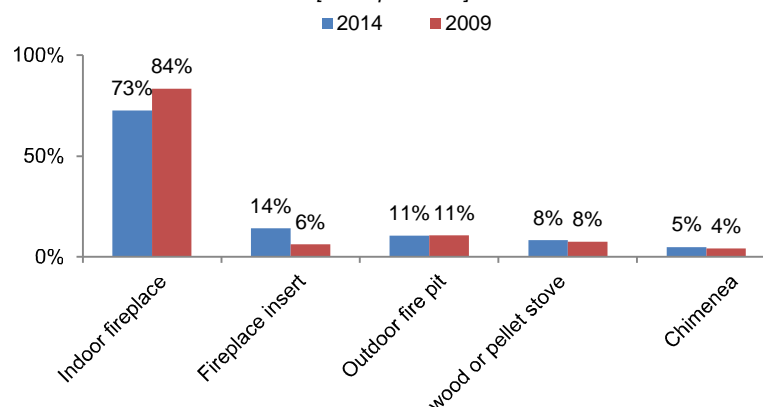
- Nearly three quarters of respondents (55%) burned less this winter than they do during typical winters.
- This percentage of respondents burning less is significantly greater than the 45% of respondents in 2009 that burned less that winter.
- The most commonly stated reason (20% of respondents) for burning less this past winter is having no need to burn, most often because it was not cold enough.
- Burn bans (11%), health concerns (7%), and air quality (7%) constitute a combined 25% of other reasons why respondents burned less this past winter.
- Over half (56%) of respondents did not use their device at all this past winter.

Device Ownership

- Fireplace insert ownership has increased significantly since 2009 from 6% to 14%, while indoor fireplace ownership has decreased from 84% to 73%.

The sample population included only Sacramento County residents who have the capability to burn wood, pellets or manufactured logs using an indoor fireplace, fireplace insert, stove, or outdoor fire pit or chiminea. The most commonly owned device is an indoor fireplace, owned by 73% of all respondents. Respondent ownership of fireplace inserts (14%), outdoor fire pits (11%), stoves (8%), and chimineas (5%) is much less prevalent.

Figure 1: Device Ownership
[all respondents]



In 2014, owning an indoor fireplace is significantly less prevalent than it was in 2009. This drop is accounted for by an increase in the ownership rate of fireplace inserts. Multiple Chi Square analyses were conducted using each of the demographic variables to determine if this change in ownership was due to a difference between the age, ethnicity, education level,

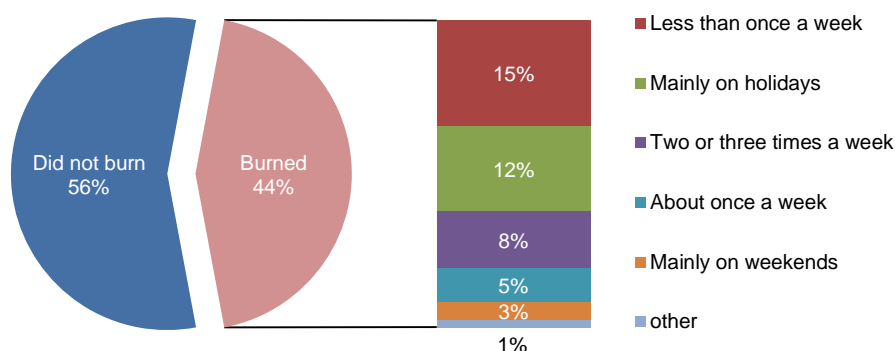
or income of the two sample populations. No analyses returned significant results, indicating that other factors have influenced the shift toward fireplace inserts.

Frequency of Burning

- ✚ Nearly three-quarters of respondents (71%) are using their device less than once a week, or not at all.
- ✚ Most respondents (55%) burned less frequently this winter than during a typical winter. This is significantly more respondents than 2009.

Most respondents (56%) did not use their device at all this past winter. The next largest group of respondents (15%) used their device less than once a week. In total, **that translates to nearly three quarters of respondents using their device less than once a week or not at all**. The rest burned mainly on holidays or infrequently throughout the week. The few respondents in the 'Other' category stated that they used their device every day this past winter.

Figure 2: Frequency of Burning
[all respondents]

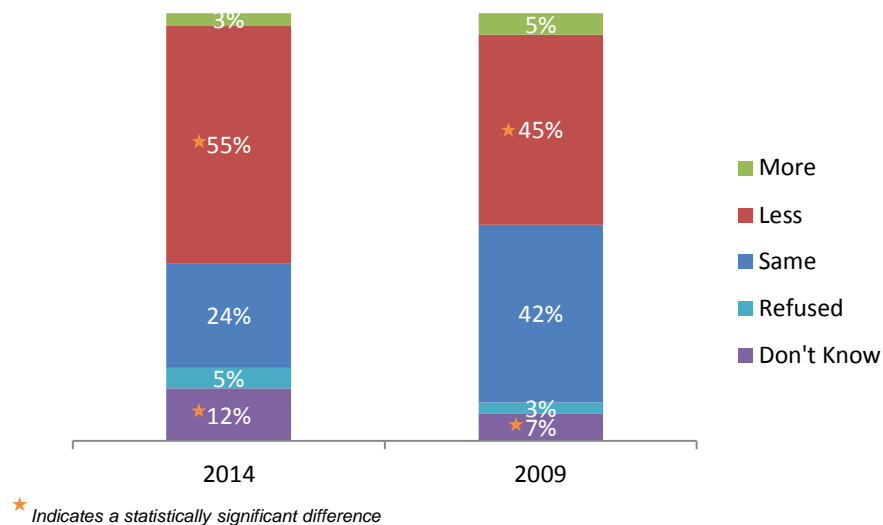


The majority of respondents (55%) said that they burned less frequently this winter than they do during a typical winter. This 55% is significantly greater than the 45% of respondents in 2009 that said they burned less than typical winters. To better explain this change, Z-tests³ were conducted within each demographic category between responses from 2009 and 2014. Because sample distributions within demographic categories are not uniform in size, Z-tests were chosen in place of two-way Analysis of Variance. Likewise, responses are considered categorical when including 'Don't Know' and 'Refused' options.

While some relationships do exist between education level, income, age, ethnicity and the frequency of burning between 2009 and 2014, the strength of those relationships is trivial, at best. Consequently, change in burning frequency is best accounted for by the main effect of elapsed time. This is an indication that five years of messaging may be working.

³ See "Analysis and Reporting" section of Methodology

Figure 3: Burning Compared to Typical Winter
[all respondents]

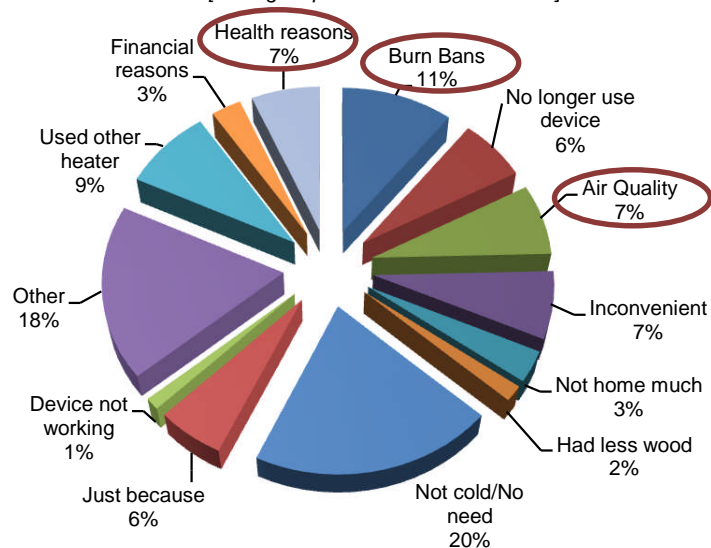


Reasons for Burning Less

- A total of 25% of respondents burned less for air quality related reasons.

Reasons for burning less show greater variation in 2014 than in 2009, but not to any significant degree. Burn bans (11%), health (7%) and air quality (7%) were mentioned by some respondents as reasons they burned less this past winter, accounting for **a combined total of 25% of respondents who burned less for air quality related reasons**. However, the majority of respondents found no need to start a fire, often because of the perception of a warm winter.

Figure 4: Reasons for burning less
[among respondents who burned less]



Those in the “other” category often had incomplete thoughts, or were not clear enough to code. For example, one respondent stated they are “Afraid to use it.” This respondent could be alluding to burn bans, or of a potential accident, it is unclear.

A sample of verbatim responses is offered below for each of the categories described above including at least 5% of responses:

Verbatim Reasons for Burning Less

“Burn Bans”

- Because of restrictions.
- County Restriction.
- We had to follow the no burn mandate.
- Because of the air quality no burn days.
- We had a lot of no burn days.

“Air Quality”

- Don’t want to create too much pollution.
- We decided the smoke and everything was unhealthy.
- We do not burn much. We try to be green, we do not try to contribute to bad air quality.
- Done for atmosphere.
- Because of the bad air.

“Health Reasons”

- We stopped using [it], my husband thinks it’s unhealthy in the house.
- Because it would be unhealthy.
- Public health.
- Because I’m on oxygen and I think they are unhealthy.
- It causes an allergic reaction for my wife.
- Because we have a history of asthma in our family so we don’t use the fireplace at all.
- Because I don’t want to breathe it.
- I have a baby.

“Not Cold/No Need”

- Just didn’t find it necessary this year. It was warmer this year.
- It was not necessary.
- Didn’t see a need.
- It was not that cold.
- The weather has not been cold enough.

“Used Other Heater”

- It’s not my primary source of heat. It’s not even a source of heat it’s for entertainment purposes.
- Have a heater in the house.
- We use a furnace heater in the house.
- Natural gas for heat.
- Another source of heat.

“Inconvenient”

- I didn't want to be bothered with the ashes, burning the wood, and feeding the fireplace.
- Pain in the neck. Fireplace is not worth it.
- It's not where we usually would be [in the house].
- It's not something I choose to deal with. I hardly sit in my living room, only when I have company.
- Didn't want to have my chimney cleaned.

“No Longer Use Device”

- We just didn't burn any[thing].
- [It's] just for the look of it.
- Don't use it.
- Because I do not burn anything in the fireplace and have not used it in 10 years.
- Fireplace never been used.

“Just Because”

- I just didn't get around to that much this year.
- Lack of interest.
- We just didn't use it that much this year.
- It just didn't come up.

“Other”

- Personal reasons.
- I have real wood.
- We don't like to use the pellets or wood.
- Even though it's cold, I could sleep with nature, I don't go with the public view.
- I use chopped wood.
- It stinks.
- Afraid to use it.

The small portion of respondents (4%) who said they burned more this past winter than a typical winter did so because they said it was cold, it saved money, and because they enjoy using it.

“Burner” Profile

- Burners in 2014 are similar to those in 2009, but can be identified by additional demographic indicators.

“Burners” are respondents who burned solid fuel at least once this past winter. In order to help the Air District better understand those who are and are not burning solid fuel during the winter, the 2009 report created a brief, “burner” profile. The 2009 burner profile indicated that Sacramento County burners were more likely to:

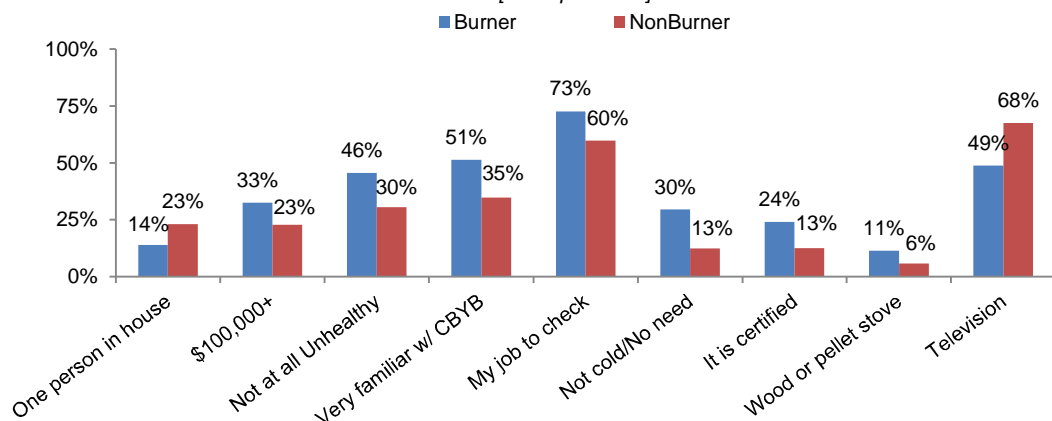
- have access to the internet,
- have some post-secondary education,
- and have household earnings of at least \$50,000.

Though exact similarities did not arise between the 2009 and 2014 burners, there appear to be consistencies between different demographic indicators of the 2009 and 2014 groups such that wealthier, more aware device owners are burning wood while less wealthy, less aware respondents are not burning wood. As is listed below, the 2014 burner (first percentage), compared with a non burner, (second percentage), is more/less likely to:

- have household earnings of \$100,000 or more (33% vs 23%),
- have more than one person living in their house (14% vs 23%),
- consider residential wood burning to be not at all unhealthy (43% vs 28%),
- consider themselves to be very familiar with the Check Before You Burn Program (51% vs 35%),
- be aware of their responsibility to check before they burn (73% vs 60%),
- have burned less because the weather was warm or they found no need (30% vs 13%),
- have an EPA certified device (24% vs 13%),
- have a wood or pellet stove in addition to an indoor fireplace (11% vs 6%) and,
- receive information about the program from a source other than T.V. (49% vs 68%).

The most concerning of these indicators is that burners are significantly more likely than non-burners to consider residential wood burning not at all unhealthy (43% vs 28%). Burners also consider themselves to be more familiar with the program and their responsibility to check before they burn than non-burners. These data question the degree to which burners are familiar with the program. They may be aware that it exists, and that they have a responsibility to check, but they are not convinced of the significant effect of residential burning on air quality.

Figure 5: Significant differences of "Burners" vs Non-Burners
[all respondents]



Awareness of the Check Before You Burn Program

Summary

- + Respondents who did not burn at all were most likely to consider residential wood burning to be very unhealthy, suggesting that messaging is working for some of the population.
- + Just under three-quarters (74%) of respondents remember reading, seeing or hearing messaging telling them not to burn.
- + 33% of all respondents reduced wood burning because of program messaging.
- + Nearly three-quarters (72%) of respondents in 2014 are at least somewhat familiar with Check Before You Burn, meaning that the messaging is penetrating.
- + However, only 36% can provide some accurate details.
- + The vast majority of respondents are receiving information about Check Before You Burn from television (50%) and the newspaper (33%).
- + The messaging is being received: two-thirds of respondents (66%) are aware of their responsibility to check before they burn.
- + Burners and purposeful reducers are more likely to be aware of their responsibility to check than non-burners, non-reducers, and those who never burn.
- + When responses are combined, nearly all respondents (92%) are aware of the program.
- + The majority of respondents aware of the program in 2014 are at least somewhat familiar with Stage 1 (60% combined) and Stage 2 (78% combined) burn
- + 43% of respondents said that they are aware of the complaint line

Perceptions of Residential Burning Healthfulness

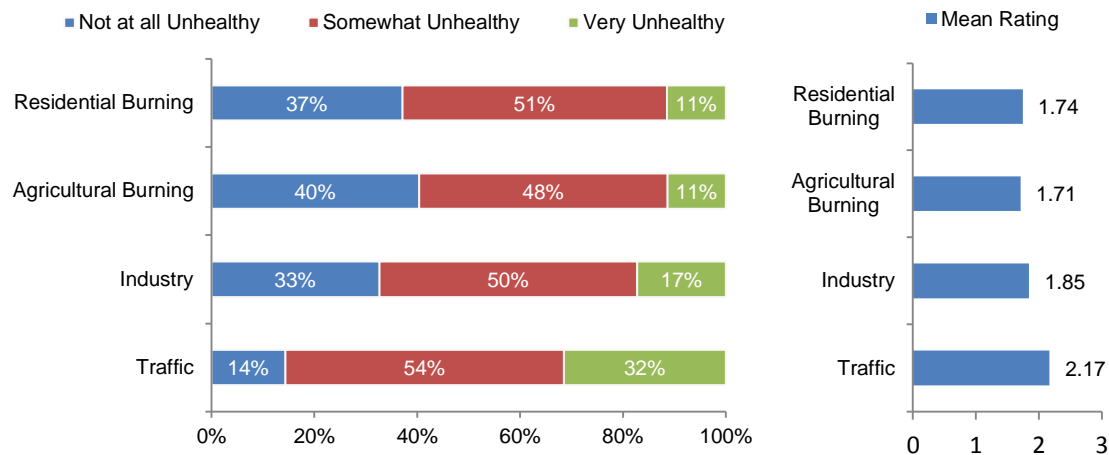
- + Residential wood burning is not considered to be the unhealthiest contributor to wintertime air pollution.
- + Respondents who did not burn at all were most likely to consider residential wood burning to be very unhealthy, suggesting that messaging is working for some of the population.

Respondents were asked to rate the contribution made by traffic, industry, agricultural burning, and residential wood burning make to poor air quality in terms of healthfulness. In many respects, this item asks if respondents are aware of the effects of wintertime residential wood burning. The interviewer asked:

"Using the scale, not at all[1], somewhat[2], or very unhealthy[3], how would you rate the contribution to WINTERTIME air pollution caused by [traffic; industry; agricultural burning; residential wood burning] in the Sacramento area?"

Residential wood burning (mean = 1.74) was rated as the third unhealthiest contributor to air quality next to industry (mean = 1.85) and traffic (mean = 2.17). That is, residential wood burning may be overlooked as a significant contributor to wintertime air pollution in comparison to other contributors. However, the majority of respondents (51%) do consider residential wood burning to be somewhat unhealthy.

Figure 6: Perceptions of contribution to unhealthful air quality
[excludes undecided and refused responses]



A series of ANOVAs⁴ were conducted using each demographic variable and the mean score of residential burning to determine if there are any demographic indicators that can be used to predict mislabeling residential burning as a weak contributor to the healthfulness of wintertime air. No tests showed significant results, meaning that no particular group is underrating the contribution of residential burning to wintertime air quality. Sacramento County residents, in general, are making this error.

Yet, one variable does show significant associations with ratings of the healthfulness of residential wood burning. Z-tests reveal that respondents who did not burn at all were more likely to rate residential wood burning as very unhealthy to air quality, suggesting some county residents get the point.

General / Unaided Awareness

- ✚ Just under three-quarters (74%) of respondents remember reading, seeing or hearing messaging telling them not to burn.
- ✚ Younger respondents (25-34) with a full household (4+ people) are least likely to recall this messaging.

General awareness items probe respondents' basic recognition of the intention behind the program, avoiding specific recognition of the Check Before You Burn slogan or the District. In the context of the current evaluation, they are 'unaided awareness' measures. In both 2009 and 2014, general awareness was measured using the question:

"During this past winter, did you hear, read, or see anything informing residents not to use their wood burning fireplaces or outdoor fire pits because of poor air quality?"

Figure 7 shows that general awareness levels have remained very high since 2009. Approximately three-quarters (76%) of respondents recall some message about not burning because of poor air quality.

⁴ See "Analysis and Reporting" section of Methodology

Figure 7: General Awareness: Heard, Read, Seen Anything
[all respondents]

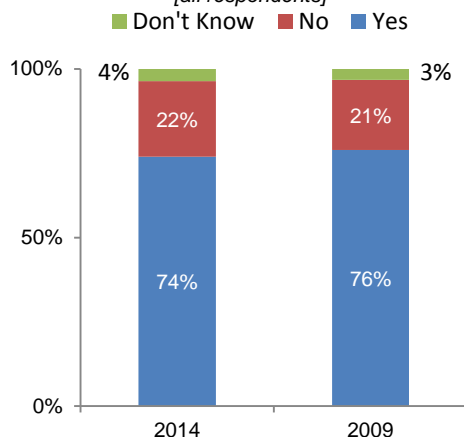
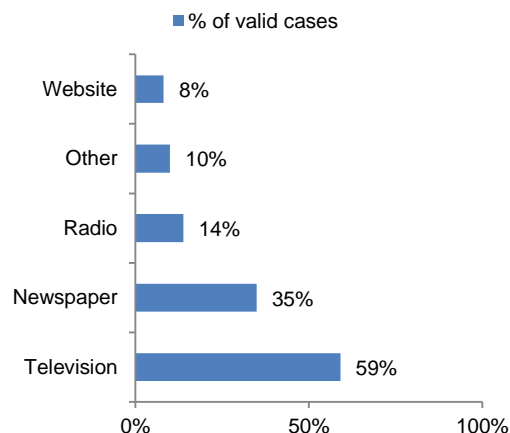


Figure 8: General Awareness: Where did you read, see, or hear that?
[those who saw messaging]



When asked where that information was read, seen or heard, the majority of respondents cite television (59%). The next largest portion cites newspaper (35%), then radio (14%), and the website (8%). The 'Other' category includes a variety of sources (5%), such as a pastor, or legislator, word of mouth (2%), Air Alert emails (2%) and some who just didn't remember (1%).

In 2009, younger respondents, aged 18-24 were significantly less likely to be generally aware of the program than their older counterparts. The same is not true in 2014. Younger respondents are just as likely to be generally aware of the program as those older than they are. However, respondents aged 25-34 during both years are less likely than those older than they are to be generally aware of the program.

Also in 2009, self-identified Asian/Pacific Islander and African American respondents were significantly less likely to be generally aware of the program than those who identified as Caucasian and Hispanic/Latino. Again, this is not true in 2014. **Ethnicity did not predict likelihood of being generally aware of the program, suggesting that outreach is reaching all ethnicities equally.**

A final demographic difference of note in 2014 is that respondents with four or more people in their household are less likely to be generally aware of the program than respondents with smaller households.

That ethnicity, income, and education level do not predict general awareness, while being 25-34 with a full house does, seems to suggest that young families of all kinds are less aware of the program than those younger than they are (perhaps with no or smaller families) and those older than they are (possibly with more stable lifestyles and older or moved-out children). Further analysis reveals that young adults with larger households who are aware are more likely to have heard something about the program on the radio or seen it on a website, supporting the notion that this less aware group is busy, and therefore missing the messaging. This, however, is only one possibility. **The data are not comprehensive enough to make claims about this group and must be interpreted generally.**

General Awareness and Behavior

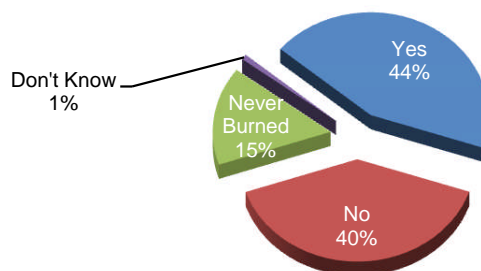
- ✚ Nearly half of respondents (44%) reduced their burning because they read, saw or heard messaging telling them not to burn.
- ✚ This translates to 33% of all respondents reducing wood burning because of program messaging.

To estimate self-reported compliance due specifically to the program prior to any aided awareness items, a follow up question to the general awareness item asks respondents:

“And did you reduce the number of fires you burned last winter because you heard or saw a notice not to burn wood?”

Results cannot be compared between the 2009 and 2014 survey years. An answer option was added in 2014 to reflect the number of respondents who have not used their devices for an extended period of time. Data for 2014 are displayed in Figure 9 for the general population.

Figure 9: Reduced burning because of General Awareness
[those generally aware]



Nearly half (44%) of respondents said they reduced their burning because they saw notices to not burn. **This translates to 33% of all respondents reducing wood burning because of program messaging.** Another small portion (15%) said they never burn, and so could not reduce their burning.

Specific Awareness / Perceived Familiarity

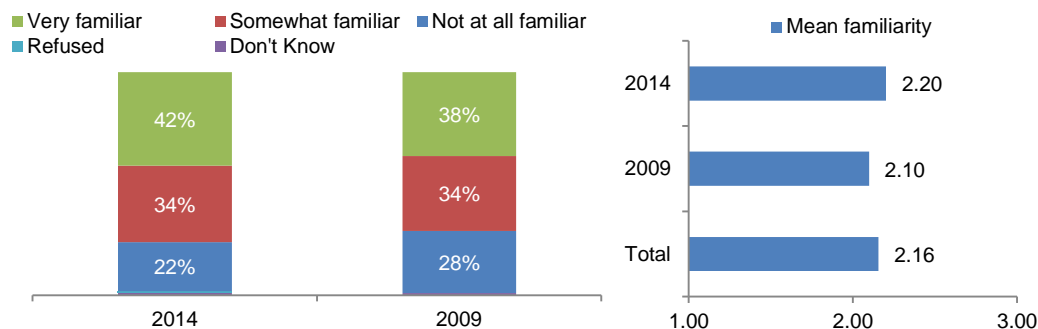
- ✚ Over three-quarters (76%) of respondents in 2014 are at least somewhat familiar with Check Before You Burn, meaning that the messaging is penetrating.
- ✚ Respondents who consider themselves to be very familiar with the program are more likely to have reduced their burning because they read, saw or heard a message

Specific Awareness items are aided, meaning they provide details within a question, often using a name, or slogan to assist respondents' memory. In this case, respondents were asked:

“How familiar would you say you are with the Check Before You Burn program? Would you say Not at all familiar[1], somewhat familiar[2], or very familiar[3]?”

The same question was asked in 2009. Results for both years are displayed in Figure 10 below. There are no significant differences in familiarity with Check Before You Burn between 2009 and 2014 respondents.

Figure 10: Specific Awareness by Year
[all respondents]

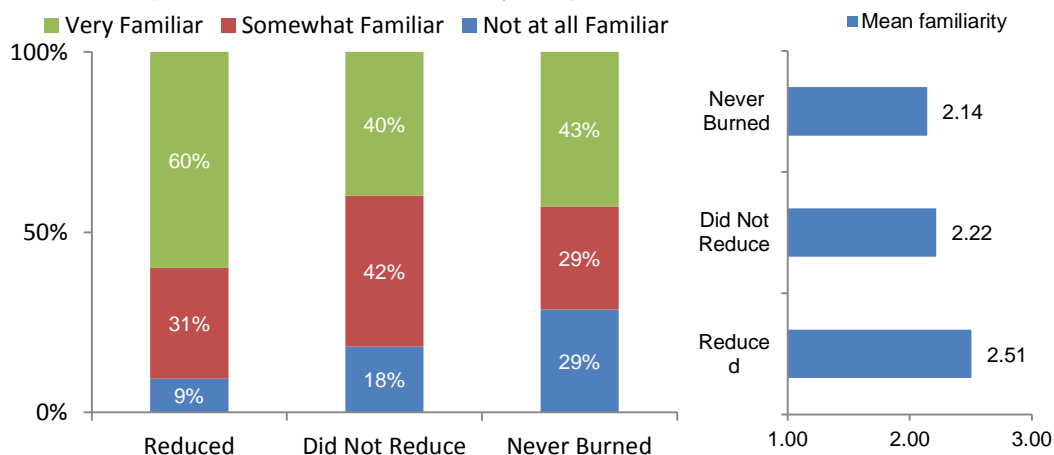


* Don't Know/Refused in 2014 = 1% total; Don't know/Refused in 2009 = 2% total

Nearly three-quarters (76%) of respondents in 2014 are at least somewhat familiar with Check Before You Burn, meaning that the messaging is penetrating. The average familiarity rating in 2014 is just above somewhat familiar, at 2.20 on the three point scale with [3] being very familiar.

Caucasians (47% very familiar) and those who did not identify with any of the pre-defined ethnic categories (54% very familiar) were more likely than respondents of other ethnicities to say they are very familiar with the program. Consistent with demographic indicators of general awareness, respondents with five or more people living in their household are less likely than those with smaller households to say they are very familiar with the program. This is further evidence that some residents may be too overwhelmed with other concerns to be familiar enough with the program to warrant perfect compliance.

Figure 11: Familiarity by Reduced Burning Because of General Awareness
[excludes Undecided and Refused responses]



In addition to the demographic indicators of perceived familiarity, one other significant relationship arose in a set of Chi Square analyses using responses to other items. **Those who consider themselves to be very familiar with the program are more likely to have reduced their burning because they read, saw or heard a message.** This is also true for respective mean ratings. Those who reduced because of exposure to messaging are significantly more likely to be very familiar with the program. However, it is not clear whether familiarity precedes reduction, or reduction creates a sense of familiarity.

Actual Familiarity

- ✚ In total, 55% of verbatim responses showed a lack of actual knowledge about the program.
- ✚ 36% can provide some accurate details.

Because both awareness items were closed ended and only measured perceived awareness and familiarity, it is useful to include open-ended items to assess actual, rather than perceived, knowledge of the program. Both offer unique insights and tell a clearer story when combined. Actual knowledge, in this case, is derived from the details provided by respondents when asked what they know about the program. It is expected that respondents who are familiar with the program should be able to state basic information, such as their responsibility to check legality, or that there are illegal burn days at all. This open-ended question asks of those who said they were at least somewhat familiar:

"Can you briefly describe what you know about the program?"

Verbatim responses were recorded and coded. Most respondents, in general, could not provide any details about the program (26%) while others offered responses that showed they were confused about the program (13%). Another large portion is specifically confused about their responsibility to check before they burn (16%). **In total, 55% of verbatim responses showed a lack of actual knowledge about the program.**

Respondents in the next two largest groups acknowledge that there are illegal burn days (16%), or specifically mention checking before burning (14%). A small number of respondents (6%) mention details about the process or purpose of Check Before You Burn, and that there are illegal burn days, but not that residents are responsible for checking before they burn. This translates to 36% of familiar respondents who can provide some accurate details about the program. Examples of verbatim responses are offered below for each of the categories listed below.

Verbatim Knowledge of Program

Not sure at all	26%
Specifically confused about responsibility to check	16%
Acknowledges there are illegal burning days	16%
Specifically mentions checking before burning	14%
Confused about program	13%

Mentions process/purpose/no burn days, but no checking	6%
Other	6%
Aware but angry	2%

Evaluation of these responses illuminates the relationship described above between familiarity and reduction. No significant differences arise between reducers and non-reducers in actual knowledge of the program, suggesting that reduction because of general messaging arouses the perception of familiarity, and not the other way around (though the data do not support a conclusion).

Further analysis reveals that **respondents who say they are very familiar with the program are significantly more likely** than respondents who are somewhat or not at all familiar **to be able to offer any details about the program**, even if not entirely accurate. Likewise, very familiar respondents (first percentage) are significantly more likely than not at all familiar respondents (second percentage) to specifically mention checking before burning (20% vs 3%), acknowledge that there are illegal burn days (17% vs 5%), or mention something about the process/purpose and illegal burn days (10% vs 0%).

Verbatim Knowledge of Program

Specifically mentions checking before burning:

- I know it is an air quality thing and you must check before you burn.
- There is a number or website to call or go to let me know when I can burn.
- They have numbers to call to see if it's ok to burn.
- I know you can call and get information as to whether or not it's a burn day.
- We can check what days we can burn.

Acknowledges there are illegal burn days:

- Certain days you're not allowed to burn wood or you could be fined.
- It is simply a program telling what you can burn [on] a specific day.
- There are no burn days meaning I can't burn anything outside and in the fireplace.
- I know that there are some days where the air quality is where you're not supposed to burn anything on those days.
- That you are not supposed to burn on certain days.

Mentions process/purpose/no burn days, but no checking

- Regulating the pollution of air.
- Conserve or not burn wood to help air quality.
- I don't know anything about it except that it is a way to control pollution and help people with breathing problems.
- That we are trying to reduce air pollution by minimizing burning wood.
- I know there is an index that measures substances in the air which will determine whether you can burn on that day or not.

Confused about program

- Seems like when it is clear outside you can't burn.

- Just an assumption that they coordinate with the media that they talk about air quality.
- There are certain days that are not advisable for burning wood, and days where temperature is high; we are advised not to go outside due to vehicular emissions.
- We are in a drought and due to the cutback on the fire Dept and I know when to burn and I am aware of high wind.
- It's just days if it's bad air quality don't burn I don't know how it works.
- Not supposed to burn on certain nights.

Specifically confused about responsibility to check:

- Tells you when you can or when you can't burn.
- They just give us warnings if we can burn or not. Depends on what they say on TV if you can burn or not.
- Monitored by the local Sacramento quality air control, when they feel the air level is too dangerous they put out the no burn notice through television and newspaper.
- They put out an alert that it is unhealthy, don't burn.
- They monitor the particle manner and let they let you know when to burn or not to burn.

Aware but angry

- It is government intruding on the private sector. It is overdone and I am not happy at all about it.
- I think it's a bunch of crap.
- It's handled by the local air quality district and they try to justify their existence by telling people not to burn.

Other

- It is a good program and convenient via the website to stay informed.
- I just saw something about it on Fox News, do not recall exactly what.
- Only can guess by its name.
- My husband is aware of the broadcast information.
- If they catch you, you get a fine. You only do it at night.

Source of Familiarity

- ✚ The vast majority of respondents are receiving their Check Before You Burn information from television (50%) and the newspaper (33%).

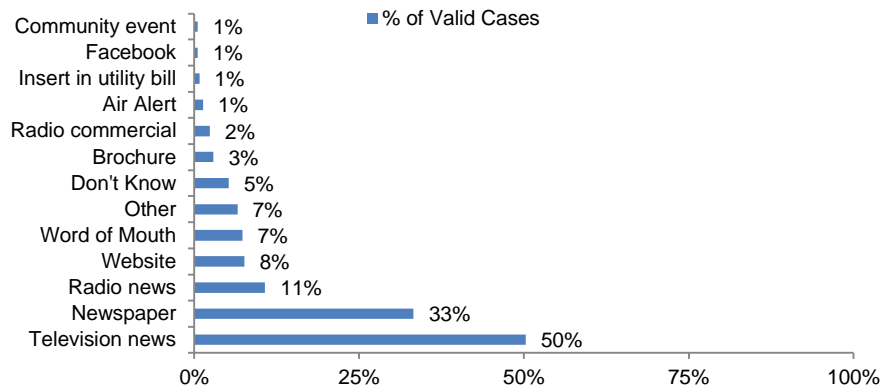
Another follow-up item asked respondents who said they felt somewhat or very familiar with the program:

"And where did you read, see, or hear about the program?"

Categories for coding responses are broader for specific awareness than for general awareness. They reflect the specific outlets used by SMAQMD for messaging. Figure 12 displays these results. Television news (50%) is the most cited source of media for feeling familiar with the program, followed by newspaper (33%). Dropping in prevalence, radio news

(11%), the website (8%), and word of mouth (7%) are the next most frequently cited sources of information.

Figure 12: Familiarity Media Source
[somewhat or very familiar with CBYB]



Respondents who said they were very familiar with the program (38%) were more likely to cite the newspaper as the source of information than respondents who said they were only somewhat familiar (28%). These respondents were also less likely to cite television (48%) news as a source of familiarity than those who were only somewhat familiar (58%). This is some evidence for a relationship between source of information and perceived familiarity. **Since perceived familiarity is related to reduction, it may be fruitful to explore how to increase familiarity using each outreach medium.**

Radio commercials are hardly cited as a source of familiarity with the program (2%). Radio commercials were the only type of paid broadcast advertising used by SMAQMD⁵ this Check Before You Burn season, but the media buy amount was minimal. **That radio commercials are not cited frequently as a source of familiarity with the program, and that increasing familiarity is related to reduced burning, is indication that re-evaluation of radio commercials as an outreach tactic is warranted.**

Awareness of Responsibility to Check Before You Burn

- ✚ The messaging is being received: two-thirds of respondents are aware of their responsibility to check before they burn.
- ✚ Burners and purposeful reducers are more likely to be aware of their responsibility to check than non-burners, non-reducers, and those who never burn.

A final awareness item explicitly probed respondents' awareness of their responsibility to check before they burn. Respondents who stated they are aware of this responsibility were asked where they learned of it. These two questions asked:

"And before today, did you know that it was your responsibility to check each day or night from November thru February to see if you were allowed to burn wood that day?"

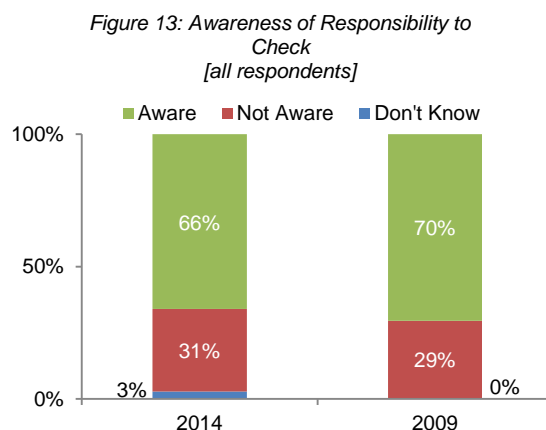
And

⁵ Email correspondence with Lori Kobza, Assoc. Communications & Marketing Specialist, SMAQMD, 05/08/14

"Where did you read, see, or hear about your responsibility to check?"

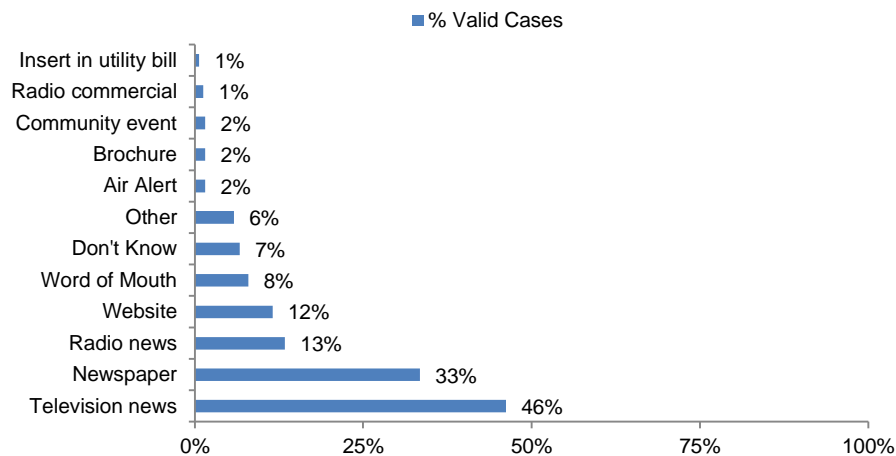
In total, 66% of respondents are aware of their responsibility to check before they burn. There are no significant differences between this 66% and the 70% of respondents from 2009 that were aware of their responsibility. This is shown in Figure 13.

Within the 2014 responses, two insightful interactions did arise. First, burners - respondents who burned at least once this year - are more likely to be aware of their responsibility to check (73%) than non-burners (60%). Second, respondents who reduced their burning because they were aware of messaging are more likely to be aware of their responsibility to check (87%) than non-reducers (64%) and those who never burned (54%). This is evidence that **the message is being received and the majority of respondents understand that it is their responsibility to check. However, many residents are still overlooking their responsibility.**



As with specific awareness, most respondents learned of their responsibility to check from television news (46%) and the newspaper (33%). Other frequently cited sources are radio news (13%), the website (12%), and word of mouth (8%). A small portion of respondents do not recall where they learned of their responsibility (7%).

Figure 14: Responsibility Awareness Media Source
[aware of responsibility]

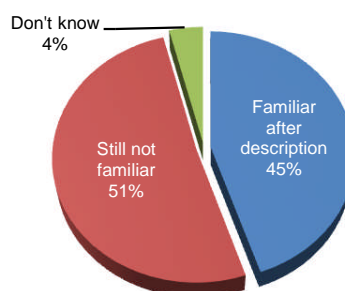


Familiarity After Description

- Of respondents who said they were unfamiliar with the program, 45% said that the program sounded familiar after they heard a brief description.

Respondents who said they were unfamiliar with the program heard a brief description and were asked again if it sounded familiar to them. Of those who originally said they were unfamiliar with Check Before You Burn (22%), **45% said that it sounds familiar once it was described to them.**

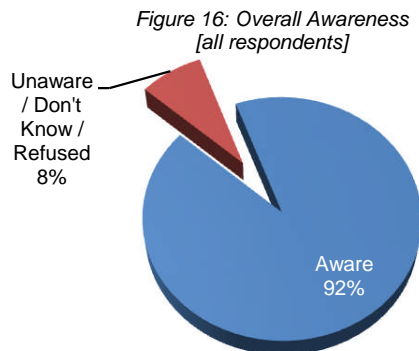
Figure 15: Familiarity after description of program
[of those unaware and unfamiliar]



Overall Awareness

- The program is reaching residents. Almost all respondents (92%) remember receiving no burn messaging, are at least somewhat familiar with the program, or can recall it after a brief description.

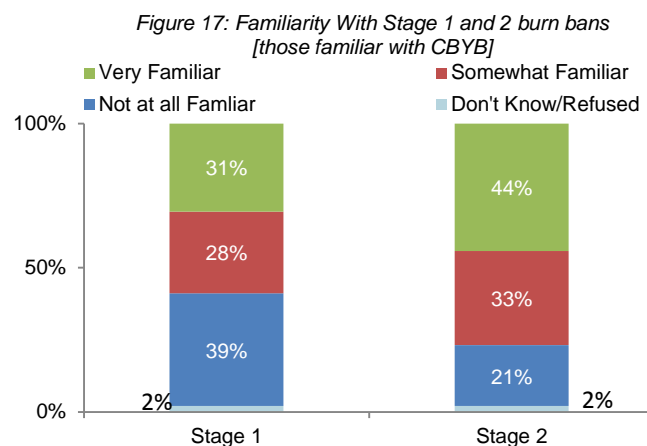
The requirements for being considered 'aware' are defined in the 2009 report. A respondent must have said that they heard, read or saw a message not to burn; or be somewhat or very familiar with the program; or have said that the program sounds familiar after hearing a brief description. By this definition, **nearly all respondents (92%) are aware of the program.**



Awareness of Different Levels of the Program

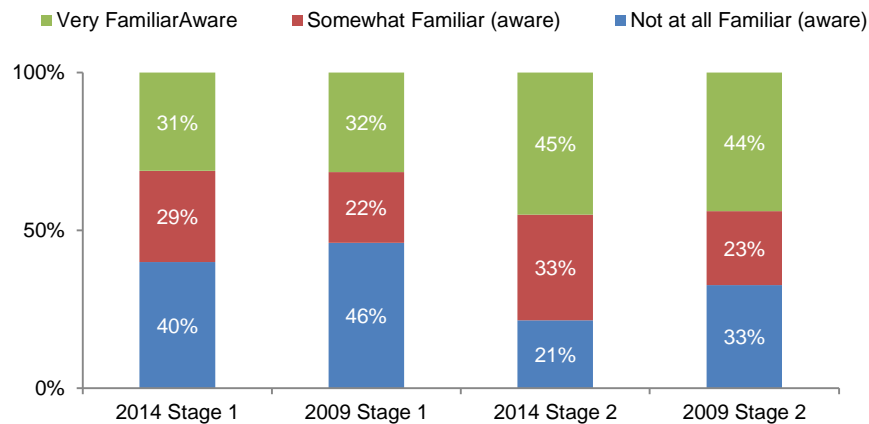
- The majority of respondents aware of the program in 2014 are at least somewhat familiar with Stage 1 (51% combined 'somewhat' and 'very' familiar) and Stage 2 (78% combined 'somewhat' and 'very' familiar) burn bans

The 2014 survey was revised from the wording of the 2009 survey to probe familiarity with Stage 1 'No burn unless exempt' and Stage 2 'All burning prohibited' burn bans instead of awareness because awareness does not necessarily translate to knowledge. Instead, the 2014 survey (Figure 16) asked how familiar respondents believe they are with each stage. This makes comparisons between the two survey years questionable, but still insightful. As such, comparisons are offered in Figure 17, but should be interpreted carefully.



The majority of respondents aware of the program in 2014 are at least somewhat familiar with Stage 1 (59% combined) and Stage 2 (78% combined) burn bans (Figure 16). As was the case in 2009, familiarity (awareness in 2009) with Stage 1 burn bans in 2014 is significantly lower than familiarity with Stage 2 burn bans. This reiterates the **need for educating residents on Stage 1, or, alternatively, eliminating this category to reduce confusion.**

Figure 18: Familiarity with Stage 1 and 2 burn bans - '09 & '14
[those familiar with CBYB. Undecided/refused excluded]



Following the procedure from the 2009 report, demographic indicators were determined by combining 'somewhat familiar' and 'very familiar' responses to create a truncated and simple 'familiar' response. Those who said they were not at all familiar remained in their own category. A series of Chi Square⁶ analyses were then conducted using each demographic variable to identify any significant patterns in the data. Some differences did arise. Most notably that respondents with five or more people in their household are less likely to be familiar with either Stage 1 or Stage 2, consistent with earlier awareness and familiarity measures on which they also showed a lack of knowledge. Below is list of unique identifiers in 2014 for those who are familiar with Stage 1 and Stage 2 bans respectively.

Stage 1

- Respondents with 5 or more people in their household are less likely than the rest of household sizes (45% vs. 60% average) to be familiar with Stage 1.
- Reducers are more likely to be familiar with Stage 1 (72%) than non-reducers (60%) or those who never burn (54%).

Stage 2

- Respondents with 5 or more people in their household are less likely than the rest of respondents to be at least somewhat familiar (68% vs 78% average) with Stage 2.
- Respondents aged 35-44 are less likely than the rest of respondents to be at least somewhat familiar (67% vs 78% average) with Stage 2.
- Hispanic/Latino respondents were less likely (64%) than the other respondents (79% average) to be familiar with Stage 2.
- Respondents with income ranging from \$40,000-100,000 (87% vs 79% average) are most likely to be familiar with Stage 2.

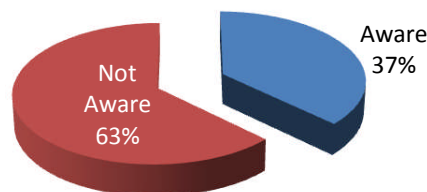
⁶ See "Analysis and Reporting" section of Methodology.

Awareness of Complaint Line

- ✚ 43% of respondents who completed the full survey (n=501) said that they are aware of the complaint line

Unique to this study is a recording of responses from a large number of unqualified respondents⁷. This method generated a larger sample pool from which awareness of the complaint line, used to alert the air district if illegal residential burning is spotted, can be determined. In total, we collected 1,155 responses from those who did not qualify (654) and those who completed the survey (501). **Of those 1,155 respondents, 37% said that they were aware of the complaint line** prior to being called by the interviewer.

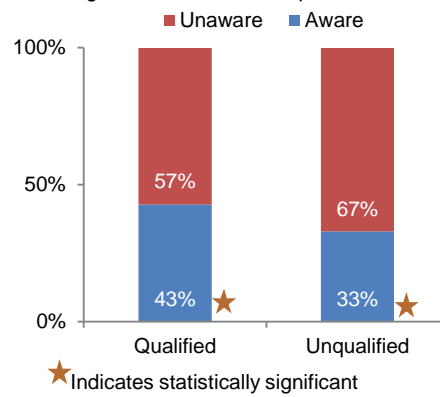
Figure 19: Aware of Complaint Line
[n = 1155]



In comparison, those respondents who completed the full survey are significantly more likely to be aware of the complaint line (43%) than those who did not qualify to participate in the full survey (33%). Another 1% of respondents refused to tell the interviewer whether or not they have the capability to burn wood. That Sacramento County residents who have wood or pellet burning devices are more aware of the complaint line is evidence that the campaign is working in multiple ways. Not only are residents receiving the message in general, but those who own devices are more aware that they could have a neighbor call District authorities, possibly imposing a sense of neighborly responsibility beyond that which they may already feel toward their environment.

⁷ To qualify, respondents must be over the age of 18, be considered a head of household, and have the capability to burn wood, pellets or manufactured logs in a fireplace, fireplace insert, outdoor fire pit, stove, or chiminea. The main reason respondents did not qualify for the survey was not having the capability to burn wood or pellets (92%) or only having a barbecue (7%).

Figure 20: Aware of Complaint Line



Compliance with Check Before You Burn

Summary

- ✚ The vast majority of respondents claim to never burn during Stage 1 bans (87%) and Stage 2 bans (91%).
- ✚ Reducers are reducing because of messaging and not just offering a socially desirable response.
- ✚ Compliance rates are significantly but only slightly better for Stage 1 days in 2014 compared to 2009, though not everyone is complying all the time.
- ✚ The best way to describe a complier is as a general Sacramento County resident.
- ✚ Of the 139 respondents who used their device, are aware of CBYB and are familiar with Stage 1 (or added as non-compliers for being completely unaware), 78% reportedly complied with all Stage 1 no burn days.
- ✚ Of the 176 respondents who use their device, are familiar with Check Before You Burn and Stage 2 (or added as a non-complier for being completely unaware), 80% reportedly complied with every Stage 2 no burn day.

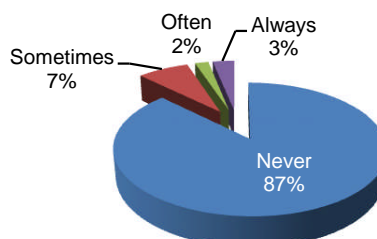
Compliance with Stage 1: 'No Burning Unless Exempt'

The 2014 survey also modified the phrasing and measurement of compliance items from the 2009 survey. The change was made to clarify the measurement units and make answering the question easier for respondents, resulting in more accurate responses. In the current study, compliance with Stage 1 burn bans was measured with the question:

"And how often did you burn wood, pellets, manufactured logs or other solid fuel on Stage 1 no burn days last winter? Would you say you never burned; burned sometimes, burned often or burned on all of them?"

Figure 20 displays the self-reported frequency of non-compliance with Stage 1 burn bans for respondents who said they were at least somewhat familiar with that stage. It can be seen that **the vast majority of respondents (87%) claim to never burn when burning is illegal**. A small percentage burned sometimes (perhaps on a holiday) when it was illegal. And very few burned illegally often (2%) or always (3%).

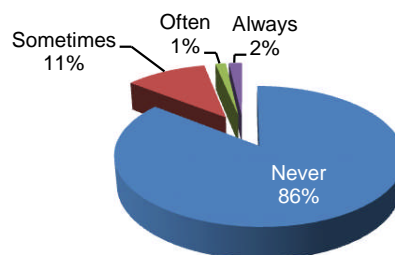
Figure 21: Frequency of Stage 1 Non-Compliance
[those familiar with Stage 1; excludes undecided/refused]



Compliance with Stage 1: Manufactured Logs

Because manufactured logs are often mistaken as safe to burn during Stage 1 burn bans, a question was added specifically regarding compliance during Stage 1 bans and burning manufactured logs. The majority of respondents who are aware of the program never burned manufactured logs during Stage 1 burn bans.

Figure 22: Non-compliance - Manufactured Logs
burning during Stage 1 Bans
[those familiar with Stage 1; excludes
undecided/don't know]



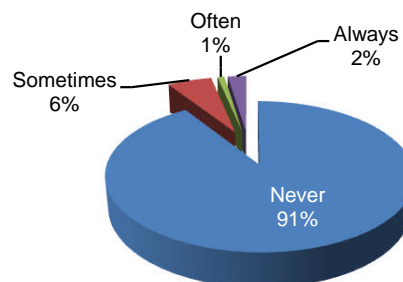
African-Americans were significantly more likely to burn manufactured logs 'sometimes' during Stage 1 bans (31% vs 11% average). Also, respondents earning \$20,000-40,000 annual income are more likely than the rest of the group to 'sometimes' burn manufactured logs during Stage 1 bans. However, no mean differences exist within any demographic, suggesting that overall, the best measure of compliance with manufactured logs during Stage 1 burn bans is the general Sacramento County resident.

Compliance with Stage 2: 'All Burning Prohibited'

- A huge majority of respondents (91%) who are at least somewhat familiar with Stage 2 burn bans never burned illegally on a Stage 2 day.

As with Stage 1 bans, a huge majority of respondents (91%) who are at least somewhat familiar with Stage 2 burn bans never burned illegally during a ban. Very few burned sometimes (6%), and even fewer burned often (1%) or always (2%) when burning was prohibited on a Stage 2 day.

Figure 23: Frequency of Stage 2 Non-Compliance
[Those familiar with Stage 2; excludes
undecided/refused]



Compliance Comparison: 2014 vs. 2009

- Compliance rates are significantly but only slightly better for Stage 1 days in 2014, though not everyone is complying all the time.

In 2014 the compliance items were phrased in the negative (i.e. "I never burned illegally"). In 2009 compliance items were phrased in the affirmative (i.e. "I complied with all days")⁸. To compare 2014 with 2009 compliance rates, the 'sometimes' and 'often' responses of 2014 were combined and recoded to be comparable to the 2009 "complied with at least one, but not all" option. The chart below shows how the 2014 responses were recoded to be consistent with the 2009 response options.

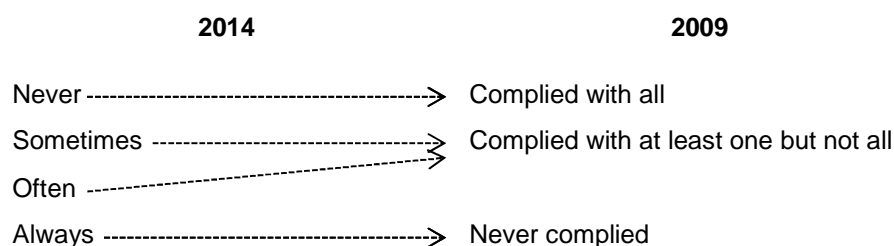
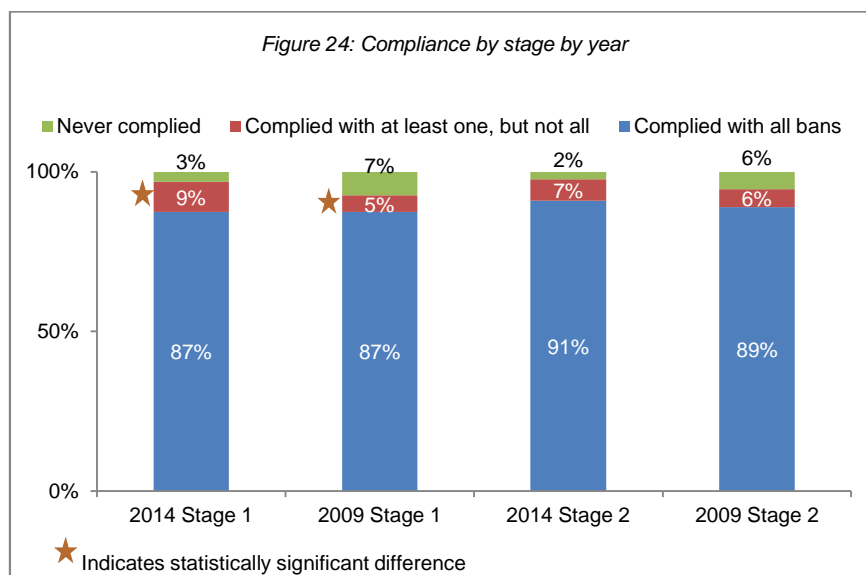


Figure 23 displays compliance rates by stage and year. Though compliance is relatively consistent between each stage and year, one significant difference is present. Respondents in 2014 are less likely than 2009 respondents to never comply with Stage 1 burn bans. That is, **compliance rates are significantly better for Stage 1, though not everyone is complying all the time.**



⁸ This was modified to create a more useful scale for statistical purposes.

Group Differences

Because the 2014 survey used an interval level measurement of compliance, ANOVA⁹ was employed to determine if there are any demographic predictors of compliance. For Stage 1 compliance, no significant differences arose between any groups, but one relationship did approach significance. Approaching significance is a term used when data suggest a relationship may exist between two variables but the relationship did not make the rigorous cut to be considered non-spurious, or beyond the realm of chance. Non-reducers approached significantly less compliance ($p = .15^{10}$), **indicating that reducers are in fact reducing because of messaging and not just offering a socially desirable response**. As noted, however, this relationship merely approaches significance and must be considered carefully.

In further support, for Stage 2 bans **a significant difference¹¹ between reducers¹² and non-reducers is present, such that non-reducers are less likely to comply with burn bans¹³**. No other relationships were significant.

In effect, that reducing burning predicts compliance with Stage 2 burn bans (and approaches significance for Stage 1) means respondents are being consistent, offering confidence in the accuracy of the data informing this analysis. It is clear that **the best way to describe a complier is as a general Sacramento County resident**.

Stage 1 Compliance Among Burners

- ✚ Of the 146 respondents who used their device, are aware of CBYB and are familiar with Stage 1 (or added as non-compliers for being completely unaware), 77% complied with all Stage 1 no burn days.

In order to conservatively estimate the effectiveness of program messaging, compliance is measured below among burners who are familiar with Check Before You Burn (somewhat or very familiar on Q5.3a; or yes on Q6) and who are familiar with the various stages (somewhat or very familiar on Q6.5 and Q6.6 respectively), including those who burned with an E.P.A. certified device. Additionally, any burner who was completely unaware of restrictions (no to Q6) was included as a non-complier¹⁴. While the compliance rates reported in the previous section reflect compliance of all respondents aware of the program overall, **the measure here serves as the most conservative estimate of compliance only among respondents who use their device**.

As shown in Figure 24, of the 146 respondents who said they used their device this winter, are familiar with Check Before You Burn (or added as a non-complier for being completely unaware), and are familiar with Stage 1, 77% complied with all Stage 1 no burn days. Dividing this group of success cases by the total number of burners (222) from the sample results in an estimated success rate. **Half (51%) of burners complied due to messaging**.

⁹ See "Analysis and Reporting" in Methodology section of this report for description of ANOVA.

¹⁰ p must be less than .05 for a researchers to be at least 95% sure that a difference is not due to chance. In this case, we're 85% sure a relationship exists between these non-reducers and compliance ($1.00 - .15 = .85$; $.85 \times 100\% = 85\%$).

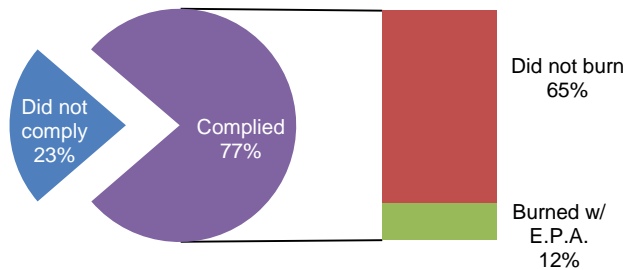
¹¹ See 'Statistical Significance' section of Methodology

¹² A reducer is defined in Wood Burning Activity as a respondent who reduced burning this year because they heard or saw messaging about burn bans.

¹³ $F(5, 464) = 10.096, p < .005$

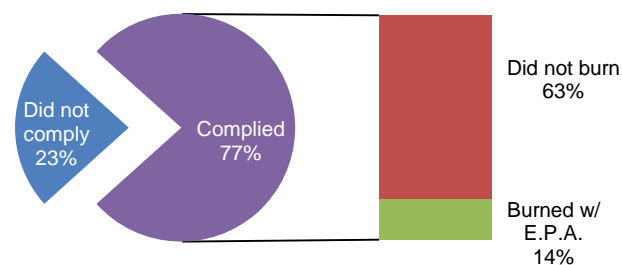
¹⁴ There were 20 respondents who were burners and completely unaware of restrictions.

Figure 25: Compliance of Aware Burners
[completely unaware burners considered non-compliers]



For manufactured logs specifically, compliance among aware burners is also 77% of all Stage 1 no burn days. That is, compliance rates for Stage 1 remain the same when considering only manufactured logs.

Figure 26: Stage 1 Compliance with Manufactured Logs of Aware Burners
[completely unaware burners considered non-compliers]

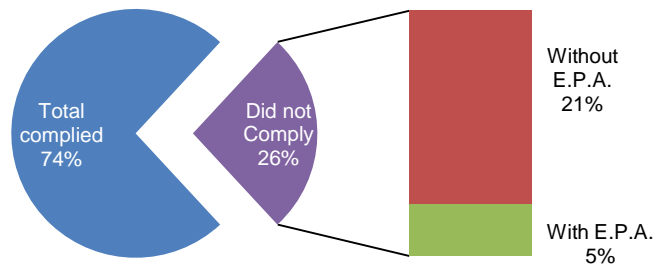


Stage 2 Compliance Among Burners

- Of the 183 respondents who use their device, are familiar with Check Before You Burn and Stage 2 (or added as a non-complier for being completely unaware), 80% complied with every Stage 2 no burn day.

The same formula as above directed the calculation of compliance with Stage 2 no burn days. Among the 176 respondents who used their device at least once, are familiar with Check Before You Burn (or added as a non-complier for being completely unaware) and are familiar with Stage 2, **74% complied with every Stage 2 no burn day**. Of the 26% who did not comply with every ban, 21% were burning without an E.P.A. certified device, while a final 5% burned using an E.P.A. certified device.

Figure XX: Stage 2 Compliance of Aware Burners
[completely unaware burners included as non-compliers]



Again by dividing this sample of success cases by the whole sample of burners, a relative success rate can be calculated. **For Stage 2 days, 61% of burners complied every time due to messaging.**

Conclusion

Respondents burned less this winter than a typical winter (55% of respondents burned less), and they did so in significantly greater proportion than in 2009 (45% of respondents burned less). Almost half of respondents (44%) who read, saw or heard a notice not to burn burned less because of the notice. That means 33% of respondents reduced their burning because of messaging.

Most respondents (74%) are aware of the messaging in a general sense. They can recall reading, seeing or hearing something telling Sacramento County residents not to burn wood, pellets or other solid fuel. Nearly the same portion of respondents (72%) is specifically familiar with the Check Before You Burn program.

While not all respondents (56% of respondents) can correctly describe the program in their own words, others who felt very familiar (43% of respondents) could define the program well, acknowledging the responsibility to check (20% of those very familiar), that there are no burn days (17% of those very familiar), and that the program is designed to protect air quality (10% of those very familiar).

The majority of respondents remembered seeing a notice not to burn on television (59%) or saw it in the newspaper (35%). The same is true for developing a sense of familiarity with Check Before You Burn. Most respondents got their information from television news (50%), or newspaper (33%).

Two-thirds of respondents (66%) say they are aware of their responsibility to check before they burn. As with their other information, television news (46%) and the newspaper (33%) were cited most often as where they learned about their responsibility to check. Since feeling familiar is related to reduction¹⁵, it may be fruitful to explore how to increase familiarity using each outreach medium, particularly those most cited as sources of information.

Awareness of each Stage 1 (59% combined 'somewhat' and 'very' familiar) and Stage 2 (78% combined 'somewhat' and 'very' familiar) no burn days was very high, and has increased since 2009.

Awareness of the complaint line also is high, with 43% of respondents who completed the survey aware of the complaint line. This means residents are aware that they could have a neighbor call District authorities, possibly imposing a sense of neighborly responsibility beyond that which they may already feel toward their environment

Overall, almost all respondents (92%) remember receiving no burn messaging, are at least somewhat familiar with the program, or can recall it after a brief description. This means the messaging is reaching audiences and penetrating. That 55% of respondents burned less this winter than a typical winter, and a quarter (25%) of them for air quality reasons, is also evidence that the messaging is working. However, it also means not everyone considers air quality their highest priority when making decisions about burning.

Nearly all respondents comply with both Stage 1 (84% never burn during a ban) and Stage 2 (91% never burn during a ban) no burn days. Rates lower dramatically when evaluated

¹⁵ See 'Source of Familiarity' section in Results & Conclusions.

specific to respondents who burned this winter, who are aware of Check Before You Burn and are aware of Stage 1 (51% complied) and Stage 2 (61% complied) days. Compliance with Stage 1 burn bans has increased significantly but only trivially since 2009 among all respondents (undecided/refused excluded), further evidence the messaging is penetrating and that messaging can work.

Appendix A

Demographics

Do you rent or own your home?

	Sample Size	501
Rent/Lease		15.97%
Own		82.24%
Live with others		0.20%
Don't Know/Refused		1.60%

How many people are living in your household?

	Sample Size	490
1		18.98%
2		43.67%
3		17.35%
4		11.02%
5 or more		8.98%
	Mean	2.47

Please stop me when I reach the category that includes your age.

	Sample Size	501
18-24		1.20%
25-34		3.79%
35-44		9.18%
45-54		19.76%
55-64		25.95%
65 & older		37.33%
Don't Know/Refused		2.79%

What is the highest level of education you have completed?

	Sample Size	501
High School or less		11.98%
Some college		23.35%
Trade or vocational school - no college		2.99%
College degree		36.93%
Post graduate degree		21.76%
Don't Know/Refused		2.99%

Do you currently subscribe to Air Alert email or text notifications?

	Sample Size	501
Yes		7.39%
No		90.62%

Please stop me when I reach the category that best describes your ethnic background

	Sample Size	501
African-American		6.59%
Asian/Pacific Islander		4.59%
Caucasian		70.86%
Hispanic/Latino		6.19%
Something else		5.59%
Don't Know/Refused		6.19%

please stop me when I read the category that best describes your TOTAL household income before taxes for 2013

	Sample Size	501
Under \$20,000		6.59%
\$20,000-\$40,000		13.97%
\$40,000-\$60,000		15.57%
\$60,000-\$100,000		20.36%
\$100,000+		20.96%
Don't Know/Refused		22.55%

Appendix B

Questionnaire

Final Approved - March 25, 2014

• INTRODUCTION •

Hello, my name is _____ from Meta Research, a public opinion research firm. We are conducting a survey about air quality issues facing our local area. This is not a solicitation and you will not be asked to buy anything.

IF A FEMALE ANSWERS: May I speak to the youngest adult male in your household who is presently at home and is considered to be a head of household?

[If NO MALE in household or none available] Are you considered to be a head of household? [IF YES, CONTINUE] Can YOU take time now for a confidential interview?

[If MALE] Are you considered to be a head of household? [IF YES, CONTINUE] Can YOU take time now for a confidential interview?

[IF NO HEAD OF HOUSEHOLD AVAILABLE, SCHEDULE CALL BACK TIME]

[IF NECESSARY: It should take approximately 10 minutes, depending on your responses.]

[IF NECESSARY: Everything you tell me will be completely confidential. You have the right to refuse to answer any question at any time. I can conduct the interview right now, or we can make an appointment for me to call you back at a more convenient time.]

[IF NECESSARY: We can share the name of sponsor at the end of the survey so as not to bias your responses.]

[IF NECESSARY: This is a research study and I'm only interested in your opinions as a Sacramento area resident. At no time will I try to sell you anything.]

• DATABASE INFORMATION •

DB1. ZIP Code (FROM SAMPLE):

• SCREENING QUESTIONS •

READ TO ALL

Thank you. This call may be monitored for quality control purposes.

[ASK ALL RESPONDENTS]

S1. What county do you live in?

[NOTE TO INTERVIEWER: If they say they live in the City of Sacramento, accept that as a YES and move on.]

- 1) Sacramento County [continue]
- 2) Any Other [THANK & TERMINATE]
- 3) Don't know/Refused

[ASK ALL RESPONDENTS]

S2. And in which city or community do you live within Sacramento County?

- | | | |
|-------------------|--------------------------|---------------------------|
| 1. Antelope | 13. Folsom | 25. McClellan park |
| 2. Clay | 14. Foothill Farms | 26. North Highlands |
| 3. Florin | 15. Franklin | 27. Orangevale |
| 4. Lemon Hill | 16. Freeport | 28. Parkway |
| 5. Rancho Murieta | 17. Fruitridge
Pocket | 29. Rancho
Cordova |
| 6. Arden-Arcade | 18. Galt | 30. Rio Linda |
| 7. Carmichael | 19. Gold River | 31. Rosemont |
| 8. Citrus Heights | 20. Herald | 32. Sacramento
City |
| 9. Courtland | 21. Hood | 33. Vineyard |
| 10. Elk Grove | 22. Isleton City | 34. Walnut Grove |
| 11. Elverta | 23. La Riviera | 35. Wilton |
| 12. Fair Oaks | 24. Mather | 36. Don't
Know/Refused |
- [THANK &
TERMINATE IF 36
OR NONE OF THE
ABOVE]

[ASK ALL RESPONDENTS]

S3a. And, do you have a wood-burning device in or outside your home; such as a fireplace, a wood or pellet stove; or an outdoor fire pit or chiminea [pronounced chee-men-A-uh]?

[NOTE TO INTERVIEWER: WE ARE LOOKING TO SPEAK WITH THOSE WHO HAVE THE CAPABILITY TO BURN WOOD OR PELLETS. INDOOR GAS UNITS AND OUTDOOR BARBEQUES OF ANY KIND DO NOT COUNT]

1. Yes (continue)
2. Yes but just a barbeque (volunteered) (THANK & TERMINATE)
3. No (THANK & TERMINATE)
- 8) Don't know (THANK & TERMINATE)
- 9) Refused (THANK & TERMINATE)

[ASK PRIOR TO TERMINATION IF S3a IS 2; 3; 8; OR 9]

T1. Are you aware of the complaint line to call to alert the Sacramento Air District if you see a neighbor burning on a day when burning is prohibited?

1. Yes (THANK AND TERMINATE)
2. No (THANK AND TERMINATE)

[ASK IF S3a =1]

S3b. And what wood-burning device or devices do you have? (Interviewer record all that apply: multi-punch)

- 1) Indoor fireplace (burns wood, pellets, or logs – NOT gas)
- 2) Fireplace insert
- 3) Wood or pellet stove
- 4) Outdoor wood burning fire pit
- 5) Chimenea [pronounced chee-men-A-uh]
- 6) Outdoor Barbeque: [Thank and Terminate if this is the ONLY device]
- 8) Don't know (VOLUNTEER)
- 9) Refused

[ASK PRIOR TO TERMINATION IF S3b IS 6]

T1. Are you aware of the complaint line to call to alert the Sacramento Air District if you see a neighbor burning on a day when burning is prohibited?

1. Yes (THANK AND TERMINATE)
2. No (THANK AND TERMINATE)

[ASK IF S3b=1]

S3c. Is burning wood or pellets the only possible way to heat your home or can you heat it with another permanent heat source?

- 1) Wood-burning is the only heat source [THANK & TERMINATE]
- 2) Other sources available to heat home [CONTINUE]
- 8) Don't know / Undecided [VOLUNTEERED] [THANK & TERMINATE]
- 9) Refused [VOLUNTEERED] [THANK & TERMINATE]

[ASK PRIOR TO TERMINATION IF S3c IS 1; 8; or 9]

T1. Are you aware of the complaint line to call to alert the Sacramento Air District if you see a neighbor burning on a day when burning is prohibited?

- 1) Yes (THANK AND TERMINATE)
- 2) No (THANK AND TERMINATE)

[ALL RESPONDENTS]

S4. [BY OBSERVATION] Gender [QUOTAS: 50/50 SPLIT]

- 1) Female
- 2) Male

[ALL RESPONDENTS]

S5. [BY OBSERVATION] Language

- 1) English
- 2) Spanish

• SURVEY BEGINS •

• AIR QUALITY ISSUES •

[ASK ALL RESPONDENTS]

1.1 Now, I'd like to talk about air quality issues in the Sacramento area. Using the scale, not at all[1], somewhat[2], or very unhealthy[3], how would you rate the contribution to WINTERTIME air pollution caused by _____ in the Sacramento area?

[IF NECESSARY: And by winter, I mean from November through February? [FOR NEXT: And how would you rate the seriousness of WINTERTIME air pollution caused by ____?]

[CATEGORIES FOR CODING]

- 1) Not at all unhealthy
- 2) Somewhat unhealthy
- 3) Very unhealthy
- 8) Undecided/Don't know [VOLUNTEERED]
- 9) Refused

RANDOMIZE

- a. traffic
- b. industry

- c. agricultural burning
- d. residential wood burning fireplaces

• WOOD BURNING ACTIVITY •

[ASK ALL RESPONDENTS]

4.0 Now let's talk about this past winter, that is, from last November through February. In general, would you say you burned wood, pellets, or manufactured logs ____ [READ LIST]

- 1) Less than once a week
- 2) About once a week
- 3) Two or three times a week
- 4) Mainly on weekends
- 5) Mainly on Holidays
- 6) Not at all

- 8) Other
- 9) Don't know/Undecided [VOLUNTEERED]
- 10) Refused [VOLUNTEERED]

[ASK ALL RESPONDENTS]

4.1 And in general would you say you burned less, the same, or more wood, pellets or manufactured logs this past winter as compared with a typical winter?

[Interviewer: This includes both indoor and outdoor devices]

- 1) Less
- 2) Same
- 3) More
- 8) Don't know/Undecided [VOLUNTEERED]

- 9) Refused [VOLUNTEERED]

[ASK if 4.1 = 1; OR 3]

4.2 Could you tell me the main reason why? Open ended.

- 50) Other [SPECIFY]
- 97) Don't know/Undecided [VOLUNTEERED]
- 99) Refused [VOLUNTEERED]

• AWARENESS OF PM POLLUTION& NO BURN •

[ASK ALL RESPONDENTS]

5.0 During this past WINTER, did you hear, read, or see anything informing residents not to use their wood burning fireplaces or outdoor fire pits because of poor air quality?

[IF NECESSARY: Again by winter, I'm talking about November through February.]

- 1) Yes
- 2) No

- 8) Don't know/Undecided [VOLUNTEERED]
- 9) Refused [VOLUNTEERED]

[ASK IF 5.0=1]

5.1 And where did you read, see or hear this information?

CATEGORIES FOR CODING

- 1) Facebook
- 2) Twitter
- 3) Website
- 4) Air Alert email
- 5) Air Alert text message
- 6) Newspaper
- 7) Television
- 8) Radio
- 9) Word of Mouth
- 10) Other (Specify)
- 11) Don't Know
- 12) Refused

[ASK IF 5.0=1]

5.2 And did you reduce the number of fires you burned last winter because you heard or saw a notice not to burn wood?

[IF NECESSARY: Again by winter, I'm talking about November through February.]

- 1) Yes
- 2) No
- 3) Yes – received an Air Alert [VOLUNTEERED]
- 4) Never burned
- 8) Don't know/Undecided [VOLUNTEERED]
- 9) Refused [VOLUNTEERED]

[ASK ALL RESPONDENTS]

5.3a How familiar would you say you are with the Check Before You Burn program? Would you say Not at all familiar, somewhat familiar, or very familiar?

- 1) Not at all familiar
- 2) Somewhat familiar
- 3) Very familiar
- 8) Don't know [VOLUNTEERED]
- 9) Refused [VOLUNTEERED]

[ASK IF 5.3a = 2 OR 3]

5.3b And where did you read, see, or hear about the program?

- 1) Facebook
- 2) Twitter
- 3) Instagram
- 4) Website
- 5) Air Alert
- 6) Newspaper
- 7) Brochure
- 8) Community event (Scooter mascot)
- 9) Television news
- 10) Radio news
- 11) Radio commercial
- 12) Outdoor billboard
- 13) Insert in utility bill

- 14) Word of mouth
- 15) Other (Specify)

- 16) Don't Know
- 17) Refused

[ASK ALL RESPONDENTS]

5.3c Can you briefly describe what you know of the program? OPEN-ENDED RESPONSE

[RECORD RESPONSE]

[ASK ALL RESPONDENTS]

5.4a And before today, did you know that it was your responsibility to check EACH DAY OR NIGHT from November thru February to see if you were allowed to burn wood that day?

- 1) Yes
- 2) No
- 8) Undecided/Don't know [VOLUNTEERED]
- 9) Refusal [VOLUNTEERED]

[ASK IF 5.4a = 1]

5.4b And where did you read, see, or hear about your responsibility to check?

- 1) Facebook
- 2) Twitter
- 3) Instagram
- 4) Website
- 5) Air Alert
- 6) Newspaper
- 7) Brochure
- 8) Community event (Scooter mascot)
- 9) Television news
- 10) Radio news
- 11) Radio commercial
- 12) Outdoor billboard
- 13) Insert in utility bill
- 14) Word of mouth
- 15) Other (Specify)
- 16) Don't Know
- 17) Refused

• AIDED AWARENESS & COMPLIANCE •

[READ if 5.3a=1, 8, or 9]

You may or may not have heard that in Sacramento County, it has been law since 2007 that from November to February residents and businesses are prohibited from using indoor or outdoor fireplaces, wood stoves, firepits and chimineas that burn wood, pellets, manufactured logs or any other solid fuel on days when air quality is forecast to be unhealthy to breathe. It is your responsibility to Check Before You Burn, to see if it is permissible to light a fire.

[ASK IF 5.3a = 1] ¹⁶

6.0 Does this now sound familiar to you?

CATEGORIES FOR CODING:

1) Yes

2) No

8) Undecided/Don't know [VOLUNTEERED]

9) Refusal [VOLUNTEERED]

[ASK ALL RESPONDENTS WHO ARE FAMILIAR (YES TO 5.2 OR SOMEWHAT, VERY FAMILIAR TO 5.3a, OR YES TO 6.0)] ¹⁷

6.1 There are two types of no burn days in the Check Before You Burn program, but you may not be familiar with them. I am going to read you a brief description of each stage and ask if you are familiar with that level, using the scale not at all, somewhat, or very familiar.

[ASK ALL RESPONDENTS WHO ARE FAMILIAR (YES TO 5.2 OR SOMEWHAT, VERY FAMILIAR TO 5.3a, OR YES TO 6.0)] ¹⁷

6.5 The first No Burn level is called Stage 1 – No Burn Unless Exempt. At this level, burning is prohibited unless EPA certified wood burning or pellet stove are used. How familiar are you with this No Burn Unless Exempt level?

1) Not at all a familiar

2) Somewhat familiar

3) Very familiar

8) Don't know [VOLUNTEERED]

9) Refused [VOLUNTEERED]

[AMONG THOSE WHO WERE FAMILIAR WITH STAGE 1]

6.5a And how often did you burn wood, pellets, manufactured logs or other solid fuel on Stage 1 no burn days last winter? Would you say you never burned; burned sometimes; burned often or burned on all of them?

[IF NECESSARY: In other words, how many times did you hear the Stage 1 burn ban and then decide not to burn because of the alert.]

[IF NECESSARY: Last winter was from Nov 2013 to Feb 2014]

[IF NECESSARY: This is an anonymous, confidential survey and your response will not be associated with your telephone number, but grouped with other responses and reported as a percentage.]

¹⁶ In future versions, this coding language should be corrected to read "Ask if 5.3a = 1, 8 or 9."

¹⁷ In future versions, this coding language should be corrected to read "Ask all respondents who are familiar (yes to 5.0 or somewhat, very familiar to 5.3a, or yes to 6.0.)"

- 1) None
- 2) Sometimes
- 3) Often
- 4) All of them

- 8) Undecided/Don't know [VOLUNTEERED]
- 9) Refusal [VOLUNTEERED]

[ASK ALL RESPONDENTS]

6.5b Thinking just about manufactured logs, would you say that you burned them during Stage 1 burn bans never; burned sometimes; burned often or burned on all of them?

- 1) Never
- 2) Sometimes
- 3) Often
- 4) Always

- 8) Undecided/Don't know [VOLUNTEERED]
- 9) Refusal [VOLUNTEERED]

[IF NECESSARY: In other words, how many times did you hear the Stage 1 burn ban and then decide not to burn manufactured logs because of the alert.]

[IF NECESSARY: Last winter was from Nov 2013 to Feb 2014]

[IF NECESSARY: This is an anonymous, confidential survey and your response will not be associated with your telephone number, but grouped with other responses and reported as a percentage.]

[ASK ALL RESPONDENTS WHO ARE FAMILIAR (YES TO 5.2 OR SOMEWHAT, VERY FAMILIAR TO 5.3a, OR YES TO 6.0)]¹⁸

6.6 The final level is Stage 2- All Burning Prohibited. At this level you are not allowed to burn any solid fuel, including wood, manufactured logs and pellets. How familiar are you with this All Burning Prohibited level?

- 1) Not at all familiar
- 2) Somewhat familiar
- 3) Very familiar

- 8) Don't know [VOLUNTEERED]
- 9) Refused [VOLUNTEERED]

[AMONG THOSE WHO WERE FAMILIAR WITH STAGE 2]

6.6a And how often did you burn wood, pellets, manufactured logs or other solid fuel on Stage 2 - All Burning Prohibited days last winter? Would you say you never burned; burned sometimes; burned often or burned on all of them?

[IF NECESSARY: In other words, how many times did you hear the Stage 2 alert and then decide not to burn because of the alert.]

[IF NECESSARY: Last winter was from Nov 2013 to Feb 2014]

[IF NECESSARY: This is an anonymous, confidential survey and your response will not be associated with your telephone number, but grouped with other responses and reported as a percentage.]

¹⁸ In future versions, this coding language should be corrected to read "Ask all respondents who are familiar (yes to 5.0 or somewhat, very familiar to 5.3a, or yes to 6.0.)"

- 1) None
- 2) Sometimes
- 3) Often
- 4) All of them

- 8) Undecided/Don't know [VOLUNTEERED]
- 9) Refusal [VOLUNTEERED]

[ASK ALL RESPONDENTS]

6.8 Do you have an Environmental Protection Agency certified wood burning fireplace or pellet burning stove?

- 1) It is certified
- 2) Not certified

- 8) Don't know [VOLUNTEERED]
- 9) Refusal [VOLUNTEERED]

[ASK ALL RESPONDENTS]

6.9 Are you aware that you can apply for a sole source of heat or economic hardship waiver to be considered exempt from burn bans if you are approved by the Air District based on necessity?

- 1) Yes
- 2) No

- 8) Don't Know/Undecided (Volunteered)
- 9) Refused (Volunteered)

[ASK ALL RESPONDENTS]

7.0 Are you aware of the complaint line to call to alert the Sacramento Air District if you see a neighbor burning on a day when burning is prohibited?

- 1. Yes
- 2. No

• **DEMOGRAPHICS** •

[ASK ALL RESPONDENTS]

Now just a few final questions for statistical purposes...

[ASK ALL RESPONDENTS]

8.1 Do you rent or own your home?

- 1) Rent/Lease
- 2) Own
- 3) Live with others [VOLUNTEERED]
- 9) Non-response (Don't know/Refused)

[ASK ALL RESPONDENTS]

8.4 How many people are living in your household?

- 1) Live alone
- 2) 2
- 3) 3
- 4) 4
- 5) 5 or more
- 9) Non-response (Don't know/Refused)

[ASK ALL RESPONDENTS]

8.5 Please stop me when I reach the category that includes your age.

[READ CHOICES]

- 1) 18 – 24
- 2) 25 – 34
- 3) 35 – 44
- 4) 45 – 54
- 5) 55 – 64
- 6) 65 & older
- 9) Non-response (Don't know/Refused)

[ASK ALL RESPONDENTS]

8.6 What is the highest level of education you have completed?

- 1) High school or less
- 2) Some college
- 3) Trade or vocational school – no college
- 4) College degree
- 5) Post graduate degree
- 9) Non-response (Don't know/Refused)

[ASK ALL RESPONDENTS]

8.7 Do you currently subscribe to Air Alert email or text notifications?

- 1) No
- 2) Yes
- 9) Non-response (Don't know/Refused)

[ASK ALL RESPONDENTS]

8.8 Please stop me when I reach the category that best describes your ethnic background. [NOTE: ORDER IS ALPHABETICAL]

- 1) African-American
- 2) Asian/Pacific Islander
- 3) Caucasian
- 4) Hispanic/Latino
- 5) Something else [CAPTURE RESPONSE]
- 9) Non-response (Don't know/Refused)

[ASK ALL RESPONDENTS]

8.9 And finally, please stop me when I read the category that best describes your TOTAL household income before taxes for 2013.

- 1) Under \$20,000
- 2) \$20,000 to less than \$40,000
- 3) \$40,000 to less than \$60,000
- 6) \$60,000 or to less than \$100,000
- 7) \$100,000 or more
- 9) Non-response (Don't know/Refused)

That's the end of our survey. This has been a confidential interview conducted by _____ at Meta Research. You may be called by someone from Meta Research to verify that this interview was conducted. May I please have just your first name for verification purposes [RECORD]? Thank you very much for your time and have a good evening

**If asked, this survey is being conducted for
Sacramento Metropolitan Air Quality Management District**