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Attitude Survey among Participants in the Gas Network's Tankless Water Heater Program

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1 Executive Summary

This report summarizes the results of a telephone survey of participants in the Gas Network's Tankless Water Heater Program. NMR conducted a total of 101 interviews between September 12 and September 19, 2006 with households that had participated in the Gas Network's Tankless Water Heater Program between March 1, 2005 and August 31, 2006.

Respondents most frequently first found out about tankless water heaters from family, friends, neighbors, co-workers or other acquaintances (20% of respondents), followed by the gas company website (14%), and a contractor or plumber (13%). (See Table 3-9 for more details)

Over half of all respondents (54%) are motivated to purchase a tankless water heater by saving energy or gas and 21% are motivated by saving money or lower gas bills. Others are motivated by never running out of hot water (13%) and saving space (13%).¹ (Table 3-10)

Overall, respondents are very satisfied with their tankless water heaters and with the various aspects of their tankless water heaters; a majority of respondents are extremely satisfied or satisfied with all aspects of their water heaters. (Table 3-12) For example, 85% of respondents are extremely satisfied with the length of time they can use hot water without running out, 76% are extremely satisfied with the amount of hot water that comes out of the faucet, and 59% are extremely satisfied with the ability to use hot water for more than one purpose. While 82% of respondents are satisfied or extremely satisfied with the time it takes for hot water to come out of the faucet, 17% are dissatisfied.

Satisfaction with the tankless water heater may be associated with the distance between the water heater and the primary faucet or appliance to which it supplies hot water. For example, respondents who report that their tankless water heater is either closer to or the same distance from the primary faucet or appliance using hot water are more likely to be satisfied with the overall performance of the water heater (72% and 76%, respectively, are extremely satisfied compared to 38% among those whose water heaters are farther away) and the amount of time it takes hot water to come out of the faucet (100% and 85%, respectively, are satisfied or extremely satisfied vs. 56% among those whose water heaters are farther away). (Table 3-13) Similarly, respondents who installed their water heater in a utility closet, bathroom or hallway are more likely to be satisfied with the overall performance of the water heater (100% extremely satisfied) and with the time it takes hot water to come out of the faucet (54% extremely satisfied) than those who installed their water heater in the basement, garage or attic (61% extremely satisfied with overall performance and 16% extremely satisfied with the time it takes hot water to come out of the faucet).² (Table 3-14)

¹ There are several modest associations between motivations for purchasing a tankless water heater and demographic characteristics. For example, respondents with annual household incomes over \$100,000 appear slightly more likely to cite saving energy or money than respondents with annual household incomes below \$100,000 (75% and 66% of respondents, respectively). (see Table 3-11 for more details)

² There are several modest associations between satisfaction with the tankless water heater and demographic characteristics. For example, respondents from households of five or more people appear to be more satisfied with gas and water savings than respondents from smaller households. (see Table 3-17 for more details)

When asked to name in their own words the characteristic with which they are most satisfied, nearly one in three respondents (30%) cite savings on natural gas bills, followed by the length of time they can run hot water without running out (23%), and space savings (11%). (Table 3-18) Respondents most commonly cite the time it takes hot water to come out of the faucet as the characteristic with which they are most dissatisfied (34% of respondents), followed by length of time they can run hot water without running out (7%), reliability (6%) and cost (5%). (Table 3-19) Twenty five percent report that they are not dissatisfied with anything.

Over 90% of respondents have one water heater (the tankless water heater) in their homes. Of the eight percent of households with multiple water heaters, only one (one home) has a water heater with a storage tank. Ninety percent of respondents replaced a storage tank water heater with their tankless water heater.

The tankless water heater provides hot water to bathtubs and showers, bathroom sinks, kitchen sinks, dishwashers and clothes washers for nearly all respondents (92% to 99%), and it provides hot water to utility sinks for 42% of respondents and Jacuzzis or whirlpools for 26% of respondents. (Table 3-28) Seventy one percent of respondents use the most hot water from their tankless water heater for bathtubs and showers, while 12% and 6% use the most hot water for the clothes washer or dishwasher, respectively. (Table 3-33) Seventy five percent of respondents estimate that they now use about the same amount of hot water as when they had a storage tank water heater.

More than four out of five (83%) tankless water heaters are located in basements and 11% are in utility closets. Tankless water heaters are commonly located close to the location of the storage tank water heater they replaced, with 88% located within 20 feet of the old water heater. Sixty percent of tankless water heaters are about the same distance from the primary use of hot water as the storage tank water heater they replaced. Slightly more tankless water heaters are closer than the old water heater to the primary use of hot water (20%) than are farther away (18%).

Participants in the Gas Network's Tankless Water Heater Program predominantly live in single family homes that are under 4,000 square feet in size, are middle aged (between 35 and 64 years of age), have moderate to high annual household incomes,³ are well educated,⁴ and live in households with four or fewer people.

³ According to the 2000 Census, the median annual household income in Massachusetts in the 2000 was \$50,502. Of those answering the question, 13% percent of respondents had annual household incomes below \$50,000, whereas 87% had annual household incomes of \$50,000 or higher. (see Table 3-4)

⁴ Respondents, as a group, have achieved higher levels of education than the general population of Massachusetts. Over half of all respondents have completed a four year college degree or beyond while approximately one-third of Massachusetts residents have achieved the same level of education. (see Table 3-3)

2 Introduction and Methodology

This report summarizes interviews with participants of the Gas Network's Tankless Water Heater Program to help assess consumer reactions to the tankless water heaters. Respondents—all recent purchasers of tankless water heaters—were asked questions on a number of topics, including:

- Sources of awareness of tankless water heaters
- Motivations for purchasing tankless water heaters
- Satisfaction with the performance of and various features of the tankless water heater
- Changes in behavior since installing the tankless water heater
- Connected water load to the tankless water heater
- Other water heaters and their connected water heater
- Location of the tankless water heater
- Type and size of home
- Demographics, including number of and ages of household occupants, household income and education level of respondent

NMR conducted a total of 101 interviews between September 12 and September 19, 2006 with households that had participated in the Gas Network's Tankless Water Heater Program between March 1, 2005 and August 31, 2006.

The report presents NMR's findings from the interviews and is organized as follows:

- Demographic Characteristics of Respondents
- Awareness of Tankless Water Heaters
- Motivations for Purchasing a Tankless Water Heater
- Satisfaction with Tankless Water Heater
- Water Use and Water Load of Respondents
- Location of Tankless Water Heater

3 Program Participant Interviews

3.1 Demographic Characteristics of Respondents

Respondents predominantly live in single family homes that are under 4,000 square feet in size, are middle aged (between 35 and 64 years of age), have moderate to high annual household incomes, are well educated, and live in households with four or fewer people. For context, the demographic characteristics of survey respondents are compared to the demographic characteristics of residents of Massachusetts.

Nearly 90% of respondents live in single family homes, whereas slightly more than 50% of Massachusetts residents reside in single family homes. (Table 3-1)

Table 3-1: Type of Residence

Type of home	Survey Respondents (Frequency)	Massachusetts, per census 2000 (percentage)
Single family	87	52%
Two- to four-family building	9	23%
Town or row house	3	4%
Other	1	n/a
Refused	1	n/a
Total	101	100%

Over three-quarters of respondents are between the ages of 35 and 64 while 53% of Massachusetts residents are in the same age range. (Table 3-2)

Table 3-2: Age Category of Respondent

Age	Survey Respondents (Frequency)	Massachusetts, per census 2000 (percentage) ⁵
25 to 34	2	20%
35 to 44	21	23%
45 to 54	29	19%
55 to 64	26	12%
65 or over	16	18%
Refused	7	n/a
Total	101	100%

⁵ Census population age category figures were adjusted to reflect the percentage of the population over the age of 20; the survey was limited to respondents 18 years or older.

Respondents are more likely to have achieved higher levels of education than the general population as over half of all respondents have completed a four year college degree or beyond while approximately one-third of Massachusetts residents have the same level of education. (Table 3-3)

Table 3-3: Level of Education

Level of Education	Survey Respondents (Frequency)	Massachusetts, per census 2000 (percentage)⁶
Less than high school	1	15%
High school graduate	13	27%
Technical or trade school graduate	2	n/a
Some college	13	17%
Two-year college graduate	11	7%
Four-year college graduate	20	20%
Some graduate or professional school	8	n/a
Graduate or professional degree	28	14%
Refused	5	n/a
Total	101	100%

Respondents are more likely to have annual household incomes over \$100,000 and less likely to have annual household incomes below \$50,000 compared to the general population. (Table 3-4)

Table 3-4: Annual Household Income Level

Income	Survey Respondents (Frequency)	Massachusetts, per census 2000 (percentage)
Less than \$50,000	8	49%
\$50,000 to \$74,999	15	20%
\$75,000 to \$99,999	12	13%
\$100,000 or more	28	18%
Refused	38	n/a
Total	101	100%

⁶ Level of education for census 2000 data is based on the population aged 25 years or older.

Respondents are more likely to reside in larger homes than the general population. While approximately one-third of all respondents live in a home that is over 2,500 square feet in size, only 9% of the general population lives in homes of that size.⁷ (Table 3-5)

Table 3-5: Size of Home (in square feet)

Size of home (square feet)	Survey Respondents (Frequency)	Massachusetts, per census 2000 (percentage) ⁸
Less than 1,000	4	16%
1000 - 1,499	13	15%
1,500 - 1,999	25	38%
2,000 - 2,499	24	22%
2,500 - 2,999	12	9% ⁹
3,000 - 3,999	9	n/a
4,000 - 4,999	7	n/a
5,000 - 7,999	2	n/a
8,000 - 9,999	1	n/a
10,000 or more	2	n/a
Don't know/Refused	2	n/a
Total Respondents	101	100%

⁷ If a respondent could not estimate the size of their home in square feet they were asked to estimate the number of rooms in their home, excluding bathrooms. Eighteen respondents could not estimate the square footage of their home, sixteen of whom were able to estimate the number of rooms in their home. Responses ranged from 5 to 11 rooms; a value of 300 square feet per room was used to estimate the square footage of the home.

⁸ The U.S. census does not report size of housing in square feet, but it does report size of housing by number of rooms. A value of 300 square feet per room was used to estimate the square footage of the home.

⁹ The U.S. Census reports the largest number of rooms as "9 or more."

Nearly 50% of respondents live in a household with one or two people while 60% of Massachusetts residents reside in the same sized households. (Table 3-6)

Table 3-6: Household Size and Characteristics

Number of Members of the Household	Number of Households	Size of Household, Massachusetts, per census 2000 (percentage)
1	11	28%
2	38	32%
3	12	16%
4	20	14%
5	6	6%
6	1	2%
7	2	1% ¹⁰
8	1	n/a
12	1	n/a
Refused	9	n/a
Total	101	100%

¹⁰ The U.S. Census reports a largest household size of “7 or more.”

Respondents most commonly reside in households with someone 35 years or older. Over 60% of households do not have someone 17 years old or younger in the household, and nearly 80% of households do not have someone between the ages of 18 and 34 residing in the household.

(Table 3-7)

Table 3-7: Household Characteristics by Age Category

Number of Members of the Household	Age Category (Frequency)			
	17 or Younger	18 to 34	35 to 54	55 or older
1	10	11	30	20
2	16	4	31	22
3	7	3	0	1
4	1	1	0	1
5	0	0	2	0
6	0	1	0	0
7	0	0	0	0
8	0	0	0	0
12	0	0	0	0
No members of household in age category	63	77	35	53
Refused	4	4	4	4
Total	101	101	101	101

Over two-thirds of respondents are male compared to 48% of the general population. Because we interviewed the member of the household responsible for making the decision to purchase a tankless water heater, the higher proportion of male respondents may indicate that males are likely to make the decisions to purchase tankless water heaters. (Table 3-8)

Table 3-8: Gender of Respondent

Gender	Survey Respondents (Frequency)	Massachusetts, per census 2000 (percentage)
Male	66	48%
Female	35	52%
Total	101	100%

3.2 Awareness of Tankless Water Heaters

Respondents most frequently first found out about tankless water heaters from family, friends, neighbors, co-workers or other acquaintances, followed by the gas company website, and a contractor or plumber. (Table 3-9) These are also the most common secondary sources of information overall, along with radio or television programs.

Table 3-9: Where Respondents Heard About Tankless Water Heaters

Information Source	First Source	All sources (multiple response)
Friend/family/neighbor/acquaintance/co-worker	20	25
The gas company website; the tankless water heater program website	14	25
Contractor or plumber (personal contact)	13	13
Radio or television program	9	16
Advertisement by contractor or plumber	7	8
Bill stuffer, information in the mail from the utility/gas company	5	8
Magazine article	5	7
Advertisement by the gas company	5	9
Advertisement by manufacturer	4	6
Living or traveling in Europe; foreign country	4	6
Occupation; work(ed) with appliances	3	3
Newspaper article	2	3
Internet	2	3
Utility representative	1	1
Visiting another state	1	1
Don't know	6	18
Total Respondents	101	101

3.3 Motivations for Purchasing a Tankless Water Heater

When asked why they considered purchasing a tankless water heater, over half of all respondents reply that it was to save energy or gas and one in five say it was to save money or lower gas bills. (Table 3-10) Other commonly cited reasons include never running out of hot water and saving space.

Table 3-10: Reasons for Purchasing Tankless Water Heater (Multiple Response)

Reasons	Frequency
Saving energy/gas; using less energy/gas	55
Saving money; lower gas bills	21
Never running out of hot water; hot water whenever needed	13
To save space	13
Tank will not rust/corrode and leak; no flooding	8
Instant/instantaneous hot water	6
Less maintenance; water heater will not break down	4
Getting the latest technology	3
Other	4
Don't know	2
Total Respondents	101

Demographic analyses show that there are no strong associations between motivations for purchasing a tankless water heater and demographic characteristics such as household income, age of respondent, household size and size of the respondent's home. However, there are several modest associations. (Table 3-11) Respondents with household incomes over \$100,000 are slightly more likely to say they were motivated by saving energy or saving money (75% combined) than respondents with household incomes below \$100,000 (66% combined). Respondents 65 years of age or older are slightly more likely to say they wanted to save energy or saving money (87% combined) than respondents between the ages of 45 and 64 (76% combined) and respondents between the ages of 18 and 44 (65% combined). Nine percent of respondents between the ages of 45 and 64 say they wanted instant hot water while no younger or older respondents cite this as a motivation. Respondents from households with three or four people are most likely to say they wanted to save energy or money (85% combined), followed by households with one or two people (74% combined) and households with five or more people (63% combined).

Table 3-11: Association of Purchasing a Tankless Water Heater to Save Energy or Money with Demographic Characteristics

Demographic Group	Motivated by Saving Energy or Money (Percent of Respondents)
\$100,000 or more (Annual household income)	75%
Less than \$100,000 (Annual household income)	66%
65 years or older (Age of respondent)	87%
18 to 44 (Age of respondent)	76%
45 to 64 (Age of respondent)	65%
3 – 4 people (Size of household)	85%
1 – 2 people (Size of household)	74%
5 or more people (Size of household)	63%

3.4 Satisfaction with Tankless Water Heater

Overall, respondents are very satisfied with their tankless water heaters and with the various aspects of their tankless water heaters; a majority of respondents are extremely satisfied or satisfied with all aspects of their water heaters. (Table 3-12) Over two-thirds of respondents are extremely satisfied with the overall performance of their tankless water heater (a score of 9 or 10 on a scale of zero to ten), and over 30% of respondents are satisfied with the overall performance (a score of 5 to 8 on the same scale). Fewer than 5% of respondents are dissatisfied with the overall performance of their tankless water heater. Respondents appear to be most satisfied with the length of time they can use hot water without running out, as nearly 90% are extremely satisfied with this aspect of their water heater. Nearly 80% of respondents are extremely satisfied with the amount of hot water that comes out of the faucet and 59% are extremely satisfied with the ability to use hot water for more than one purpose. While a majority of respondents are extremely satisfied with the reliability of their tankless water heater and a majority is either satisfied or extremely satisfied with the savings on gas and water, more than 30% of respondents could not rate their level of satisfaction with these three characteristics. This is likely due to the relatively short period of time respondents have used the water heaters and thus have not formed solid judgments of their satisfaction with these characteristics.¹¹ Finally, while over 80% of respondents are satisfied or extremely satisfied with the time it takes for hot water to come out of the faucet, this aspect has the highest level of dissatisfaction as nearly 20% of respondents are dissatisfied.

¹¹ Anecdotally, NMR staff noted that when asked about gas or water savings, several respondents who replied “Don’t know” elaborated that they had not used the water heater long enough to be able to make a judgment on gas or water savings.

Table 3-12: Satisfaction with Tankless Water Heater
(n=101)

Characteristic	Level of Satisfaction			
	Dissatisfied (0 to 4)	Neutral or satisfied (5 to 8)	Extremely satisfied (9 to 10)	Don't Know
Overall performance of tankless water heater	3	30	67	1
Length of time you can use hot water without running out	2	7	86	6
The amount of hot water that comes out of the faucet	2	18	77	4
The ability to use hot water for more than one purpose	5	32	60	4
The reliability of the tankless water heater	3	15	51	32
Savings on natural gas bill	0	32	29	40
The amount of time it takes for hot water to come out of the faucet	17	62	21	1
The savings on water bills	0	36	26	39

Satisfaction with overall performance and with some of the characteristics of the tankless water heater may be associated with the distance of the water heater to the primary faucet or appliance to which it supplies hot water. (Table 3-13) For example, while over 70% of respondents who report that their tankless water heater is either closer to the point of usage than the water heater it replaced or the same distance are extremely satisfied with the water heater's overall performance, fewer than 40% of those who report the water heater is farther away are extremely satisfied. Similarly, respondents with tankless water heaters that are either closer to or the same distance from the primary use of hot water appear to be more likely to be satisfied or extremely satisfied with the amount of time it takes hot water to come out of the faucet, the ability to use hot water for multiple purposes, and the reliability of the tankless water heater.

Table 3-13: Association of Satisfaction with Tankless Water Heater and Distance of Water Heater from Main Use of Hot Water

Level of Satisfaction	Closer	Farther	About the same distance
The reliability of the tankless water heater			
Dissatisfied (0 to 4)	0 (0%)	1 (6%)	0 (0%)
Neutral or satisfied (5 to 8)	1 (6%)	5 (31%)	6 (11%)
Extremely satisfied (9 to 10)	11 (61%)	6 (38%)	32 (59%)
Don't Know	6 (33%)	4 (25%)	16 (30%)
Savings on natural gas bill			
Dissatisfied (0 to 4)	0 (0%)	0 (0%)	0 (0%)
Neutral or satisfied (5 to 8)	6 (33%)	5 (31%)	19 (35%)
Extremely satisfied (9 to 10)	8 (44%)	5 (31%)	15 (28%)
Don't Know	4 (22%)	6 (38%)	20(37%)
The amount of hot water that comes out of the faucet			
Dissatisfied (0 to 4)	0 (0%)	0 (0%)	0 (0%)
Neutral or satisfied (5 to 8)	3 (17%)	5 (31%)	9 (17%)
Extremely satisfied (9 to 10)	15 (83%)	11 (69%)	43 (80%)
Don't Know	0 (0%)	0 (0%)	2 (4%)
The amount of time it takes for hot water to come out of the faucet			
Dissatisfied (0 to 4)	0 (0%)	7 (44%)	8 (15%)
Neutral or satisfied (5 to 8)	16 (89%)	6 (38%)	31 (57%)
Extremely satisfied (9 to 10)	2 (11%)	3 (19%)	15 (28%)
Don't Know	0 (0%)	0 (0%)	0 (0%)
The savings on water bills			
Dissatisfied (0 to 4)	0 (0%)	0 (0%)	0 (0%)
Neutral or satisfied (5 to 8)	8 (44%)	8 (50%)	18 (33%)
Extremely satisfied (9 to 10)	6 (33%)	4 (25%)	15 (28%)
Don't Know	4 (22%)	4 (25%)	21 (39%)
Length of time you can use hot water without running out			
Dissatisfied (0 to 4)	0 (0%)	0 (0%)	0 (0%)
Neutral or satisfied (5 to 8)	1 (6%)	2 (13%)	3 (6%)
Extremely satisfied (9 to 10)	16 (89%)	13 (81%)	48 (89%)
Don't Know	1 (6%)	1 (6%)	3 (6%)
The ability to use hot water for more than one purpose			
Dissatisfied (0 to 4)	1 (6%)	1 (6%)	1 (2%)
Neutral or satisfied (5 to 8)	6 (33%)	7 (44%)	14 (26%)
Extremely satisfied (9 to 10)	11 (61%)	7 (44%)	38 (70%)
Don't Know	0 (0%)	1 (6%)	1 (2%)
Overall performance of tankless water heater			
Dissatisfied (0 to 4)	0 (0%)	2 (13%)	0 (0%)
Neutral or satisfied (5 to 8)	5 (28%)	8 (50%)	13 (24%)
Extremely satisfied (9 to 10)	13 (72%)	6 (38%)	41 (76%)
Don't Know	0 (0%)	0 (0%)	0 (0%)
Total Respondents	18	16	54

The location of the water heater appears to be modestly associated with overall satisfaction and satisfaction with the amount of time it takes for hot water to come out of the faucet. (Table 3-14) All respondents who installed their water heater in a utility closet, bathroom or hallway are extremely satisfied with the overall performance of the water heater while 61% of respondents who installed their water heater in the basement, garage or attic are extremely satisfied. In addition, respondents who installed their water heater in the basement, garage or attic are more likely to be dissatisfied with the time it takes hot water to come out of the faucet (20%) and less likely to be extremely satisfied (16%) than those who installed their water heater in a utility closet, bathroom or hallway, none of whom is dissatisfied and 54% of whom are extremely satisfied.

Table 3-14: Association of Satisfaction with Tankless Water Heater and Location of the Water Heater

Level of Satisfaction	Basement, garage or attic	Utility closet, bathroom or hallway
Overall performance of tankless water heater		
Dissatisfied (0 to 4)	3 (3%)	0 (0%)
Neutral or satisfied (5 to 8)	30 (35%)	0 (0%)
Extremely satisfied (9 to 10)	53 (61%)	11 (100%)
Don't Know	1 (1%)	0 (0%)
The amount of time it takes for hot water to come out of the faucet		
Dissatisfied (0 to 4)	17 (20%)	0 (0%)
Neutral or satisfied (5 to 8)	55 (63%)	6 (46%)
Extremely satisfied (9 to 10)	14 (16%)	7 (54%)
Don't Know	1 (1%)	0 (0%)
Total Respondents	87	11

Satisfaction with some characteristics of the tankless water heater may be modestly associated with some demographic characteristics. For example, households with annual incomes over \$100,000 are more likely to be extremely satisfied with the reliability of their tankless water heaters (61%) and less likely to respond “Don’t know” (18%) than those with annual household incomes below \$100,000, 49% of whom are extremely satisfied and 37% of whom don’t know their level of satisfaction. (Table 3-15) However, respondents with annual household incomes below \$100,000 appear to be more likely to be satisfied or extremely satisfied with the time it takes hot water to come out of the faucet (95%) and less likely to be dissatisfied (6%) than respondents with annual household incomes over \$100,000, 82% of whom are satisfied or extremely satisfied while 18% are dissatisfied.

Table 3-15: Association of Satisfaction with Tankless Water Heater and Annual Household Income

Level of Satisfaction	Less than \$100,000	\$100,000 or more
The reliability of the tankless water heater		
Dissatisfied (0 to 4)	0 (0%)	1 (4%)
Neutral or satisfied (5 to 8)	5 (14%)	5 (18%)
Extremely satisfied (9 to 10)	17 (49%)	17 (61%)
Don't Know	13 (37%)	5 (18%)
The amount of time it takes for hot water to come out of the faucet		
Dissatisfied (0 to 4)	2 (6%)	5 (18%)
Neutral or satisfied (5 to 8)	24 (69%)	18 (64%)
Extremely satisfied (9 to 10)	9 (26%)	5 (18%)
Don't Know	0 (0%)	0 (0%)
Total Respondents	35	28

Age appears to be modestly associated with satisfaction with reliability, the time it takes for hot water to come out of the faucet, gas and water savings. (Table 3-16) Respondents 65 years old and older and respondents between the ages of 18 and 44 are less likely to extremely satisfied or satisfied with the reliability of their water heater (57% and 61%, respectively) and more likely to reply “Don’t know” (44% and 39%, respectively) than respondents between the ages of 45 and 64, 73% of whom are extremely satisfied or satisfied with the reliability of their water heater and 22% of whom don’t know. Respondents between the ages of 45 and 64 are more likely to be dissatisfied with the time it takes hot water to come out of the faucet (22%) than those between the ages of 18 and 44 (4%) and those 65 or older (6%). Finally, respondents aged 65 or older are more likely to reply “Don’t know” when asked to rate their level of satisfaction with gas and water savings (50% and 56%, respectively) then those between the ages of 45 and 64 (35% reply “Don’t know” for both gas and water savings) and those between the ages of 18 and 44 (30% reply “Don’t know” for both gas and water savings).

Table 3-16: Association of Satisfaction with Tankless Water Heater and Age of Respondent

Level of Satisfaction	18 to 44 years old	45 to 64 years old	65 years old and older
The reliability of the tankless water heater			
Dissatisfied (0 to 4)	0 (0%)	3 (6%)	0 (0%)
Neutral or satisfied (5 to 8)	5 (22%)	8 (15%)	2 (13%)
Extremely satisfied (9 to 10)	9 (39%)	32 (58%)	7 (44%)
Don't Know	9 (39%)	12 (22%)	7 (44%)
Savings on natural gas bill			
Dissatisfied (0 to 4)	0 (0%)	0 (0%)	0 (0%)
Neutral or satisfied (5 to 8)	10 (44%)	16 (29%)	6 (35%)
Extremely satisfied (9 to 10)	6 (26%)	20 (36%)	2 (13%)
Don't Know	7 (30%)	19 (35%)	8 (50%)
The amount of time it takes for hot water to come out of the faucet			
Dissatisfied (0 to 4)	1 (4%)	12 (22%)	1 (6%)
Neutral or satisfied (5 to 8)	19 (83%)	30 (55%)	9 (56%)
Extremely satisfied (9 to 10)	3 (13%)	13 (24%)	5 (31%)
Don't Know	0 (0%)	0 (0%)	1 (6%)
The savings on water bills			
Dissatisfied (0 to 4)	0 (0%)	0 (0%)	0 (0%)
Neutral or satisfied (5 to 8)	9 (39%)	22 (40%)	4 (25%)
Extremely satisfied (9 to 10)	7 (30%)	14 (26%)	3 (19%)
Don't Know	7 (30%)	19 (35%)	9 (56%)
Total Respondents	23	55	16

Size of household appears to be modestly associated with satisfaction with reliability, as well as gas and water savings. (Table 3-17) Respondents in households of three or four people appear to be more likely to respond “Don’t know” when asked to rate their level of satisfaction with the reliability of their water heater (44%) and less likely to be extremely satisfied or satisfied (54%) than respondents from households with one or two people, 25% of whom reply “Don’t know” and 71% of whom are extremely satisfied or satisfied, or from households with five or more people 27% of whom “Don’t know” and 73% of whom are extremely satisfied or satisfied. In addition, respondents from households with five or more people appear to be more likely to be extremely satisfied or satisfied with gas and water savings (82% for both) and less likely to reply “Don’t know” (18% for both) than respondents from households with one or two people or respondents from households with three or four people.

Table 3-17: Association of Satisfaction with Tankless Water Heater and Size of Household

Level of Satisfaction	1 or 2 people	3 or 4 people	5 or more people
The reliability of the tankless water heater			
Dissatisfied (0 to 4)	2 (4%)	1 (3%)	0 (0%)
Neutral or satisfied (5 to 8)	8 (16%)	4 (13%)	3 (27%)
Extremely satisfied (9 to 10)	27 (55%)	13 (41%)	5 (46%)
Don't Know	12 (25%)	14 (44%)	3 (27%)
Savings on natural gas bill			
Dissatisfied (0 to 4)	0 (0%)	0 (0%)	0 (0%)
Neutral or satisfied (5 to 8)	17 (35%)	11 (34%)	3 (27%)
Extremely satisfied (9 to 10)	12 (25%)	10 (31%)	6 (55%)
Don't Know	20 (41%)	11 (34%)	2 (18%)
The savings on water bills			
Dissatisfied (0 to 4)	0 (0%)	0 (0%)	0 (0%)
Neutral or satisfied (5 to 8)	17 (35%)	14 (44%)	3 (27%)
Extremely satisfied (9 to 10)	13 (27%)	5 (16%)	6 (55%)
Don't Know	19 (39%)	13 (41%)	2 (18%)
Total Respondents	49	32	11

When asked to name the one thing with which they are most satisfied with their tankless water heater, nearly one in three respond savings on natural gas bills, followed by the length of time they can run hot water without running out. (Table 3-18)

Table 3-18: Characteristic of Tankless Water Heater with which Respondent is Most Satisfied

Most satisfied with:	Frequency
Savings on natural gas bills	30
Length of time you can use hot water without running out	23
Space savings	11
Amount of hot water that comes out of the faucet	9
Energy conservation/efficiency; environmental aspects	9
Ability to use hot water for more than one purpose at the same time	6
Reliability/repair/need for adjustment	5
Placement/location of the water heater	3
Savings on water bills	2
Amount of time it takes for hot water come out of the faucet	1
Other	1
Don't know	1
Total Respondents	101

The most commonly cited characteristic with which respondents are most dissatisfied is the amount of time it takes for hot water to come out of the faucet, followed by length of time they can run hot water without running out. (Table 3-19) Nearly 25% report that they are not dissatisfied with anything.

Table 3-19: Characteristic of Tankless Water Heater with which Respondent is Most Dissatisfied

Most dissatisfied with:	Frequency
Amount of time it takes for hot water come out of the faucet	34
Nothing-not dissatisfied with anything	25
Length of time you can keep using hot water without running out	7
Reliability/repair/need for adjustment	6
Cost	5
Amount of hot water that comes out of the faucet	4
Ability to use hot water for more than one purpose at the same time	4
Noise	3
Gas meter needs to be upgraded (for water heater and furnace to work properly)	2
Other home renovations required to install water heater	1
Incorrect placement (of water heater)	1
Other	3
Don't know	6
Total Respondents	101

Only six respondents have performed any regular or scheduled maintenance or repairs on their water heaters. (Table 3-20) Of those, five purchased their water heaters before May of 2006. Of the six respondents who have performed any repairs or maintenance, three have cleaned the filters, one has cleaned the filter basket, one does not remember the nature of the repairs or maintenance and one responds that they “had to add a six gallon water heater.”

Table 3-20: Maintenance or Repairs Performed on the Tankless Water Heater

	Frequency
Yes, have performed maintenance or repairs	6
No	95
Total Respondents	101

Awareness of regular or scheduled maintenance is relatively low, with fewer than 20% of respondents being aware that their tankless water heater needs regular or scheduled maintenance or repairs. (Table 3-21)

Table 3-21: Awareness of Regular or Scheduled Maintenance or Repairs for Tankless Water Heater

Aware of suggested maintenance or repair	Frequency
Yes	20
No	80
Don't know	1
Total Respondents	101

Of those who are aware of regular or scheduled maintenance, respondents identify annual maintenance or checkups, cleaning of filters, or other types of cleaning or maintenance. (Table 3-22)

Table 3-22: Suggested Maintenance or Repairs for Tankless Water Heaters

Aware of suggested maintenance or repair	Frequency
Annual maintenance or check up	8
Clean filters	7
Other cleaning or maintenance	5
Do not recall specific maintenance or repairs	1
Total Respondents	20

3.5 Water Use and Water Load of Respondents

Approximately three-quarters of respondents estimate that they now use about the same amount of hot water as when they had a storage tank water heater. (Table 3-23) Twelve respondents estimate that they use more hot water and twelve respondents estimate they use less hot water, so overall there appears to be no net snapback nor snapforward.

Table 3-23: Household Use of Hot Water after Installing Tankless Water Heater

Hot water use with tankless water heater	Frequency
Use more water than before	12
Use less water than before	12
Use about the same amount as before	76
Don't know	1
Total Respondents	101

For respondents who now use more hot water, the most commonly cited reason is because of longer showers. (Table 3-24)

Table 3-24: Ways in which Household Uses More Hot Water with Tankless Water Heater (Multiple Response)

Ways use more hot water	Frequency
Take longer showers	8
Waiting for hot water	2
Take more baths or showers	1
Fill the bathtub fuller	1
Run the water at kitchen sink while washing dishes	1
Larger family (than before)	1
Waiting for hot water	1
Use hot water in clothes washer	1
Total Respondents	12

For households that now use less water, respondents most commonly reply that they simply use hot water less often or use more cold water now. (Table 3-25)

Table 3-25: Ways in which Household Uses Less Hot Water with Tankless Water Heater (Multiple Response)

Ways use less hot water	Frequency
Use more cold water; use hot water less often	5
Turn the water on and off at the kitchen sink while washing dishes	2
Take shorter showers	1
Take fewer baths and showers	1
Water heater conserves water	1
Other	1
Don't know	1
Total Respondents	12

Over 90% of respondents have one water heater in their homes, while seven respondents have two waters and one respondent has four water heaters. (Table 3-26) Of the eight households with more than one water heater, only one has a water heater with a storage tank.

Table 3-26: Number of Water Heaters in Household

Number of water heaters	Frequency
1	93
2	7
4	1
Total Respondents	101

Over 90% of respondents reply that their tankless water heater replaced a storage tank water heater. (Table 3-27)

Table 3-27: Did Tankless Water Heater Replace a Storage Tank Water Heater?

	Frequency
Yes, replaced a storage tank water heater	91
No, did not replace a storage tank water heater	10
Total Respondents	101

Nearly all respondents have their tankless water heater providing hot water to bathtubs and showers, bathroom sinks, kitchen sinks, dishwashers and clothes washers. (Table 3-28) Approximately 40% of respondents have their tankless water heater providing hot water to utility sinks and 25% have their tankless water heater providing hot water to Jacuzzis or whirlpools. One respondent has their tankless water heater providing hot water to a single utility sink in a dark room only.

Table 3-28: Number of Faucets and Appliances Connected to the Tankless Water Heater (All Respondents)

Number of faucets or appliances	Bathtubs or showers	Jacuzzis or whirlpool baths	Bathroom sinks	Utility sinks	Kitchen sinks	Dishwashers	Clothes Washers
0	1	75	1	59	2	8	4
1	29	23	16	39	88	89	92
2	45	3	46	3	9	4	4
3	15	0	23	0	0	0	0
4	7	0	10	0	1	0	1
5	2	0	4	0	1	0	0
6	1	0	0	0	0	0	0
7	1	0	1	0	0	0	0
Total Respondents	101	101	101	101	101	101	101

Of those respondents with one water heater, all have the tankless water heater providing hot water to bathtubs or showers, bathroom sinks and kitchen sinks, and nearly all have the tankless water heater providing hot water to clothes washers and dishwashers. (Table 3-29)

Table 3-29: Number of Faucets and Appliances Connected to the Tankless Water Heater (Respondents with One Tankless Water Heater Only)

Number of faucets or appliances	Bathtubs or showers	Jacuzzis or whirlpool baths	Bathroom sinks	Utility sinks	Kitchen sinks	Dishwashers	Clothes Washers
0	0	68	0	56	0	5	1
1	28	22	14	34	83	85	88
2	41	3	43	3	9	3	3
3	14	0	22	0	1	0	0
4	6	0	9	0	0	0	1
5	2	0	4	0	0	0	0
6	1	0	1	0	0	0	0
7	1	0	0	0	0	0	0
Total Respondents	93	93	93	93	93	93	93

Of the seven respondents with multiple tankless water heaters, all have the new tankless water heater providing hot water to their bathtubs or showers and bathroom sinks. (Table 3-30) A majority has their new tankless water heater providing hot water to their kitchen sinks, dishwashers, clothes washers and utility sinks.

Table 3-30: Number of Faucets and Appliances Connected to the Newest Tankless Water Heater (Respondents with Multiple Tankless Water Heaters Only)

Number of faucets or appliances	Bathtubs or showers	Jacuzzis or whirlpool baths	Bathroom sinks	Utility sinks	Kitchen sinks	Dishwashers	Clothes Washers
0	0	6	0	2	1	2	2
1	1	1	2	5	5	4	4
2	4	0	3	0	0	1	1
3	1	0	1	0	0	0	0
4	1	0	1	0	1	0	0
Total Respondents	7	7	7	7	7	7	7

The one respondent with one tankless water heater and one storage tank water heater has the tankless water heater providing water to a single utility sink in a darkroom.

Of the seven respondents with multiple tankless water heaters, two of seven report that the other tankless water heater is the primary source of hot water to bathtubs and showers, bathroom sinks, utility sinks, kitchen sinks, dishwashers, and clothes washers.

Table 3-31: Number of Faucets and Appliances That Get Water Mainly from Other Tankless Water Heaters

Number of faucets or appliances	Bathtubs or showers	Jacuzzis or whirlpool baths	Bathroom sinks	Utility sinks	Kitchen sinks	Dishwashers	Clothes Washers
0	5	7	5	5	5	5	5
1	1	0	1	2	2	2	2
2	1	0	1	0	0	0	0
3	0	0	0	0	0	0	0
Total Respondents	7	7	7	7	7	7	7

Table 3-32 provides details of the faucets and appliances connected to the storage tank water heater for the one respondent with a storage tank water heater.

Table 3-32: Number of Faucets and Appliances That Get Water Mainly from Storage Tank Water Heaters

Use the most hot water for:	Number of faucets or appliances
Bathtubs or showers	2
Jacuzzis or whirlpool baths	1
Bathroom sinks	3
Utility sinks	1
Kitchen sinks	1
Dishwashers	1
Clothes Washers	1
Total Respondents	1

Over 70% of respondents use the most hot water from their tankless water heater for bathtubs and showers, while approximately 10% and 6% use the most hot water for the clothes washer or dishwasher, respectively. (Table 3-33)

Table 3-33: Largest Water Use from Tankless Water Heater

Use the most hot water for:	Frequency
Bathtubs or showers	72
Clothes washers	12
Dishwashers	6
Kitchen sinks	4
Jacuzzis or whirlpool baths	1
Bathroom sinks	1
Don't know	4
Total Respondents	100 ¹²

Respondents with multiple tankless water heaters most commonly use the most hot water from their new tankless water heater for bathtubs and showers. (Table 3-34)

Table 3-34: Largest Water Use Based on Number of Tankless Water Heaters

Use the most hot water for:	1 Water Heater	2 Water Heaters	4 Water Heaters
Bathtubs or showers	66	5	1
Clothes washers	11	1	0
Dishwashers	6	0	0
Kitchen sinks	4	0	0
Jacuzzis or whirlpool baths	1	0	0
Bathroom sinks	1	0	0
Don't know	6	0	0
Total Respondents	93	6	1

¹² Only respondents who report that their tankless water heater is connected to multiple types of faucets and appliances were asked this question.

3.6 Location of Tankless Water Heater

Over 80% of tankless water heaters are located in basements and over 10% are located in utility closets. (Table 3-35)

Table 3-35: Location of Tankless Water Heater

Location of tankless water heater	Frequency
Basement	84
Utility closet	11
Garage	2
Bathroom	1
Hallway	1
Attic	1
Don't know	1
Total Respondents	101

Old storage water heaters replaced by the tankless water heater were most commonly found in basements. (Table 3-37)

Table 3-36: Location of Old Water Heater

Location of old water heater	Frequency
Basement	79
Utility closet	6
Garage	1
Kitchen	1
Hallway	1
Crawlspace	1
Wall (room not specified)	1
Don't know	1
Tankless water heater did not replace storage tank water heater	10
Total Respondents	101

Tankless water heaters are commonly located relatively close to the location of the storage tank water heater they replaced, with nearly 90% located within 20 feet of the old water heater. (Table 3-37)

Table 3-37: Distance of Tankless Water Heater from Old Storage Tank Water Heater (Respondents Who Replaced a Storage Tank Water Heater Only)

Distance	Frequency
Same place	10
Less than 5 feet	20
5 to 10 feet	31
11 to 20 feet	19
Over 20 feet	10
Don't Know	1
Total Respondents	91

Sixty percent of tankless water heaters are about the same distance from the primary use of hot water as the storage tank water heater they replaced. (Table 3-38) Slightly more tankless water heaters are closer to the primary use of hot water than are farther away.

Table 3-38: Distance from Faucet or Appliance That Uses the Most Hot Water

Distance	Frequency
Closer	18
Farther	16
About the same distance	54
Don't Know	2
Total Respondents	90

Appendix:

**Tankless Water Heater Program
Participant Questionnaire**

Hello, my name is _____. I'm calling on behalf of KeySpan/NSTAR/Bay State Gas [INSERT UTILITY NAME FROM SAMPLE]. We are talking to customers about their water heaters. The information you provide will help KeySpan/NSTAR/Bay State Gas [INSERT UTILITY NAME FROM SAMPLE] improve service to you and other customers. Your responses will be kept strictly confidential. The survey should take about ten to fifteen minutes.

[IF RESPONDENT STOPS YOU OFFER TO SCHEDULE A CALLBACK]

[IF THE RESPONDENT QUESTIONS THE VALIDITY OF THE SURVEY OR ASKS "HOW DO I KNOW YOU ARE REALLY CALLING ON BEHALF OF KEYSpan/NSTAR/BAY STATE GAS?" SAY "YOU CAN CALL SUBID WAGLEY IN KEYSpan'S ENERGY MANAGEMENT DEPARTMENT AT 781-466-5448 DURING NORMAL BUSINESS HOURS."]

- C1. First of all, our records from KeySpan/NSTAR/Bay State Gas [INSERT UTILITY NAME FROM SAMPLE] show that your household has purchased a tankless on demand water heater in the past year or so. Is that correct?
1. Yes [CONTINUE]
 2. No [ASK TO SPEAK WITH APPROPRIATE PERSON, OR ARRANGE FOR A CALL BACK TIME; IF NO SUCH PERSON OR NO ONE IN HOUSE KNOWS, THEN TERMINATE]
 3. (Don't know) [ASK TO SPEAK WITH APPROPRIATE PERSON, OR ARRANGE FOR A CALL BACK TIME; IF NO SUCH PERSON OR NO ONE IN HOUSE KNOWS, THEN TERMINATE]
- C2. Were you the person in your household who decided to purchase the tankless water heater?
1. Yes, the main decision maker [CONTINUE]
 2. Yes, one of the decision makers [CONTINUE]
 3. No [ASK SPEAK WITH APPROPRIATE PERSON, OR ARRANGE FOR A CALL BACK TIME]

Awareness

- A1A. Where did you FIRST find out about tankless water heaters? [**RECORD FIRST RESPONSE UNDER A1B; DO NOT READ RESPONSES**]
- A1B. Where else did you see or hear about tankless water heaters? [**MULTIPLE RESPONSE; DO NOT READ RESPONSES**]
1. (Bill stuffer, information in the mail from KeySpan/ NSTAR/Bay State Gas/ utility/gas company, it was in my gas bill)
 2. (The KeySpan/NSTAR/Bay State Gas website; the tankless water heater program website; www.gasnetworks.com)
 3. (Contractor, plumber told me)
 4. (Radio or television program)
 5. (Magazine article)
 6. (Newspaper article)
 7. (Advertisement by KeySpan)
 8. (Advertisement by manufacturer)
 9. (Advertisement by contractor or plumber)
 10. (Friend/family/neighbor/acquaintance/co-worker)
 11. (Other [**SPECIFY:** _____])
 12. (Don't know)

Motivations

- M1. What made you consider buying a tankless water heater instead of a regular water heater with a storage tank? [**MULTIPLE RESPONSE; DO NOT READ RESPONSES**]
1. (Saving energy/gas, using less energy/gas)
 2. (Saving money, lower gas bills)
 3. (Never running out of hot water, hot water whenever I need it)
 4. (Instant/instantaneous hot water, getting hot water immediately, not having to wait)
 5. (Getting the latest technology)
 6. (Other [**SPECIFY:** _____])
 7. (Don't know)

Satisfaction

Now I'm going to ask you to rate your satisfaction with various aspects of your tankless water heater. Please use a scale from 0 to 10, where 0 is "extremely dissatisfied" and 10 is "extremely satisfied." [11=DON'T KNOW] How satisfied are you with:

[RANDOMIZE AND READ #S1-S7, THEN #S8]

- S1. The reliability of the tankless water heater—how often it needs to be repaired or adjusted
- S2. The savings on your natural gas bills, compared to what they would have been with a regular water heater
- S3. The amount of hot water that comes out of the faucet
- S4. The amount of time it takes for the water coming out of the faucet to turn hot
- S5. The savings on your water bills, compared to what they would have been with a regular water heater
- S6. The length of time you can use hot water without running out
- S7. The ability to use hot water for more than one purpose at the same time
- S8. The overall performance of your tankless water heater
- S9. What is the one thing you are MOST satisfied with about your tankless water heater?
[DO NOT READ RESPONSES]
 - 1. (Reliability/repair/need for adjustment)
 - 2. (Savings on natural gas bills)
 - 3. (Amount of hot water that comes out of the faucet)
 - 4. (Amount of time it takes for the water coming out of the faucet to turn hot)
 - 5. (Savings on water bills)
 - 6. (Length of time you can keep using hot water without running out)
 - 7. (Ability to use hot water for more than one purpose at the same time)
 - 8. (Nothing—not satisfied with anything)
 - 9. (Other [**SPECIFY:** _____])
 - 10. (Don't know)

S10. What is the one thing you are most DISsatisfied with about your tankless water heater?

[DO NOT READ RESPONSES]

1. (Reliability/repair/need for adjustment)
2. (Savings on natural gas bills)
3. (Amount of hot water that comes out of the faucet)
4. (Amount of time it takes for the water coming out of the faucet to turn hot)
5. (Savings on water bills)
6. (Length of time you can keep using hot water without running out)
7. (Ability to use hot water for more than one purpose at the same time)
8. (Nothing—not dissatisfied with anything)
9. (Other [**SPECIFY:** _____])
10. (Don't know)

S11. **[IF #S1 LE 5]** What problems have you had with the reliability of your tankless water heater? **[PROBE; MULTIPLE RESPONSE]**

S12. Have you performed any regular or scheduled maintenance or repairs on the water heater? **[IF YES]** What maintenance or repairs have you performed?

1. No, have not performed maintenance or repairs
2. (Don't know)
3. Yes, [**SPECIFY; MULTIPLE RESPONSE:** _____]

S13. Are you aware of any regular or scheduled maintenance that needs to be performed on the water heater? **[IF YES]** What maintenance needs to be performed on your water heater?

1. No, not aware of any maintenance that needs to be performed
2. (Don't know)
3. Yes, [**SPECIFY; MULTIPLE RESPONSE:** _____]

Behavior

B1. Which of the following statements would you say is most accurate about your household's hot water use after you got the tankless water heater?

1. We use MORE hot water than we did before
2. We use LESS hot water than we did before
3. We use ABOUT THE SAME AMOUNT of hot water that we did before
4. (Don't know)

B2. **[ASK IF 1 TO #B1]** In what ways do you use more hot water than before? **[DO NOT READ RESPONSES; MULTIPLE RESPONSE]**

1. (Take longer showers)
2. (Fill the bathtub fuller)
3. (Take more baths or showers)
4. (Run the water at the kitchen sink while washing dishes)
5. (Have new equipment **[SPECIFY EQUIPMENT—E.G., JACUZZI:**
_____])
6. (Other **[SPECIFY: _____]**)
7. (Don't know)

B3. **[ASK IF 2 TO #B1]** In what ways do you use less hot water than before?

1. (Take shorter showers)
2. (Don't fill the bathtub as much)
3. (Take fewer baths and showers)
4. (Turn the water on and off at the kitchen sink while washing dishes)
5. (Other **[SPECIFY: _____]**)
6. (Don't know)

Water Load

W1. How many water heaters are there in your home, including the tankless water heater you bought recently?

1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8 or more
9. (Don't know)

W2a. **[IF MORE THAN 2 TO #W1]** How many of your other water heaters are regular water heaters with storage tanks? **[DO NOT ALLOW #W2a TO BE GREATER THAN #W1; RECORD NUMBER, 9=DON'T KNOW]**

W2b. **[IF 2 TO #W1]** Is your other water heater a regular water heater with a storage tank?

1. Yes
2. No
3. (Don't know)

W3. Did the tankless water heater you bought recently replace a storage tank water heater?

1. Yes
2. No
3. (Don't know)

How many of the following faucets and appliances are connected to the tankless water heater you bought recently? **[RECORD EXACT NUMBER; 99=DON'T KNOW]**

- W4. Bathtubs or showers
- W5. Jacuzzis or whirlpool baths
- W6. Bathroom sinks
- W7. Utility sinks
- W8. Kitchen sinks
- W9. Dishwashers
- W10. Clothes washers
- W11. Anything else? **[IF YES] What? [MULTIPLE RESPONSE]**
 - 1. No, nothing else
 - 2. Yes **[SPECIFY: _____]**
 - 3. (Don't know)

- W12a. **[IF 1 OR MORE TO #W2a OR YES TO #W2b, AND IF JUST ONE USE MENTIONED IN #W4-W11]** Does your storage tank water heater provide backup hot water for **[RESPONSE FROM #W4-W11]**?
- 1. Yes
 - 2. No
 - 3. (Don't know)

- W12b. **[IF 1 OR MORE TO #W2a OR YES TO #W2b, AND IF MORE THAN ONE USE MENTIONED IN #W4-W11]** Does your storage tank water heater provide backup hot water for any of these faucets or appliances? **[IF YES] Which ones? [READ ONLY THOSE THINGS MENTIONED IN #W4-W11; IF DON'T KNOW TRY TO GET THEM TO GUESS. MULTIPLE RESPONSE]**
- 1. (Bathtubs or showers)
 - 2. (Jacuzzis or whirlpool baths)
 - 3. (Bathroom sinks)
 - 4. (Utility sinks)
 - 5. (Kitchen sinks)
 - 6. (Dishwashers)
 - 7. (Clothes washers)
 - 8. (Or something else **[SPECIFY: _____]**)?
 - 9. (No, does not provide backup)
 - 10. (Don't know)

W13. **[SKIP IF ONLY ONE USE MENTIONED IN #W4-W11]** For which ONE thing do you use the most hot water from your new tankless water heater? **[READ ONLY THOSE THINGS MENTIONED IN #W4-W11; IF DON'T KNOW TRY TO GET THEM TO GUESS. RECORD ONLY ONE RESPONSE]**

1. (Bathtubs or showers)
2. (Jacuzzis or whirlpool baths)
3. (Bathroom sinks)
4. (Utility sinks)
5. (Kitchen sinks)
6. (Dishwashers)
7. (Clothes washers)
8. (Or something else **[SPECIFY: _____]**)?
9. (Don't know)

[ASK #W14-W21 IF MORE THAN 1 TO #W1]

How many of the following faucets and appliances get hot water mainly from your other water heater(s)—other than the tankless water heater you bought recently?

W14. Bathtubs or showers

W15. Jacuzzis or whirlpool baths

W16. Bathroom sinks

W17. Utility sinks

W18. Kitchen sinks

W19. Dishwashers

W20. Clothes washers

W21. Anything else? **[IF YES]** What? **[MULTIPLE RESPONSE]**

1. No, nothing else
2. Yes **[SPECIFY: _____]**
3. (Don't know)

W22. Where is the tankless water heater you bought recently located? Is it in the

1. Basement
2. Kitchen
3. Bathroom
4. Hallway
5. Utility closet
6. Or somewhere else? (**[SPECIFY: _____]**)
7. (Don't know)

W23. **[IF YES TO #W3]** Where was your old water heater located? Was it in the

1. Basement
2. Kitchen
3. Bathroom
4. Hallway
5. Utility closet
6. Or somewhere else (**[SPECIFY: _____]**)
7. (Don't know)
8. (Not applicable—didn't have water heater)

W24. **[IF YES TO #W3]** How far—how many feet—would you say your new tankless water heater is from the spot where the old water heater was? **[IF THEY DON'T KNOW TRY TO GET THEM TO GUESS; RECORD NUMBER OF FEET; 0=IN THE SAME PLACE; 999=DON'T KNOW]**

W25. **[IF #W24 NE 0 AND NE 999]** Compared to the water heater it replaced, is your new tankless water heater closer, farther, or about the same distance from the faucet or appliance where you use it most for hot water?

1. Closer
2. Farther
3. About the same distance
4. (Don't know)

Demographics/House characteristics

D1. What type of residence do you live in? **[READ RESPONSES]**

1. Single family (house on a separate lot)
2. Two- to four-family building
3. Apartment in a building with 5 or more units
4. Town or row house (adjacent walls to another house)
5. Mobile home, house trailer
6. (Other **[SPECIFY: _____]**)
7. (Refused)

D2. Approximately how many square feet is your home?

1. Less than 1,000
2. 1000 – 1,499
3. 1,500 – 1,999
4. 2,000 – 2,499
5. 2,500 – 2,999
6. 3,000 – 3,999
7. 4,000 – 4,999
8. 5,000 – 7,999
9. 7,000 – 9,999
10. 10,000 or more
11. (Don't know/Refused) **[ASK #D3]**

D3. **[IF #D2=DON'T KNOW]** How many rooms are in your home, not counting bathrooms?
[RECORD NUMBER; 99=DON'T KNOW]

D4. What is the highest level of education you have completed? **[READ CATEGORIES]**

1. Less than high school
2. High school graduate
3. Technical or trade school graduate
4. Some college
5. Two-year college graduate
6. Four-year college graduate
7. Some graduate or professional school
8. Graduate or professional degree
9. (Refused)

D5. Which of the following categories best describes your age?

1. 18 to 24
2. 25 to 34
3. 35 to 44
4. 45 to 54
5. 55 to 64
6. 65 or over
7. (Refused)

How many people in the following age groups, including yourself, live in your house most of the year? **[RECORD NUMBER; 7=7 OR MORE, 8=NONE, 9=REFUSED]**

D6. 17 or younger

D7. 18-34

D8. 35-54

D9. 55 or older

D10. What category best describes your total household income in 2005, before taxes?

1. Less than \$15,000
2. \$15,000 - \$24,999
3. \$25,000 - \$34,999
4. \$35,000 - \$49,999
5. \$50,000 - \$74,999
6. \$75,000 - \$99,999
7. \$100,000 or more
8. (Refused)

D11. **[DO NOT READ]** Sex

1. Female
2. Male

Thank you very much!