

FORESTS, UTILITIES, AND WATERSHEDS

Partners in Source Water Protection

Prepared by:

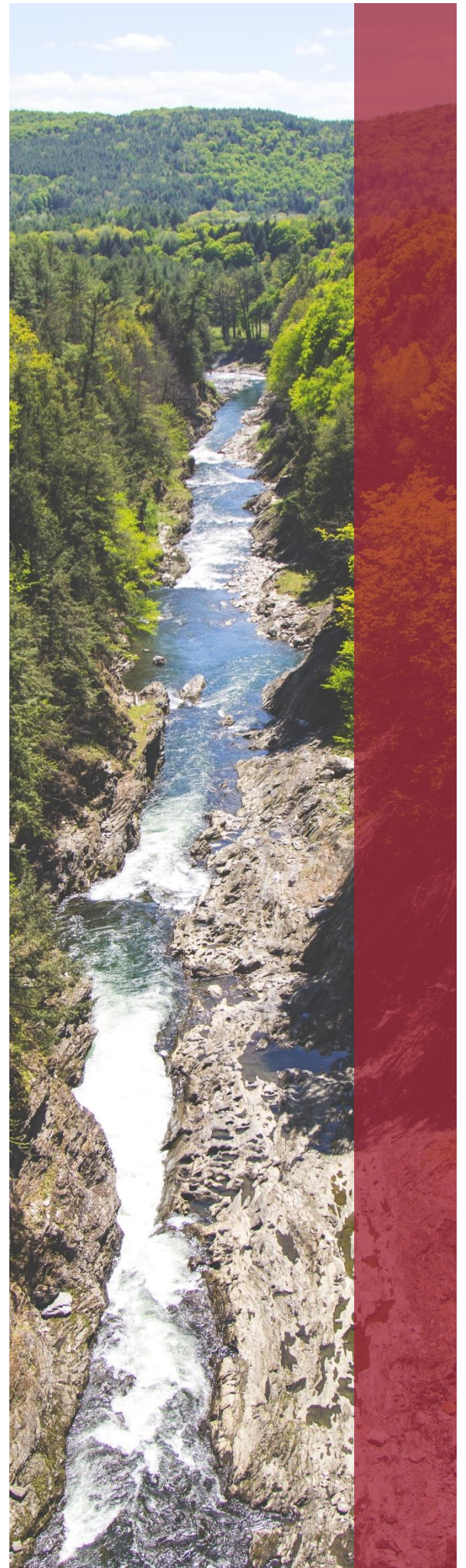
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Executive Summary

The planning and management of public water sources (PWS) are traditionally the domain of public utilities or utilities commissions. Yet, collaboration and partnerships among utilities, watershed, and forest managers can improve the efficiency and sustainability of PWS quality and availability. The quality and availability of PWSs, especially those originating from overland flow, are dependent on the quality and status of land resources. This is particularly salient in forested watersheds, which require appropriate forest management practices.

The objective of the “Forests, Utilities, and Watersheds: Partners in Source Water Protection” project was to survey water utility rate payers’ in Hot Springs, AR and Fayetteville, AR in relation to:

- Frequency of water use for drinking (and other activities); water and forest recreation.
- Knowledge of water utility operations and forest management.
- Exposure to information that pertains to water utility’s management and operations.
- Perspectives on and experiences with and ratings of water and the water utility.
- Levels of trust and perception of responsibility.
- Familiarity with and opinions on controlled burns.

Past research indicates that while utilities own tracts of forestland within a source watershed, forest management plans, their implementation, and consultation with trained foresters is minimal^{1,2}. Moreover, public water utilities may set examples among one another and other land management organizations in terms of source water protection importance, prioritization, and design³. The mutual benefit best managements practices grant water resources and forest health implies it may be helpful to understand the extent to which public water utilities implement forest management within a source watershed^{4,5}. However, given the relative uncommonness of such forest management by public water utilities, is it perhaps more strategic and necessary to understand rate payers’ perceptions their water utility in relation to forest management practices in a source watershed⁶.

Key Takeaways

- Tap water is the primary source of drinking water for a greater proportion of adults residing in Fayetteville (67.7%) than Hot Springs (51.1%). The survey does not show any obvious reason for the differences between the two groups of residents.
 - It should be noted that similar proportions of residents from the two areas use tap water every day for cooking and cleaning (87.7-88.4%) as well as use tap water a few times a week or more for watering grass/plants or washing cars (37.5-42.1%).
- A total of 46.4% of the respondents visited local lakes or rivers six or more times a year and 43.7 % of the respondents visited a local forest six or more times a year. Differences in the

¹ Dyckman CS, Paulsen K. Not in My watershed! Will increased federal supervision really bring better coordination between land use and water planning? *J. Plan. Educ. Res.* 32, 91–106 (2012).

² Herbert, E. Forest management by West Coast water utilities: Protecting the source? *J. Am. Water. Works. Assoc.* 99, 91–106 (2007).

³ Richards et al. WH, et al. Landscape-scale forest management in the municipal watersheds of Vienna, Austria, and Seattle, USA: Commonalities despite disparate ecology and history. *Nat. Areas J.* 32, 199–207 (2012).

⁴ Garcia-Chevesich et al., Forest management and the impact on water resources: A review of 13 countries (2017). Available at: https://www.fs.fed.us/rm/pubs_journals/2017/rmrs_2017_garcia_chevesich_p001.pdf

⁵ Hornbeck JW, et al. Long-term impacts of forest treatment on water yield: A summary of the Northeastern USA. *J. Hydrol.* 150, 323–344 (1993).

⁶ National Research Council. Watershed management for source water protection (2000). Available at: <https://www.nap.edu/read/9677/chapter/6#p200067d09970130001>

proportion of residents from each study area visiting lakes/streams and forests six or more times a year were minimal.

- A higher proportion Fayetteville residents indicated that they had a good amount or a great deal of knowledge concerning the location of their water supply (63.4% vs. 39.2%) and what is meant by the term “watershed” (47.9% vs. 33.9%).
 - Approximately 32-38% of the Hot Springs while only 14-15% of the Fayetteville respondents indicated they had little or no knowledge concerning these two subjects.
 - This in part may reflect to what degree residents felt that their utilities provided information concerning their drinking water sources.
 - A total of 68.4% of residents in Fayetteville somewhat or strongly agreed while 19.4% somewhat or strongly disagreed that their utility provided Fayetteville residents with the basic information on their drinking water source.
 - A total of 58.6% of Hot Springs residents somewhat or strongly agreed that the Hot Spring utility provided this information while 31.2% somewhat or strongly disagreed the utility provided this information.
- Most respondents (77.4%) rated their water utility B or better on the water utility services.
 - The proportion of the respondents that rated the services as a B or better was greater for Fayetteville residents (87.8%) than Hot Springs residents (65.7%).
 - More than 3-out-of-4 residents in both study areas somewhat or strongly agreed that their water utility provided quality drinking water (80.3-90.1%).
- Most household water users (74.6%) were willing to pay for part of the costs of improving water quality. Differences between individual study areas were minimal.
 - Most water users (59.7%) also are willing to pay part of the costs of managing forests in the water source area.
 - Although water users are willing to financially support management costs, approximately 80% of the respondents somewhat or strongly agreed that water users should have input on these management decisions.
- Water users generally recognized that controlled burns (prescribed fire) is somewhat or very necessary (82.8%) for land management and most water users (69.1%) considered controlled burns somewhat or very safe.
 - A greater portion of Hot Springs residents generally recognize the necessity and safety of controlled burning than did Fayetteville residents. This may reflect the closer proximity of a federal forest lands to Hot Springs compared to Fayetteville.
 - Although the majority of respondents from both study areas strongly or somewhat agreed that they trusted their utility to make decisions concerning the use of controlled burns (63.2-67.0%) more than 90% of respondents somewhat or strongly agreed that utility should partner with other federal and state land management organizations to conduct controlled burns.

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Methods and Sampling

The project was carried out by the Arkansas Forest Resources Center with funding provided by the U.S. Endowment for Forestry and Communities. To achieve project objectives, standard research protocols were used to collect data via a telephone survey—cellular and landline—from rate payers in Hot Springs, AR and Fayetteville, AR. Data collection was conducted from May–July 2019. All survey data collection was conducted by University of Little Rock Survey Research Center, in partnership with researchers at the Arkansas Forest Resources Center.

The population of interest was adults (>18 years of age) of Hot Springs, AR residing within the Hot Spring Water Utility service area and adults (>18 years of age) of Fayetteville, AR residing within the Beaver Lake Water Utility service area who pay for household water service (i.e., excludes residents whose water services are included in rent or otherwise paid by a second party). Two sampling frames were used: cell phone (listed) and landline (listed and random-digit dialing). A simple random sampling procedure was used at a ratio of 1:1 from each sampling frame until the predetermined quota per city ($n = 400$) was reached or response rates dropped below the efficacy threshold (1-respondent/hour). The combined response rate was ~25% but differed substantially among frames (Table 1). A total of 778 telephone interviews were conducted in the two cities (Table 2). The average length of interview was 8-minutes. Error margins are presented in Table 3.

Table 1. Response rate (combined and per telephone type).	Percent
Combined	24.6
Landline	42.4
Cell	16.7

Table 2. Sample size (total and per city).	Count	Percent
Total	778	100.00
Hot Springs	393	50.5
Fayetteville	385	49.5

Table 3. Margin of error (total and per city).	Percent
Total	6.0
Hot Springs	6.0
Fayetteville	6.0

Findings and Results

WEIGHTING

Data weighting is a standard procedure for survey data analysis; weighting allows data to be interpreted as representing the population of interest rather than just the sample data was collected from. Weighting procedures correct for imbalances between the survey sample and the population of interest. For example, people aged 18-24 were under-sampled and people aged 75+ over-sampled; weighting allows us to correct this under- and over-sampling by calculating a “weight” based on the difference between the percentage of each category in the sample and the known percentage of each category in the actual population (based on census data⁷). By applying the weight to our analyses, the results reflect the populations of interest, the cities of Hot Springs and Fayetteville, rather than just the sampled respondents from each city.

Data are presented in two formats:

- Pooled data (red) are presented as *unweighted*. The reason for this is that the pooled data is aggregated sample data and not generalizable to a distinct population.
- Data from Hot Springs (yellow) and Fayetteville (blue) are presented as *weighted*. The reason for this is that these city-level data can be interpreted as generalizable to the population of each city, respectively. The respective weights reflect the differences in response rates associated with different age categories (as seen by sample percentage).

Below are the weights applied to analyses data from each city:

Table 4a. Hot Springs survey weights.				
Age Category	Population Percentage	Sample Count	Sample Percentage	Weight
18-24	7.9	11	2.8	2.82
25-34	12.0	13	3.3	3.63
35-44	10.4	25	6.4	1.63
45-54	11.7	52	13.2	0.88
55-64	14.9	79	20.1	0.74
65-74	12.8	115	29.3	0.44
75+	10.4	98	24.9	0.42

Table 4b. Fayetteville survey weights.				
Age Category	Population Percentage	Sample Count	Sample Percentage	Weight
18-24	15.0	15	3.9	3.85
25-34	15.6	40	10.4	1.50
35-44	12.6	90	23.4	0.54
45-54	11.2	81	21.0	0.53
55-64	10.1	62	16.1	0.63
65-74	6.7	75	19.5	0.34
75+	4.6	22	5.7	0.81

⁷ Source: American Community Survey, 2018 ACS 1-year estimates subject table (Table ID: S0101)

DIRECT EXPERIENCE AND PSYCHOLOGICAL DISTANCE

Frequency of direct experience or interaction with water influences how abstract or concrete rate payers perceive the natural resource management issues related to water. In psychology, the abstract-concrete range can be thought of as the time between experiencing or interacting with an object, event, or other phenomenon; this is called *psychological distance*. Measures of psychological distance, in the form of frequency of use, provide information that indicate the potential for rate payers to take action on or support water-related issues.

The results presented below indicate that rate payers in both cities **frequently interact** with water through various behaviors, from the individual, household, and landscape level.

Table 5. How often do you make it a point to drink water?	Count	Percent
Several times a day	707	90.9
Once a day	35	4.5
A few times a week	18	2.3
A couple of times a month	—	—
Rarely	15	1.9

*Reporting threshold of ≥1%

Hot Springs	Count	Percent
Several times a day	273	86.8
Once a day	19	6.0
A few times a week	12	3.8
A couple of times a month	5	1.7
Rarely	6	1.8

Fayetteville	Count	Percent
Several times a day	265	90.7
Once a day	18	6.3
A few times a week	4	1.3
A couple of times a month	—	—
Rarely	5	1.7

*Reporting threshold of ≥1%

Table 6. When you drink water do you mostly drink tap water or water from other sources?	Count	Percent
Tap water	477	61.4
Other sources	246	31.7
Both equally	54	6.9

Hot Springs	Count	Percent
Tap water	161	51.0
Other sources	127	40.4
Both equally	27	8.6

Fayetteville	Count	Percent
Tap water	197	67.7
Other sources	73	24.9
Both equally	22	7.4

Table 7. How often do you use tap water from your household faucets for activities like cooking and cleaning?

	Count	Percent
Every day	701	90.2
A few times a week	55	7.1
Once a week	9	1.2
A couple of times a month	—	—
Rarely	—	—
Never	—	—

*Reporting threshold of ≥1%

Hot Springs	Count	Percent
Every day	278	88.4
A few times a week	28	8.9
Once a week	6	1.8
A couple of times a month	—	—
Rarely	—	—
Never	—	—

*Reporting threshold of ≥1%

Fayetteville	Count	Percent
Every day	256	87.7
A few times a week	28	9.8
Once a week	—	—
A couple of times a month	—	—
Rarely	5	1.8
Never	—	—

*Reporting threshold of ≥1%

Table 8. How often do you use water from your outdoor faucets for activities like watering grass or plants, or washing your car?

	Count	Percent
Every day	99	12.9
A few times a week	248	32.2
Once a week	90	11.7
A couple of times a month	107	13.9
Rarely	152	19.8
Never	73	9.5

Hot Springs	Count	Percent
Every day	31	9.8
A few times a week	87	27.7
Once a week	38	12.3
A couple of times a month	53	17.0
Rarely	69	22.0
Never	35	11.3

Fayetteville	Count	Percent
Every day	37	13.0
A few times a week	84	29.1
Once a week	40	14.1
A couple of times a month	37	12.8
Rarely	52	18.2
Never	37	12.8

Table 9. In the past year, how many times would you say you have visited a local lake or river?

	Count	Percent
None/Never	155	19.9
Only once	49	6.3
2-5 times	210	27.0
6-9 times	53	6.8
10 times or more	308	39.6

Hot Springs	Count	Percent
None/Never	52	16.6
Only once	20	6.5
2-5 times	70	22.2
6-9 times	18	5.6
10 times or more	153	48.7

Fayetteville	Count	Percent
None/Never	38	13.2
Only once	15	5.0
2-5 times	85	29.3
6-9 times	25	8.4
10 times or more	129	44.1

Table 10. In the past year, how many times would you say you have visited a local forest?

	Count	Percent
None/Never	178	22.9
Only once	58	7.5
2-5 times	198	25.4
6-9 times	40	5.1
10 times or more	300	38.6

Hot Springs	Count	Percent
None/Never	70	22.2
Only once	27	8.4
2-5 times	70	22.3
6-9 times	17	5.3
10 times or more	130	41.4

Fayetteville	Count	Percent
None/Never	46	15.7
Only once	18	6.3
2-5 times	97	33.3
6-9 times	12	4.0
10 times or more	118	40.4

KNOWLEDGE

Knowledge is a fundamental component of informed decision-making and ability to respond to natural resource management challenges. For water utility providers, an informed constituency of rate payers who know where their water comes from, that forests are a component of water quality, and that forests and water interact at a watershed level can be seen as a positive asset.

In terms of knowing the waterbody that is the source of their household water, results suggest a mix of knowledge—either little/none or great deal—and a **disparity between Hot Springs and Fayetteville**. Different patterns emerge in terms of rate payers' knowledge of forests importance to maintaining water quality. For Hot Springs and Fayetteville, 49-54% of responses fall within the great/good deal response categories. However, in terms of knowledge of what a watershed is, a over 40% of Hot Springs respondents have little to no knowledge, whereas a similar percentage of Fayetteville respondents indicate they have a good or great deal of knowledge.

Table 11. Your level of knowledge of where the water you use at home comes from, that is, the location of the exact rivers or lakes that supply your water?

	Count	Percent
Little or no knowledge	162	20.8
Some knowledge	61	7.8
A moderate amount	117	15.0
A good amount of knowledge	143	18.4
A great deal of knowledge	289	37.1
Don't know*	—	—

*Reporting threshold of ≥1%

Hot Springs	Count	Percent
Little or no knowledge	101	32.0
Some knowledge	43	13.7
A moderate amount	43	13.7
A good amount of knowledge	44	14.0
A great deal of knowledge	79	25.2
Don't know*	5	1.4

Fayetteville	Count	Percent
Little or no knowledge	42	14.4
Some knowledge	25	8.5
A moderate amount	40	13.8
A good amount of knowledge	65	22.3
A great deal of knowledge	120	41.1
Don't know*	—	—

*Reporting threshold of ≥1%

Table 12. Your level of knowledge of why trees and forests are important to drinking water quality?

	Count	Percent
Little or no knowledge	114	14.7
Some knowledge	87	11.2
A moderate amount	171	22.0
A good amount of knowledge	152	19.5
A great deal of knowledge	246	31.6
Don't know*	8	1.0

Hot Springs	Count	Percent
Little or no knowledge	62	19.6
Some knowledge	43	13.7
A moderate amount	51	16.3
A good amount of knowledge	48	15.4
A great deal of knowledge	101	32.2
Don't know*	9	2.9

Fayetteville	Count	Percent
Little or no knowledge	37	12.6
Some knowledge	46	15.6
A moderate amount	66	22.6
A good amount of knowledge	72	24.6
A great deal of knowledge	71	24.4
Don't know*	—	—

*Reporting threshold of ≥1%

Table 13. Your level of knowledge of what a watershed is?

	Count	Percent
Little or no knowledge	197	25.3
Some knowledge	96	12.3
A moderate amount	148	19.0
A good amount of knowledge	123	15.8
A great deal of knowledge	205	26.3
Don't know*	9	1.2

*Reporting threshold of ≥1%

Hot Springs	Count	Percent
Little or no knowledge	120	38.2
Some knowledge	29	9.2
A moderate amount	53	16.8
A good amount of knowledge	43	13.7
A great deal of knowledge	64	20.2
Don't know*	6	1.8

Fayetteville	Count	Percent
Little or no knowledge	43	14.8
Some knowledge	52	17.8
A moderate amount	58	19.7
A good amount of knowledge	56	19.0
A great deal of knowledge	83	28.5
Don't know*	—	—

*Reporting threshold of ≥1%

INFORMATION

Like knowledge, access to information is a fundamental component of informed decision-making and ability to respond to natural resource management challenges. The results presented below indicate that a majority of rate payers agree (strongly or somewhat) that their water **utility provides them with basic information** on where their drinking water comes from. In contrast, rate payers in both cities are equally distributed in their disagreement or agreement that their water utility provides them with the basic information on what influences the price of their drinking water.

Table 14. Your water utility provides you with the basic information on where your drinking water comes from.

	Count	Percent
Strongly agree	285	36.6
Somewhat agree	236	30.3
Neither agree nor disagree	50	6.4
Somewhat disagree	105	13.5
Strongly disagree	80	10.3
Don't know	19	2.4

Hot Springs	Count	Percent
Strongly agree	92	29.1
Somewhat agree	93	29.5
Neither agree nor disagree	25	7.8
Somewhat disagree	49	15.6
Strongly disagree	49	15.6
Don't know	7	2.3

Fayetteville	Count	Percent
Strongly agree	106	36.3
Somewhat agree	94	32.1
Neither agree nor disagree	25	8.7
Somewhat disagree	34	11.8
Strongly disagree	22	7.6
Don't know	8	2.8

Table 15. Your water utility provides you with the basic information on what influences the price of your drinking water.

	Count	Percent
Strongly agree	138	17.7
Somewhat agree	228	29.3
Neither agree nor disagree	83	10.7
Somewhat disagree	143	18.4
Strongly disagree	151	19.4
Don't know	33	4.2

Hot Springs	Count	Percent
Strongly agree	68	21.7
Somewhat agree	77	24.4
Neither agree nor disagree	29	9.1
Somewhat disagree	43	13.7
Strongly disagree	85	27.1
Don't know	11	3.6

Fayetteville	Count	Percent
Strongly agree	38	12.9
Somewhat agree	82	28.1
Neither agree nor disagree	46	15.9
Somewhat disagree	67	22.9
Strongly disagree	43	14.7
Don't know	15	5.2

PERSPECTIVES AND EXPERIENCES

The perspectives and experiences of rate payers with the goods and services provided by a public water utility are an essential component of monitoring and evaluation. The gap between positive and negative perspectives and experiences is a helpful evaluative metric for any service provider. In the context of this project, concerns about water quality and forest management, as well as an overall rating of the water utility, were measured.

The results presented below indicate that approximately 40% of rate payers in both cities are not concerned with the quality of their tap water. However, of the remaining 60%, respondents indicated they were **very, moderately, or slightly concerned**, approximately 20% per response category. In contrast, ~85% agree (strongly or somewhat) that their water utility provides quality tap water. These seemingly disparate results may indicate that rate payers have concern for water quality, in general, but view their personal, household water quality as being of an acceptable quality to themselves. A **grade of A or B** from 65-77% of rate payers buoys this interpretation.

Table 16. Thinking about the services you receive from your water utility, what letter grade would you give them overall?

	Count	Percent
A	291	37.4
B	311	40.0
C	138	17.7
D	25	3.2
F	10	1.3

Hot Springs	Count	Percent
A	86	27.2
B	121	38.5
C	89	28.4
D	12	3.7
F	5	1.7

Fayetteville	Count	Percent
A	139	47.5
B	118	40.3
C	31	10.6
D	3	1.2
F	—	—

*Reporting threshold of ≥1%

Table 17. How concerned are you with the quality of your tap water?

	Count	Percent
Very concerned	192	24.8
Moderately concerned	157	20.3
Slightly concerned	119	15.4
Not at all concerned	307	39.6

Hot Springs	Count	Percent
Very concerned	75	23.8
Moderately concerned	73	23.2
Slightly concerned	54	17.1
Not at all concerned	113	36.0

Fayetteville	Count	Percent
Very concerned	62	21.4
Moderately concerned	55	19.0
Slightly concerned	48	16.7
Not at all concerned	125	42.9

Table 18. Your water utility provides you with quality drinking water.

	Count	Percent
Strongly agree	401	51.5
Somewhat agree	263	33.8
Neither agree nor disagree	23	3.0
Somewhat disagree	49	6.3
Strongly disagree	41	5.3
Don't know*	—	—

*Reporting threshold of ≥1%

Hot Springs	Count	Percent
Strongly agree	133	42.3
Somewhat agree	120	38.0
Neither agree nor disagree	10	3.3
Somewhat disagree	22	6.9
Strongly disagree	30	9.4
Don't know*	—	—

*Reporting threshold of ≥1%

Fayetteville	Count	Percent
Strongly agree	162	55.7
Somewhat agree	100	34.4
Neither agree nor disagree	6	1.9
Somewhat disagree	16	5.6
Strongly disagree	7	2.3
Don't know*	—	—

*Reporting threshold of ≥1%

Table 19. How concerned are you with the management of the forests in your water source area?

	Count	Percent
Very concerned	187	24.0
Moderately concerned	258	33.2
Slightly concerned	169	21.7
Not at all concerned	157	20.2

Hot Springs	Count	Percent
Very concerned	82	26.2
Moderately concerned	100	31.7
Slightly concerned	81	25.8
Not at all concerned	48	15.3

Fayetteville	Count	Percent
Very concerned	67	22.9
Moderately concerned	87	29.9
Slightly concerned	66	22.5
Not at all concerned	72	24.6

TRUST AND RESPONSIBILITY

Fundamental to any natural resource management endeavor involving a public good like water relies on perceptions trust and opinions of the delegation of responsibilities. The results presented below indicate that a majority of rate payers in both cities **trust** their water utility to make the right management decisions of their water. A majority of rate payers also believe their water utility operates in a manner that **does not harm the environment** but take **responsibility for the effects of their actions** on the environment. Respondents in both cities somewhat agree or strongly agree that household water users should be **willing to pay** for part of the costs to improve water quality and manage forests in their water source area.

Table 20. You trust your water utility to make the right management decisions about your water.

	Count	Percent
Strongly agree	295	37.9
Somewhat agree	312	40.1
Neither agree nor disagree	49	6.3
Somewhat disagree	66	8.5
Strongly disagree	51	6.6
Don't know	—	—

*Reporting threshold of ≥1%

Hot Springs	Count	Percent
Strongly agree	99	31.6
Somewhat agree	118	37.4
Neither agree nor disagree	28	9.0
Somewhat disagree	34	10.7
Strongly disagree	35	11.1
Don't know	—	—

*Reporting threshold of ≥1%

Fayetteville	Count	Percent
Strongly agree	115	39.5
Somewhat agree	131	44.9
Neither agree nor disagree	20	6.7
Somewhat disagree	15	5.2
Strongly disagree	5	1.9
Don't know	5	1.8

Table 21. You trust your Water Utility is not operating in ways that are harmful to the environment.

	Count	Percent
Strongly agree	294	37.8
Somewhat agree	285	36.6
Neither agree nor disagree	70	9.0
Somewhat disagree	57	7.3
Strongly disagree	38	4.9
Don't know	29	3.7

Hot Springs	Count	Percent
Strongly agree	92	29.3
Somewhat agree	123	38.9
Neither agree nor disagree	31	9.7
Somewhat disagree	36	11.4
Strongly disagree	20	6.2
Don't know	13	4.2

Fayetteville	Count	Percent
Strongly agree	120	41.2
Somewhat agree	104	35.8
Neither agree nor disagree	34	11.6
Somewhat disagree	15	5.2
Strongly disagree	7	2.6
Don't know	9	3.1

Table 22. Household water users should take responsibility for the effects of their actions on the environment.

	Count	Percent
Strongly agree	520	66.8
Somewhat agree	180	23.1
Neither agree nor disagree	33	4.2
Somewhat disagree	21	2.7
Strongly disagree	15	1.9
Don't know*	—	—

*Reporting threshold of ≥1%

Hot Springs	Count	Percent
Strongly agree	201	63.8
Somewhat agree	66	21.1
Neither agree nor disagree	19	6.2
Somewhat disagree	16	5.1
Strongly disagree	8	2.5
Don't know*	4	1.3

Fayetteville	Count	Percent
Strongly agree	200	68.5
Somewhat agree	71	24.3
Neither agree nor disagree	10	3.4
Somewhat disagree	3	1.0
Strongly disagree	6	2.2
Don't know*	—	—

*Reporting threshold of ≥1%

Table 23. Household water users should be willing to pay for part of the costs of improving water quality.

	Count	Percent
Strongly agree	237	30.5
Somewhat agree	343	44.1
Neither agree nor disagree	45	5.8
Somewhat disagree	58	7.5
Strongly disagree	84	10.8
Don't know*	10	1.3

*Reporting threshold of ≥1%

Hot Springs	Count	Percent
Strongly agree	87	27.7
Somewhat agree	132	41.8
Neither agree nor disagree	22	6.9
Somewhat disagree	30	9.4
Strongly disagree	42	13.2
Don't know	—	—

*Reporting threshold of ≥1%

Fayetteville	Count	Percent
Strongly agree	88	30.1
Somewhat agree	140	48.1
Neither agree nor disagree	20	7.0
Somewhat disagree	18	6.1
Strongly disagree	21	7.3
Don't know	—	—

*Reporting threshold of ≥1%

Table 24. Household water users should be willing to pay for part of the costs of managing forests in their water source area.

	Count	Percent
Strongly agree	174	22.4
Somewhat agree	290	37.3
Neither agree nor disagree	81	10.4
Somewhat disagree	107	13.8
Strongly disagree	109	14.0
Don't know	15	1.9

Hot Springs	Count	Percent
Strongly agree	82	26.1
Somewhat agree	103	32.7
Neither agree nor disagree	26	8.4
Somewhat disagree	41	12.9
Strongly disagree	57	18.1
Don't know	5	1.7

Fayetteville	Count	Percent
Strongly agree	64	22.0
Somewhat agree	120	41.1
Neither agree nor disagree	35	12.1
Somewhat disagree	38	12.9
Strongly disagree	31	10.5
Don't know	4	1.3

Table 25. Household water users should have input in the water management decisions made by their water provider.

	Count	Percent
Strongly agree	237	30.5
Somewhat agree	343	44.1
Neither agree nor disagree	45	5.8
Somewhat disagree	58	7.5
Strongly disagree	84	10.8
Don't know	10	1.3

Hot Springs	Count	Percent
Strongly agree	180	57.1
Somewhat agree	90	28.7
Neither agree nor disagree	9	2.8
Somewhat disagree	15	4.7
Strongly disagree	14	4.6
Don't know	7	2.1

Fayetteville	Count	Percent
Strongly agree	130	44.7
Somewhat agree	116	39.7
Neither agree nor disagree	19	6.4
Somewhat disagree	15	5.2
Strongly disagree	9	3.0
Don't know	—	—

*Reporting threshold of ≥1%

CONTROLLED BURNS

The last section of the questionnaire asked rate payers to give their opinion on controlled burns (prescribed burns). Respondents were given a description of controlled burns as a type of fire conducted under close watch to maintain the health of lands and forests, reduce the risk of wildfires, and improve wildlife habitats. The results presented below indicate that a majority of rate payers in both cities view controlled burns as **somewhat necessary or very necessary**. Results also show that a majority of rate payers in both cities perceive controlled burns as **somewhat safe or very safe**. In terms of conducting controlled burns, a majority of rate payers in both cities indicated that they **trust** their water utility but expect them to **partner** with an appropriate state or federal agency.

Table 26. How would you rate the need for controlled burns?	Count	Percent
Very unnecessary	24	3.1
Somewhat unnecessary	18	2.3
Neutral	84	10.8
Somewhat necessary	155	19.9
Very necessary	489	62.9
Don't know	8	1.0

Hot Springs	Count	Percent
Very unnecessary	10	3.3
Somewhat unnecessary	8	2.6
Neutral	26	8.2
Somewhat necessary	38	12.2
Very necessary	230	73.0
Don't know	—	—

*Reporting threshold of ≥1%

Fayetteville	Count	Percent
Very unnecessary	6	1.9
Somewhat unnecessary	9	3.0
Neutral	48	16.4
Somewhat necessary	73	25.0
Very necessary	149	51.1
Don't know	8	2.6

Table 27. How safe do you think controlled burns are?	Count	Percent
Very unsafe	24	3.1
Somewhat unsafe	35	4.5
Neutral	172	22.1
Somewhat safe	275	35.3
Very safe	263	33.8
Don't know	9	1.2

Hot Springs	Count	Percent
Very unsafe	11	3.5
Somewhat unsafe	13	4.1
Neutral	66	20.8
Somewhat safe	96	30.4
Very safe	128	40.6
Don't know	—	—

*Reporting threshold of ≥1%

Fayetteville	Count	Percent
Very unsafe	7	2.4
Somewhat unsafe	15	5.1
Neutral	81	27.7
Somewhat safe	105	36.0
Very safe	79	27.2
Don't know	5	1.6

Table 28. You trust your water utility to make the right decisions about the use of controlled burns.

	Count	Percent
Strongly agree	215	27.6
Somewhat agree	302	38.8
Neither agree nor disagree	145	18.6
Somewhat disagree	50	6.4
Strongly disagree	48	6.2
Don't know	17	2.2

Hot Springs	Count	Percent
Strongly agree	85	26.9
Somewhat agree	114	36.3
Neither agree nor disagree	58	18.4
Somewhat disagree	25	8.0
Strongly disagree	26	8.4
Don't know	6	1.8

Fayetteville	Count	Percent
Strongly agree	74	25.3
Somewhat agree	121	41.7
Neither agree nor disagree	60	20.6
Somewhat disagree	19	6.4
Strongly disagree	9	3.0
Don't know	9	3.0

Table 29. You expect your water utility to partner with appropriate agencies, like the Arkansas Forestry Commission or US Forest Service, when they conduct controlled burns.

	Count	Percent
Strongly agree	560	72.0
Somewhat agree	152	19.5
Neither agree nor disagree	23	3.0
Somewhat disagree	16	2.1
Strongly disagree	11	1.4
Don't know	15	1.9

Hot Springs	Count	Percent
Strongly agree	219	69.6
Somewhat agree	62	19.6
Neither agree nor disagree	8	2.5
Somewhat disagree	13	4.2
Strongly disagree	6	1.8
Don't know	7	2.4

Fayetteville	Count	Percent
Strongly agree	209	71.5
Somewhat agree	63	21.5
Neither agree nor disagree	11	3.6
Somewhat disagree	—	—
Strongly disagree	—	—
Don't know	7	2.4

*Reporting threshold of ≥1%

Table 30. Has there ever been an occasion where you were negatively affected by smoke from a controlled burn?

	Count	Percent
Yes	136	17.5
No	642	82.5

Hot Springs	Count	Percent
Yes	41	13.1
No	274	86.9

Fayetteville	Count	Percent
Yes	48	16.6
No	243	83.4

SOCIODEMOGRAPHICS

Table 31. Age, count and frequency per category (weighted)	Count	Percent
18-24	117	19.8
25-34	121	20.6
35-44	98	16.6
45-54	87	14.8
55-64	79	13.3
65-74	52	8.8
74+	35	6.0

*Weighted mean age: 43.32

Hot Springs	Count	Percent
18-24	31	9.8
25-34	47	15.0
35-44	41	12.9
45-54	46	14.5
55-64	58	18.6
65-74	51	16.1
74+	41	13.1

*Weighted mean age: 43.49

Fayetteville	Count	Percent
18-24	58	19.8
25-34	60	20.6
35-44	49	16.7
45-54	43	14.7
55-64	39	13.4
65-74	25	8.7
74+	18	6.1

*Weighted mean age: 43.15

Table 32. Age, count and frequency per category (unweighted)	Count	Percent
18-24	26	3.3
25-34	53	6.8
35-44	115	14.8
45-54	133	17.1
55-64	141	18.1
65-74	190	24.4
74+	120	15.4

*Weighted mean age: 57.35

Hot Springs	Count	Percent
18-24	11	2.8
25-34	13	3.3
35-44	25	6.4
45-54	52	13.2
55-64	79	20.1
65-74	115	29.3
74+	98	24.9

*Weighted mean age: 63.46

Fayetteville	Count	Percent
18-24	15	3.9
25-34	40	10.4
35-44	90	23.4
45-54	81	21.0
55-64	62	16.1
65-74	75	19.5
74+	22	5.7

*Weighted mean age: 51.12

Table 33. Political views, count and frequency per category.	Count	Percent
Very conservative	93	12.0
Conservative	192	24.7
Moderate	240	30.8
Liberal	138	17.7
Very liberal	55	7.1
Don't Know	—	—
Other	16	2.1
Refused	36	4.6

Hot Springs	Count	Percent
Very conservative	36	11.5
Conservative	94	29.7
Moderate	92	29.3
Liberal	37	11.7
Very liberal	20	6.3
Don't Know	7	2.1
Other	5	1.6
Refused	24	7.7

Fayetteville	Count	Percent
Very conservative	36	9.4
Conservative	78	20.3
Moderate	127	33.0
Liberal	85	22.1
Very liberal	36	9.4
Don't Know	—	—
Other	9	2.3
Refused	10	2.6

Table 34. Marital status, count and frequency per category.	Count	Percent
Married	446	57.3
Divorced	113	14.5
Widowed	93	12.0
Separated	11	1.4
Never been married	79	10.2
A member of an unmarried couple	23	3.0
Refused	13	1.7

Hot Springs	Count	Percent
Married	152	52.0
Divorced	34	11.7
Widowed	10	3.3
Separated	—	—
Never been married	78	26.7
Unmarried couple	12	4.2
Refused	—	—

Fayetteville	Count	Percent
Married	245	63.6
Divorced	49	12.7
Widowed	19	4.9
Separated	5	1.3
Never been married	50	13.0
Unmarried couple	11	2.9
Refused	6	1.6

Table 35. Education, count and frequency per category.	Count	Percent
High school incomplete (Grade 9-11)	25	3.2
High School graduate/GED	136	17.5
Associate/Technical/Trade Degree	88	11.4
College/University Incomplete	140	18.1
College/university graduate or higher	385	49.7

Hot Springs	Count	Percent
High school incomplete (Grade 9-11)	15	4.7
High School graduate/GED	83	26.5
Associate/Technical/Trade Degree	53	16.9
College/University Incomplete	62	19.7
College/university graduate or higher	101	32.0

Fayetteville	Count	Percent
High school incomplete (Grade 9-11)	8	2.1
High School graduate/GED	41	10.7
Associate/Technical/Trade Degree	28	7.3
College/University Incomplete	54	14.1
College/university graduate or higher	252	65.8

Table 36. Annual income, count and frequency per category.	Count	Percent
Less than \$25,000	215	29.4
Less than \$50,000	79	10.8
Less than \$75,000	104	14.3
Less than \$100,000	102	14.0
More than \$100,000	212	29.1
Don't know	17	2.3

Hot Springs	Count	Percent
Less than \$25,000	113	38.8
Less than \$50,000	36	12.5
Less than \$75,000	35	12.0
Less than \$100,000	44	15.0
More than \$100,000	53	18.3
Don't know	9	3.2

Fayetteville	Count	Percent
Less than \$25,000	73	19.9
Less than \$50,000	28	7.6
Less than \$75,000	56	15.3
Less than \$100,000	58	15.8
More than \$100,000	146	39.8
Don't know	6	1.6

Appendix

2019 FORESTS & WATERSHEDS SOURCE WATER PROTECTION SURVEY

City of Hot Springs/Fayetteville Water Utilities

Hello, I'm _____ calling from the University of Arkansas. We are doing a survey about WATER QUALITY in the Fayetteville area. We are NOT trying to sell you anything. Your phone number has been chosen randomly to be included in this important university study.

If needed:

The survey is to learn more about what «CITY» area water users THINK about issues such as the services they receive and the quality of their water. We will not ask for your name or other personal information.

CONTACT INFO:

Kenneth E. Wallen
870.460.1052

Voicemail (1st/3rd/9th call): Hello, I'm ___ calling from the University of Arkansas for a research study. Your opinion is extremely important to us. We'll call back later.

C1

Am I speaking to you on a cell phone?

- 1 Yes
- 2 No

SKIPS from Q2

IF q2=1 SKIP TO: 4
IF q2=2 SKIP TO: 6

C2

I need to make sure that you are not operating a motor vehicle and that you are in a safe place and can speak freely. Is this correct?

S1

I have just a few quick questions to see if you are eligible for this study.

Are you 18 years of age or older?

- 1 Yes
- 2 No
- 9 Refused

SKIPS from Q6

IF q6=1 SKIP TO: 8

S2

And, do you receive your water from the «CITY» Water Utility?

- 1 Yes
- 2 No
- 7 Don't know / Refused

SKIPS from Q8

IF q8=1 SKIP TO: 12

IF q8=7 SKIP TO: 10

S3

Does your household pay for its' water or is the cost for water included in your rent or someone else pays the bill?

- 1 Pays for water
- 2 Included in my rent
- 7 Don't Know / Special arrangement / Unclear / Someone else
- 3 No bill - have WELL water

SKIPS from Q12

IF q12=1 SKIP TO: 14

IF q12=2 SKIP TO: 14

IF q12=7 SKIP TO: 14

INFORMED CONSENT - MUST READ

I won't ask for your name, address, or other personal information that can identify you. You don't have to answer any question you don't want to, and you can end the interview at any time and your confidential data will not be included in the study. The interview takes only about 9 minutes. This research is conducted with the oversight of the UA Little Rock Institutional Review Board. If you have any questions or concerns, I can give you information on who to contact.

It is important for the quality of this survey that I read the questions and all the possible answers so that we can make sure we get your best answer.

CONTACT INFO:

Kenneth E. Wallen
870.460.1052

If needed for IRB info:

Crystal Hunnicutt
501-569-8657

And I need to verify . . . Are you male or female?

- Male
- Female
- Refused

Q1

First, in general, how often do you make it a point to drink water? Would you say . . .

- Several times a day
- Once a day
- A few times a week
- A couple of times a month, OR
- Rarely
- Don't know
- Refused
- Other «»

Q2

When you drink water, do you mostly drink tap water, that is, water from a faucet, or do you mostly drink water from other sources?

- Tap water (Includes filtered tap water)
- Other sources
- Both equally (volunteered)
- Don't know
- Refused
- Other (Specify) «»

Q3

How often do you use tap water from your household faucets for activities like cooking and cleaning? Would you say . . .

- Every day
- A few times a week
- Once a week
- A couple of times a month
- Rarely, OR
- Never
- Don't know
- Refused
- Other (Specify) «»

Q4

How often do you use water from your OUTDOOR faucets for activities like watering the grass or plants, or washing your car? Think about the time of the year when you do these activities most often. Would you say . . .

- Every day
- A few times a week
- Once a week
- A couple of times a month
- Rarely, OR
- Never
- Don't know

Refused
Other (Specify) «»

Q5

Now, still thinking about the tap water from your household faucets . . .

How concerned are you with the QUALITY of your tap water? Would you say you are. . .

Very concerned
Moderately concerned
Slightly concerned, OR
Not at all concerned
Don't know
Refused

Next, on a scale of 1 to 5, with . . . [slowly]

1 -- being you have LITTLE TO NO knowledge, and, . . .

5 -- being you have a GREAT DEAL of knowledge . . .

Please rate your level of knowledge of the following.

Q6 - Random

[How about your LEVEL of knowledge of . . .]

Where the water you use at home comes from, that is, the location of the exact rivers or lakes that supply your water?

1 (Little to no knowledge)
2
3
4
5 (Great deal of knowledge)
Don't know
Refused

Q7 - Random

Why trees and forests are important to drinking water quality?

1 (Little to no knowledge)
2
3
4
5 (Great deal of knowledge)
Don't know
Refused

Q8 – Random

What a watershed is

1 (Little to no knowledge)
2
3
4

5 (Great deal of knowledge)
Don't know
Refused

The Water Utilities in the Fayetteville area get their water from Beaver Lake. This area is called the WATER SOURCE.

The Water Utilities in the Hot Springs area generally get their water from Lake Hamilton, Lake Ouachita and Lake Sanderson. These areas are called the WATER SOURCE.

Q9

Now . . . Thinking about «if q28=1 then THESE water source areas»«if q27=1 then THIS water source area», how concerned are you with the management of the forests in your water source area? Would you say you are . . .

Very concerned
Moderately concerned
Slightly concerned, OR
Not at all concerned
Don't know
Refused

Q10

Thinking about the services you receive from your Water Utility, what letter grade would you give them overall? Would you give them an "A", "B", "C", "D", or "F" ?

A
B
C
D
F
Don't know
Refused

Q11

For the next few statements, please tell me if you strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, or strongly disagree.

Your Water Utility provides you QUALITY drinking water.

STRONGLY agree
SOMEWHAT agree
Neither agree nor disagree
SOMEWHAT disagree
STRONGLY disagree
Don't Know
Refused

Q12 Random
[How about . . .]

Your Water Utility provides you with the basic information on where your drinking water comes from.

- STRONGLY agree
- SOMEWHAT agree
- Neither agree nor disagree
- SOMEWHAT disagree
- STRONGLY disagree
- Don't Know
- Refused

Q13 Random

Your Water Utility provides you with the basic information on what influences the price of your drinking water.

- STRONGLY agree
- SOMEWHAT agree
- Neither agree nor disagree
- SOMEWHAT disagree
- STRONGLY disagree
- Don't Know
- Refused

Q14 Random

Household water users should have input in the water management decisions made by their water provider.

- STRONGLY agree
- SOMEWHAT agree
- Neither agree nor disagree
- SOMEWHAT disagree
- STRONGLY disagree
- Don't Know
- Refused

Q15 Random

You trust your Water Utility to make the right management decisions about your water.

- STRONGLY agree
- SOMEWHAT agree
- Neither agree nor disagree
- SOMEWHAT disagree
- STRONGLY disagree
- Don't Know
- Refused

Q16 Random

You trust your Water Utility is NOT operating in ways that are harmful to the environment.

STRONGLY agree
SOMEWHAT agree
Neither agree nor disagree
SOMEWHAT disagree
STRONGLY disagree
Don't Know
Refused

Q17 Random

Household water users should take responsibility for the effects of their actions on the environment.

STRONGLY agree
SOMEWHAT agree
Neither agree nor disagree
SOMEWHAT disagree
STRONGLY disagree
Don't Know
Refused

Q18 Random

Household water users should be willing to pay for part of the costs of improving water quality.

STRONGLY agree
SOMEWHAT agree
Neither agree nor disagree
SOMEWHAT disagree
STRONGLY disagree
Don't Know
Refused

Q19 Random

Household water users should be willing to pay for part of the costs of managing forests in their water source area.

STRONGLY agree
SOMEWHAT agree
Neither agree nor disagree
SOMEWHAT disagree
STRONGLY disagree
Don't Know
Refused

Q20

Now, on another topic:

In the past year, how many times would you say you have visited a local LAKE or RIVER?

10 times or more

6-9 times
2-5 times
Only once
None/Never
Don't Know
Refused
Other (Specify) «»

Q21

In the past year, how many times would you say you have visited a local FOREST?

10 times or more
6-9 times
2-5 times
Only once
None/Never
Don't Know
Refused
Other (Specify) «»

Thank you for your time so far. These last few questions are about controlled burning, sometimes called prescribed burning. This type of burning involves allowing a fire to burn under close watch, to: Maintain the health of lands and forests ... reduce the risk of wildfires ... and improve wildlife habitats.

Q22

On a scale of 1 to 5 with 1 being very UN-necessary and 5 being VERY necessary, how would you rate the need for controlled burning?

1 (Very UN-necessary)
2
3
4
5 (Very necessary)
Don't know
Refused

Q23

On a scale of 1 to 5 with 1 being very UN-safe and 5 being VERY safe, how SAFE do you think controlled burnings are?

1 (Very UN-safe)
2
3
4
5 (Very safe)
Don't know
Refused

Q24

And now, please tell me your level of agreement with the next two statements. . .

You trust your Water Utility to make the right decisions about the use of controlled burning.

Do you strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, or strongly disagree?

- STRONGLY agree
- SOMEWHAT agree
- Neither agree nor disagree
- SOMEWHAT disagree
- STRONGLY disagree
- Don't Know
- Refused

Q25

You expect your Water Utility to partner with appropriate agencies, like the Arkansas Forestry Commission or US Forest Service, when they conduct controlled burnings.

- STRONGLY agree
- SOMEWHAT agree
- Neither agree nor disagree
- SOMEWHAT disagree
- STRONGLY disagree
- Don't Know
- Refused

Q26

Has there ever been an occasion where you were negatively affected by smoke from a controlled burn?

- Yes
- No
- Don't know
- Refused

Q27

Lastly, I have a few final questions about you.

In general, would you describe your political views as VERY conservative, conservative, moderate, liberal, or VERY liberal?

- Very conservative
- Conservative
- Moderate
- Liberal
- Very liberal
- Don't know

Refused
Other (Specify) «»

Q28

What is your age?

___ years
Don't know
Refused

Q29

How many years have you lived in the «CITY» area?

___ years
Less than one year
Don't know
Refused

Q30

Are you currently . . .

Married
Divorced
Widowed
Separated
Never been married, OR
A member of an unmarried couple
Refused

Q31

Which one or more of the following would you say is your race or ethnicity?

Would you say . . .

White
Black or African American
Asian
Native Hawaiian or other Pacific Islander, OR
American Indian or Alaskan Native
Don't Know
Refused
Hispanic or Latino
Other [Specify] «»

Q32

What is the last grade or class that you completed in school?

None, or grade 1-4
Grades 5-7
Grade 8
High school incomplete (Grade 9-11)
High school grad/Grade 12/GED

Associates/Tech/Trade Degree
College/university incomplete
College/university grad or higher
Don't know
Refused

Q33

Annual household income from all sources . . .

Less than \$10,000?
Less than \$15,000?
Less than \$20,000?
Less than \$25,000?
Less than \$35,000?
Less than \$50,000?
Less than \$75,000?
Less than \$100,000?
More than \$100,00?
Don't Know
Refused

That was my last question. Everyone's answers will be combined to help us better understand attitudes towards drinking water.

Thank you very much for your time and cooperation.