Quality of Life and Energy Production in Johnson County, Texas: An Illustrative Summary

Prepared by:

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Acknowledgements

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Introduction

This document provides an illustrative summary of the results obtained from a 2006 general population survey of individuals in Johnson County, Texas.

The purpose of this document is to provide insights into the current social impacts associated with the exploration and production of natural gas in Johnson County, Texas. Moreover, attitudes and behaviors of the citizens of Johnson County, as well as information on selected individual-level characteristics are presented. Figures and tables are used to simplify presentation of the data. No conclusions or inferences are made. County leaders and members of the general public interested in statistical analyses and more detailed information should contact Dr. Gene L. Theodori at:

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Methodology

During the late spring and early summer of 2006, a survey questionnaire was mailed to a randomly selected sample of 800 households in Johnson County, Texas. A cover letter explaining the purpose of the study and an addressed postage-paid return envelope accompanied the questionnaire.

To obtain a representative sample of individuals within residences, we stated in the cover letter that the questionnaire was to be completed by the adult in the household who celebrated his or her birthday most recently.

Approximately three weeks after the initial mailing, a reminder postcard was mailed to each sampled household that had not yet completed and returned the questionnaire. One week later a second wave of surveys was mailed. Then, approximately three weeks after the second mailing, a third and final wave was mailed.

The survey instrument, organized as a self-completion booklet, contained 42 questions and required approximately 60 minutes to complete. After three mailings, we received completed surveys from 301 individuals.
Section I

Individual-Level Characteristics

Figures 1 through 15 summarize selected individual-level traits of the survey respondents. Included here are characteristics such as gender, age, marital status, ethnicity, level of education, employment status, household income, home ownership, length of residence in the county, land ownership, and mineral rights ownership.
Figure 2

Age
(n = 282)

20 to 29
30 to 39
40 to 49
50 to 59
60 to 69
70 to 79
80 or more

Percent

0% 5% 10% 15% 20% 25% 30%
Figure 3

Marital status
(n = 289)
Johnson County, Texas

Figure 4

Ethnicity

(n = 280)
Johnson County, Texas

Figure 5

Level of education

- Did not complete high school: 8.87% (n=25)
- Completed high school or equivalent: 22.70% (n=64)
- Some college or post high school training: 30.85% (n=87)
- Completed associate's degree: 11.35% (n=32)
- Complete bachelor's degree: 15.25% (n=43)
- Graduate or professional training (beyond college): 10.99% (n=31)
Figure 6

Employment status

- Not employed: 8.87% (n=22)
- Employed full-time: 54.44% (n=135)
- Employed part-time: 36.69% (n=91)
Figure 7

Employed (part-time or full-time) in an occupation related to the natural gas industry

94.08%  
n=143

5.92%  
n=9

No

Yes
Figure 8

2005 household income
(n = 266)
Figure 9

Home ownership in Johnson County

97.17%

2.83%

n=275

n=8

Own home

Do not own home
Figure 10

Length of residence in the county
(n = 295)
Figure 11

Life-long resident of the county

- Yes: 7.43% (n=22)
- No: 92.57% (n=274)
Figure 12

Land ownership in Johnson County

- Yes: 76.57%, n=219
- No: 23.43%, n=67
Figure 13

Ownership of mineral rights with land owned in Johnson County

- Yes: 75.12% (n=151)
- No: 24.88% (n=50)
Figure 14

Land currently being leased to gas industry operators by landowners who OWN mineral rights

65.54%  
n=97

34.46%  
n=51

Yes
No
Figure 15

Land currently being leased to gas industry operators by landowners who DO NOT OWN mineral rights

- Yes: 9.09% (n=4)
- No: 90.91% (n=40)
Section II

Quality of Life

Figures 16 through 19 illustrate residents’ perception of the overall quality of life in Johnson County. Included here are past and present-day ratings of the quality of life, as well as the perceived effect on quality of life from the large-scale exploration and production of natural gas. In addition, residents’ likelihood of moving away from Johnson County in the near future is summarized.
Overall, how would you rate the quality of life in Johnson County today?

(n = 296)
Johnson County, Texas

Figure 17

Effects of exploration and production of natural gas in Johnson County on quality of life

More POSITIVE than negative effects 20.14% n=58
More NEGATIVE than positive effects 13.54% n=39
The positive and negative effects are ABOUT THE SAME 11.11% n=32
It is TOO EARLY TO TELL 55.21% n=159

More POSITIVE than negative effects
More NEGATIVE than positive effects
The positive and negative effects are ABOUT THE SAME
It is TOO EARLY TO TELL
Figure 18

How would you rate the quality of life in Johnson County BEFORE the large-scale exploration and production of natural gas began?

(n = 282)
Figure 19

Is it likely that you might move away from Johnson County within the next 5 years?

- No: 80.23% (n=211)
- Yes: 19.77% (n=52)
Section III

Attitudes Toward the Exploration and Production of Natural Gas in Johnson County

Figures 20 through 38 summarize residents’ attitudes toward the production and exploration of natural gas in Johnson County.
Figure 20

The natural gas industry is important to the local economy.

(n = 289)
Johnson County, Texas

Figure 21

Natural gas industry operators in this area are too politically powerful.
(n = 266)
Figure 22

Decisions about natural gas-related development should be made solely on economic grounds. 
(n = 281)
Not enough information concerning the development of natural gas is being made available to the general public.

(n = 289)
Figure 24

Even when carefully controlled, natural gas development is likely to upset the quality of life in a local area.

(n = 282)
Too little attention is being paid to the social costs of natural gas development.

(n = 276)
Figure 26

The natural gas companies have no compassion for our natural environment.

(n = 282)
Figure 27

Because industries have to be competitive, it is unfair to expect them to tell the public about their plans.
(n = 293)
All in all, the benefits of natural gas development for this area are greater than the costs.

(n = 272)
Decisions about natural gas development should be given to the effects on lifestyles and values of the people in this area.

(n = 284)
Natural gas operators MUST adopt and use more environmentally friendly drilling practices.

(n = 282)
Figure 31

Natural gas companies will do only what’s required by law.

(n = 282)

Strongly agree

Agree

Disagree

Strongly disagree

Percent
In the long run, I’m sure that people in this area will be better off if our natural gas resources are developed.

(n = 280)
Figure 33

Natural gas operators are drilling and producing too close to homes and businesses.

(n = 274)
Figure 34

People who object to natural gas development in this area should move someplace else.

(n = 285)
Figure 35

How do you feel about the drilling of more GAS WELLS in Johnson County?

(n = 288)

- Strongly favor
- Neutral
- Strongly oppose

Percent

0% 5% 10% 15% 20% 25% 30% 35%
How do you feel about the drilling of more DISPOSAL WELLS in Johnson County?
(n = 279)
Figure 37

How do you feel about the drilling of WATER WELLS in Johnson County to provide water for the natural gas industry?
(n = 282)

Percent

Strongly favor

Neutral

Strongly oppose

Percent

0% 5% 10% 15% 20% 25% 30% 35%
Figure 38

How do you feel about the use of CITY WATER supplies by the natural gas industry?

(n = 286)
Section IV

Potential Problems in Johnson County

This section deals with residents’ perceptions of the potential problems in Johnson County which may or may not be associated with the continued development of natural gas. Survey respondents were presented with 33 issues which may or may not be problems in Johnson County. Respondents were asked to indicate whether they believe each issue currently is “no problem at all,” a “slight problem,” a “moderate problem,” or a “serious problem.” Respondents were then asked to indicate whether the seriousness of the problem is “getting better,” “staying the same,” or “getting worse” with the continued development of natural gas. The results are summarized below.

Figures 39a through 71a illustrate the perceived problematic extent of the issue today. Figures 39b to 71b illustrate the apparent seriousness of the problem with the continued development of natural gas.

For purposes of presentation, the issues were ranked from the perceived “most serious” to the “least serious” (see the Mean Score and coding notation).
**Issue:** Use of illegal drugs

*(n = 268)*

- **Mean:** 3.071
- **Standard deviation:** 0.967

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, use of illegal drugs is:

- Getting better: 5.53% (n=14)
- Staying the same: 24.90% (n=63)
- Getting worse: 69.57% (n=176)
**Issue:** High tax rates  
(n = 272)

<table>
<thead>
<tr>
<th>Problem Level</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious problem</td>
<td>30%</td>
</tr>
<tr>
<td>Moderate problem</td>
<td>20%</td>
</tr>
<tr>
<td>Slight problem</td>
<td>10%</td>
</tr>
<tr>
<td>No problem at all</td>
<td>5%</td>
</tr>
</tbody>
</table>

**Mean:** 3.033  
**Standard deviation:** 0.966

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, high tax rates are:

- Getting better: 6.59% (n=17)
- Getting worse: 43.80% (n=113)
- Staying the same: 49.61% (n=128)
Figure 41a

**Issue:** Conditions of streets and roads  
(n = 286)

![Bar graph showing the percentage of respondents who perceive different severity levels of street and road conditions. The bars are labeled as follows: No problem at all, Slight problem, Moderate problem, Serious problem.]

**Mean** 3.031  
**Standard deviation** 0.864  
(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, conditions of streets and roads are:

- Getting better: 11.03% (n=30)
- Staying the same: 37.13% (n=101)
- Getting worse: 51.84% (n=141)
Figure 42a

**Issue:** Increased truck traffic
(n = 280)

- **Mean:** 2.943
- **Standard deviation:** 1.014
  (coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Figure 42b

Because of the development of natural gas, increased truck traffic is:

- Getting better: 2.77% (n=7)
- Staying the same: 24.51% (n=62)
- Getting worse: 72.73% (n=184)
Figure 43a

*Issue*: Depletion of aquifers  
(n = 244)

- **Mean**: 2.795  
  **Standard deviation**: 1.042  
  (coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, depletion of aquifers is:

- Getting better: 5.53% (n=13)
- Staying the same: 41.70% (n=98)
- Getting worse: 52.77% (n=124)
Figure 44a

**Issue**: Crime  
(n = 273)

![Bar chart showing the percentage distribution of responses to the crime issue. The categories are:

- No problem at all
- Slight problem
- Moderate problem
- Serious problem

The mean is 2.714 with a standard deviation of 0.891.

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Figure 44b

Because of the development of natural gas, crime is:

- Getting better: 5.30% (n=14)
- Staying the same: 68.18% (n=180)
- Getting worse: 26.52% (n=70)
**Figure 45a**

*Issue:* Amount of freshwater used by gas producers  
(n = 260)

<table>
<thead>
<tr>
<th>Percent</th>
<th>No problem at all</th>
<th>Slight problem</th>
<th>Moderate problem</th>
<th>Serious problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30%</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>40%</td>
<td></td>
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</tr>
<tr>
<td>50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60%</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Mean** 2.696  
**Standard deviation** 1.099  
(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Figure 45b

Because of the development of natural gas, amount of freshwater used by gas producers is:

- Getting better: 2.51% (n=6)
- Staying the same: 45.19% (n=108)
- Getting worse: 52.30% (n=125)
Figure 46a

**Issue:** Traffic accidents  
(n = 273)

![Bar Chart]

- **Serious problem**
- **Moderate problem**
- **Slight problem**
- **No problem at all**

Mean: 2.634  
Standard deviation: 0.938  
(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, traffic accidents are:

- Getting better: 5.12% (n=13)
- Getting worse: 35.83% (n=91)
- Staying the same: 59.06% (n=150)
Figure 47a

**Issue:** Water pollution  
(n = 271)

<table>
<thead>
<tr>
<th>Category</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious problem</td>
<td>20%</td>
</tr>
<tr>
<td>Moderate problem</td>
<td>30%</td>
</tr>
<tr>
<td>Slight problem</td>
<td>30%</td>
</tr>
<tr>
<td>No problem at all</td>
<td>20%</td>
</tr>
</tbody>
</table>

Mean: 2.565  
Standard deviation: 1.001  
(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, water pollution is:

- Getting better: 5.16% (n=13)
- Staying the same: 31.35% (n=79)
- Getting worse: 63.49% (n=160)
**Figure 48a**

*Issue:* Too much residential development  
(*n = 274*)

- **Mean:** 2.558  
  **Standard deviation:** 1.122

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, too much residential development is:

- Getting better: 8.06% (n=20)
- Staying the same: 53.63% (n=133)
- Getting worse: 38.31% (n=95)
**Figure 49a**

*Issue:* Air pollution  
*(n = 278)*

- **Serious problem**
- **Moderate problem**
- **Slight problem**
- **No problem at all**

<table>
<thead>
<tr>
<th>Percent</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
</tr>
</thead>
</table>

**Mean** 2.554  
**Standard deviation** 0.996  
(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, air pollution is:

- Getting better: 5.43% (n=14)
- Staying the same: 55.81% (n=144)
- Getting worse: 38.76% (n=100)
**Figure 50a**

*Issue:* Poverty  
(n = 268)

- **Mean:** 2.552
- **Standard deviation:** 0.887

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, poverty is:

- Getting better: 14.73% (n=38)
- Staying the same: 72.09% (n=186)
- Getting worse: 13.18% (n=34)
Figure 51a

**Issue:** Respect for law and order  
(n = 277)

<table>
<thead>
<tr>
<th>Problem Level</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No problem at all</td>
<td>0%</td>
</tr>
<tr>
<td>Slight problem</td>
<td>10%</td>
</tr>
<tr>
<td>Moderate problem</td>
<td>20%</td>
</tr>
<tr>
<td>Serious problem</td>
<td>30%</td>
</tr>
<tr>
<td>No problem at all</td>
<td>60%</td>
</tr>
</tbody>
</table>

Mean: 2.502  
Standard deviation: 0.977

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, respect for law and order is:

- Getting better: 8.33% (n=22)
- Staying the same: 71.21% (n=188)
- Getting worse: 20.45% (n=54)
Figure 52a

Issue: Absence of zoning regulations
(n = 259)

Mean 2.444
Standard deviation 0.944
(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, absence of zoning regulations is:

- Getting better: 14.57% (n=36)
- Staying the same: 65.59% (n=162)
- Getting worse: 19.84% (n=49)

Johnson County, Texas
Figure 53a

Issue: Medical and health care services
\((n = 272)\)

- No problem at all
- Slight problem
- Moderate problem
- Serious problem

Mean: 2.419
Standard deviation: 1.084
(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Johnson County, Texas

Figure 53b

Because of the development of natural gas, medical and health care services are:

- Getting better: 15.38%, n=40
- Staying the same: 68.46%, n=178
- Getting worse: 16.15%, n=42

Legend:
- Red: Getting better
- Blue: Staying the same
- Green: Getting worse
**Figure 54a**

*Issue:* Population growth  
(n = 272)

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No problem at all</td>
<td>20%</td>
</tr>
<tr>
<td>Slight problem</td>
<td>20%</td>
</tr>
<tr>
<td>Moderate problem</td>
<td>20%</td>
</tr>
<tr>
<td>Serious problem</td>
<td>20%</td>
</tr>
</tbody>
</table>

Mean: 2.408  
Standard deviation: 1.093

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, population growth is:

- Getting better: 7.69% (n=19)
- Getting worse: 76
- Staying the same: 53.04% (n=131)
- 39.27% (n=97)
**Figure 55a**

* Issue: Effectiveness of city governments  
  (n = 258)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No problem at all</td>
<td>10%</td>
</tr>
<tr>
<td>Slight problem</td>
<td>20%</td>
</tr>
<tr>
<td>Moderate problem</td>
<td>30%</td>
</tr>
<tr>
<td>Serious problem</td>
<td>30%</td>
</tr>
<tr>
<td>Total</td>
<td>77%</td>
</tr>
</tbody>
</table>

**Mean** 2.360  
**Standard deviation** 0.965  
(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, effectiveness of city governments is:

- Getting better: 13.67% (n=35)
- Staying the same: 73.05% (n=187)
- Getting worse: 13.28% (n=34)
**Issue:** Fire hazards (n = 273)

<table>
<thead>
<tr>
<th>Problem Level</th>
<th>Percent</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>No problem at all</td>
<td>30%</td>
<td>1</td>
<td>0.962</td>
</tr>
<tr>
<td>Slight problem</td>
<td>30%</td>
<td>2</td>
<td>0.962</td>
</tr>
<tr>
<td>Moderate problem</td>
<td>20%</td>
<td>3</td>
<td>0.962</td>
</tr>
<tr>
<td>Serious problem</td>
<td>10%</td>
<td>4</td>
<td>0.962</td>
</tr>
</tbody>
</table>

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, fire hazards are:

- Getting better: 8.33% (n=21)
- Staying the same: 66.27% (n=167)
- Getting worse: 25.40% (n=64)
**Figure 57a**

**Issue:** Availability of good jobs  
*(n = 272)*

- **Mean:** 2.342  
- **Standard deviation:** 1.054  

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Figure 57b

Because of the development of natural gas, availability of good jobs is:

- Getting better: 34.08% (n=91)
- Staying the same: 58.80% (n=157)
- Getting worse: 7.12% (n=19)
**Figure 58a**

*Issue:* Noise pollution  
*(n = 280)*

<table>
<thead>
<tr>
<th>Problem Level</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No problem at all</td>
<td></td>
</tr>
<tr>
<td>Slight problem</td>
<td></td>
</tr>
<tr>
<td>Moderate problem</td>
<td></td>
</tr>
<tr>
<td>Serious problem</td>
<td></td>
</tr>
</tbody>
</table>

- **Mean:** 2.325  
- **Standard deviation:** 0.994  

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, noise pollution is:

- Getting better: 4.89% (n=13)
- Staying the same: 52.26% (n=139)
- Getting worse: 42.86% (n=114)
**Figure 59a**

**Issue:** Environmental quality

(n = 267)

<table>
<thead>
<tr>
<th>Category</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No problem at all</td>
<td>0%</td>
</tr>
<tr>
<td>Slight problem</td>
<td>10%</td>
</tr>
<tr>
<td>Moderate problem</td>
<td>20%</td>
</tr>
<tr>
<td>Serious problem</td>
<td>30%</td>
</tr>
<tr>
<td>No problem at all</td>
<td>40%</td>
</tr>
<tr>
<td>Slight problem</td>
<td>50%</td>
</tr>
<tr>
<td>Moderate problem</td>
<td>60%</td>
</tr>
</tbody>
</table>

*Mean* = 2.318

*Standard deviation* = 1.037

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, environmental quality is:

- Getting better: 7.26% (n=18)
- Staying the same: 55.65% (n=138)
- Getting worse: 37.10% (n=92)
Figure 60a

**Issue:** Effectiveness of county government  
(n = 264)

- **Mean:** 2.307
- **Standard deviation:** 0.919

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, effectiveness of county government is:
Figure 61a

**Issue:** Land use conflicts  
(n = 263)

- Serious problem
- Moderate problem
- Slight problem
- No problem at all

**Mean:** 2.259  
**Standard deviation:** 1.020

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Figure 61b

Because of the development of natural gas, land use conflicts are:

- Getting better: 5.88% (n=14)
- Staying the same: 60.50% (n=144)
- Getting worse: 33.61% (n=80)
Figure 62a

**Issue:** Loss of privacy  
(n = 272)

<table>
<thead>
<tr>
<th>Category</th>
<th>Percent</th>
<th>Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious problem</td>
<td>10%</td>
<td>4</td>
</tr>
<tr>
<td>Moderate problem</td>
<td>20%</td>
<td>3</td>
</tr>
<tr>
<td>Slight problem</td>
<td>30%</td>
<td>2</td>
</tr>
<tr>
<td>No problem at all</td>
<td>40%</td>
<td>1</td>
</tr>
</tbody>
</table>

Mean: 2.143  
Standard deviation: 1.065  
(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Figure 62b

Because of the development of natural gas, loss of privacy is:

- Getting better: 5.37% (n=13)
- Staying the same: 62.81% (n=152)
- Getting worse: 31.82% (n=77)
Figure 63a

**Issue:** Local police protection  
(n = 269)

- **No problem at all**
- **Slight problem**
- **Moderate problem**
- **Serious problem**

**Mean:** 2.089  
**Standard deviation:** 0.969

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Figure 63b

Because of the development of natural gas, local police protection is:

- Getting better: 12.64% (n=33)
- Staying the same: 76.25% (n=199)
- Getting worse: 11.11% (n=29)
Figure 64a

*Issue:* Quality of local schools  
(n = 267)

- **No problem at all:** 0%
- **Slight problem:** 10%
- **Moderate problem:** 20%
- **Serious problem:** 30%

**Mean:** 2.056  
**Standard deviation:** 0.962  
(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Johnson County, Texas

Figure 64b

Because of the development of natural gas, quality of local schools is:

- Getting better: 14.18% (n=37)
- Staying the same: 66.67% (n=174)
- Getting worse: 19.16% (n=50)
Figure 65a

**Issue:** Odors/fumes from drilling equipment

(n = 269)

- No problem at all
- Slight problem
- Moderate problem
- Serious problem

Mean: 2.052
Standard deviation: 1.021

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Figure 65b

Because of the development of natural gas, odors/fumes from drilling equipment are:

- Getting better: 4.45% (n=11)
- Staying the same: 62.75% (n=155)
- Getting worse: 32.79% (n=81)
**Figure 66a**

**Issue:** Light from gas drilling operations  
(n = 271)

- **Mean:** 2.041  
  **Standard deviation:** 1.005  
  (coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, light from gas drilling operations is:

- Getting better: 4.45% (n=11)
- Staying the same: 61.54% (n=152)
- Getting worse: 34.01% (n=84)
Figure 67a

**Issue:** Fire protection services  
(n = 273)

- **Serious problem**
- **Moderate problem**
- **Slight problem**
- **No problem at all**

**Mean:** 2.000  
**Standard deviation:** 0.951

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Johnson County, Texas

Figure 67b

Because of the development of natural gas, fire protection services are:

- Getting better: 17.25% (n=44)
- Staying the same: 72.94% (n=186)
- Getting worse: 9.80% (n=25)
Figure 68a

**Issue:** Gas well explosions
(n = 269)

Mean: 1.993
Standard deviation: 0.985

(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, gas well explosions are:

- Getting better: 9.17% (n=22)
- Staying the same: 22.92% (n=55)
- Getting worse: 67.92% (n=163)
**Figure 69a**

**Issue:** Disagreements among local residents  
(n = 268)

![Bar chart showing the distribution of disagreements among local residents.]

- **No problem at all:** 30%
- **Slight problem:** 20%
- **Moderate problem:** 10%
- **Serious problem:** 10%

**Mean:** 1.933  
**Standard deviation:** 0.901  
(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, disagreements among local residents are:

- Getting better: 8.06% (n=20)
- Staying the same: 73.39% (n=182)
- Getting worse: 18.55% (n=46)
**Figure 70a**

**Issue:** Too much industrial development  
(n = 269)

- **Serious problem**
- **Moderate problem**
- **Slight problem**
- **No problem at all**

- **Mean:** 1.881  
- **Standard deviation:** 0.985  
  (coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, too much industrial development is:

- Getting better: 13.36% (n=33)
- Staying the same: 60.32% (n=149)
- Getting worse: 26.32% (n=65)
Figure 71a

**Issue:** Too much commercial development  
(n = 273)

- **Serious problem**
- **Moderate problem**
- **Slight problem**
- **No problem at all**

<table>
<thead>
<tr>
<th>Percent</th>
<th>No problem at all</th>
<th>Slight problem</th>
<th>Moderate problem</th>
<th>Serious problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
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<tr>
<td>60%</td>
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</tbody>
</table>

**Mean** 1.872  
**Standard deviation** 0.994  
(coding: 1 = no problem at all; 2 = slight problem; 3 = moderate problem; 4 = serious problem)
Because of the development of natural gas, too much commercial development is:

- Getting better: 14.11% (n=34)
- Staying the same: 63.07% (n=152)
- Getting worse: 22.82% (n=55)
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Section V

Actions Which May or May Not Have Been Taken in Response to the Exploration and Production of Natural Gas in Johnson County

This section deals with eight actions which residents may or may not have taken in response to exploration and production of natural gas in Johnson County. Survey respondents were asked to indicate whether or not they had engaged in such actions. Respondents were then asked to indicate their likelihood of engaging in such actions in the future. The results are summarized below.

Figures 72a through 79a illustrate the extent to which respondents had engaged in such actions. Figures 72b to 79b illustrate the likelihood of engaging in such actions in the future.
**Figure 72a**

*Action*: Attended a meeting to get information and learn more about the drilling and production of natural gas

- **16.38%**  
  *n=47*

- **83.62%**  
  *n=240*
Likelihood in the future: To attend a meeting to get information and learn more about the drilling and production of natural gas

- Not likely: 41.70% (n=118)
- Somewhat likely: 27.56% (n=78)
- Very likely: 30.74% (n=87)
Figure 73a

**Action:** Contacted a local elected official or governmental agency to complain about a natural gas drilling and/or production issue

- **Yes:** 6.62% (n=19)
- **No:** 93.38% (n=268)
Figure 73b

Likelihood in the future: To contact a local elected official or governmental agency to complain about a natural gas drilling and/or production issue

- Not likely: 60.57% (n=169)
- Somewhat likely: 30.82% (n=86)
- Very likely: 8.60% (n=24)
**Figure 74a**

*Action:* Voted FOR a political candidate because of his/her position on the drilling and/or production of natural gas

- **Yes:** 8.36%  
  - n=24
- **No:** 91.64%  
  - n=263
**Figure 74b**

*Likelihood in the future:* To vote FOR a political candidate because of his/her position on the drilling and/or production of natural gas

- **Not likely:** 57.91% (n=161)
- **Somewhat likely:** 27.34% (n=76)
- **Very likely:** 14.75% (n=41)
**Figure 75a**

*Action:* Voted AGAINST a political candidate because of his/her position on the drilling and/or production of natural gas

- Yes: 8.45%  
  - n=24

- No: 91.55%  
  - n=260
Figure 75b

**Likelihood in the future:** To vote AGAINST a political candidate because of his/her position on the drilling and/or production of natural gas

- Not likely: 60.29% (n=167)
- Somewhat likely: 24.19% (n=67)
- Very likely: 15.52% (n=43)
**Figure 76a**

*Action:* Attended a gas industry-sponsored meeting to get information and learn more about leasing options

- **Yes:** 15.60%  
  - n=44
- **No:** 84.40%  
  - n=238
Likelihood in the future: To attend a gas industry-sponsored meeting to get information and learn more about leasing options

- Not likely: 40.65% (n=113)
- Somewhat likely: 32.01% (n=89)
- Very likely: 27.34% (n=76)
Figure 77a

*Action*: Attended a public meeting to OPPOSE the continued exploration and production of natural gas

- 3.50% of 10 people voted No.
- 96.50% of 276 people voted Yes.
Figure 77b

**Likelihood in the future:** To attend a public meeting to OPPOSE the continued exploration and production of natural gas

- **Not likely:** 72.00% (n=198)
- **Somewhat likely:** 19.64% (n=54)
- **Very likely:** 8.36% (n=23)
Figure 78a

Action: Attended a public meeting to SUPPORT the continued exploration and production of natural gas

- Yes: 94.04% (n=268)
- No: 5.96% (n=17)
Figure 78b

Likelihood in the future: To attend a public meeting to SUPPORT the continued exploration and production of natural gas

- Not likely: 57.71% (n=161)
- Somewhat likely: 29.75% (n=83)
- Somewhat likely: 12.54% (n=35)
- Very likely: 12.54% (n=35)
Figure 79a

**Action**: Wrote and mailed a letter to the editor of your local newspaper

- **Yes**: 2.44%  
  - n=7

- **No**: 97.56%  
  - n=280
Likelihood in the future: To write and mail a letter to the editor of your local newspaper

- Not likely: 76.26% (n=212)
- Somewhat likely: 17.63% (n=49)
- Very likely: 6.12% (n=17)
Section VI

Desalination of water

Desalination is a process by which salt and other contaminants are removed from the water produced in gas and oil operations. With desalination technology, such water is treated and purified, in turn, creating a beneficial freshwater resource that can be used in many different ways.

Figures 80 through 82 and Tables 1 and 2 summarize respondents’ level of familiarity with desalination and their attitudes toward the process.
Figure 80

How familiar are you with the process of desalination?
(n = 273)

- Extremely familiar
- Neutral
- Extremely unfamiliar

Percent

<table>
<thead>
<tr>
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<th>15%</th>
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<th>25%</th>
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</thead>
<tbody>
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<td></td>
<td></td>
<td>20%</td>
<td>15%</td>
<td>10%</td>
<td>5%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Table 1

A ranking of ways desalinated water from gas and oil field operations might safely be used

<table>
<thead>
<tr>
<th>Ways desalinated water could be safely used:</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Re-use by gas and oil industry operators (n = 271)</td>
<td>93.0%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Industrial use (e.g., manufacturing, etc.) (n = 267)</td>
<td>92.9%</td>
<td>7.1%</td>
</tr>
<tr>
<td>Municipal uses (e.g., watering golf courses and city parks, etc.) (n = 263)</td>
<td>81.4%</td>
<td>18.6%</td>
</tr>
<tr>
<td>Home irrigation purposes (e.g., watering lawns and shrubs, etc.) (n = 266)</td>
<td>77.8%</td>
<td>22.2%</td>
</tr>
<tr>
<td>Irrigation of farmland and/or rangeland (n = 267)</td>
<td>68.5%</td>
<td>31.5%</td>
</tr>
<tr>
<td>Maintenance of stream flows/reservoir levels (n = 261)</td>
<td>59.0%</td>
<td>41.0%</td>
</tr>
<tr>
<td>Aquifer recharge (n = 247)</td>
<td>52.2%</td>
<td>47.8%</td>
</tr>
<tr>
<td>Watering of livestock (n = 260)</td>
<td>49.2%</td>
<td>50.8%</td>
</tr>
<tr>
<td>People’s drinking water (n = 258)</td>
<td>26.0%</td>
<td>74.0%</td>
</tr>
</tbody>
</table>
Figure 81

What is your level of confidence that desalinated water from gas and oil field operations could meet HUMAN DRINKING WATER quality and purity standards?

(n = 279)
Figure 82

Should industry operators be required to desalinate water produced in the drilling and production of oil and natural gas?

- No: 79.28% (n=199)
- Yes: 20.72% (n=52)
# Table 2

A ranking of who might be likely to buy desalinated water if available for purchase

<table>
<thead>
<tr>
<th>Who might be likely to buy desalinated water:</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial users (n = 264)</td>
<td>79.9%</td>
<td>20.1%</td>
</tr>
<tr>
<td>Farmers (n = 264)</td>
<td>61.0%</td>
<td>39.0%</td>
</tr>
<tr>
<td>Developers (n = 263)</td>
<td>51.3%</td>
<td>48.7%</td>
</tr>
<tr>
<td>Ranchers (n = 263)</td>
<td>48.7%</td>
<td>51.3%</td>
</tr>
<tr>
<td>Business owners (n = 264)</td>
<td>42.0%</td>
<td>58.0%</td>
</tr>
<tr>
<td>Rural water systems (n = 264)</td>
<td>33.7%</td>
<td>66.3%</td>
</tr>
<tr>
<td>Municipal water systems (n = 264)</td>
<td>32.6%</td>
<td>67.4%</td>
</tr>
<tr>
<td>Home owners (n = 264)</td>
<td>24.2%</td>
<td>75.8%</td>
</tr>
<tr>
<td>People like me (n = 264)</td>
<td>20.1%</td>
<td>79.9%</td>
</tr>
</tbody>
</table>
Section VII

Preparedness of Local Leaders

This final item (Figure 83) deals with residents’ perceptions of the preparedness of local leaders for the large-scale exploration and production of natural gas in Johnson County.
Figure 83

How prepared, overall, do you think LOCAL LEADERS were for the large-scale exploration and production of natural gas in Johnson County?

(n = 279)
Note

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