

THE ENVIRONMENTAL (IN)JUSTICE OF FRACKING IN DENTON, TEXAS: WHO BENEFITS AND WHY WAS IT BANNED?

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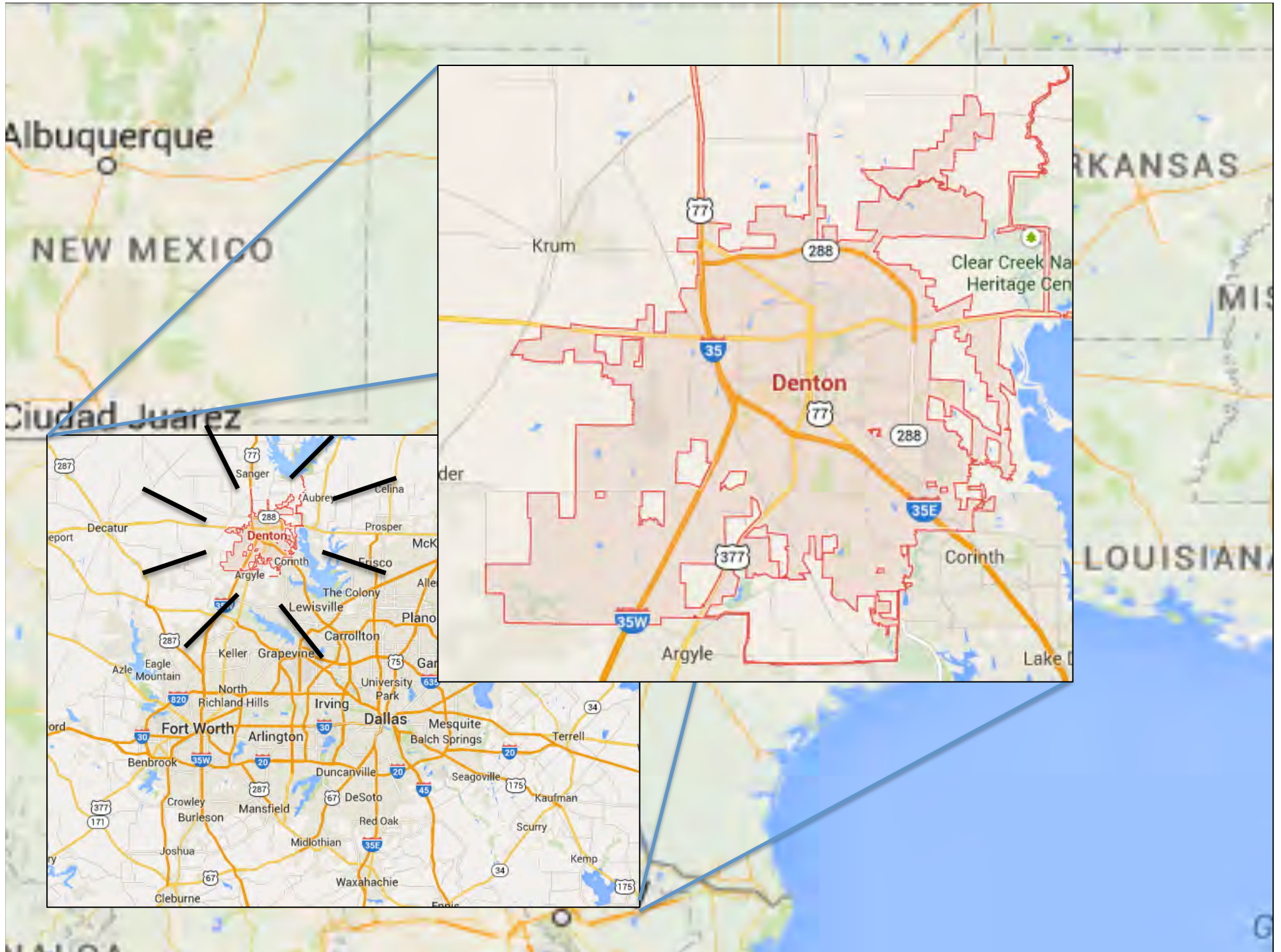
The Committee on
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TWO-FOLD THESIS:

1. A) DISTRIBUTIVE AND B) PARTICIPATORY ENVIRONMENTAL INJUSTICE CHARACTERIZES SHALE GAS DEVELOPMENT IN DENTON, TEXAS

2. ENVIRONMENTAL INJUSTICE EXPLAINS WHY DENTON VOTED TO BAN SGD IN NOV. 2014

ENVIRONMENTAL JUSTICE FRAMEWORK

DISTRIBUTIVE

- 1. THOSE WHO SHOULDER THE RISKS AND HARMS OF SGD OUGHT REAP FAIR BENEFITS**

PARTICIPATORY

- 2. THOSE WHO SHOULDER THE RISKS AND HARMS OF SGD OUGHT BE THE ONES WHO DECIDE TO DRILL**
- 3. THEIR EXPOSURE OUGHT BE A FUNCTION OF INFORMED CONSENT**

MAIN QUESTIONS OF THIS ANALYSIS:

- 1) HOW ARE THE RISKS, HARMS, AND BENEFITS OF SHALE GAS DEVELOPMENT DISTRIBUTED IN DENTON?**
- 2) DO THOSE WHO SHOULDER THE BURDENS OF SHALE GAS DEVELOPMENT REAP THE BENEFITS?**
- 3) WHAT PARTICIPATORY CONDITIONS EXPLAIN THIS DISTRIBUTION?**
- 4) DOES 3) ALSO EXPLAIN THE NOV. 2014 DECISION TO BAN FRACKING IN DENTON?**

<< SPOILER ALERT >>

1) HOW ARE THE RISKS, HARMS, AND BENEFITS OF SHALE GAS DEVELOPMENT DISTRIBUTED IN DENTON?

– INEQUITABLY

2) DO THOSE WHO SHOULDER THE BURDENS OF SHALE GAS DEVELOPMENT REAP THE BENEFITS?

– FOR THE VERY MOST PART, NO

3) WHAT PARTICIPATORY CONDITIONS EXPLAIN THIS DISTRIBUTION?

– VESTED RIGHTS

– SPLIT-ESTATE DOCTRINE

– OBSTRUCTIONS TO INFORMED CONSENT

4) DOES 3) ALSO EXPLAIN THE NOV. 2014 DECISION TO BAN FRACKING IN DENTON?

– WE THINK SO

What sorts of risks and harms and who bears them?

Resident complaints:

- noise, light pollution, nosebleeds, nausea, headaches (Goldenberg, 2013)

Lawsuits:

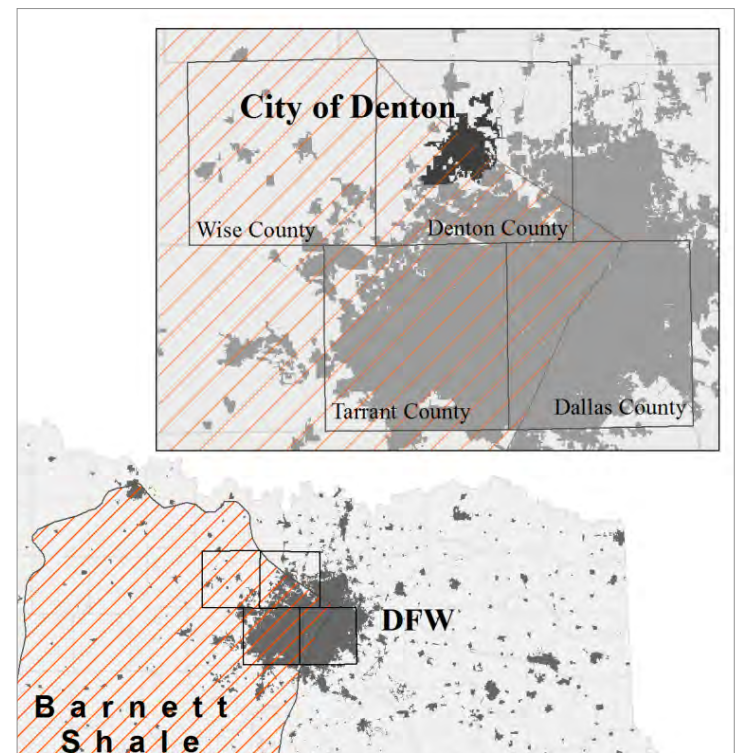
- 43 homeowners \$25 million lawsuit against EagleRidge for damages (Sakelaris, 2014)
- Wise County family won \$3m lawsuit against Aruba Petroleum for health impacts (Buchele, 2014)

Municipal Studies:

- 3% to 14% ↓ in property values <1,000ft from wells (Integra Realty Resources, 2010)
- ↑ acrolein and formaldehyde >600 ft from wells (Eastern Research Group 2011)

Ordinance Amendments:

- restrictions on noise, dust, traffic, light, aesthetics
- ↑ distance from homes, schools, and churches



Peer-Reviewed Studies on Impacts

- **proximity to fracking increases health risks** (Shonkoff et al. 2014)
 - fatigue, burning eyes, dermatologic irritation, headaches, difficulty breathing, delirium, nosebleeds, etc. (McDermott-Levy et al. 2013)
 - ↑ health risks from air emissions for residents living within 0.5 miles (0.8 km) of gas wells (McKenzie et al. 2012)
 - ↑ birth defects within 0.8 km of wells (McKenzie et al. 2014)
 - ↑ in low birth weights within 1.5 mile (2.5 km) (Hill 2013)
- **contamination of ground and surface water**, e.g. ↑ in endocrine disruptors (Kassotis et al. 2013)
- **safe disposal of flowback fluids**, e.g. ↑ levels of radium isotopes (Vengosh et al. 2014) and residual organic contaminants (Orem et al. 2014)
- **sediment run-off and stream loading** (Williams 2008; Entrekin et al. 2011)
- **DFW residents perceptions mixed**, e.g. for 1/3 it is the greatest threat to water supplies (Fry et al. 2012); more negative over time (Theodori 2012)

What kinds of benefits and who
reaps them?

Economic benefits of drilling?

- Industry-funded reports, e.g., Perryman Group (2011, 2014), show substantial economic growth and job creation
- Peer-reviewed economic studies show less gains, e.g. 1.5% versus 5.92% (Weber 2012)
- Non-peer reviewed economic reports are misleading and use questionable economic estimates (Kinnaman 2011)
- Municipal governments and school districts with small populations receive some funds from local mineral property taxes (Weber, Burnett, and Xiarchos, 2014)
- Costs of health and environment rarely factored in; Litovitz et al. (2013) estimate \$7.2 to \$32 million/year in PA
- Mineral owners and royalties?

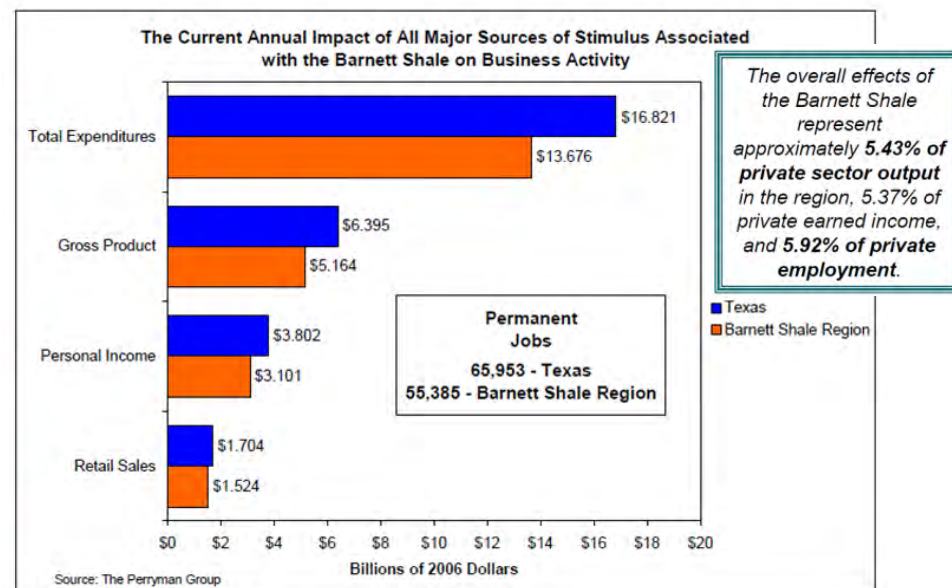


Table 2

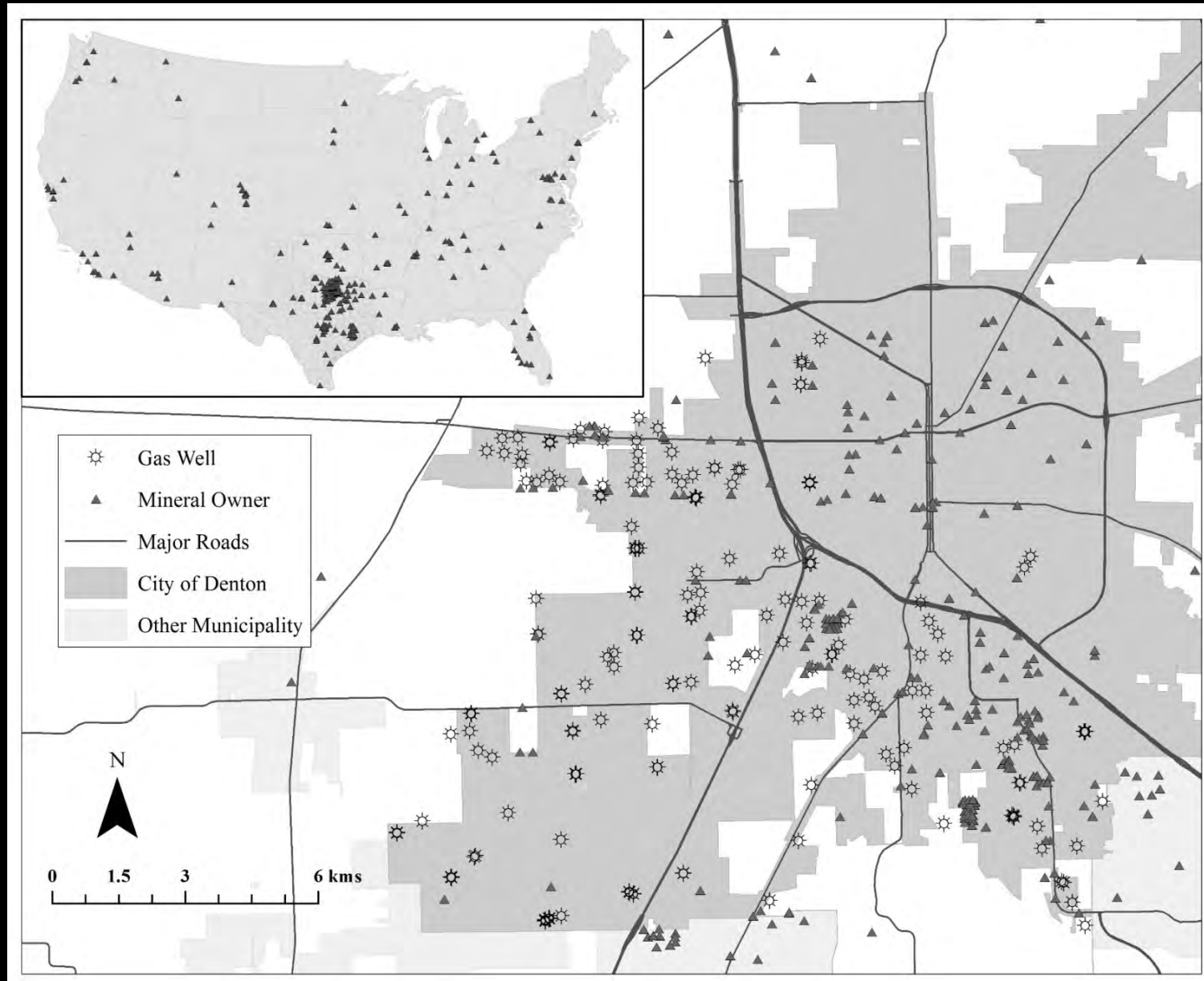
Average annual percent increases. (bold implies active shale gas extraction).

Region	1990–2000	2000–2006
Denton County, Texas	Population ↑ 5.8%	Population ↑ 5.8%
Barnett Shale (began 2001)	Median HH Income ↑ 5.8%	Median HH Income ↑ 2.5%
Faulkner County, Arkansas	Population ↑ 4.3%	Population ↑ 2.8%
Fayetteville Shale (began 2002)	Median HH Income ↑ 6.1%	Median HH Income ↑ 1.5%
White County, Arkansas	Employment ↑ 4.8%	Employment ↑ 1.1%
Fayetteville Shale (began 2002)	Population ↑ 2.2%	Population ↑ 1.3%
	Median HH Income ↑ 6.3%	Median HH Income ↑ 2.1%
10th Congressional Dist, PA	Employment ↑ 2.4%	Employment ↑ 0.5%
Marcellus Shale (began 2006)	Population ↑ 1.4%	Population ↑ 0.1%
	Median HH Income ↑ 4.0%	Median HH Income ↑ 2.5%

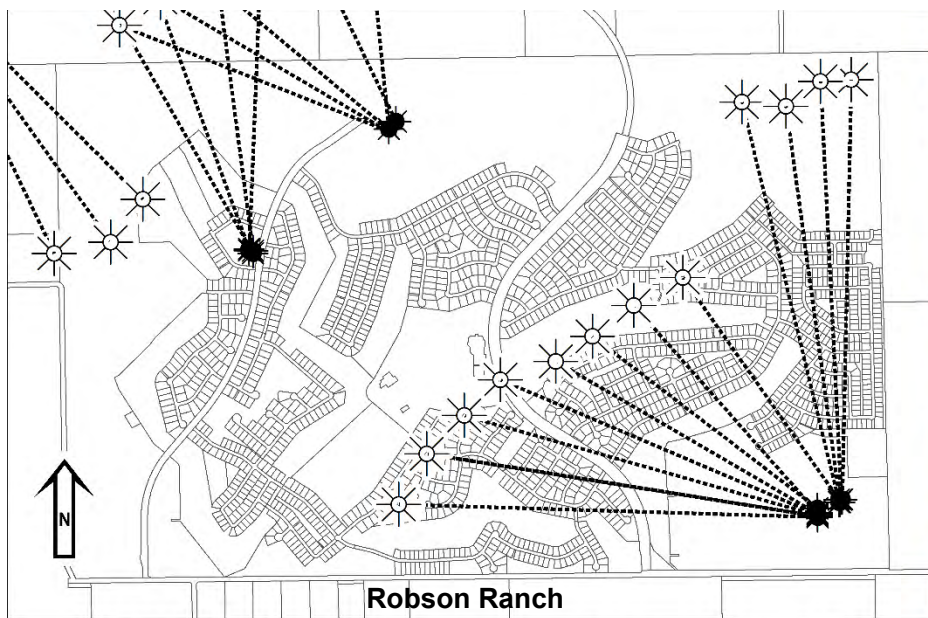
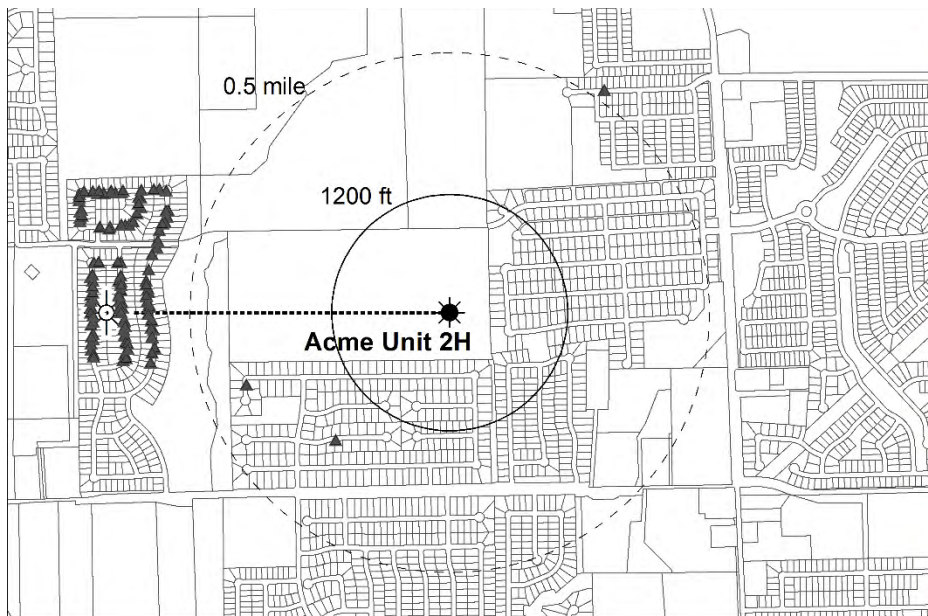
Kinnaman, T. C. (2011). The economic impact of shale gas extraction: A review of existing studies. *Ecological Economics*, 70(7), 1243-1249.

Do those who shoulder the
burdens reap the benefits?

How are royalty benefits from fracking in Denton distributed?

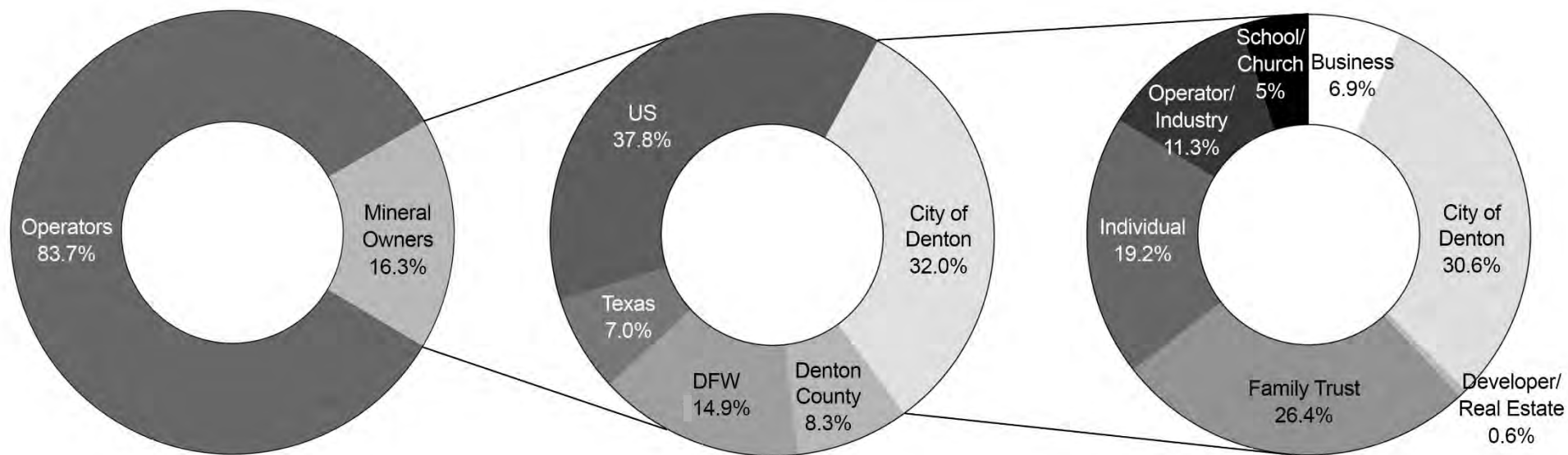


\$66,202,354 total appraised value (excluding operators)



▲ Mineral owner mailing address ★ Gas well ☼ Bore hole end Horizontal bore hole

How much of Denton's SGD wealth
stays in Denton?



- At least 68% of assessed mineral values leave the City of Denton (17% of addresses are PO boxes, receive 46% of appraised value)
- Denton homeowners own 19% of value that stays in city, or 6.3% of the \$66,202,354 value not going to operators, or 1% of the \$405,372,172 total appraised value, including operator interests
- More non-mineral owners than mineral owners live near gas wells, proximity greatly increases health and environmental risks (Shonkoff et al., 2014)
- **Bottom line:** there is an uneven distribution of costs and benefits from fracking in the City of Denton

How has the City of Denton used its
SGD revenue to benefit its citizens?



City mineral revenues:

- Airport royalty payments 2006-2012 = \$11,215,271 (City of Denton, 2014)
 - fund the Airport Enterprise Fund, including its current business and master plans
- Non-Airport gas wells, >\$2.5 million (City of Denton, 2014)
 - Planning Department software (\$600,000)
 - Transportation Department fiber-optics (\$392,900)
 - update of the City's comprehensive plan (\$600,000)
 - water slide (\$250,000)
 - soccer fields (\$950,000)
 - golf driving range (\$200,000)
 - park property acquisition (\$500,000) and other park enhancements

So what's the gist of the distributive situation?

the distribution of costs and benefits of fracking in Denton

- Do other Texas cities have similar distributions of mineral owners?
- Not all active gas wells are in the Denton County Appraisal District data set.
- No information on bonus payments.

1. Main financial beneficiaries of fracking in Denton live outside of city – receive most of the rewards and suffer little-to-none of the negative effects.

2. Most local beneficiaries make very little money.

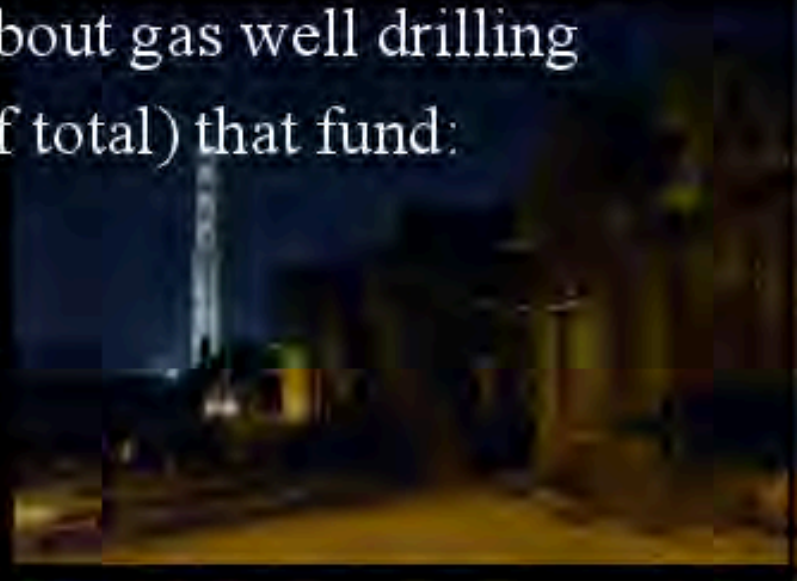
3. Local mineral owners, surface owners and renters bear the brunt of negative effects.

What participatory conditions explain
this inequitable distribution?

Does the uneven distribution of costs/benefits constitute an environmental injustice?

- Participation in decisions matters:
 - just participation is a function of informed, non-coerced consent
- Severance of property estates affects full participation
- Non-mineral owners rely on city government to be their institutional voice in decisions about gas well drilling
 - City owns minerals (12.1% of total) that fund:

Airport Enterprise Fund, water slide, soccer fields, golf driving range, park enhancements, etc.





Two problems remain:

1. Vested rights: 462 gas wells permitted before 2013 (260 in city territory and 202 in its extraterritorial jurisdiction)

Full participative justice would allow communities to consent to environmental hazards as scientific understandings of those hazards evolve (Ottinger 2013)

2. New homes, old well sites: in order to give consent, homebuyers require meaningful information about risks

In Denton, short paragraph in home-sale closing documents indicates the presence of gas wells.

Does this explain why Denton voted to
ban fracking in Nov. 2014?

~59% of Denton voters passed the
municipal ban in Nov. 2014



Thank you for listening.

Questions?