Hazardous Materials Commodity Flow Study

PIPELINES IN LUBBOCK COUNTY, TEXAS

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September 2011

HAZARDOUS MATERIALS COMMODITY FLOW STUDY: PIPELINES IN LUBBOCK COUNTY, TEXAS

Prepared for
Lubbock County Local Emergency Planning Committee

and

Texas Department of Public Safety
Texas Division of Emergency Management

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September 2011

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ACKNOWLEDGMENTS

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ABSTRACT

The Lubbock County hazardous materials (HazMat) commodity flow study (CFS) was conducted between January 2011 and September 2011. The project focused on hazardous materials transport via roadways, railways, and pipelines. This report covers pipeline transportation and also includes mapping information on critical facilities, critical infrastructure, and life safety priorities in Lubbock County.

SUMMARY

A hazardous materials (HazMat) commodity flow study was conducted for Lubbock County, Texas, from January through September 2011. The project included a general evaluation of hazardous materials transport via roadways, railways, and pipelines. The project was funded through the U.S. Department of Transportation (U.S. DOT), Pipeline and Hazardous Materials Safety Administration (PHMSA), Hazardous Materials Emergency Preparedness (HMEP) Grant Program. Funding was administered by the Texas Division of Emergency Management (TDEM). Texas Transportation Institute (TTI) was the contractor for the study. Grant match funding was provided through in-kind match by the Lubbock County Local Emergency Planning Committee (LEPC) and through reduction of indirect rate costs by TTI.

A HazMat commodity flow study (HMCFS) can provide important information about HazMat transportation in an area. An HMCFS identifies the types and amounts of hazardous materials transported through a specific geographic area. An HMCFS is used as part of a community's Emergency Operations Plan (EOP), which is required under federal homeland security programs. HMCFS information can also be used to educate the public about risks, help guide incident response training activities, identify risk hotspots, evaluate equipment and supplies needs, develop warning systems (e.g., evacuation or shelter-in-place), locate and schedule personnel and equipment, or designate HazMat routes. An HMCFS can also be used to support comprehensive community planning (transportation, emergency services, land use, etc.) and, very rarely, legal takings.[1] This report provides basic information about HazMat transportation by pipelines in the Lubbock County area that can be used in emergency planning, risk and vulnerability assessment, and emergency response. Other reports cover HazMat transport by roadways and railways.

PIPELINE MAPS

The pipeline maps in Appendix A of this report are based on data provided by the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, National Pipeline Mapping System (NPMS). NPMS data cover crude oil, natural gas, hazardous liquids, and other pipelines. Maps for individual pipeline operators are provided and show only pipeline location information for Lubbock County, as pipeline location data for other counties were not provided by NPMS. Pipeline operator maps include contact information included with

[1] *Guidebook for Local Hazardous Materials Commodity Flow Studies*, by David H. Bierling, George O. Rogers, Deborah L. Jasek, Anna A. Protopapas, Jeffrey E. Warner, and Leslie E. Olson. HMCRP Report 3. Transportation Research Board of the National Academy of Sciences, Washington, D.C. 2011.

the NPMS mapping data. The accuracy of mapping information is variable and may range from 50 feet to +/- 500 feet.[2]

The pipeline maps included in this document have been designated as limited-release information by PHMSA. Pipeline maps are 'For Official Use Only.' The pipeline maps are not to be distributed beyond the LEPC community and the LEPC's official state partners.

Appendix A also contains maps of priority infrastructure in the Lubbock County area, using information contained in the Federal Emergency Management Agency's Hazards U.S. Multi-Hazard (HAZUS-MH) Software Version 2.0, which is available upon request free-of-charge from FEMA to local and state officials. Accuracy and completeness of mapped information is as provided in the HAZUS-MH software. The mapped information includes locations of:

- Critical facilities (emergency centers, fire stations, police stations, and care facilities);
- Life safety priorities (dams, HazMat facilities, and schools); and
- Critical infrastructure (wastewater, potable water, oil, natural gas, electric power, communication, rail, ferry, port, bus, and airport facilities).

Given the content of some of the mapped information, we have included them with the pipeline maps in this LEPC-'For Official Use Only' report.

PIPELINE INCIDENTS

Pipelines are a typically 'unseen' mode of hazardous materials transport, since most pipeline infrastructure is below the ground surface. Incidents involving release of HazMat from pipelines can be extremely destructive.

- In August 2000, a 30-inch natural gas transmission line exploded near the Pecos River at Carlsbad, New Mexico. Twelve persons who were camping nearby were killed, and three bridges were damaged or destroyed, with property and other damage losses near $1 million. Internal pipeline corrosion was cited as the cause by the National Transportation Safety Board (NTSB).[3]

[2] Roop, S.S., Olson, L.E., Bierling, D.H., Warner, J.E., Rinehart, A., Sandoval, A., Beruvides, M., and Weisner, T. *The Value of Pipelines to the Transportation System of Texas: Year Two Report.* Texas Department of Transportation Research Report 1858-2. Texas Transportation Institute, February 2002.
[3] *Pipeline Accident Report; Natural Gas Pipeline Rupture and Fire Near Carlsbad, New Mexico; August 19, 2000.* Accident Report NTSB/PAR-03/01. National Transportation Safety Board, February 11, 2003.

- In November 2007, a 12–inch diameter liquid propane pipeline ruptured near Carmichael, Mississippi. The gas cloud resulting from the breach enveloped nearby homes and ignited, killing two and injuring seven people. Property damages alone were estimated to be over three million dollars. The NTSB determined the cause of the incident was due to pipeline weld failures.[4]

Figure 1. Rupture and explosion of hazardous liquids pipeline, Carmichael, Mississippi, 2007 (source: NTSB).

- In November 2009, a natural gas pipeline exploded in Bushland, Texas due to a fracture near a pipe weld.[5] A number of homes in the area suffered damage, nearby residents were evacuated, and three people were hospitalized with burns.[6]

- In July 2010, a 30-inch crude oil pipeline burst near Kalamazoo, Michigan. The spill of over 800,000 gallons of tar sands crude[7] closed approximately 30 miles of the

[4] *Pipeline Accident Report; Rupture of Hazardous Liquid Pipeline With Release and Ignition of Propane; Carmichael, Mississippi; November 1, 2007.* Accident Report NTSB/PAR-09/01. National Transportation Safety Board, October 14, 2009.
[5] *Bushland explosion cause released.* KDFA News Channel 10 Assignments Desk. December 16, 2009. Accessed October 5, 2010 at http://www.newschannel10.com/Global/story.asp?S=11686700.
[6] *3 injured when natural gas pipeline explodes.* The Associated Press. November 5, 2009. Accessed October 5, 2010 at http://www.msnbc.msn.com/id/33670832/.
[7] *Enbridge Spill near Marshall, MI.* Pipeline and Hazardous Materials Safety Administration. Accessed September 5, 2011 at http://opsweb.phmsa.dot.gov/pipelineforum/facts-and-stats/recent-incidents/marshall-mi/.

Kalamazoo River[8], affected fisheries, recreation and water supply, and required months of cleanup.

- In September 2010, a natural gas pipeline exploded in San Bruno, California. The explosion and fire killed 8 people, destroyed nearly 40 homes, and created a 72-foot by 26-foot crater. It took 95 minutes for Pacific Gas and Electric Company (PG&E) to stop the flow of gas in the pipeline, increasing the risks and severity of the damage. The NTSB found problems in the manufacture of the pipeline, PG&E's pipeline integrity management system, and regulatory oversight at state and federal levels.[9]

Impacts due to excavation or outside forces cause most pipeline incidents, but other causes can include corrosion and welding failures. The rupture of hazardous liquids and transmission pipelines can result in ignition and explosion, even without an external ignition source.

Based on data from the Pipeline and Hazardous Materials Safety Administration, incidents involving gas distribution pipelines (Table 3) were reported more frequently in Lubbock County than incidents involving hazardous liquid (Table 1) or gas transmission (Table 2) pipelines. Gas distribution pipeline incidents have been reported three times as much as either hazardous liquid or gas transmission pipeline incidents in Lubbock County and, to date, these incidents have caused one fatality and twelve injuries. It should be noted that most of the incident records contained in the database occurred in the 1980s; two incidents have been reported in the last twenty years.

[8] Kalamazoo River/Enbridge Spill Overview Map - 08/06/2010. Accessed September 5, 2011 at http://www.epa.gov/enbridgespill/images/enbridge_overview_map_20100806.pdf.
[9] *Pipeline Accident Report: San Bruno, CA, Natural Gas Pipeline Explosion and Fire, September 9, 2010*. National Transportation Safety Board. Accessed September 5, 2011 at http://www.ntsb.gov/news/events/2011/san_bruno_ca/index.html.

Table 1. Hazardous Liquids Pipeline Incidents, Lubbock County, Texas.
(Source: http://primis.phmsa.dot.gov/comm/reports/safety/SIDA.html)

Company Name	Incident Date	City	Property Damage in 2011 Dollars	Commodity	Lost	Recovered	Units*	Fatalities, Injuries	Cause**	Maximum Operating Pressure (PSI)
Amoco Pipeline Co	8/18/1992		$0	Crude oil	370	320	B	0, 0	Out.	700
BP Oil Pipeline Co	10/9/2000		$188,400	Crude oil	500	450	B	0, 0	Mal.	590
Valero Logistics Operations LP	12/24/2004	Lubbock	$3,943	Unleaded gasoline	22	0	B	0, 0		
Valero Logistics Operations LP	1/16/2005	Lubbock	$8,600	Unleaded gasoline	40	0	G	0, 0		

*B= Barrels, G= Gallons
**Out.= Outside Force Damage. Mal.= Malfunction of Control or Relief Equipment

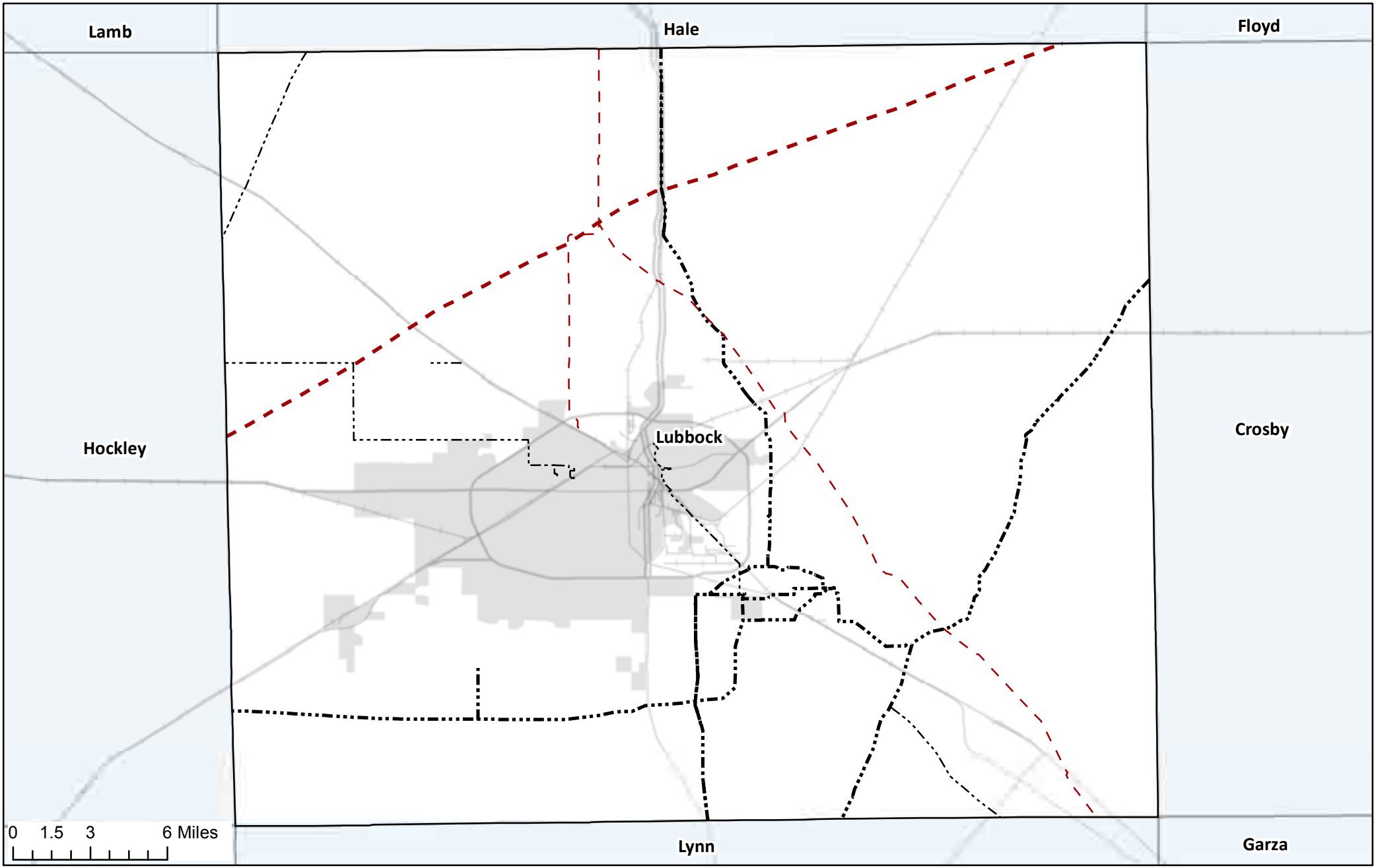
Table 2. Gas Transmission Pipeline Incidents, Lubbock County, Texas.
(Source: http://primis.phmsa.dot.gov/comm/reports/safety/SIDA.html)

Company Name	Incident Date	City	Property Damage	Fatalities	Injuries	General Cause	Max. Operating Pressure (PSI)
Power Tex Joint Venture	3/11/1988	Lubbock	$168,147	0	0	Other	1000
Cabot Gas Supply Corp	3/11/1988	Lubbock	$67,259	0	0	Damage By Outside Force	571
Oneok Westex Transmission, LP	2/13/2006	Lubbock	$66,301	0	0	Third Party Excavation Damage	575
Markwest Pinnacle LP	1/10/2008	Wolfforth	$18,659	0	1	Component	920

Table 3. Gas Distribution Pipeline Incidents, Lubbock County, Texas.
(Source: http://primis.phmsa.dot.gov/comm/reports/safety/SIDA.html)

Company Name	Incident Date	City	Property Damage	Fatalities	Injuries	General Cause	Max. Operating Pressure (PSI)
Energas Co	10/21/1986	Lubbock	$88,982	1	0	Other	16
Energas Co	7/17/1987	Lubbock	$0	0	0	Other	60
Energas Co	8/27/1987	Lubbock	$867	0	0	Damage by outside forces	60
Energas Co	9/21/1987	Lubbock	$34,687	0	1	Other	0
Energas Co	10/2/1987	Lubbock	$3,035	0	0	Other	60
Energas Co	11/7/1987	Lubbock	$45,094	0	10	Other	1
Energas Co	1/10/1988	Lubbock	$109,296	0	1	Other	60
Energas Co	9/21/1988	Shallowater	$5,044	0	0	Other	60
Energas Co	4/27/1989	Lubbock	$0	0	0	Damage by outside forces	60
Energas Co	9/24/1991	Lubbock	$22,562	0	0	Damage by outside forces	60
Energas Co	8/11/2003	Lubbock	$59,896	0	0	Other	0.9
Atmos Energy - West Texas Division	12/17/2007	Lubbock	$595	0	0	Third party excavation damage	60

APPENDIX A
PIPELINE AND PRIORITY INFRASTRUCTURE MAPS



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Commodity

- Gas Diameter < 12"
- Gas Diameter ≥ 12"
- Liquid Diameter < 12"
- Liquid Diameter ≥ 12"

Lubbock County Pipelines

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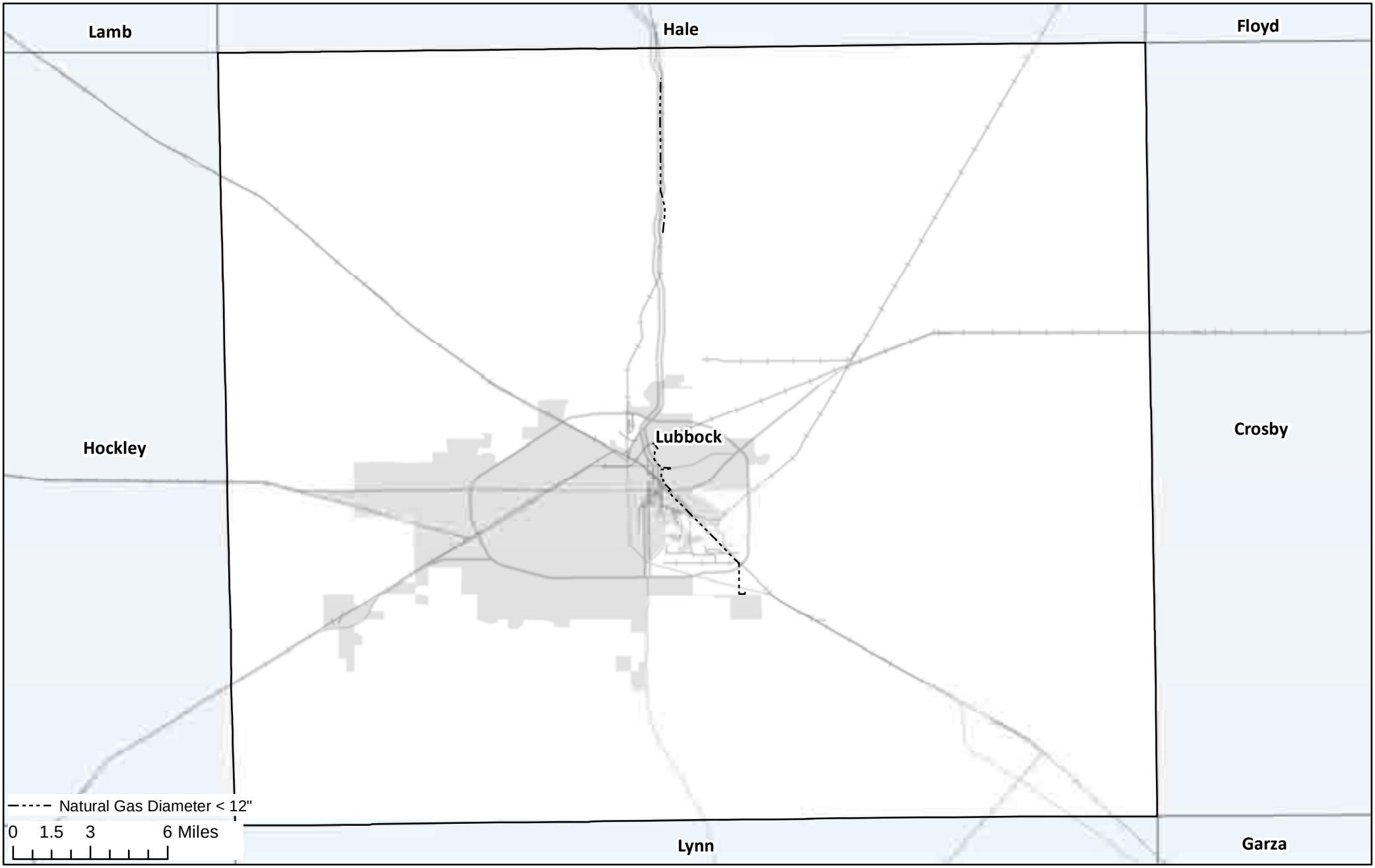
Major Sources: National Pipeline Mapping System;
National Transportation Atlas Database (2010)
Accuracy is limited to the validity of available data
Projection: Texas Statewide Mapping System
GCS: North America 1983



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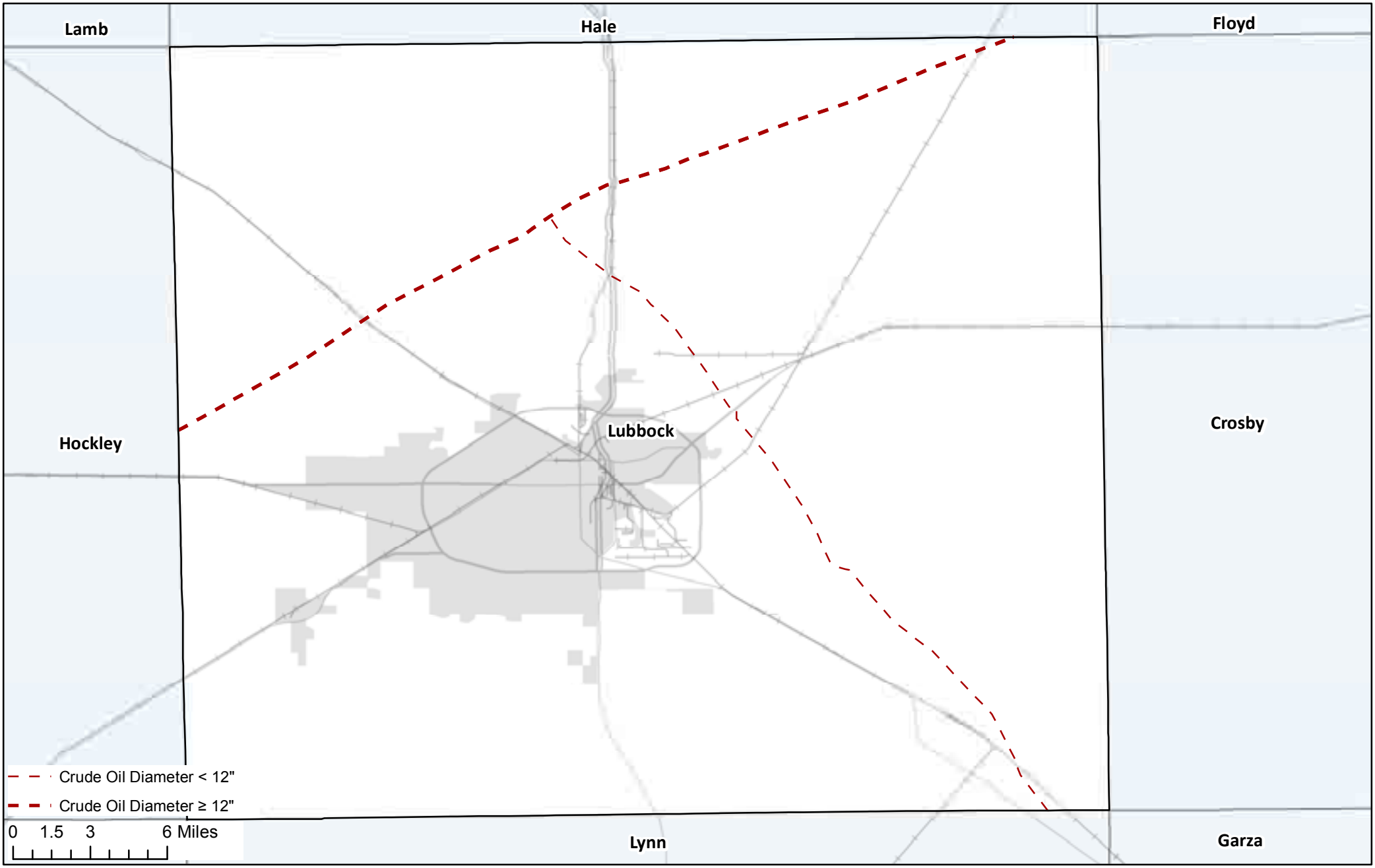

Centurion Pipeline LP

N

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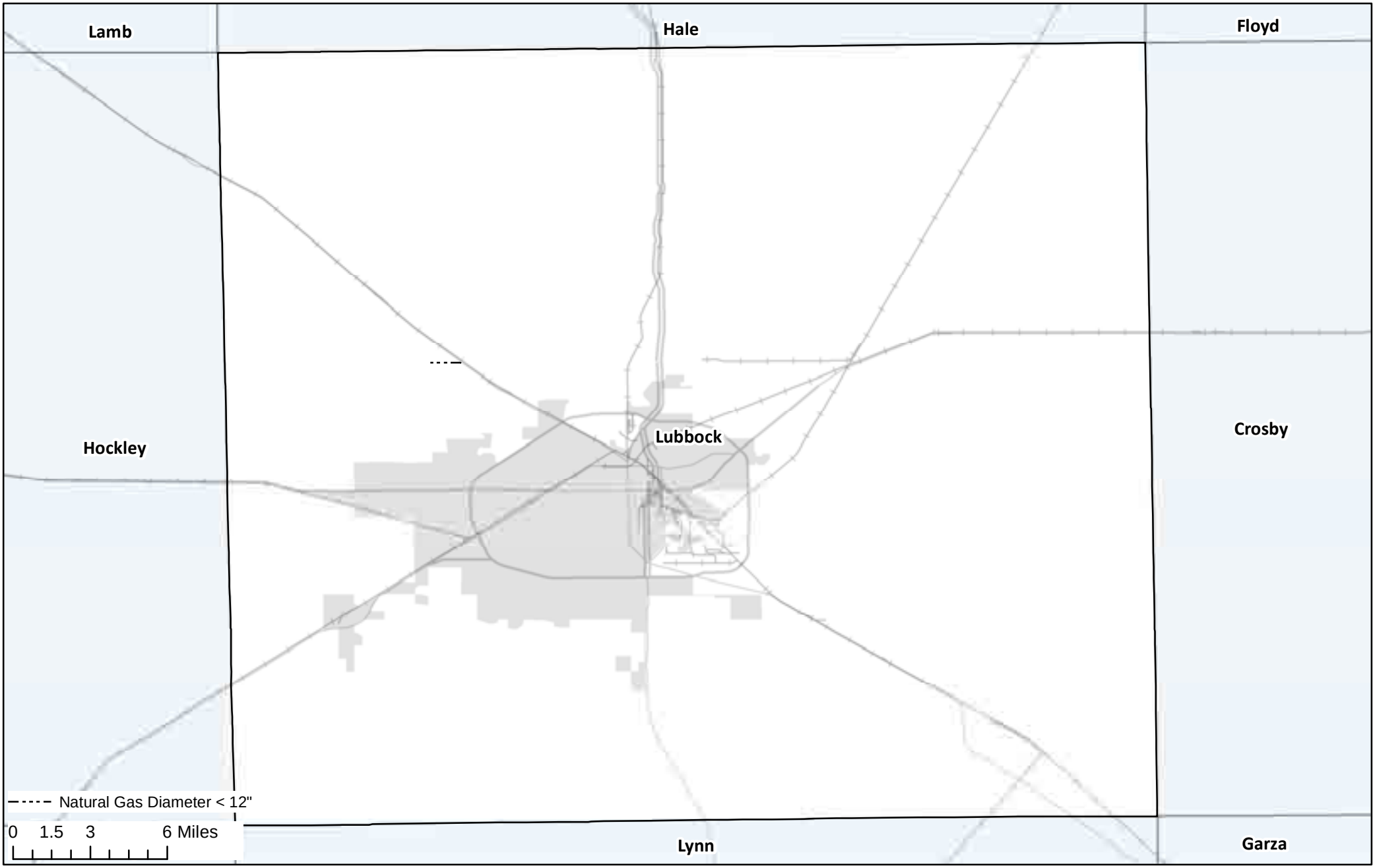

Lubbock Gas Gathering

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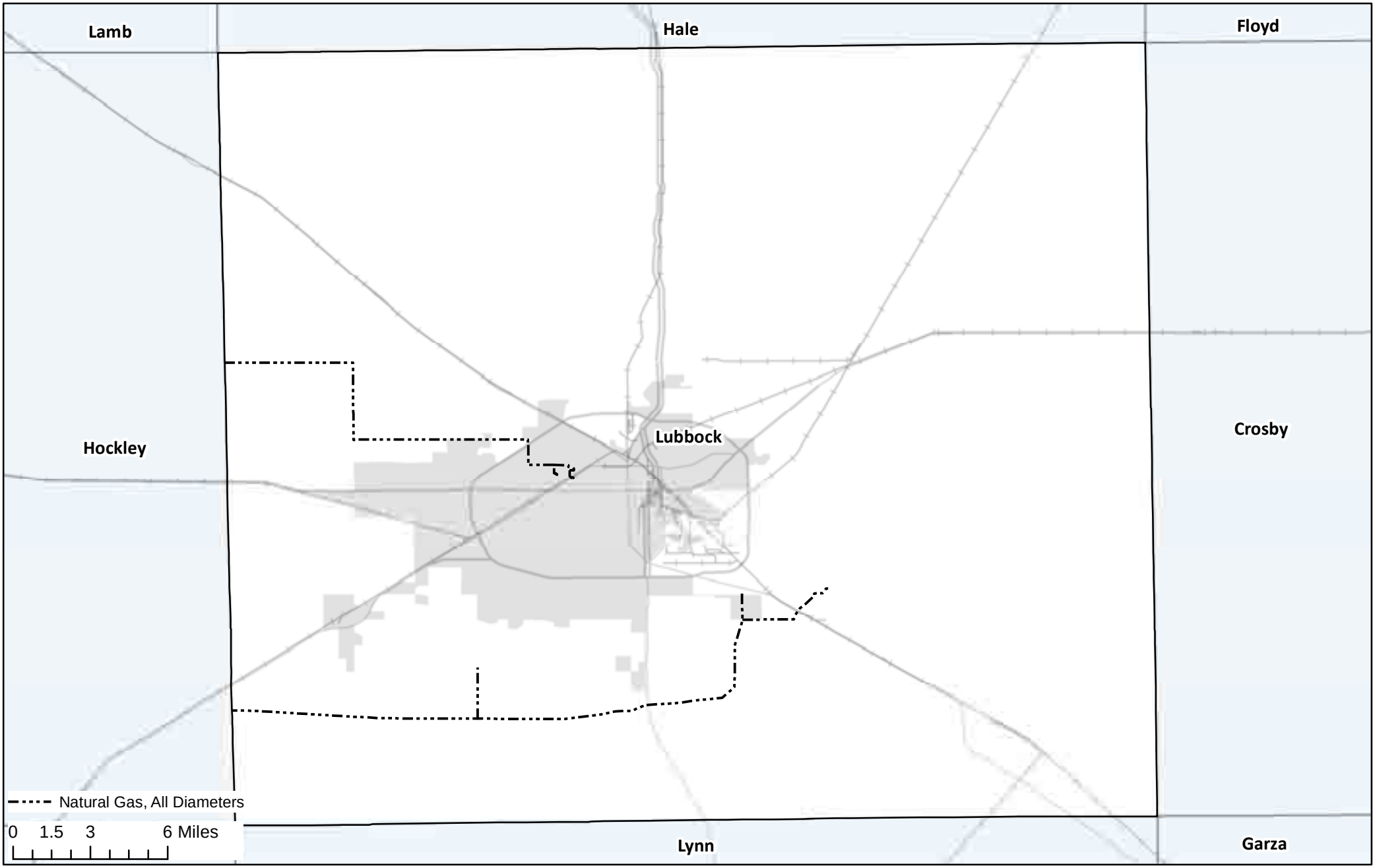

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Markwest Energy Partners LP

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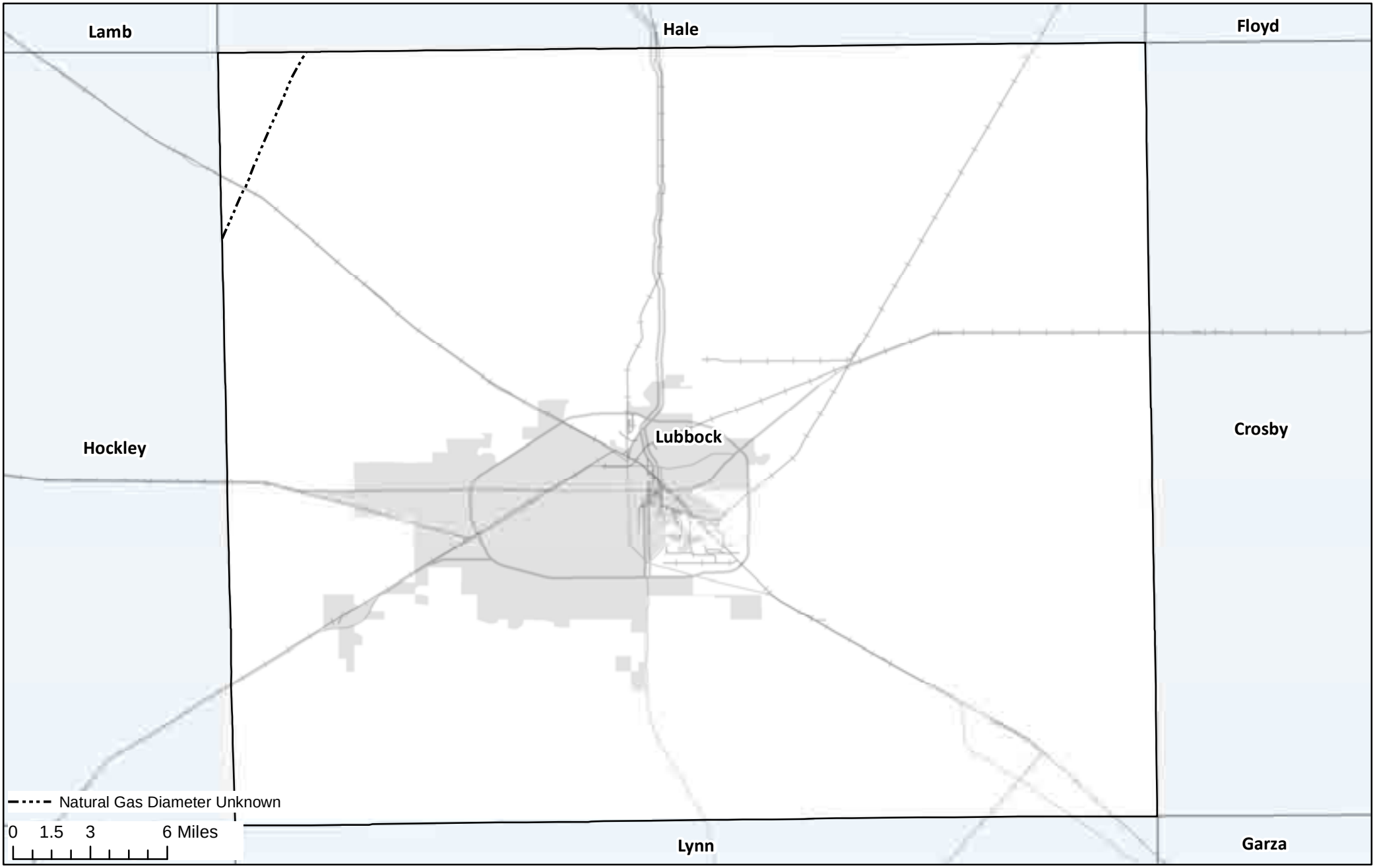

Northern Natural Gas Company

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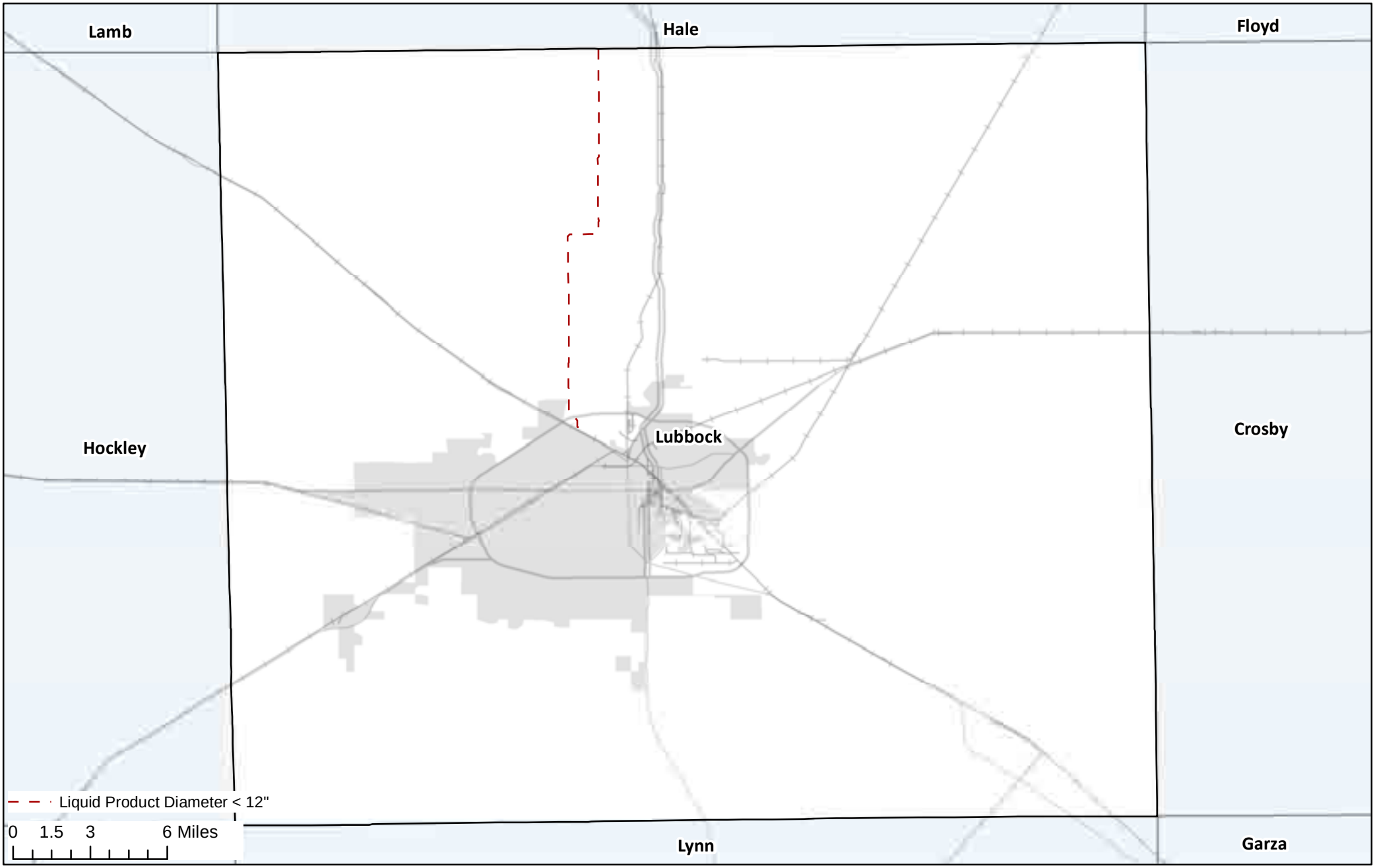

Nustar Logistics

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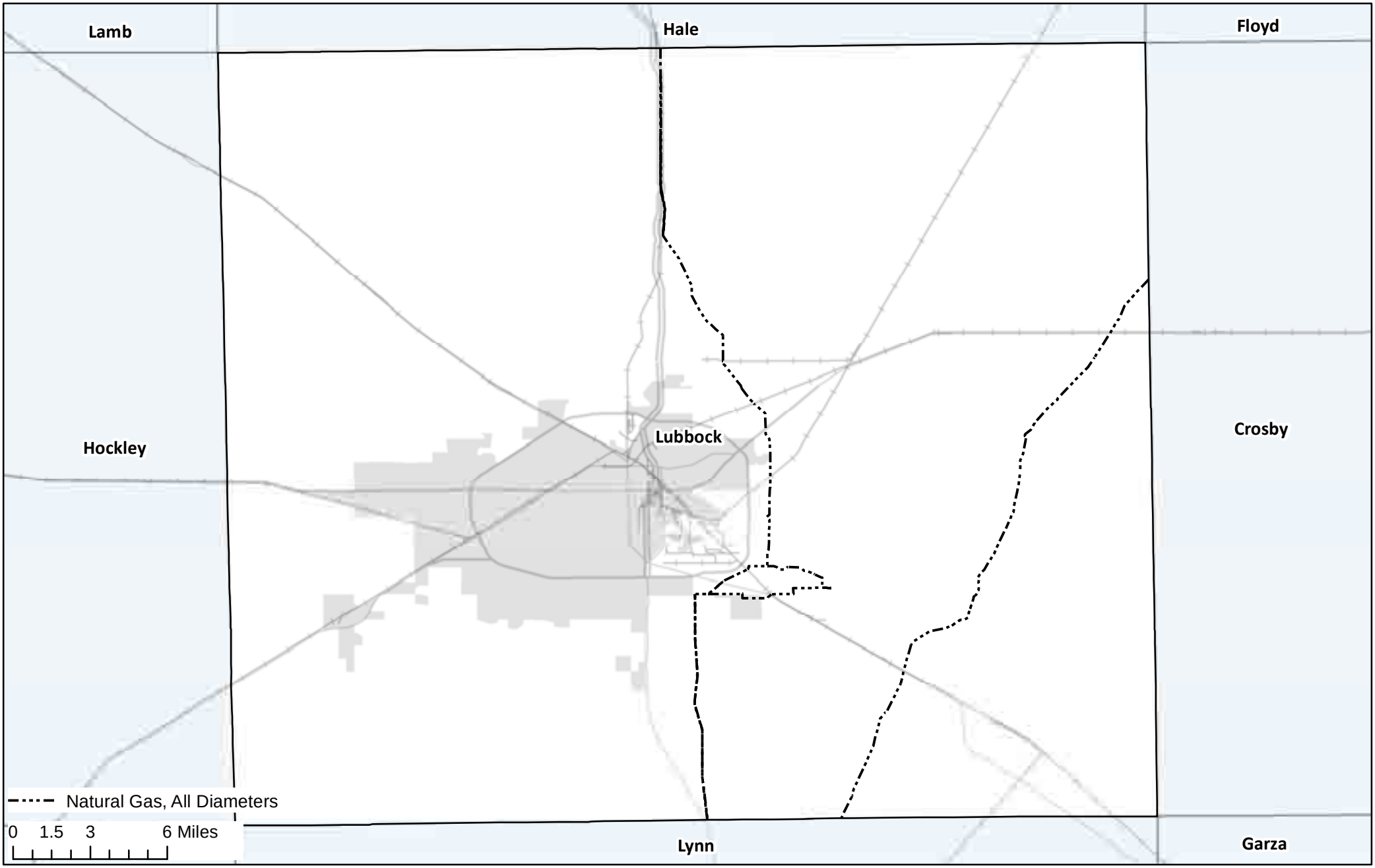

N

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ONEOK Partners

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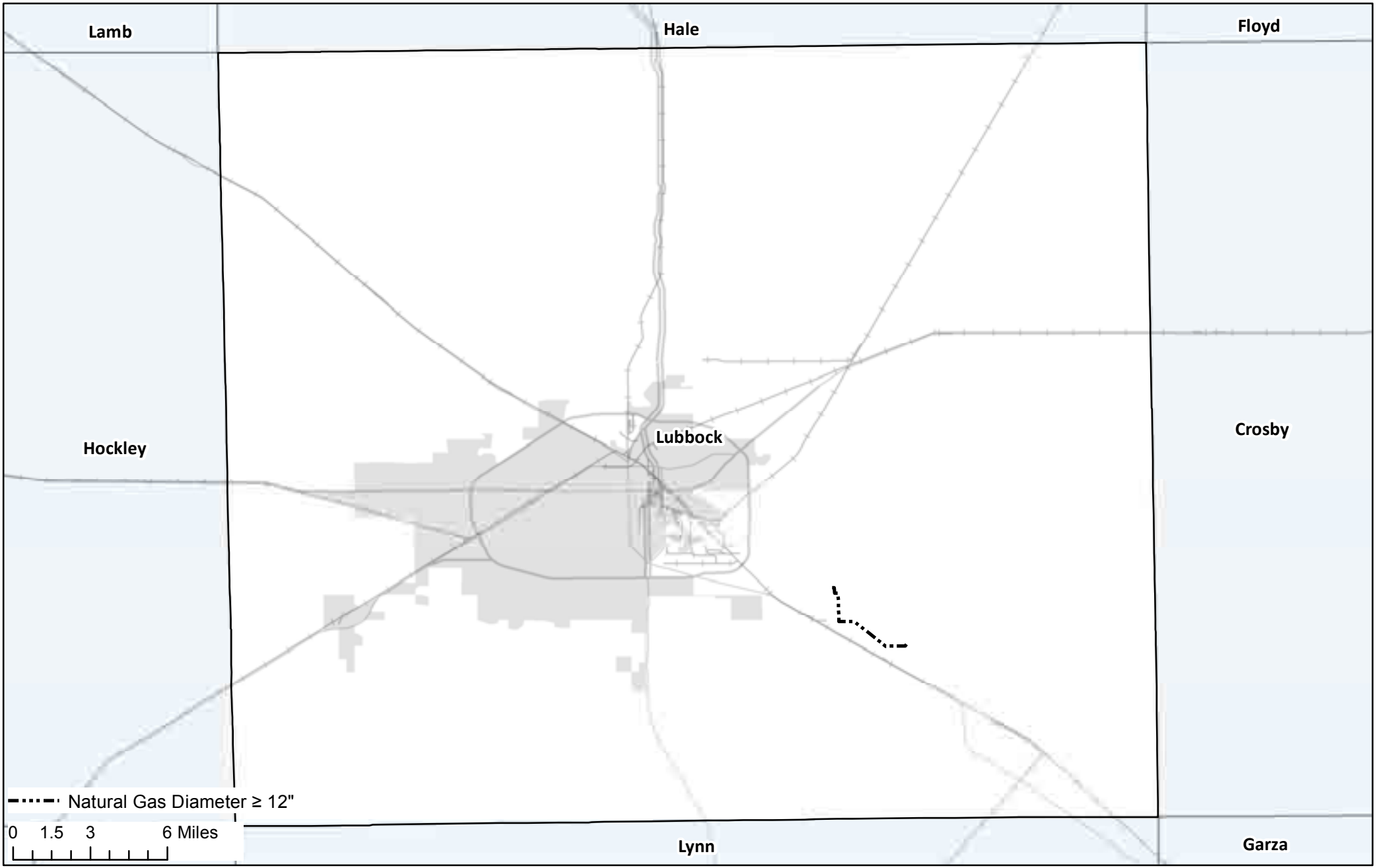

Southwestern Public Service Company

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Email: Kevin.L.Worley@xcelenergy.com

Major Sources: National Pipeline Mapping System;
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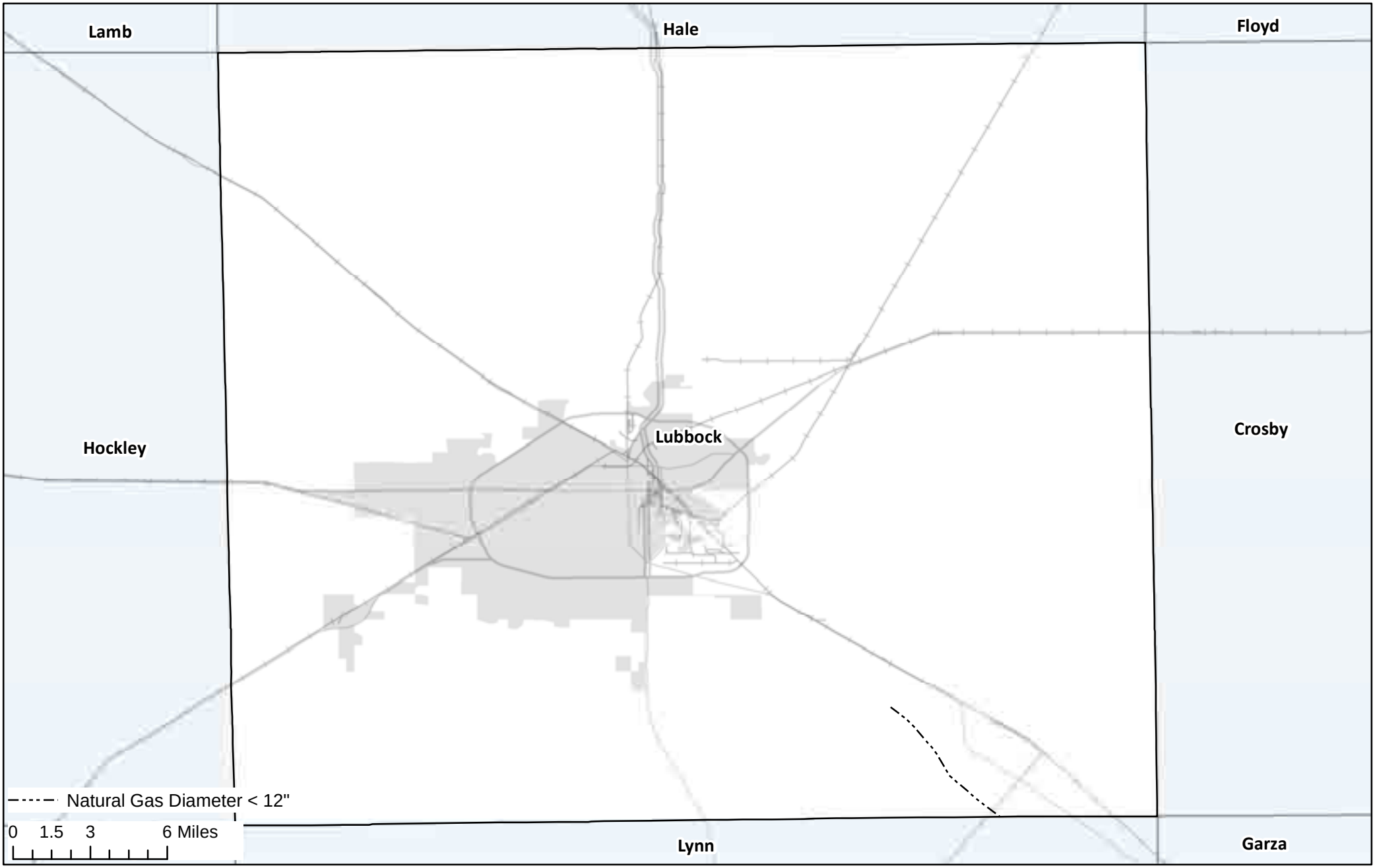

N

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WTG Gas Transmission Company

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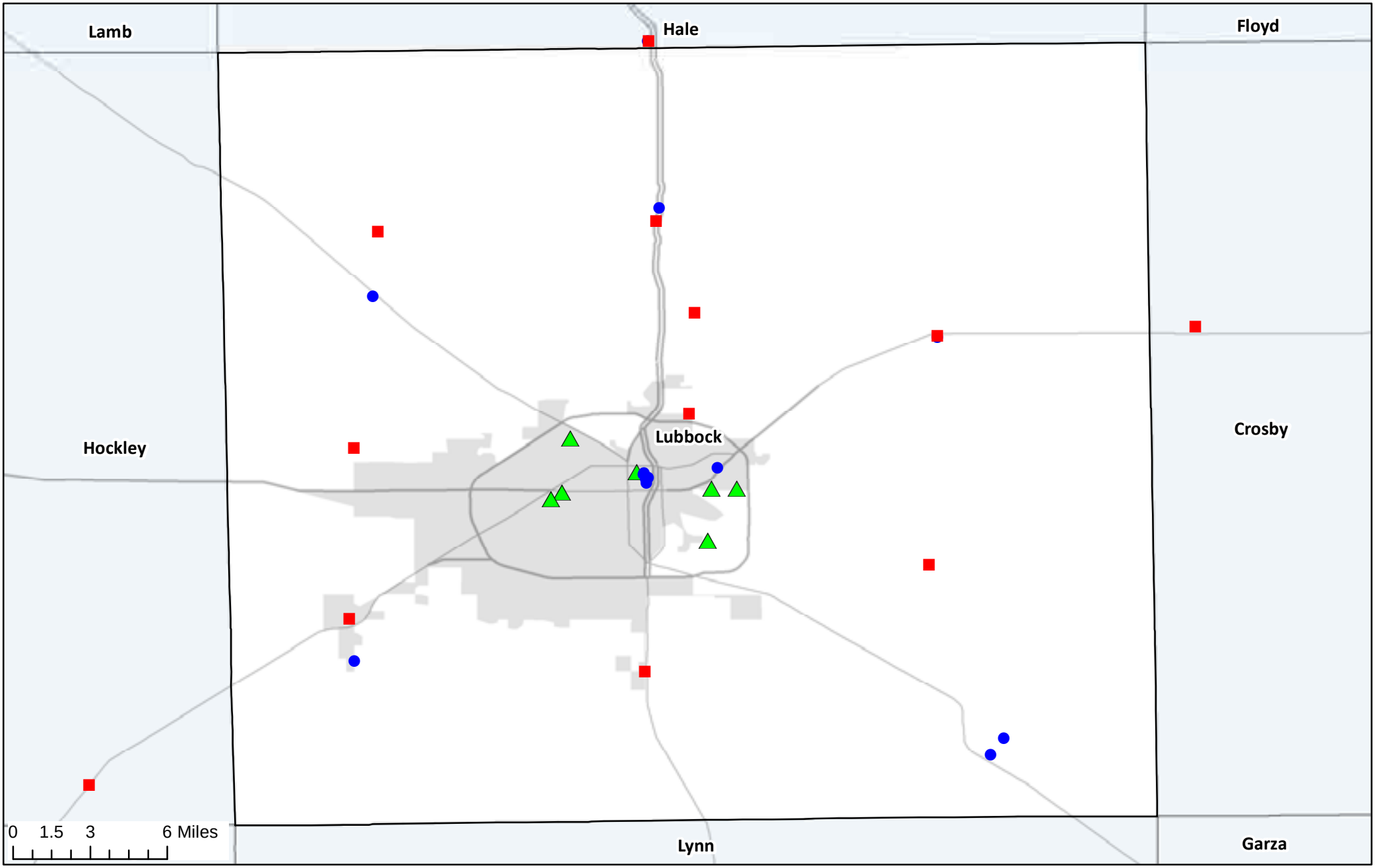

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Fire Station

Police Station

Care Facility

Lubbock County

Urban Areas

Critical Facilities in Lubbock County and Surrounding Area

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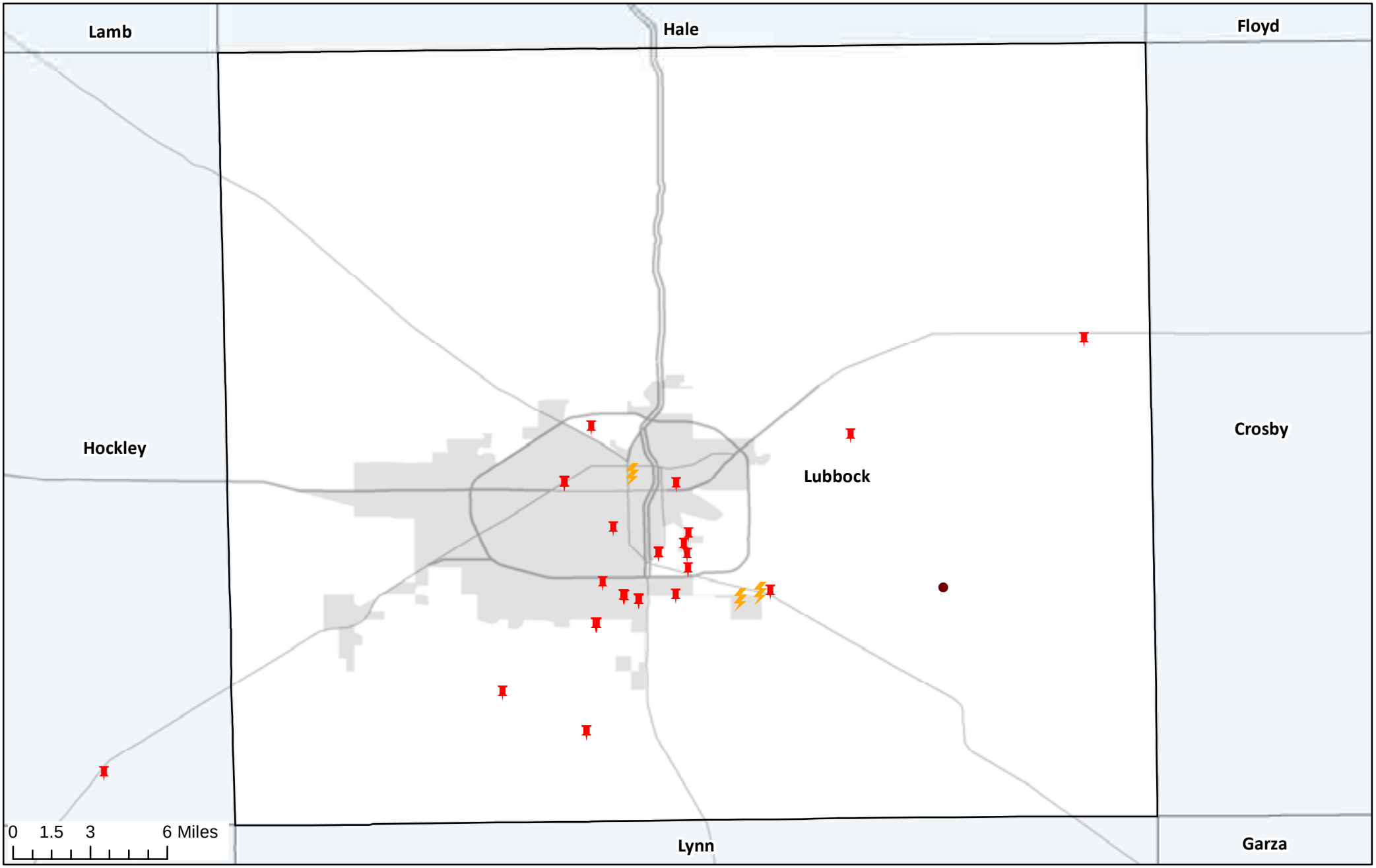

N

- Communication Facility
- Electric Power Facility
- Waste Water Facility
- Lubbock County
- Urban Areas

Critical Infrastructure in Lubbock County and Surrounding Area

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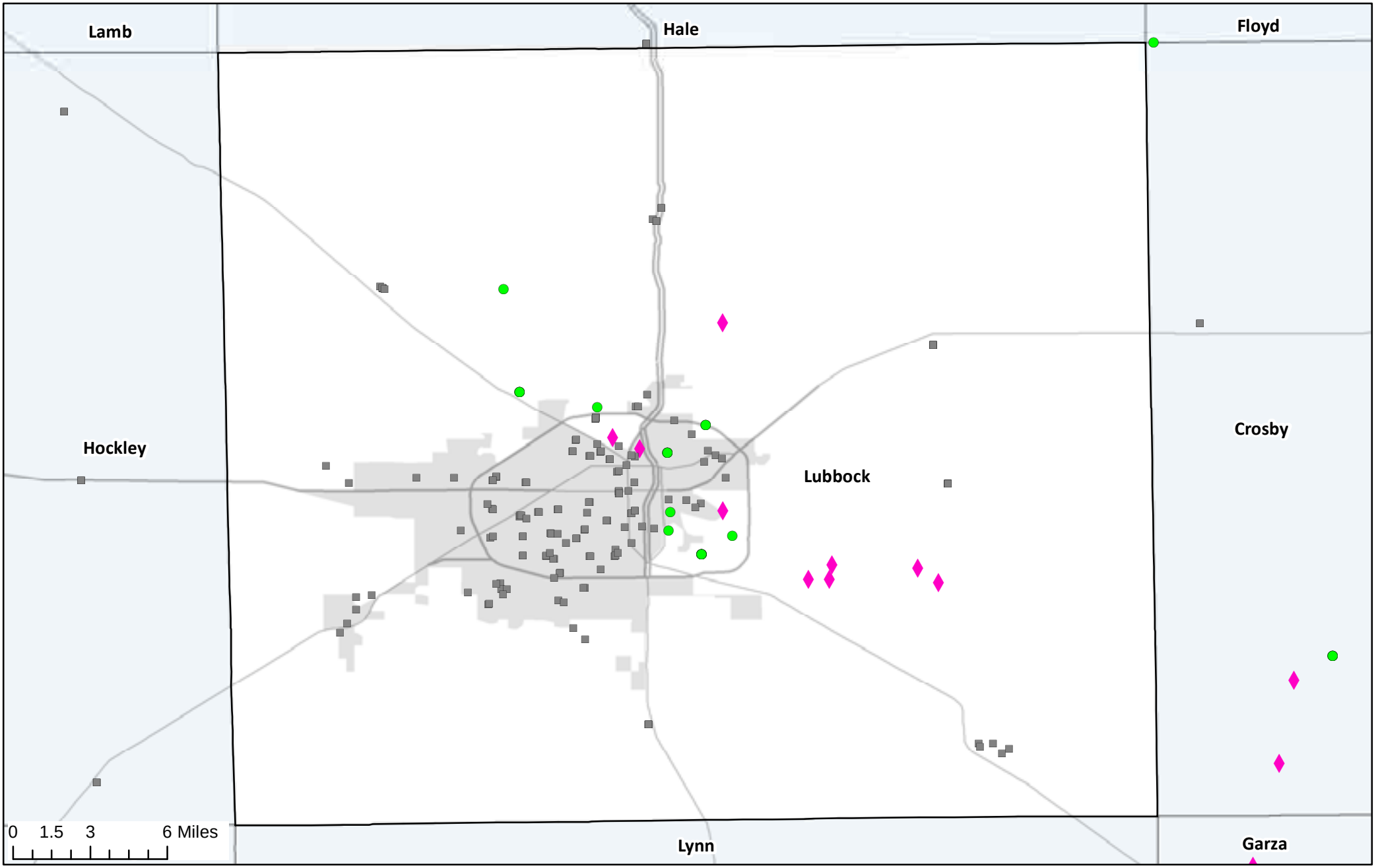

N

- Facilities Containing HazMat
- Schools
- Dams
- Lubbock County
- Urban Areas

Life Safety Priorities in Lubbock County and Surrounding Area

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