Natural Gas Pipeline Constraints in Iowa

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Natural gas service to Iowa customers originates in other parts of the United States and where producers have wells. The main sources of natural gas for Iowa are from the Rocky Mountains and the Gulf Coast region. The natural gas is then transported from the producers by interstate pipeline companies. These companies are regulated by the Federal Energy Regulatory Commission (FERC) and are only allowed to transport the gas. This means they do not own the gas; however, since they own the transmission pipelines, these companies play an integral role in delivering gas to Iowa customers. The Utilities Board has no jurisdiction over the interstate pipeline companies.

Natural gas utilities in Iowa buy gas from the producers and then have it transported over the interstate pipelines to city gates at which natural gas utilities' distribution systems are interconnected with the interstate pipeline. The natural gas utility then delivers the natural gas over the distribution system to individual customers. The rates and services for rate-regulated natural gas utilities are regulated by the Utilities Board. There are also municipal utilities and at least one electric cooperative that operate natural gas distribution systems that provide gas to customers. The Utilities Board does not regulate the rates of municipal or cooperative natural gas utilities, but has some regulatory authority over their service to customers.

The attached maps show the natural gas pipelines that service Iowa, the location of the areas served by natural gas distribution utilities, the interstate pipeline system for one interstate pipeline that serves Iowa, and a larger scale version of the pipeline system in Northwestern Iowa.

Constraints on this pipeline system can occur on the interstate pipeline system, on the branch lines, or behind the city gates. If the constraint is lack of capacity on the interstate pipeline, then the FERC authorizes construction of facilities and regulates the rates and services offered. FERC allows some expansions without prior notice to FERC for non-mainline facilities up to $10.6 million. For construction on interstate pipelines costing between $10.6 million and $30.2 million, the interstate pipeline must file a 70-100 day notice with FERC. For construction over $30.2 million, the interstate pipeline must file for FERC authorization which can take from 9-14 months. The costs of an expansion are to be paid for by the customers obtaining the benefit of the expansion.

Looking at the map of Northwest Iowa as an example, there are at least three areas where there are constraints that are now present on this section of the natural gas pipeline system. First, there are constraints on the total firm transportation that can be provided over the interstate pipeline as it is currently constructed. This means that the firm capacity – the amount of natural gas that can be delivered to customers without

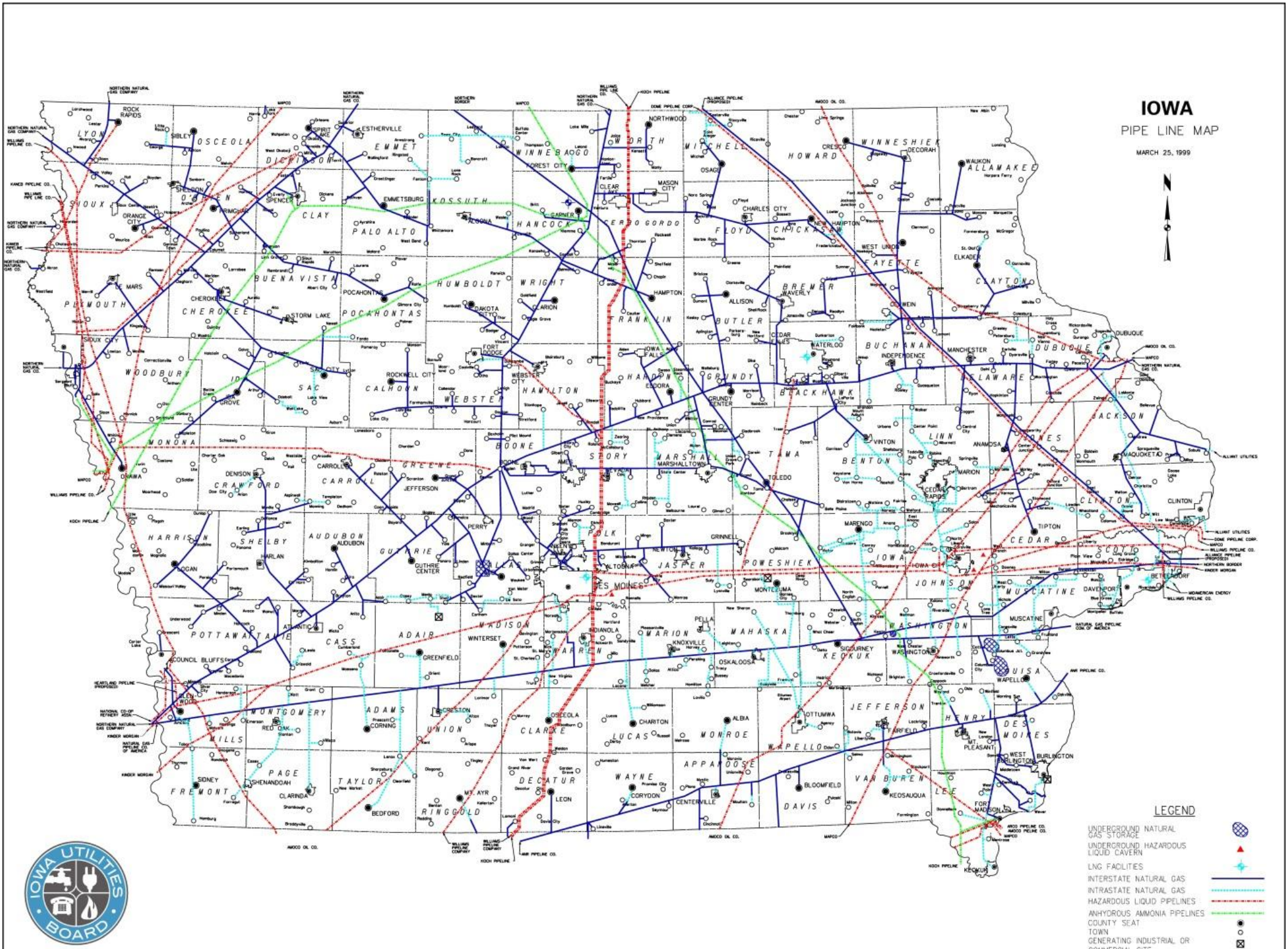
interruption – is fully contracted for. Some of this firm capacity is contracted for by individual large customers while most of the firm capacity is contracted for by natural gas utilities (rate-regulated or municipals). There is still capacity on the pipeline for interruptible customers who are willing to be interrupted on those occasions when firm customers take their maximum limits. These interruptible customers can take gas at a lower cost and historically have not been interrupted except on very rare occasions.

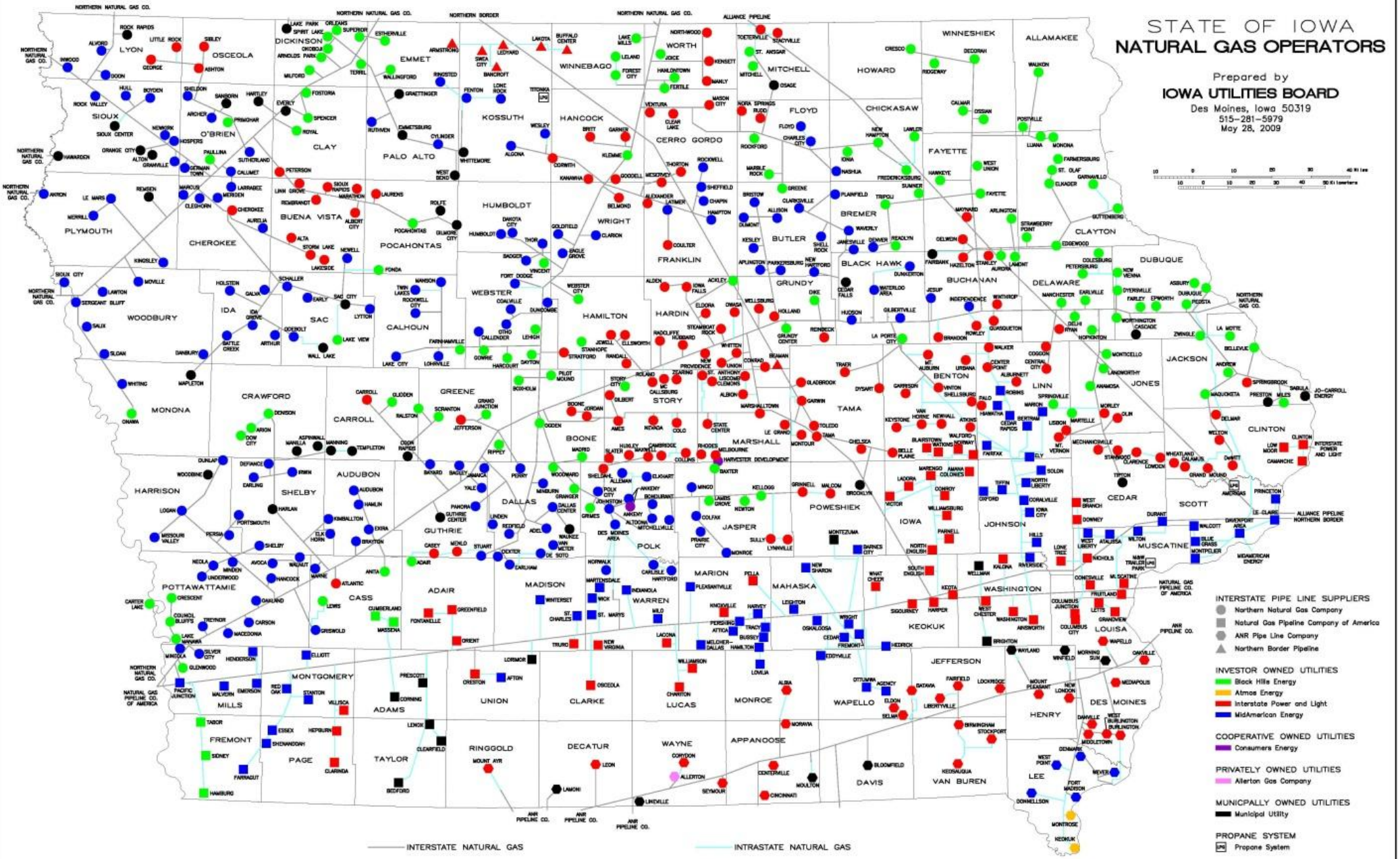
Another constraint is the size of the pipeline that serves a municipality or area downstream from the interstate pipeline. The further from the interstate pipeline the customer is located, the smaller the pipeline and the less capacity available. Again, capacity constraints usually involve those customers wanting firm capacity. Interruptible customers can usually still get natural gas.

Another constraint is where the distribution line from the interstate pipeline to a municipality is so small that even if additional capacity is expanded on the interstate line, there is no additional capacity to the municipality located on the small line.

Solutions to capacity issues are usually addressed on the interstate pipeline by adding a new or larger compressor station so that additional gas can be carried by the same pipe. This solution is expensive, but is not as expensive as adding a larger pipeline.

Constraints on a natural gas line can limit an area's ability to attract new businesses or to expand existing businesses. Constraints can be addressed only when there are enough customers willing to pay for the expansion.


IOWA
PIPE LINE MAP
MARCH 25, 1999
LEGEND
UNDERGROUND NATURAL GAS STORAGE
UNDERGROUND HAZARDOUS LIQUID CAVERN
LNG FACILITIES
INTERSTATE NATURAL GAS
INTRASTATE NATURAL GAS
HAZARDOUS LIQUID PIPELINES
ANHYDROUS AMMONIA PIPELINES
COUNTY SEAT
TOWN
GENERATING INDUSTRIAL OR COMMERCIAL SITE
IOWA UTILITIES BOARD


STATE OF IOWA
NATURAL GAS OPERATORS
Prepared by
IOWA UTILITIES BOARD
Des Moines, Iowa 50319
515-281-5979
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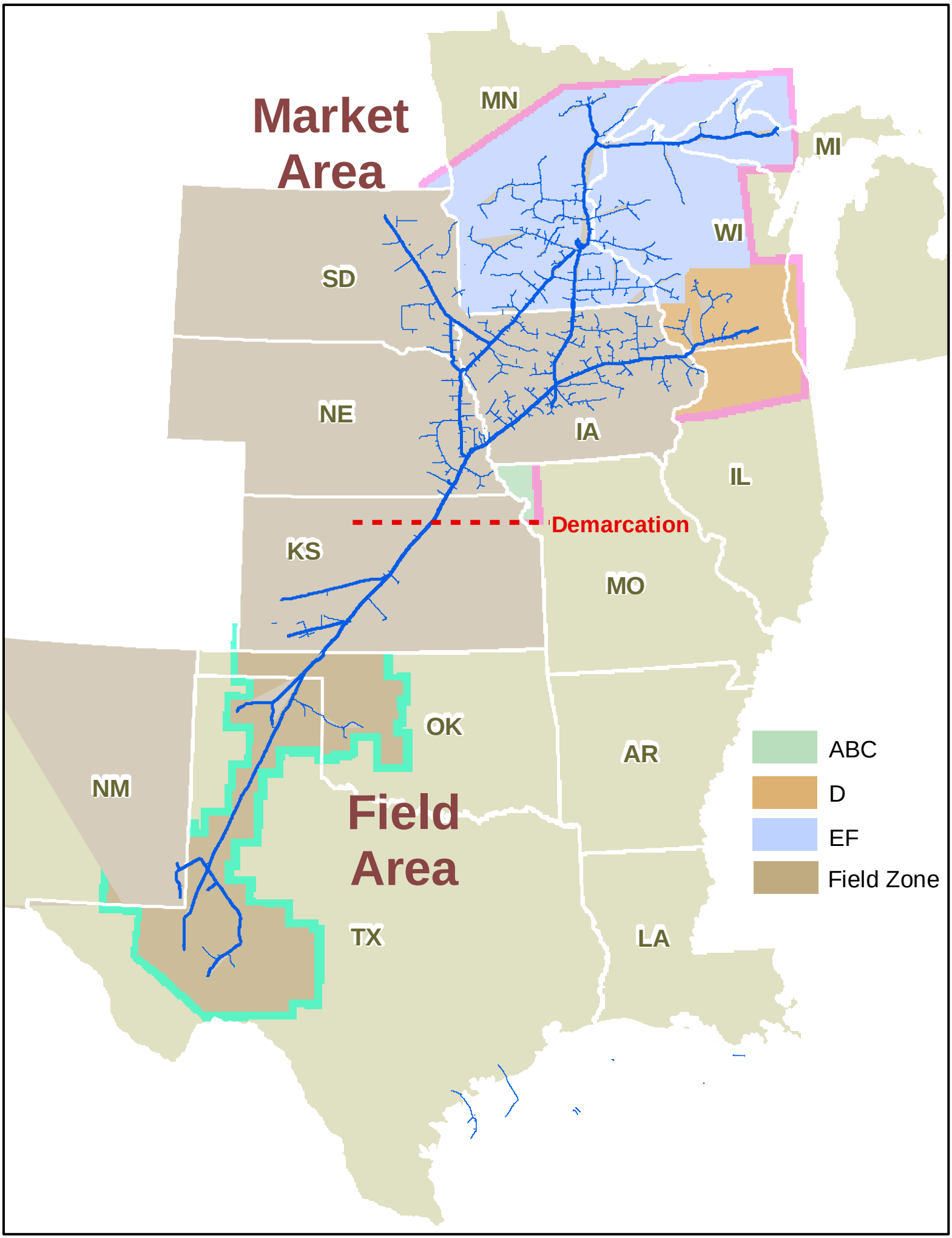
INTERSTATE PIPE LINE SUPPLIERS
Northern Natural Gas Company
Natural Gas Pipeline Company of America
ANR Pipe Line Company
Northern Border Pipeline
INVESTOR OWNED UTILITIES
Black Hills Energy
Atmos Energy
Interstate Power and Light
MidAmerican Energy
COOPERATIVE OWNED UTILITIES
Consumers Energy
PRIVATELY OWNED UTILITIES
Allerton Gas Company
MUNICPALLY OWNED UTILITIES
Municipal Utility
PROPANE SYSTEM
Propane System
INTERSTATE NATURAL GAS
INTRASTATE NATURAL GAS


Market Area
MN
MI
WI
SD
NE
IA
IL
Demarcation
KS
MO
OK
AR
NM
Field Area
TX
LA
ABC
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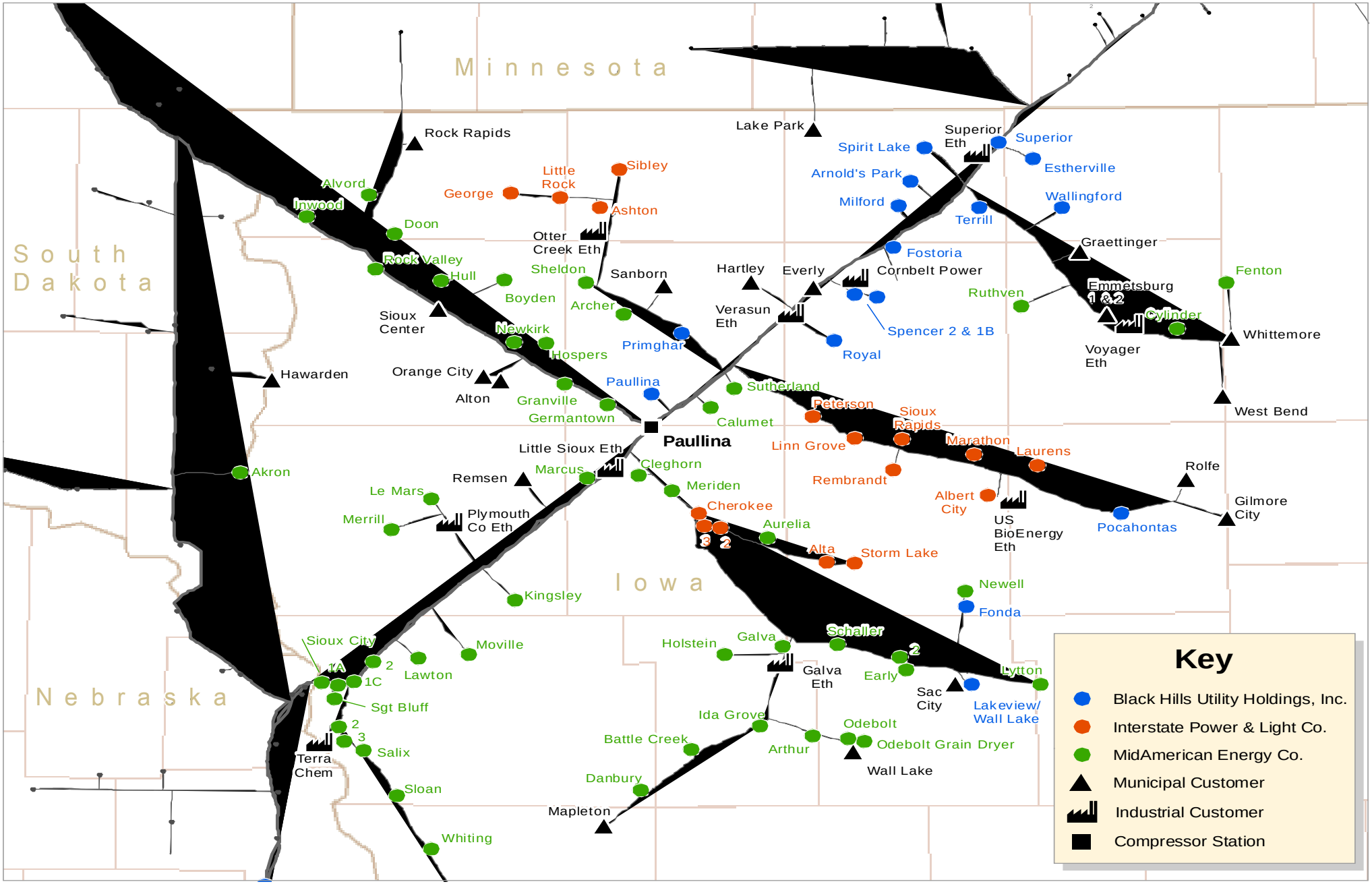
EF
Field Zone


Minnesota
South Dakota
Nebraska
Iowa
Rock Rapids
Lake Park
Superior Eth
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Estherville
Arnold's Park
Milford
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Wallingford
Graettinger
Fostoria
Cornbelt Power
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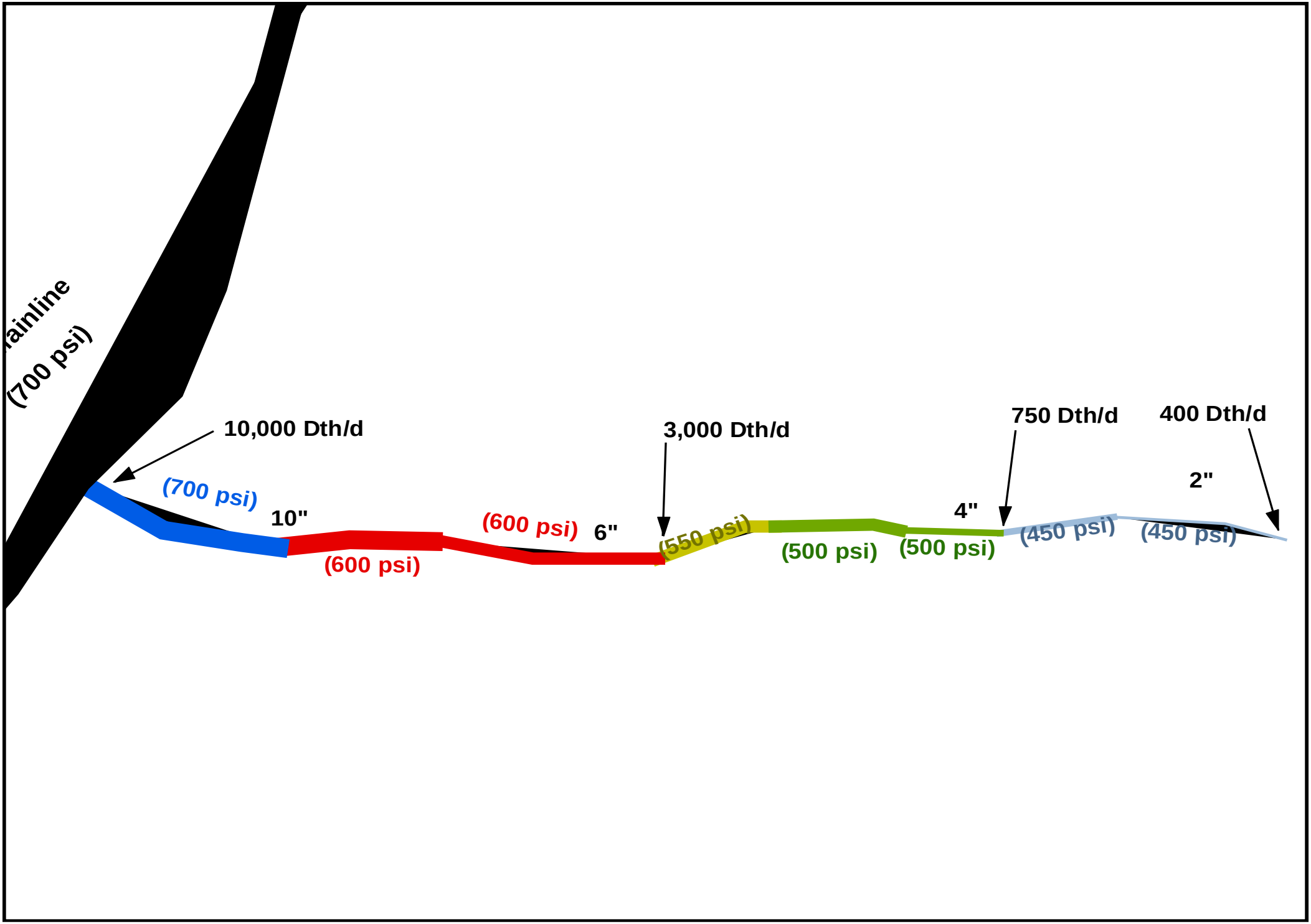
Verasun Eth
Spencer 2 & 1B
Royal
Ruthven
Emmetsburg 1 &2
Cylinder
Voyager Eth
Fenton
Whittemore
West Bend
Alvord
Inwood
Doon
Rock Valley
Hull
Sioux Center
Sheldon
Boyden
Newkirk
Hospers
Orange City
Alton
Granville
Germantown
Sanborn
Archer
Primghar
Paullina
Sutherland
Calumet
Paullina
Little Sioux Eth
Marcus
Cleghorn
Meriden
Cherokee
Aurelia
Alta
Storm Lake
Peterson
Sioux Rapids
Linn Grove
Marathon
Laurens
Rembrandt
Albert City
US BioEnergy Eth
Pocahontas
Rolfe
Gilmore City
Hawarden
Akron
Remsen
Le Mars
Merrill
Plymouth Co Eth
Kingsley
Little
George
Sibley
Ashton
Otter Creek Eth
Sioux City
1A
1C
2
Lawton
Moville
Sgt Bluff
2
3
Salix
Terra Chem
Sloan
Whiting
Holstein
Galva
Galva Eth
Schaller
2
Early
Sac City
Lytton
Lakeview/ Wall Lake
Newell
Fonda
Ida Grove
Battle Creek
Arthur
Odebolt
Odebolt Grain Dryer
Wall Lake
Danbury
Mapleton
Key
Black Hills Utility Holdings, Inc.
Interstate Power & Light Co.
MidAmerican Energy Co.
Municipal Customer
Industrial Customer
Compressor Station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