NATURAL GAS FLARING
AN OVERVIEW OF REGULATORY APPROACHES

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Holliday Energy Law Group, PC is a San Antonio-based transactional energy law firm focused on rendering title opinions and providing operational/regulatory advising to oil and gas operators active across the continental United States. We represent clients throughout all stages of a drilling program – from acquisition through divestiture – in Texas, Oklahoma, North Dakota, Ohio, New Mexico, Montana, and Illinois.
Presentation Overview

• Economic considerations are primary driver of flaring/venting is economic
• State and Federal Regulation Review
• Infrastructure growth is likely to disincentivize major revolutions in technical mitigation approaches
• Incoming Biden Administration likely to tighten Federal oversight
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Gas Flaring Overview

• Terminology
  • Flaring – Controlled combustion of natural gas
  • Venting – Direct release of natural gas into the atmosphere

• General focus is flaring/venting accompanying shale oil wells

• Shale wells produce varying amounts of “associated” or “casinghead” gas
  • Raw mixture of volatile hydrocarbons, mostly methane

• Flaring (or burning) oxidizes Methane into Carbon Dioxide (CO2) and Water (H2O)
Gas Flaring Overview

• **Flaring v. Venting** – Flaring, or converting Methane to CO2, is 25x less impactful from a greenhouse gas perspective

• **Effective Flaring v. Sales** - Net neutral environmental impact
  - Variations exist due to constituents of the gas and efficiency of flare
  - Gas burned in a flare or in use has largely same environmental impact

• **Risk of Flaring**
  - Inefficient/ineffective flares increase the methane and NOx concentrations

• Wasteful
By some estimates, ~1% of man-made atmospheric CO2 emissions globally are linked to flaring.
So Why Are We Flaring/Venting? Safety & Operational Reasons

• Flaring (usually short in time)
  • Diversion/Disposal (D&D)
    • gas kick during drilling
    • produced gas during well testing
    • flowback gas during well completion
    • compression/processing during maintenance

• Venting (usually low in vol.)
  • Pressure release emergency
  • Blow-down prior to pipeline repair
So Why Are We Flaring/Venting?
MAIN REASON = ECONOMICS

• PRIMARY REASON: No economic access to gathering system
  • No existing pipeline infrastructure
  • Economic factors dictate oil production at expense and in advance of natural gas capture
Why Non-Economic to Gather Gas?

• **Wildcat/New Areas** - Operator may require robust production data from numerous wells before committing to build gas gathering system
  • Must ensure that production levels will justify infrastructure construction/expansion
  • Then flaring will stop

• Potential for infrastructure buildout is what has hampered many attempts at technological solutions
Why Non-Economic to Gather Gas?

• Flare v. Gather & Sale NOT a Simple Calculation
• Important variables addition to expected volumes and infrastructure cost:
  • Producer’s cost of capital – P.E. Backed v. Multi-National
  • Competition for investment capital with other options in producer’s portfolio
  • Gas processing cost
  • Natural Gas Price & Price Risk
  • Lease terms
  • Likelihood of right of way approval
  • Cost of land acquisition
Why Non-Economic to Gather Gas?

BOTTOM LINE

Economics of most flaring situations dictates that liquids production be accelerated even where flaring is required.
Permian Basin
Eagle Ford
Texas

• In 2019, Texas ranked No. 1 in both oil production and vented/flared gas
• 2018 – Texas accounted for 51% of total 1.28Bcf/d vented and flared gas in the United States
Texas

- Regulatory Oversight
- Railroad Commission of Texas
  - Regulates oil and gas production
  - Jurisdiction over permitting of flaring operations
- Texas Commission on Environmental Quality
  - Regulates air emissions and water pollution
History of the Name

• Established 1891 to regulate rail industry
  • Reaction to Texas agrarian populism of late 1800s
  • Political movement hostile to growth of Trusts and monopolies dominated by eastern US states

• March 29, 1899 – First Regulation re:
  • Legislature declares that any gas well is to be shut-in within ten days after its completion until such time as the gas produced therefrom is to be used for light, fuel or power purposes.
Texas
Regulatory Oversight

• February 20, 1917 – RRC begins oversight of oil and gas
  • Legislature declares pipelines to be common carriers and gives Railroad Commission jurisdiction over same. This is the first act to designate the Railroad Commission as the agency to administer the conservation laws relating to oil and gas.

• March 31, 1919 – Commission formally charged with regulatory oversight of oil and gas
  • Legislature enacts a statute requiring the conservation of oil and gas, forbidding waste, and giving the Railroad Commission jurisdiction.
Texas Gas Flaring Regulation
Overview

• Statewide Rule 32 (Texas Administrative Code Title 16, Part 1, Chapter 3, Section 32)

• General Rule: No Flaring
  • Gas Well Gas and Casinghead Gas shall be utilized for legal purposes
  • Gas must be used for lease operations or sold if it can be readily measured

• SWR32 recognizes categories of exemptions and exceptions
  • Most common exceptions:
    • No takeaway (i.e. no pipeline)
    • Limited takeaway capacity (e.g. pipeline has reached capacity)
    • Gas plant shutdowns
    • Repairs to compressor, gas line, or well
Texas Gas Flaring Regulation
Authorized Flaring & Venting

• Situations where no permit required to flare
• Flaring During Drilling & Completion Operations – Operators can flare without a permit…
  • During tests for well potential
    • If <24 hours, may vent unless flaring is necessary for safety reasons
    • If >24 hours, shall be burned in a flare if gas can be burned safely
  • Up to 10 producing days after initial completion, recompletion in another field, or workover in same field
Texas Gas Flaring Regulation
Flaring Exceptions

• Permit required for flaring beyond authorized situations
• Two Categories: Administrative Exceptions and Final Order
• Administrative Exceptions
  • Permanent Exceptions
    • If flaring <50mcf/d and adequate justification, Commission may administratively grant indefinite/permanent exception
    • Based primarily on demonstrated cost/benefit analysis and gas reserves
  • Temporary Exceptions
    • Pipeline capacity issues or system upsets - 45-60 Days
    • Lack of pipeline - 90 Days (Most Common)
    • May renew administratively up to 180 days
      • Must demonstrate progress toward establishing ability to produce versus flare
Texas Gas Flaring Regulation
Flaring Exceptions

- >180 days – Exception only through Final Order
  - Requires hearing and order signed by Commission

- Timeline
  - Drilling + 10 Days After Completion = Flaring is Authorized
  - 10 Days After Completion to 180 Days = Administrative Exception Possible
  - 180+ Days = Hearing and Final Order Required

- Flared volumes MUST be reported to Commission via monthly production reports
  - Actual, metered volumes
Texas Gas Flaring Regulation
Flaring Expansion

• Flaring has increased exponentially in past decade
  • Primarily due to increase in ‘tight’ or unconventional oil development
  • Permian Basin
    • 2017 = 12% Flared Gas
  • Eagle Ford
    • 2017 = 35% Flared Gas

Number of Flaring Exceptions by Fiscal Year

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Texas Gas Flaring Regulation
Flaring Expansion

• While flaring has increased, this is primarily due to an increase in overall production

• As of August 2019, Texas had 264,877 producing oil and gas wells
  • 6,972 flaring permits in 2019 is a relatively small fraction

FIGURE 14. Texas venting and flaring vs. natural gas production. Vertical axis units in Bcf per year (EIA data for 2018 Vented and Flared is not available; data shown is an estimate). (Data Source: EIA)\(^9\)

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Texas Gas Flaring Regulation
Why the Flaring Expansion?

• **Primary Reason** – Increased production in areas with limited/no existing takeaway capacity
Texas Gas Flaring Regulation
Why the Flaring Expansion?

• E.g. Permian Basin (estimates)
  • Natural Gas = 20% of initial production (BOE)
    • As production declines, % of natural gas increases
    • Nat gas increases to 50% BOE in Year 4, whereas total well production has declined by 70%

• Economics Drives Behavior
  • 2018 Oil to Gas Price Ratio = 28:1
  • Est. for Wolfcamp – Loss of gas sales revenue had minimal impact on well economics
    • Flush production in first 6-12 months
    • Flaring 100% natural gas in first 6-12 months only raised break-even oil price from $42/bbl to $45/bbl (inclusive of mineral owner compensation)
Texas Gas Flaring Regulation
Why the Flaring Expansion?

• Economics Drives Behavior
  • Curtailing liquids-focused operations to wait for gas takeaway capacity results in a net loss
    • Opportunity cost of delaying well completions or decreasing production rates far exceeds lost revenue from gas sales
  • Rational economic behavior is to seek ways to continue oil production at expense of natural gas, most commonly through flaring
Texas Gas Flaring Regulation
Why the Flaring Expansion?

• What Comes Next?
  • Increased takeaway capacity beyond 2020
  • Increased regulatory scrutiny

• Commission tends to move incrementally (e.g. SWR40)
  • Not expected to move forcefully to restrict oil production to curtail flaring
  • Based on WSJ reporting, 20,000 permit requests 2013-2018 with none denied
Texas Gas Flaring Regulation

Next Steps

• November 2020 – Updated Application for SWR32 Exception (Flaring Permit)
  • R-32 Application for Exception to Statewide Rule 32
  • Changes to the application, not the rule
  • Incentivizes operators to adopt production technology that will reduce flaring
  • Provides specific guidance for following re: Flaring Exceptions
    • When permissible
    • Circumstances
    • Length of time
      • Will be reduced 50-80% in some cases
Texas Gas Flaring Regulation
Next Steps

• Updated Application is expected to...
  • Increase incentives for operators to voluntarily reduce flaring
  • Require more specific information justifying need to flare/vent
  • Increase enforcement by providing Commission with additional datapoints to facilitate compliance audits
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North Dakota Gas Flaring Regulation
Regulatory Oversight

• North Dakota Industrial Commission (NDIC)
  • Oil & Gas Division - Regulates drilling and production of oil and gas
  • Department of Mineral Resources
• North Dakota Division of Air Quality
  • Subset of North Dakota Division of Environmental Quality
North Dakota Gas Flaring Regulation Overview

- Venting is banned
- Casinghead gas must be flared
- Estimated flare volumes must be reported to North Dakota Department of Mineral Resources
- All wells must be registered with North Dakota Division of Air Quality
- All flares must adhere to regulations regarding…
  - Requirements for Organic Compounds Gas Disposal
  - Restrictions Applicable to Flares
  - Controls of Emissions from Oil and Gas Well Production Facilities
- Flares must be operational and capable of proper combustion at all times
North Dakota Gas Flaring Regulation
Overview

• NDIC Order No. 24665
  • Establishes Drilling Permit Review Policy
  • Producers must submit gas capture plan with every drilling permit application
  • Gas Capture Plan must include…
    • Information on area gathering systems
    • Rate/duration of planned flowback
    • Current system capacity
    • Timeline for connecting the well
    • Signed affidavit verifying that the gas capture plan has been shared with area midstream companies
  • Establishes gas capture % targets
North Dakota Gas Flaring Regulation Overview

• 2019 Flared Gas = ~ 19% of total production
  • NDIC Target = 12%
• Flaring % decrease 2014-2016
• % increase 2016 forward due to increased concentration on core Bakken, which exhibits higher GOR
  • Increased associated gas production resulted in corresponding increase in flaring

FIGURE 17: North Dakota natural gas production and vented and flared gas. Vertical axis in Bcf per year. (EIA data).
(Data Source: EIA)
North Dakota Gas Flaring Regulation Overview

• Uptick in Flaring resulted in increased oversight 2018
• April 2018 NDIC amends flaring reduction rules
  • Incentivize drilling outside of gas-rich Bakken core
    • Certain non-core wells allowed 1 year no capture
  • Doubled credit time to 6 months
  • Credits companies for utilizing captured natural gas to power equipment/facilities
  • Allow companies meeting capture targets to forego submitting capture plan with drilling permits
• November 2018 NDIC amends Order No. 24665 capture goals
  • Nov. 1, 2020 onward = 91%
North Dakota Gas Flaring Regulation

Why Flaring?

• North Dakota is an issue of capacity versus infrastructure (e.g. Texas)
• 75% flaring comes from wells connected to pipeline, but inadequate capacity
  • Pipeline
  • Processing Plant
• 25% flared gas due to no takeaway

Next Steps

• Enhanced enforcement – Plan to require producers flaring >15% to shut-in wells
• Increased processing capacity – Several pipelines and processing plants under construction
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California Gas Flaring Regulation Overview

• Far more restrictive than Texas or North Dakota
• Precedent for not allowing release of natural gas
• 1939 – Chapter 2, Section 3500-3503 Public Resources Code
  • “Wasting of Natural Gas”
  • “All persons, firms, corporations … are prohibited from willfully permitting natural gas wastefully to escape into the atmosphere…”
  • Violations = Misdemeanor
    • Punishable by fine or imprisonment
    • Each day natural gas is wasted is a separate violation
• 2017 – Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities, California Code of Regulations
  • Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4, Subarticle 13
California Gas Flaring Regulation
Overview

• Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities, California Code of Regulations
  • Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4, Subarticle 13
  • Purpose is to reduce methane emissions
  • Facilities on private, state, federal, offshore property are required to limit...
    • Vented gas
    • Unintentional leaks
    • Fugitive emissions
  • Enforced by California Air Resources Board (CARB)

• Local Air Districts
  • Primarily responsible for controlling air pollution from stationary sources
  • Air districts with oil and gas production have regulated venting/flaring for decades
California Gas Flaring Regulation
Overview

• Greenhouse Emissions Standards intended to supplement local air district regulations for methane sources not previously addressed
• Aim is to reduce fugitive and vented methane emissions from new and existing O&G facilities by enforcing standards for...
  • Separator and tank systems
  • Circulation tanks for well stimulations
  • Leak detection and repair
  • Undeground nat gas storage
  • Compressors
• Implementation is dependent on local air districts and CARB
• Memoranda of Agreements sets out enforcement responsibility
California Gas Flaring Regulation
Future

• Unlikely California will see any meaningful increase in nat gas flaring or venting
  • Oil production is declining
  • Secondary/Tertiary recovery produces mostly heavy oil
  • Small volumes of associated gas
Federal Regulation
Federal Regulation

• Quad O – 40 CFR Part 60, Subpart OOOO
  • Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification, or Reconstruction Commenced After August 23, 2011
  • Governs hydrocarbon emissions from onshore facilities
    • Storage tanks
    • Compressors
    • Hydraulically fractured wells
• Quad Oa – Amends OOOO to regulate VOC and GHGs not previously regulated under OOOO
Federal Regulation

• 2016 Waste Prevention Rule (aka Venting and Flaring Rule)
  • *Note – Potential target for incoming Biden Administration*
  • “Waste Prevention, Production Subject to Royalties, and Resource Conservation, Final Rule” 81 Federal Register 83008
  • Issued November 18, 2016 (during Obama Administration, following Trump election) pursuant to Mineral Leasing Act Section 225
  • Requires BLM to ensure that Lessees “use all reasonable precautions to prevent waste of oil or gas developed in the land.”
  • Targets natural gas emissions as a potential…
    • Waste of public resources
    • Loss of royalty revenue
Federal Regulation

• 2016 Waste Prevention Rule (aka Venting and Flaring Rule)
  • Required operators to take specific action to reduce waste
    • MAIN METHODS
      • Duty to seek out and repair leaks
      • Requirements to reduce emissions from well completions, storage vessels, pneumatic controllers
      • Operators required to submit waste minimization plan prior to obtaining drilling permit
  • Established criteria for when flared gas will be considered waste
    • Wasted gas is subject to royalty payment requirement
  • Clarifies the on-site uses of gas exempt from royalties
Federal Regulation

• 2018 Rollback
  • Trump Administration finalized rollback of Waste Prevention Rule on methane from is leaked, vented, or flared on federal lands
  • BLM issued final rule removing main 2016 requirements
    • Duty to seek out and repair leaks
    • Requirements to reduce emissions from well completions, storage vessels, pneumatic controllers
    • Operators required to submit waste minimization plan prior to obtaining drilling permit
  • Highly likely that Biden Administration will rollback the rollback
Federal Regulation

• Why ‘Rollback’ Waste Prevention Rule?
  • Industry argued over-broad and in practice regulated oil and gas production out of existence
  • Rule was retroactive
    • Required retro-fitting all wells on federal lands, including marginal wells
  • Broad requirement to install emissions equipment on marginal wells would have caused many to become uneconomic
  • Waste Prevention Rule would therefore lead to early well plugging before end of many wells’ productive lives

• Highly likely that Biden Administration will rollback the rollback
Federal Regulation

• EPA New Source Performance Standards
• CAA New Source Performance Standards drafted by Obama Administration
  • Goal – Limit emissions of methane from oil and gas facilities through leak detection and repair requirements
• Trump Administration – September 11, 2018, proposed changes for oil and gas industry
  • Streamlined/reduced reporting requirements
  • Lower frequency for monitoring fugitive emissions at well sites/compressor stations
  • Remove certification requirements
  • Increase leak repair time
QUESTIONS?

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