Environmental Permitting for Upgrading and Supplying RNG

Presentation by: Jason Linkimer & Tony Widboom, PE.
Barr Engineering Co.
What are the environmental permitting requirements associated with bringing RNG into the natural gas pipeline network?
Overview

Environmental Permitting for Upgrading & Supplying RNG

- What is driving this market?
- Potential project locations (biogas sources)
- Biogas processing
- Environmental permitting considerations
- Timelines for permitting
- Questions
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What is Driving This Market?

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<thead>
<tr>
<th>Regulatory/legislative drivers</th>
<th>Voluntary drivers</th>
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<tr>
<td>- Federal Renewable Fuel Standard (RFS)</td>
<td>- Societal pressure</td>
</tr>
<tr>
<td>- California Low Carbon Fuel Standard (LCFS)</td>
<td>- Shareholder sustainability expectations</td>
</tr>
<tr>
<td>- Oregon Clean Fuels Program</td>
<td>- Customer demand &amp; brand loyalty</td>
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<tr>
<td>- British Columbia LCFS</td>
<td>- Capital availability – where investors are hedging long-term return</td>
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<td>- Additional activity</td>
<td>- Private industry recognition of economic opportunity</td>
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Potential Project Locations (Biogas Sources)

DAIRY/POULTRY/SWINESWINE OPERATIONS
AGRICULTURAL WASTE
FOOD WASTE
WASTEWATER TREATMENT
LANDFILLS
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Biogas Processing

Recovery & distribution

- Biogas treatment
  - Train includes:
    - Upgrading/treating gas
    - Compression
    - Storage
    - Pipeline connections
- Wastewater
- Solid waste
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Environmental Permitting Considerations

Defining the Source & Project

Air Quality in Project Location (Attainment Issues)

State Specific Rules, Requirements, Exemptions

Environmental Review Programs

Hazardous Substance Regulatory Programs
Defining the Source & Project

Applicable Programs

- Stationary source definition:
  - Common control
  - Contiguous or adjacent
  - Same 2-digit SIC or “support facility”

- Project definition:
  - Consider other related changes at the stationary source meeting certain criteria
Air Quality in Project Location

Implications for nonattainment

- Lower major source thresholds
- Significant requirements, costs and schedule risks
- Emission offsets
- Lowest Achievable Emission Rates regardless of cost

Map courtesy of United States Environmental Protection Agency
Environmental Requirements vary by State

<table>
<thead>
<tr>
<th>Environmental Requirements</th>
<th>Air permitting</th>
<th>Waste management</th>
<th>Water</th>
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<td>Air toxics</td>
<td>Air dispersion modeling</td>
<td>Solid or hazardous</td>
<td>Wastewater</td>
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<td>Air dispersion modeling</td>
<td></td>
<td>Land application</td>
<td>Stormwater</td>
</tr>
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</table>
Environmental Review Programs

States with Environmental Policy Acts
Hazardous Substance Regulatory Programs

Applicable Programs

- Risk Management Program (RMP) requires a plan to address accidents and emergencies
- OSHA’s Process Safety Management (PSM) program addresses management of hazards
- Chemical Facility Anti-Terrorism Standards (CFATS) addresses security

Threshold quantity: 10,000 lbs or 236,100 scf of methane

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Timelines for Permitting

Pre-construction approvals
- AIR PERMIT
- ENVIRONMENTAL REVIEW (IF REQUIRED)

Pre-operation approvals
- WASTEWATER
- STORM WATER
- RMP
- WASTE
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Questions
Questions?

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