



# Alberta Methane Emission Regulatory Risk Assessment Methane Abatement Cost Pathways Evaluations

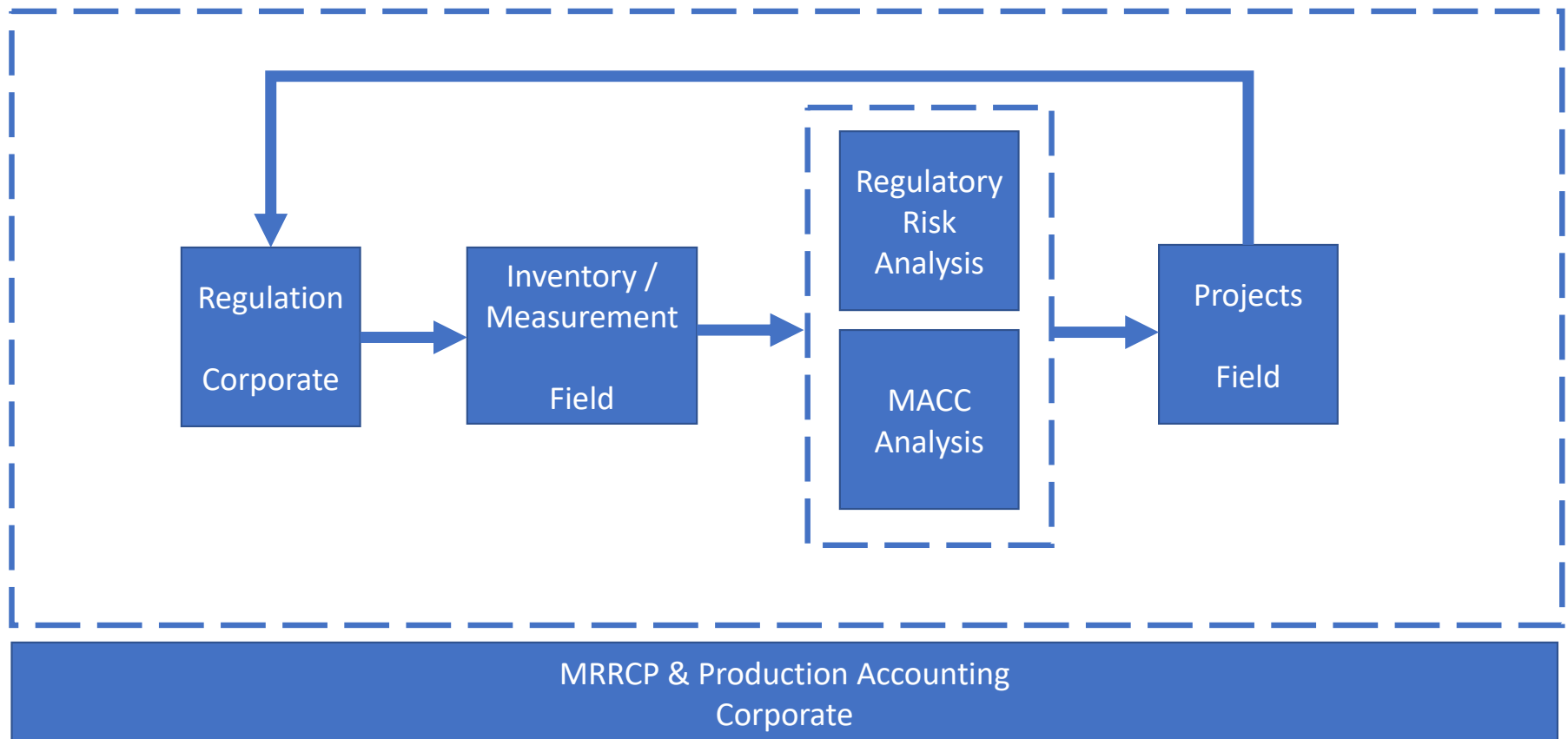
**Joshua Anhalt**

President

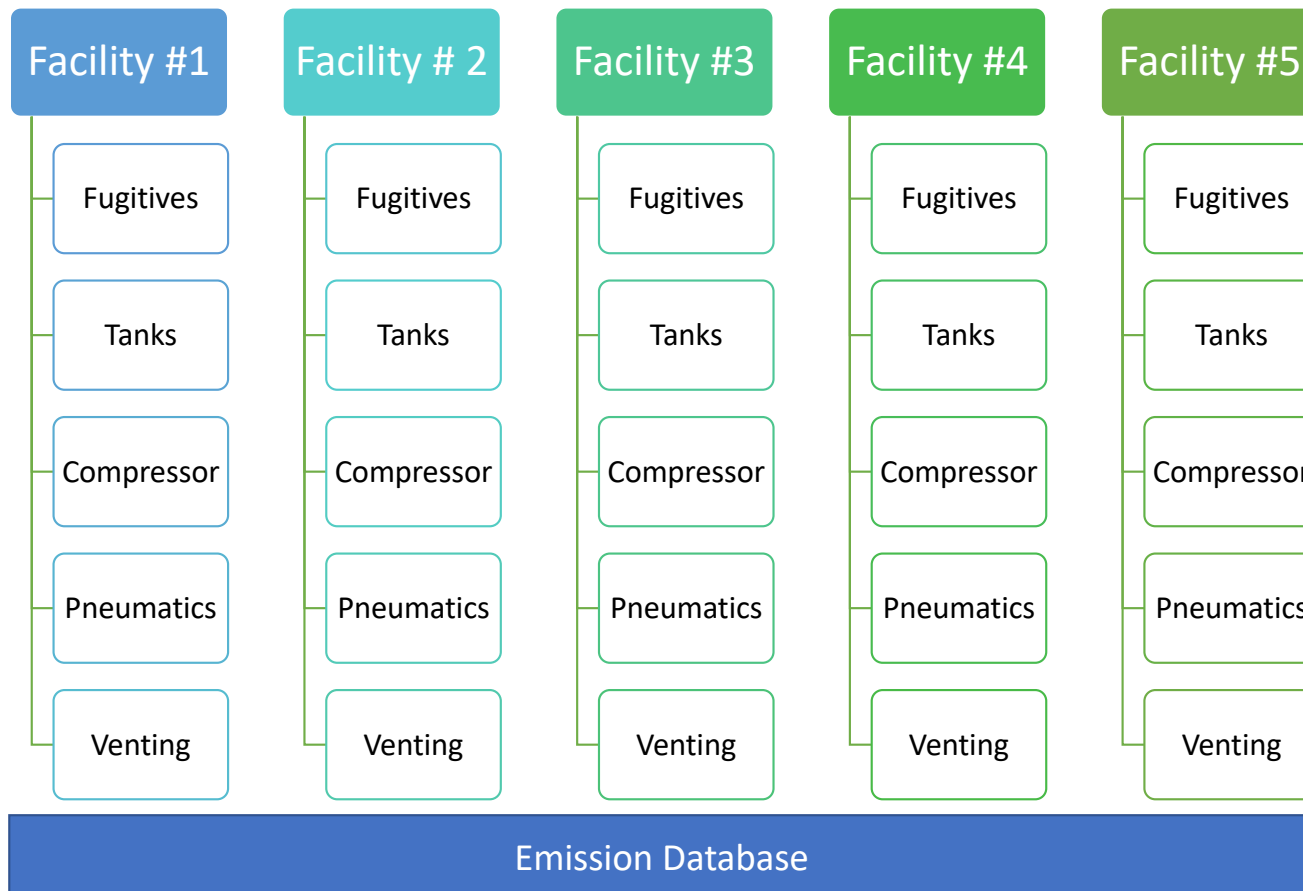
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# Emission Management Process



# 1<sup>st</sup> Stage Inventory & Measurement



- **Facility Inventory**
  - Active ?
  - D056 License Type?
- **Fugitives**
  - OGI / Method 21
- **Tanks**
  - Controlled ?
  - Vent rate ?
- **Compressors**
  - Controlled?
  - Vent rate / throw
- **Pneumatics**
  - Fuel Gas ?
  - Device ID details
  - Function ?
- **Venting**
  - Routine vent rate?

# Fugitive Emissions

- Leak survey method
- Engineering Calculation and Direct Measurement
- Measurement
  - Budget vs. Speed vs. Accuracy
  - Volumetric sampling
  - Quantifiable Optical Gas Imaging (QOGI)
- Fugitive challenges
  - Repair tracking
  - FEMP reporting bottom up vs. top down
  - Emission Technologist training & process knowledge



# Storage Tanks

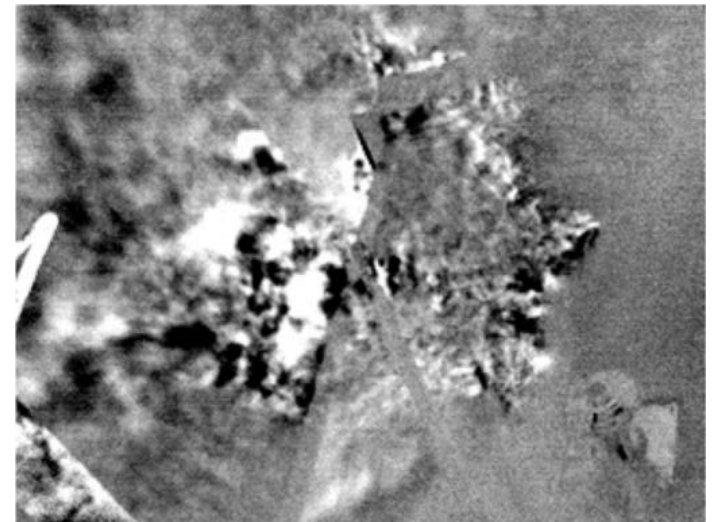
- FLIR Gfx320 provides quick ID of heavy, continuous and controlled losses
- Tank controlled ?
- Engineering Calculation and Direct Measurement
- Direct Measurement Challenges
  - Backpressure
  - Safety
  - Multiple vent sources ?
  - Budget and speed ?
  - Working & breathing loss – length of test?
- Consideration
  - Undersized separators
  - Dump valve malfunction
  - Controlled tank losses. Fugitive, VRU process, etc





# Compressors

- Screen w/ FLIR GFx320 and/or Direct Measurement
- Measurement challenges
  - Measurement process connection ?
  - Working at heights
  - Multiple vent sources?
  - Emission Technologist Training & process knowledge
- Considerations
  - Non-operating & pressurized compressor may still vent
  - Screen control devices w/ OGI to ensure full capture
  - Engine start vent rate and fate of gas







# Pneumatics

- Emission factor or Direct Measurement
- Vent Side & Supply Side Measurement
  - Backpressure
  - Case seal leaks
  - Budget and speed
- Why 15 minutes for level ?
  - 10 tones vs 100 tones ?
- Inventory challenges
  - Annual pump utilization rate ?
  - Acquisition, divestment and shut in sites
  - Delineating production ?
  - Bottom up vs. top down
  - Age of previous inventory
  - Training & process knowledge
- LDAR identify malfunction devices



# Pneumatics



# Step 1 – Regulatory Risk Analysis



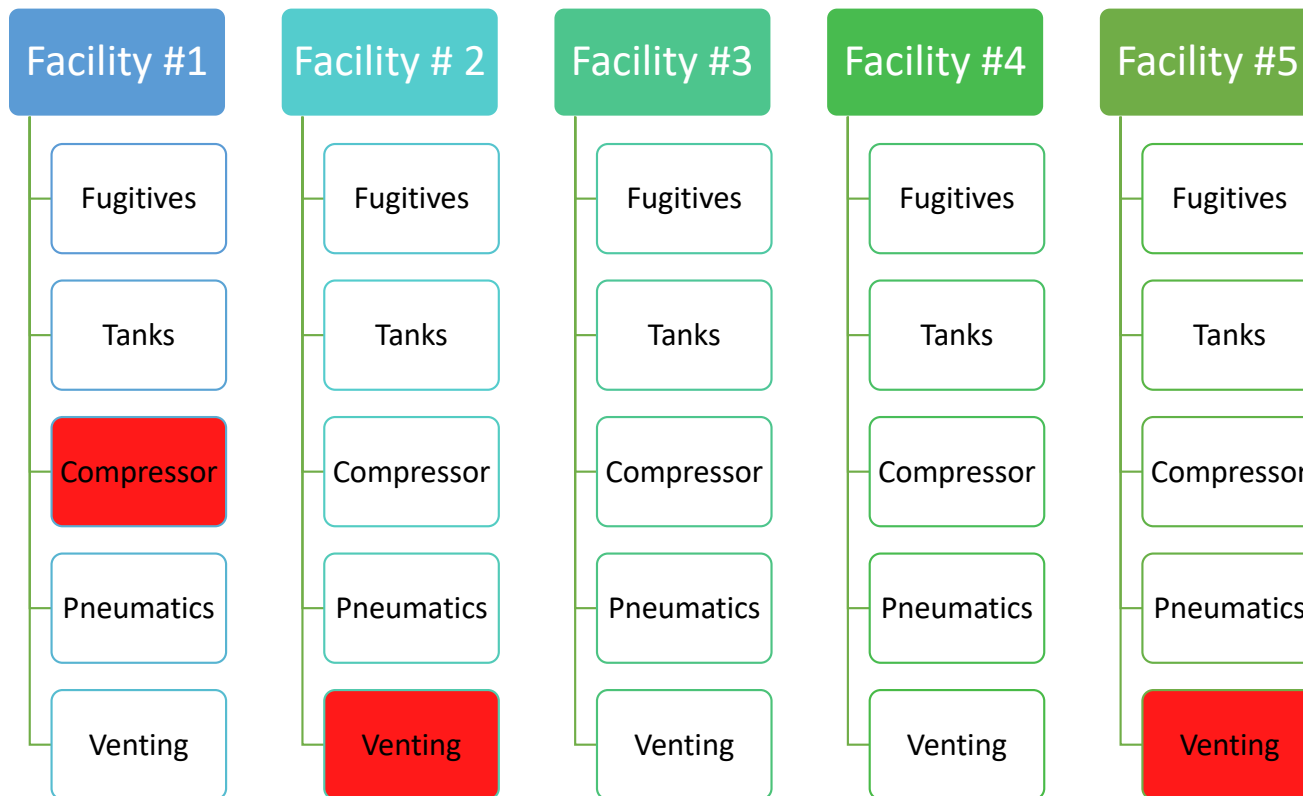
- Compile site emission source inventory & measurements
- Compare each emission sources against site emission regulations
- Any emission sources outside of compliance moves to MACC process
- Foundation for AER Methane Reduction Retrofit Compliance Plan (MRRCP)

# Step 1 – Regulatory Risk Analysis



Location	Pneumatic (m3/hr)	Fugitives (m3/hr)	Compressor Seals (m3/hr)	Venting (e3m3/month)
Facility #1	0.10	1.5	2-Throw = 5.1	1.75
Facility #2	0.30	1.25	2 Throw = 4.9	3.0
Facility #3	0.00	0.00	2 Throw = 0.0	2.5
Facility #4	0.20	1.0	2 Throw = 0.5	3.5
Facility #5	0.50	0.75	2 Throw = 1.2	4.5
<b>Company Total</b>	<b>1.1</b>	<b>4.5</b>	<b>11.7</b>	<b>15.25</b>
<b>Fleet Average</b>	<b>0.22</b>	<b>0.90</b>	<b>2.34 or 0.98 /throw</b>	<b>3.05</b>
Annual Inventory, Measurement Production Accounting				

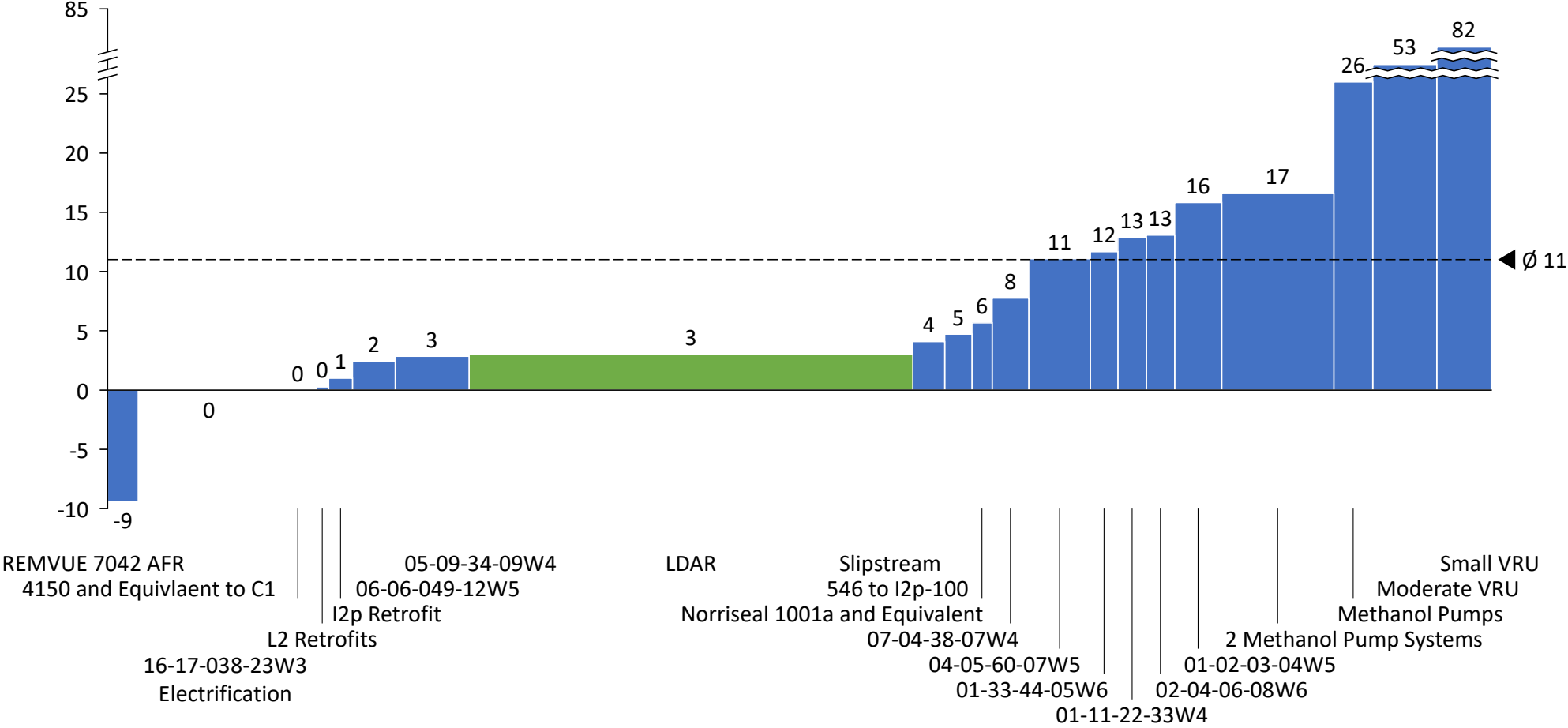
# Step 2 - MACC



## MACC

- Based on inventory and measurement of site assets
- Costs of technology
- Economics
- Lowest cost pathway to regulatory compliance
- Avoid stranded capital in delineated assets
- Capital compliance cost

# Step 2 - MACC



Thank You