

The Relationship Between the Number of Leaks and Facility Emissions is Poor

Phase I UT Study Data - 2013

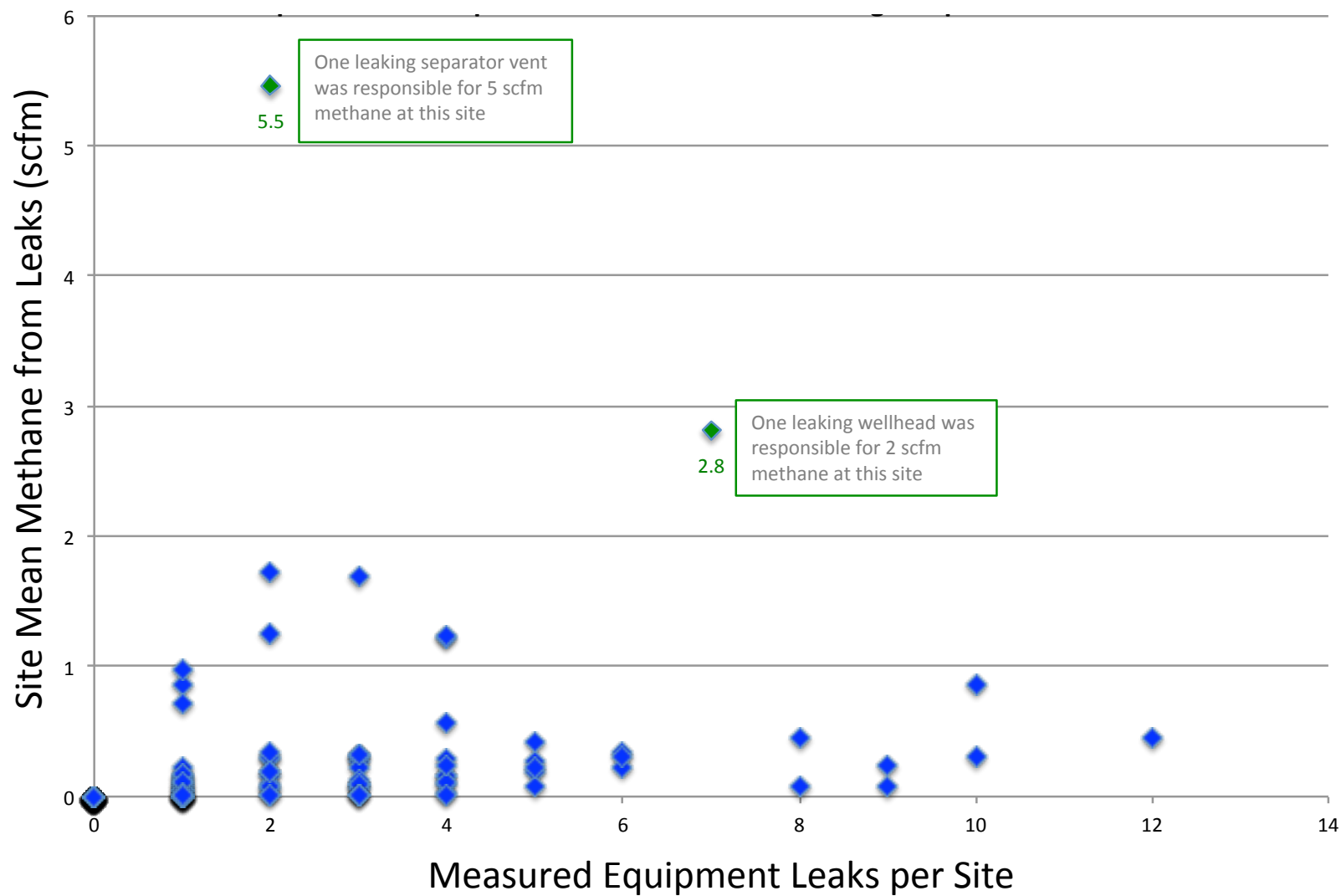
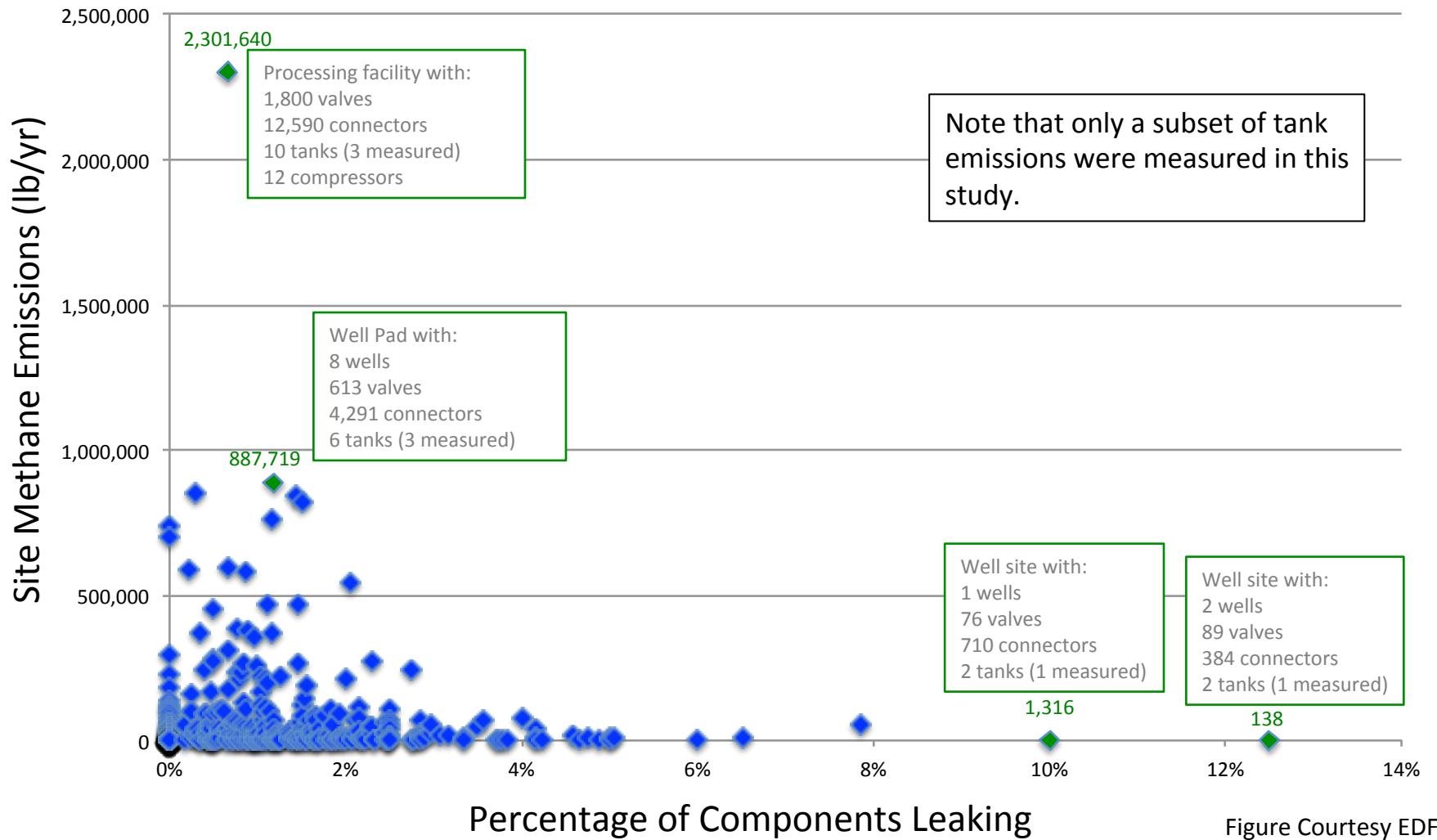


Figure Courtesy EDF

The Relationship Between the Percentage of Leaking Components and Facility Emissions is Also Poor

City of Fort Worth Natural Gas Air Quality Study Data - 201



LDAR with OGI is Cost-Effective

A number of studies have demonstrated this, using diverse methodologies:

- State of Colorado (tiered frequency)
 - Well Facilities: \$805 / short ton methane + ethane
 - Compressor Stations: \$474 / short ton methane + ethane
- Carbon Limits (quarterly frequency)
 - Well Facilities: \$143 / metric ton methane
 - Compressor Stations: \$276 / metric ton methane
- ICF International (quarterly frequency)
 - Well Facilities: \$133 / metric ton methane
 - Gathering Compressor Stations: \$48 / metric ton methane
 - Transmission Compressor Stations: \$114 / metric ton methane
- Reports from Industry:
 - Encana Oil and Gas (**monthly**): \$228 / short ton VOC
 - Noble Energy (Estimate of their costs for Colorado's tiered rule):
\$130 per short ton VOC

(These costs are roughly 10x lower than VOC abatement costs estimated by the State of Colorado)