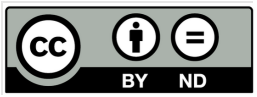
Monitoring Technology Compatibility Assessment

Project Canary

Canary X

July 2025



Purpose

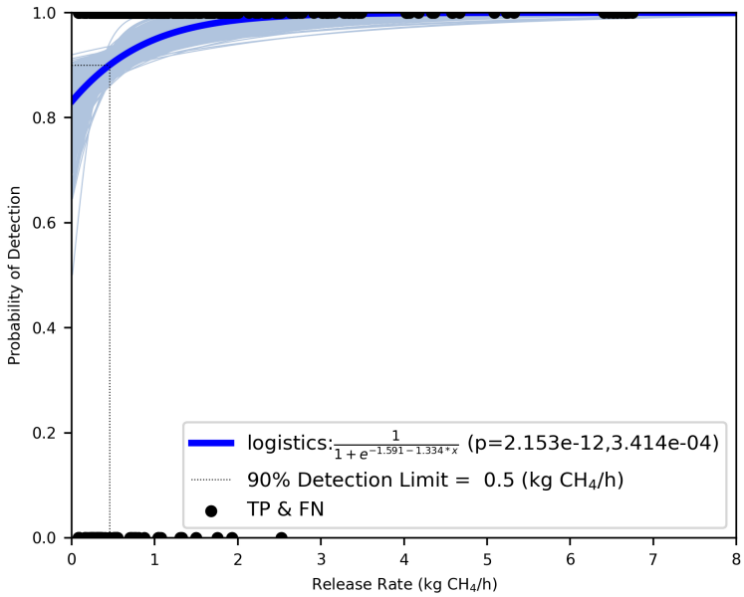
The MiQ Foundation, as the Standard holder, has developed this monitoring technology compatibility assessment to streamline market research conducted by Operators and other stakeholders to assess the compatibility of methane monitoring technologies against the requirements in the Monitoring Technology Deployment pillar of the MiQ Standard.

This document does not endorse or reflect the personal views of the MiQ Foundation and is not intended to be exhaustive. The sole aim of this document is to provide stakeholders with an impartial summary mapping the characteristics of methane monitoring technologies and methods to MiQ requirements. This document does not guarantee that a monitoring technology or method will be compliant for a specific deployment of that technology or method. MiQ Auditors may reference the information in this document while conducting MiQ Audits but still must assess each deployment individually. MiQ encourages Operators to carry out additional independent assessments of technologies and methods for their specific deployments.

MiQ has conducted the following assessment based on best available data, vendor-provided documentation, and published studies at the time of preparation. MiQ reserves the right to make updates to the documentation on a periodic basis to conform with new MiQ Standard updates and updated vendor documentation.

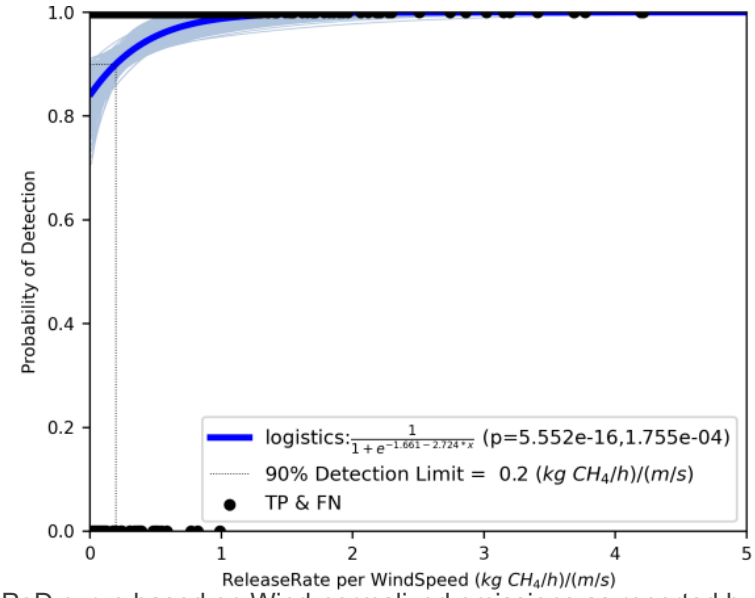
MiQ is not liable for any information provided or technology capabilities guaranteed by the technology provider.

CRITERIA	STANDARD REFERENCE	DESCRIPTION
GENERAL INFORMATION		
Name		Project Canary
MiQ Application	Section 3.2.1	Facility Scale and Source Level Inspections
Deployment Method	Section 4.1 – *Table 3 Detection Technology Specification (Bullet 2)*	Continuous Monitoring Systems (CMS) – Canary X integrated monitoring devices (Canary X) using Tunable Diode Laser Absorption Spectroscopy (TDLAS) sensors.
Sensor	Section 4.1 – *Table 3 Detection Technology Specification (Bullet 1)*	Project Canary CMS solution utilizes Canary X in conjunction with site-specific meteorological measurement(s) and proprietary emissions modeling tools to detect, localize, and quantify emissions.
PERFORMANCE SPECIFICATIONS		
Emission Source Coverage	Section 3.2.1- *Item 1*	Canary X measures emissions methane emissions with the lowest detection limit 2σ ≤ 0.15 ppm with 10 s averaging, with a resolution of 0.01 ppm and accuracy of ±2%. as low as 0.1 kg/hour from above surface, elevated sources in three-dimensional space and underground buried sources once methane reaches the atmosphere.
Measurement Frequency	Section 3.2.1- *Item 1*	Continuous – Canary X take measurements every second and transmits the data every minute to Project Canary SENSE cloud-based analytics platform for data analysis, visualization, and recordkeeping.
Attribution Level	Section 3.2.1- *Item 4*	Equipment Group level
Published Test Protocol	Section 4.1 – *Table 3 Detection Technology Specification (Bullet 4)*	The Advancing Development of Emissions Detection (ADED) project by Colorado State University (CSU) Methane Emission Technology Evaluation Center (METEC) Document 1 - Assessing the Performance of Emerging and Existing Continuous Monitoring Solutions under a Single-blind Controlled Testing Protocol Document 2 – The METEC Continuous Monitoring Final Report - Project Canary
MDL @ 90% PoD (Min MiQ MDL requirement is 25kg/hr)	Section 3.2.1- *Item 3*	90% PoD reported by METEC (2024): 0.5 kg CH4/hr



PoD curve reported by METEC (2024)

PoD Curve Section 3.2.1- *Item 3*



PoD curve based on Wind-normalized emissions as reported by METEC (2024)

TECHNOLOGY LIMITATIONS		
Operational Limitations	Section 4.1 – *Table 3 Detection Technology Specification (Bullet 3)*	Eligible monitoring areas are limited to a 100m radius of each device with quantification error bands of +/- 20%.
Environmental Limitations	Section 4.1 – *Table 3 Detection Technology Specification (Bullet 3)*	Presence of low wind (< 0.5 m/s) and high winds (> 15 m/s), along with temperatures outside of -10 to 50 °C range influence the detection sensitivity of Canary X.
EQUIVALENCY DETERMINATION		
Applicability	Section 3.2.3	Operators utilizing Canary X CMS across a subset of their sites may employ customized deployment strategies for Source Level and/or Facility Scale inspections, deviating from the standard strategies outlined in Table 2 of the MTD Subsidiary Document 3 of the MiQ Standard. See the MiQ Equivalency Table.
RECONCILIATION CONDISERATIONS		
Reconciliation	MI Section 3.3 - *Item 4*	Project Canary continuous monitoring system is deployed as networks of at least 3 Canary X integrated devices and one 2D sonic anemometer. Project Canary follows a CMS network configuration algorithm to determine an optimum network configuration, including sensor density and optimum placement (within the property boundaries), depending on project objectives, facility complexity, and meteorological conditions. Using a proprietary algorithm for emissions event detection, localization, and quantification, Project Canary's system enables detailed emissions attribution, pinpointing sources to equipment groups or individual units. All the data is streamed to a secured cloud-based system and Project Canary's SENSE platform is used to visualize data in near Real-time. Anomaly detection alerts are provided via email, text messages, SCADA, and dashboards, aiding operators in the identification and characterization of elevated emission events. This system assists operators with in-depth analysis of the emission events, including emission event frequency and duration along with the contribution of various source groups to the overall site emissions. Operational data can be used to further screen emissions insights. An example of the application of operational data to inform emission insights is categorizing emission events to fugitive and intrinsic emissions based on operational records that are available in often SCADA systems. Depending on the project objectives, further inspections, including ground-level walking surveys may be necessary to precisely localize emission sources. CMS systems can enhance the actionable insights, offering several key benefits, including (i) providing a comprehensive picture of site-level emissions for the entire period of deployment, (ii) rapid detection of emissions ranging from relatively low rates to super emitting events, (iii) capturing both short-duration/intermittent and continuous events, (iv) accurate

	time-bounding of intermittent emission events, (v) providing equipment-specific emissions insights that can aid in root cause analysis and provide strategically relevant information for targeted mitigation efforts, and (vi) complimenting other measurement methods using a continuous stream of site-specific data on emission estimates, direct concentration measurements, and meteorology.
ADDITIONAL DOCUMENTS	
Project Canary Guides & Whitepapers	https://www.projectcanary.com/learn/white-papers-guides/
Project Canary Case Studies	https://www.projectcanary.com/learn/case-studies/
Project Canary CMS Configuration Optimization Algorithm	https://chemrxiv.org/engage/chemrxiv/article-details/66fee87bcec5d6c142103149
Stanford Paper on CMS Performance Evaluation	https://pubs.acs.org/doi/epdf/10.1021/acsestair.4c00015?ref=article_openPDF

Document Status

Table: Version History

Version	Date	Summary of Change
1.0		