Monitoring Technology Compatibility Assessment

GHGSAT- DATA.SAT

March 2024

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.

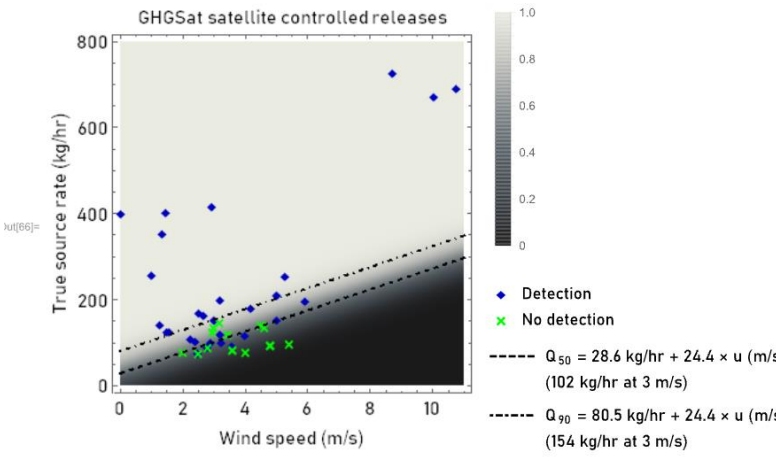
CRITERIA	STANDARD REFERENCE	DESCRIPTION
GENERAL INFORMATION		
Name		GHGSAT – Satellite DATA.SAT
MiQ Application	Section 3.2.1	Facility Scale Inspection
Deployment Method	Section 4.1 – *Table 3 Detection Technology Specification (Bullet 2)*	Satellite - DATA.SAT
Sensor	Section 4.1 – *Table 3 Detection Technology Specification (Bullet 1)*	DATA.SAT utilizes a patented Wide-Angle Fabry Perot (WAF-P) imaging spectrometer to measure methane at a high spatial resolution. The instrument is sensitive to methane-specific absorption in backscattered solar radiation, enabling plumes to be detected as local excess column downwind of the source.
PERFORMANCE SPECIFICATIONS		
Emission Source Coverage	Section 3.2.1- *Item 1*	DATA.SAT measures methane emissions from all sources, including elevated sources (onshore and offshore) and underground sources (e.g. buried pipelines) once methane reaches the atmosphere.
Measurement Frequency	Section 3.2.1- *Item 1*	Periodic- GHGSAT constellation has an average revisit time as low as 1-2 days.
Attribution Level	Section 3.2.1- *Item 4*	Site Level. DATA.SAT can identify emission sources to the individual site level.
Published Test Protocol	Section 4.1 – *Table 3 Detection Technology Specification (Bullet 4)*	Test Results published in 2024: https://amt.copernicus.org/articles/17/765/2024/.
MDL @ 90% PoD (Min MiQ MDL requirement is 25kg/hr)	Section 3.2.1- *Item 3*	~150kg/hr at 3 m/s. See PoD curve below to calculate MDL for other wind conditions. Per test results linked above GHGSat's lower detection threshold is estimated to be 100-200 kg/hr (Jacob et al.2022). See Additional Documents for Jacob et al, 2022. GHGSAT Satellite currently does not meet MiQ's 25kg/hr detection threshold. However, for the purposes of Certification Producers/Operators can include the technology in equivalency monitoring. See Equivalency Determination below for additional detail.
PoD Curve	Section 3.2.1- *Item 3*	

Figure 1. *PoD Curve indicates the (50%,90%) detection thresholds (102 kg/hr, 154kg/hr)*

TECHNOLOGY LIMITATIONS

Operational Limitations	Section 4.1 – *Table 3 Detection Technology Specification (Bullet 3)*	The WAF-P relies on detecting sunlight backscattered from surfaces beneath the emission plume and hence is limited to daytime monitoring only.
Environmental Limitations	Section 4.1 – *Table 3 Detection Technology Specification (Bullet 3)*	Presence of high wind, water bodies and wet terrain can influence detection sensitivity. Clouds above the emitter hinders detection and/or quantification of emissions.
EQUIVALENCY DETERMINATION		
Applicability	Section 3.2.3	A Producer/Operator utilizing GHGSAT Satellites for MiQ Certification may be able to implement a deployment frequency in combination with other monitoring solutions with higher sensitivities to meet the monitoring requirements of a particular MiQ grade. Please contact MiQ for additional information regarding equivalency determination.
RECONCILIATION CONDISERATIONS		
Reconciliation	MI Section 3.3 - *Item 4*	GHGSAT Satellites can attribute individual emission plumes to a single area/site-level. A Producer/Operator utilizing this technology must follow up with a ground inspection to attribute emissions accurately to an equipment or component level. This technology quantifies emission rate using a proprietary process that takes into consideration the environmental conditions and methane plume vertical and lateral profiles. Due to the nature of periodic screening technologies, Producers/Operators will need to conduct a Causal Examination using operational and maintenance data to further characterize the origin, cause, and duration of a detected event, and in some cases to verify the accuracy of the emission rate provided by GHGSat.
ADDITIONAL DOCUMENTS		
GHGSAT News and Resources		https://www.ghgsat.com/en/newsroom/
GHGSAT Whitepaper-Validation and Metrics for Emissions Detection via Satellite		https://go.ghgsat.com/hubfs/Reports/WhitePaper_Validation%20and%20Metrics%20for%20Emissions%20Detection%20by%20Satellite_JMcKeeverDJervis_092022.pdf
Jacob 2022		https://acp.copernicus.org/articles/22/9617/2022/acp-22-9617-2022.pdf)

Document Status

Table: Version History

Version	Date	Summary of Change
1.0	2024-03	First Publication