OFFICE OF AIR QUALITY PLANNING AND STANDARDS
RESEARCH TRIANGLE PARK, NC 27711

09/30/2025

Mr. Fredrick Givhan
Earthview Corporation
908 Dragon St
Dallas TX 75207

Dear Mr. Givhan:

We are writing in response to your submission on behalf of Earthview Corporation (Earthview), located in Dallas, Texas, dated February 3, 2025, and subsequent correspondence dated September 3 and 4, 2025. In that request Earthview seeks approval of an "Alternative Test Method for Methane Detection Technology" under the New Source Performance Standards for Crude Oil and Natural Gas Facilities for which construction, modification or reconstruction commenced after December 6, 2022 (40 CFR Part 60, Subpart OOOOb). EPA has considered this request under 40 CFR 60.5398b(d), based on the information Earthview has submitted (as described below). The EPA's Office of Air Quality Planning and Standards has been delegated certain authorities under this provision, including authority to consider and/or approve alternative test methods for methane detection technology.

As EPA understands, Earthview has developed a measurement solution, the Blubird Continuous Monitoring System (BluBird CMS). BluBird CMS is a network of fixed-based sensors packages, known as BluBirds, that measure methane concentrations and other environmental measurements (*e.g.,* wind speed and direction). These measurements are then transferred to a cloud-based software known as the Gridded Pad Analysis and Quantification System (GPAQS). These systems are used to determine whether an emission is present, approximate the location and size of the emission, and notify the owner or operator of a facility if there is an emission event.

To support the submittal, Earthview has provided the following documents through EPA's publicly facing portal or through EPA's Confidential Business Information (CBI) Office:

- Executive Summary documents (February 3, 2025): Submission information and technical summary of the technology, a summary of all submitted documents, and

additional contextualizing information. See §60.5398b(d)(2) and §60.5398b(d)(3)(i)-(ii).

- Description of Technology document (February 3, 2025): Detailed information on the measurement technology, including the sensors used to collect the measurement, practices for treating sensor data, method workflow, and quality control measures to determine the accuracy of reported data from the technology. Earthview supplemented publicly facing documents with additional documentation claimed as CBI (February 12, 2025), further contextualizing product specification and operations. See §60.5398b(d)(3)(iii), §60.5398b(d)(3)(v), and §60.5398b(d)(3)(vi)(C).

- Peer review external report (February 3, 2025, updated September 4, 2025): Controlled release study conducted at Colorado State University's Methane Emissions Technology Evaluation Center (METEC). The study was conducted as part of METEC's 2024 Advanced Development of Emission (ADED) 2024 study. This report, developed by Earthview from results from the ADED, serves as supporting evidence that BluBird CMS can detect methane emission at the 5 kg/hr leak probability of detection threshold, as applied in the field. See §60.5398b(d)(3)(vi)(A).

- Sampling protocol (*i.e.,* alternative test method) titled *"Earthview Corporation: Period Screening System"*(February 3, 2025, updated September 3, 2025): All the required procedures, applicable quality assurance, control requirements, and workflow consistent with Earthview's operation of the advanced methane detection solution. See §60.5398b(d)(3)(iv)(A) and §60.5398b(d)(3)(vi)(C).

EPA conducted an initial review of the submitted material. Based on this review and receipt of additional information, and consistent with the requirements in §60.5398b(d)(1)(i), EPA determined Earthview's submission to be complete on May 5, 2025.

Based on a review of the provided material and recognizing that Earthview meets the criteria found in §60.5398b(d)(2) to submit an alternative test method for consideration, EPA has determined that The BluBird CMS meets the periodic screening requirements for the 5 kg/hr, 10 kg/hr, and 15 kg/hr detection thresholds. Additionally, EPA is approving Earthview's solution for use by an owner or operator, on an affected facility, for the alternative periodic screening process as described in §60.5398b(b).

Furthermore, the alternative test method may be used as an alternative to fugitive emissions monitoring under the New Source Performance Standards for Crude Oil and Natural Gas Facilities for which construction, modification or reconstruction commenced after September 18, 2015, and on or before December 6, 2022 (40 CFR Part 60, Subpart OOOOa), provided the owner or operator using the solution complies with §60.5398b, including the notification, recordkeeping, and reporting requirements outlined in §60.5424b.

EPA has created a docket EPA-HQ-OAR-2024-0619 and is making the relevant documents mentioned in this letter publicly available there. Additional material developed by EPA to justify these decisions is also attached to this letter.

Because the alternative method may be used by owners and operators subject to the monitoring of fugitive emissions components affected facilities, and inspection and monitoring of covers and closed vent systems subject to 40 CFR part 60, Subparts OOOOa and OOOOb, EPA will post this letter as **MATM-015** on the EPA website at https://www.epa.gov/emc/oil-and-gas-alternative-test-methods for use by interested parties.

This approval letter is not an implied or express endorsement by EPA of any specific companies or products, as EPA does not promote the products, services, or enterprises of non-federal entities. This letter may be freely distributed and used for non-commercial, scientific and educational purposes. The use of the official EPA Seal and Logo is intended for US Government purposes only and may only be reproduced and used with the express, written permission of EPA's Office of Public Affairs. Further, the EPA Seal or Logo may not be used in a way that implies an EPA endorsement.

If you should have any questions or require further information regarding this approval, please contact my staff at MethaneATM@epa.gov.

Sincerely,

STEFFAN JOHNSON

Digitally signed by STEFFAN JOHNSON
Date: 2025.10.01 15:21:16 -04'00'

Steffan M. Johnson, Group Leader
Measurement Technology Group

cc:
Greg Fried, OECA/AED
Elizabeth Leturgey, OECA/OC
Ned Shappley, OAQPS/AQAD
Karen Wesson, OAQPS/AQAD
Regional Testing Contacts

Attachments (2)

Earthview Alternative Test Method (MATM-015).pdf

Acceptance Justification: BluBird CMS

MEMORANDUM

TO: EPA-HQ-OAR-2024-0619

FROM Ned Shappley and Dave Nash, EPA/OAQPS/AQAD/MTG

DATE: September 30, 2025

Subject: **Acceptance Justification: BluBird CMS**

This memorandum summarizes EPA's technical consideration of Earthview's approach for their periodic measurement solution, the BluBird Continuous Monitoring Solution (BluBird CMS) documented in ALTTECH-92, 93, and 94.

EPA's consideration of this technology as a periodic measurement solution under this program, and its application to this program, is further described in EPA's approval letter dated September 30, 2025. This Memorandum also includes a summary of meetings between the company and EPA staff related to the company's request for approval of this technology.

Background Information

Earthview is a methane detection solution provider based in Dallas, TX that has developed a proprietary solution, the BluBird Continuous Monitoring Solution (BluBird CMS), for the mid-stream and up-stream oil and gas sector. BluBird CMS is used to identify emissions from fugitive components and covers, along with closed vent systems. Based on the information provided[1] to the EPA from Earthview, the BluBird CMS has been deployed to most of the production basins in the Continental United States (CONUS). Earthview, has developed and validated their solution through internal programs[2] and third-party studies, such as the 2024 Advancing Development of Emissions Detection (ADED) Tests performed at the Methane Emissions Technology Evaluation Center (METEC) by Colorado State University[3]. Based on BluBird's application in multiple production basins, and internal and external validations efforts,

[1] Supporting Information #1
[2] Supporting Information #2
[3] Supporting Information #3

Earthview requested their technology be broadly applicable in the periodic screening program at sensitivities of 5, 10, and 15 kg/hr. Based on the information described included in Earthview's application, they meet the requirements for an entity to submit an alternative request in §60.5398b(d)(2) and
and provided the EPA the required information from §60.5398b(d)(3)(i-ii).

Technology Description

Earthview's Description of Technology Document submitted though EPA's public portal[4] and supplemental document submitted through EPA's Confidential Business Information (CBI) Office, completely details the company's measurement technology. The Earthview BluBird gas monitoring system consists of multiple measuring and reporting instrument(s) installed on a site, the cloud-based computations that compute analyte concentrations and emission rates, along with the cloud-based tools and human interactions that deliver the information to the customer.

The theory of operation for each BluBird field instrument is to allow an air sample to interact with a set of three different metal oxide semiconductor (MOS) sensors. As EPA understand, each MOS exhibits different sensitivities to methane and VOC while also having different responses to humidity and air temperature. The combination of the MOS sensor also allows Earthview to infer VOC content, which can be used to assist identification the potential source of emission. Each BluBird is also equipped with relative humidity and temperature sensors that aid in correlating signals from the MOS sensor to determine a methane concentration. MOS sensors are commonly used in methane detection but can be prone to environmental interference. To account for these factors, Earthview developed a propriety virtual model, or "digital twin," which predicts the expected clean-air resistance of the MOS sensor based on measured environmental conditions, humidity, temperature. This establishes a baseline resistance that the sensor *should* exhibit in the given conditions, without the influence of methane and allows for real-time adjustments in the data to account for the presence of sensor

[4] Supporting Information #4

drift.

Each Blubird is also equipped with a wind vain and anemometer to determine wind direction and magnitude. This information, along with the MOS, temperature and relative humidity data, is continuously uploaded to Earthview's AWS system. This information is used to inform their inverse plume model(s) which is used to calculate their methane leak rates determined either through a standard Gaussian plume model or through proprietary plume model at low-wind conditions. When a periodic survey yields a plume above a certain level, a client is notified via the Earthview platform.

The potential interferences for these techniques are mentioned in the description of technology, and data quality objectives are in place in Earthview's test methods to minimize the impact and ensure operation of the solution. For example, location of the BluBird(s) is key to maintaining the sensitivity of the monitoring system, and the method incorporates citing requirements to determine the minimum number of BluBirds and their optimal location. Additionally, environmental conditions wind speed, relative humidity, and temperature need to be within limits to ensure the probability of detection of the system is maintained and the test method limits the collection of information when these conditions are not met.

This information included in this section of the memo consistent with the applicable regulatory requirements in in §60.5398b(d)(3)(iii-v).

Method Sensitivity

Earthview demonstrated a solution sensitivity (90% Probability of Detection) based on testing from the 2024 ADED conducted at METEC at Colorado State University. The METEC facility was designed to mimic and simulate a wide range of emission scenarios associated with upstream and midstream natural gas operations. The facility was built using surface equipment donated from oil and gas operators. A controlled release system allowed metering and control of gas releases at realistic sources such as vents, flanges, fittings, valves, and pressure relief devices

found throughout equipment. The series of tests were conducted from February-April 2024, where tests ranged in duration from 0.3 to 8 hours, with 1-5 simultaneous sources in an emission event.

Earthview's analysis of the METEC data indicates a 90% probability of detection (POD) of approximately 2.4 kg/hr for the single release. Earthview analysis of the METEC data is weighted towards leak duration instead of the mass rate which significantly lowers the POD from the public reports published from METEC. EPA found Earthview's analysis to be reflective of their potential application in the field and that subject to environmental factors, their Blubird sensors would identify methane emissions of approximate 5 kg/hr coming from affected equipment within a reasonable time frame. This assumption is further substantiated in examples provided in Earthview's application from the field, where the BluBird CMS were able to identify emission of
<5 kg/hr from an upstream oil and gas production site.

Consistent with the requirements in §60.5398b(d)(3)(vi)(A), Earthview data has provided sufficient evidence to support their requested BluBird CMS emissions monitoring system detection thresholds. This data also identifies the approximates source of emissions within the local boundaries of the site, satisfied the facility-level spatial resolution requirements in §60.5398b(d)(3)(vii).

Note: The METEC public reported an unclassified number for their 90% POD for the Earthview CMS based on CSU's experimental design. EPA's findings are not intended to question these results as they were determined according to the protocol.

Testing Protocol

The final alternative test method, developed by Earthview and with feedback from EPA, matches EPA's understanding for how the BluBird CMS system will be implemented in the field, how data will be collected, and how information from this system will be reported to an

affected owner or operator.

The application of the Blubird system in Earthview's method is consistent with the operation of the system in the METEC study, however it appears the sensor density in real-life application will be reduced. EPA accepts the reduction in sensor density for a periodic survey due to the length of sampling required to ensure full coverage of a site for every screening cycle. The alternative test method includes all the information required in §40 CFR 60.5398b(d)(3)(vi)(B) and (C),and appears to be adequate for use for in the alternative monitoring standards identified in §40 CFR 60.5398b(b). The method identifies any potential interferences and environmental conditions in which the method would not apply, and provides mitigation steps to ensure proper implementation to maintain the solutions' probability of detection. The method also includes an extensive set up quality assurance criteria designed to ensure the proper operation of the sensors, sufficient data collection, and transfer of information. This quality assurance criteria includes appropriate corrective action when testing criteria are not met . The method also details the amount of valid data needed to verify either the presence or the absence of an emission, and is written to include sufficient recordkeeping of Earthview's procedures that would allow a third-party, for example a state regulatory authority, to audit the Earthview processes.

Applicability

Earthview requested the Blubird CMS be approved broadly across the oil and gas sector in the contiguous United States based on successful deployment in several states and basins including, by not limited to, Basins in California, Colorado, Oklahoma, Pennsylvania, and Texas. Any meteorological differences between basins that may cause challenges are identified prior to deployment, as EPA assumes that data quality tools within the method are sufficient to mitigate environmental conditions which could negatively impact the measurement. EPA agrees with the broad approval request.

Meeting Summary between EPA Measurement Technology Group and Earthview

Date	Venue	Participants	Topics
01/23/2025	Teams meeting	Kevin Yoon, Fredrick Givhan, Jim Maslanik, Ned Shappley , and Mike Stovern	Pre-submittal meeting - Process
03/12/2025	Teams meeting	Kevin Yoon, Fredrick Givhan, Jim Maslanik, Ned Shappley, and Dave Nash	Supporting Data Discussion
04/17/2025	Teams meeting	Kevin Yoon, Fredrick Givhan, Jim Maslanik, Ned Shappley, and Dave Nash	Discussion of section 1-7 of test method
05/15/2025	Teams meeting	Kevin Yoon, Fredrick Givhan, Jim Maslanik, Ned Shappley, and Dave Nash	Discussion of section 8 and 9 of test method
05/29/2025	Teams meeting	Kevin Yoon, Fredrick Givhan, Jim Maslanik, Ned Shappley, and Dave Nash	Comments on test method
06/05/2025	Teams meeting	Kevin Yoon Ned Shappley, and Dave Nash	Discussion on Earthview's approach for alerting in their test method
06/26/2025	Teams meeting	Kevin Yoon, Fredrick Givhan, Jim Maslanik, Ned Shappley, and Dave Nash	Discussion of additional supporting evidence on sensitivity and sensor placement.
07/23/2025	Teams meeting	Kevin Yoon, Fredrick Givhan, Jim Maslanik, Ned Shappley, and Dave Nash	Discuss comments on the alternative test method