

Qube Technologies Inc.

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California Air Resources Board

Monitoring and Laboratory Division

SB 1137 Implementation

Submitted via email to: SB1137implementation@arb.ca.gov

Re: Qube Technologies Inc. Comments on the Discussion Draft Performance Standards for Continuously Operating Emissions Detection Systems Required by California Senate Bill 1137 for Upstream Oil and Gas Production Facilities in Health Protection Zones (Draft, January 5, 2026) — Proposed 17 CCR § 93504(c), (d), (g), (i), (j), and (m)

Dear CARB Staff:

Qube Technologies Inc. (“Qube”) is grateful for the opportunity to comment on the discussion draft regulatory text and the accompanying Performance Standards Technical Support Document (“TSD”) implementing the continuously operating emissions detection system (“EDS”) requirements of SB 1137. Our comments below address proposed § 93504(c) (continuous operation and downtime), § 93504(d) (detection limit, precision, and performance testing), § 93504(g) (baseline conditions), § 93504(i) (meteorological monitoring system), § 93504(j) (automated alerting functionality), and § 93504(m) (LDRP content requirements). For each provision we quote the relevant draft text, explain our concern, and where applicable propose specific revised regulatory text.

About Qube Technologies Inc.

Qube is an end-to-end continuous monitoring technology company. Qube’s low-cost continuous monitoring system is a network of fixed sensors designed to detect methane leaks near instantaneously from oil and gas facilities. The Qube continuous monitoring system consists of three components: (i) an Industrial Internet of Things (IIoT) device that measures gas concentration (capable of supporting CH₄, CO, VOC, NO_x, SO_x, H₂S, CO₂, and PM_{2.5}) and environmental data (wind speed/direction, etc.), transmitted through cell networks to the cloud; (ii) a cloud-based analytics platform that records and analyzes data received by the IIoT device and converts raw sensor readings into leak locations and quantification rate estimates; and (iii) a web-based user dashboard that aggregates emissions rates, volumes, and alarms generated by the analytics platform and presents equipment-level emission breakdowns that enable efficient repairs by operations and maintenance teams (see Figure 1).

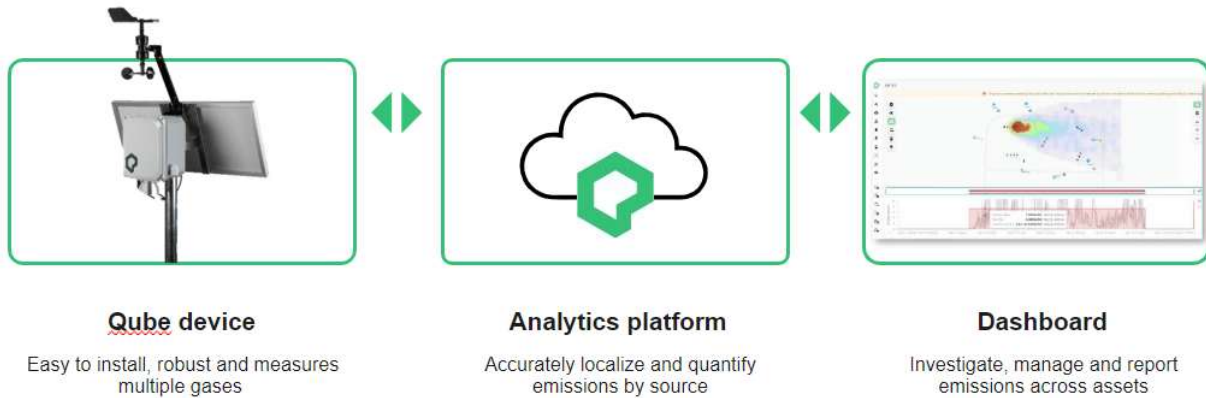


Figure 1. Overview of the Qube continuous monitoring system.

Qube’s customers have deployed over 8,000 continuous monitoring devices across 1,000+ oil and gas facilities across the United States, including California. Qube has received regulatory approval as an EPA Alternative Test Method for LDAR equivalency under NSPS OOOOb Periodic Screening Work Practices, and for Alberta, Canada Alternative Fugitive Emissions Management Plans. Qube is headquartered in Calgary, Alberta, Canada and has offices in Houston, TX and Midland, TX.

II. Comments on § 93504(c) — Continuous Operation and Downtime

“(c) The EDS shall be capable of continuous air monitoring.

(2) The EDS must continuously collect data as specified in subparagraph 93504(c)(1), except as specified in subparagraphs 93504(c)(2)(A) through (D):

(A) The rolling 12-month average operational downtime of the EDS must be less than or equal to 10%.

(B) Operational downtime of the EDS is defined as a period of time for which any sensor or monitor fails to collect or transmit data as specified in subparagraph 93504(c)(1) or any sensor or monitor is out-of-control as specified in subparagraph 93504(c)(2)(C).

(C) A sensor or monitor is considered out-of-control if either of the following occurs: 1. The sensor or monitor fails ongoing quality assurance checks, as specified in subparagraph 93504(m)(8)(I). 2. The sensor or monitor output is outside of the applicable operating range.

(D) The out-of-control period for a sensor or monitor begins at the time a quality assurance check failure occurs under subparagraph (C)(1) or, for a sensor or monitor outside of range under subparagraph (C)(2), at the time the output first reads outside of the applicable operating range, and ends only when the sensor or monitor, including any replacement sensor or monitor, subsequently passes a quality assurance check conducted in accordance with subparagraph 93504(m)(8)(I) or, for a sensor or monitor outside of range, when the output returns to within the applicable operating range.” (Proposed § 93504(c))

1. Alternative method for downtime: a program-based repair timeline (§ 93504(c)(2)(A)).

Rather than a rolling 12-month 10% downtime cap, we recommend CARB consider a program-based repair standard that defines repair timelines for sensors identified as down due to malfunction or other issue. A defined repair-timeline standard more directly serves the rule’s underlying purpose — prompt restoration of monitoring coverage — than a bare percentage cap, and gives operators and CARB a clear, auditable metric independent of fleet size or facility count.

Suggested revised text:

“(A) The operator shall attempt a first repair of any sensor or monitor identified as down (via alarm notification or otherwise) within seven (7) days of identification, and shall complete repair, replacement, or calibration of that sensor or monitor no later than thirty (30) days after identification.”

2. If a 12-month rolling 10% downtime threshold is retained: coverage-weighted downtime and a grace period (§ 93504(c)(2)(A)).

If CARB retains a percentage-based downtime cap, we recommend two refinements. First, for EDS composed of a network of sensors (e.g., point sensor network, or “PSN”, EDS), one sensor being out-of-control is not the same as the whole system being down. We recommend downtime be calculated as the percentage of the sensor or monitor network that is out-of-control at a given time — a coverage-weighted approach — rather than treating any single sensor outage as system-wide downtime. This is straightforward for an operator to calculate and verify directly from EDS status data. Second, the logistics of identifying a down or malfunctioning sensor (via alarm notification or routine data review) and completing repairs can quickly consume the 10% allowance before an operator has had a fair opportunity to respond. We recommend a seven (7) day buffer between a sensor first failing and that failure counting toward downtime, to allow sufficient time for identification and repair.

Suggested revised text:

“(A) The rolling 12-month average operational downtime of the EDS must be less than or equal to 10%. For an EDS composed of a network of two (2) or more sensors or monitors (e.g., a point sensor network EDS), operational downtime for any period shall be calculated as the percentage of deployed sensors or monitors that are out-of-control during that period, rather than treating the EDS as down in its entirety whenever any single sensor or monitor is out-of-control. A sensor or monitor shall not begin accruing downtime under subparagraph 93504(c)(2)(C) until seven (7) days after the conditions described in that subparagraph first occur, to allow for identification and repair.”

3. Separate data collection from data transmission (§ 93504(c)(2)(B)).

Many EDS technologies include some on-device data storage. There will be instances where data is successfully collected at the sensor but transmission is delayed by an interruption in the cellular or other transmission network, rather than by a failure of the sensor itself. Once connectivity is restored and the stored data uploads, the data is delayed but the underlying monitoring was never actually “down.” This distinction is also consistent with the automated alerting standard at proposed § 93504(j)(1), which already measures timeliness against what is “technically feasible” rather than an absolute real-time standard.

Suggested revised text:

“(B) Operational downtime of the EDS is defined as a period of time for which any sensor or monitor fails to collect data as specified in subparagraph 93504(c)(1) or is out-of-control as specified in subparagraph 93504(c)(2)(C). Where a sensor or monitor has on-board data storage capability, a period during which data is successfully collected but not yet transmitted due to a loss of network connectivity shall not, by itself, constitute downtime, provided the stored data is transmitted as soon as technically feasible upon restoration of connectivity, consistent with paragraph 93504(j)(1).”

4. Clarify that replacement with a lab-calibrated sensor ends an out-of-control period (§ 93504(c)(2)(D)).

Proposed subparagraph (D) states that a downtime/out-of-control period “ends” when a sensor passes a quality assurance check conducted under § 93504(m)(8). Some technology vendors may recommend that operators swap a sensor that fails its field QA check for a new or refurbished, lab-calibrated sensor rather than attempting to requalify the original unit in the field. We recommend the text clarify that installing such a replacement also ends the out-of-control period.

Suggested revised text (addition to subparagraph (D)):

“...or, where the sensor or monitor is replaced with a new or refurbished sensor or monitor that has passed a lab-based quality assurance check consistent with paragraph 93504(m)(8)(I), upon installation and verification of that replacement sensor or monitor.”

III. Comments on § 93504(d) — Detection Limit, Precision, and Performance Testing

*“(d) The EDS shall be capable of measuring the alert threshold(s) set pursuant to paragraph 93504(e).
(1) The EDS shall have a minimum detection limit at least three (3) times less than the alert threshold(s).
(2) The EDS shall have a manufacturer-documented precision within ± 15 percent at the alert threshold concentration(s).
(3) EDS sensor(s) or monitor(s) shall be performance tested at least once per quarter to verify field precision is maintained within ± 25 percent at the alert threshold concentration(s). A sensor or monitor that does not meet this criterion shall be calibrated, repaired, or replaced.
(A) Testing shall be performed using a NIST-traceable standard at concentration(s) equal to the alert threshold(s) of the detection target.
(B) For EDS measuring the site-specific toxic of highest concern, testing methods shall prevent any emission of the detection target. Testing may be conducted using contained methods or surrogate gases that ensure safety and maintain traceability to an appropriate standard.
(C) EDS equipped with an automated built-in functional verification feature (e.g., optical reference cell, optical filter) that provides a traceable and logged response check equivalent to a manual performance verification test may be exempt from manual quarterly performance verification testing, provided the automated verification is conducted at least quarterly and manufacturer documented equivalency is maintained.
(D) The methodology used for testing the EDS shall be documented in the LDRP.
(E) Test records shall be maintained pursuant to paragraph 93504(m)(8)(I)(3).” (Proposed § 93504(d))*

1. Add an absolute 1 ppm allowance to address low-concentration alert thresholds (§ 93504(d)(1)-(3)).

For operators using methane as a surrogate for the toxic of highest concern, the REL-level leak rate can convert to a single-digit ppm methane alert threshold (e.g., 9 ppm methane). Field performance testing at ± 25 percent of such a low threshold can require resolving differences smaller than the sensor’s underlying resolution (approximately 1 ppm for many commercially available sensors). In that situation, a sensor may fail the percentage-based test not because its performance is inadequate, but because the percentage tolerance is finer than the instrument’s resolution at low concentrations. We recommend an absolute 1 ppm floor be added so the test remains meaningful across the full range of site-specific alert thresholds.

Suggested revised text:

“(1) The EDS shall have a minimum detection limit at least three (3) times less than the alert threshold(s); provided that where three (3) times less than the alert threshold(s) is less than 1 ppm, a minimum detection limit of 1 ppm or less shall satisfy this requirement.

(2) The EDS shall have a manufacturer-documented precision within ± 15 percent, or ± 1 ppm, whichever is greater, at the alert threshold concentration(s).

(3) EDS sensor(s) or monitor(s) shall be performance tested at least once per quarter to verify field precision is maintained within ± 25 percent, or ± 1 ppm, whichever is greater, at the alert threshold concentration(s). A sensor or monitor that does not meet this criterion shall be calibrated, repaired, or replaced.”

2. Align the mandatory quarterly manual testing requirement with the TSD’s own “where appropriate” standard for manual oversight, and allow operators to define QA/QC procedures using demonstrated vendor performance data (§ 93504(d)(3)).

The TSD’s Section IV.G (“EDS Quality Assurance and Quality Control”) states that the LDRP “should still define and implement comprehensive QA/QC procedures that address all aspects of data quality management, including manual oversight where appropriate” (Performance Standards TSD, pp. 20–21). That framing is conditional: manual oversight belongs where circumstances call for it, not as a categorical default. Proposed § 93504(d)(3) does not carry that conditionality forward — it mandates quarterly manual performance testing for all EDS, with relief available only through the narrow, hardware-oriented exemption in subparagraph (C) for a “built-in functional verification feature” with manufacturer-documented equivalency. The operative standard is materially more rigid than the TSD’s own supporting rationale calls for.

The “where appropriate” determination the TSD contemplates is inherently technology- and deployment-specific, and the LDRP is the right place to make it, not a fixed rule that treats every EDS the same regardless of demonstrated performance. The draft standards already recognize vendor-generated performance data as an appropriate basis for evaluating an EDS: § 93504(m)(7)(C) requires the LDRP to include “relevant performance data and validation results, where validation results may include controlled release testing results or other field-based evaluations demonstrating that the system performs as expected.” We recommend CARB extend that same evidentiary approach to QA/QC methodology.

Rather than confining automated or algorithmic quality assurance to the narrow exemption in subparagraph (C), operators — working with their EDS manufacturers — should be permitted to propose a QA/QC and calibration program in the LDRP that relies on algorithmic controls (e.g., automated baselining, drift correction), supported by manufacturer- or vendor-demonstrated performance data such as controlled-release validation testing or long-term field deployment history, subject to CARB approval. This keeps the same case-by-case, evidence-based review CARB already applies to siting and detection performance under (m)(7)(C), applied consistently to QA/QC.

3. If this standard is maintained, allow alternative, programmatic QA/QC approaches in lieu of manual quarterly field performance testing (§ 93504(d)(3)).

For technologies without an automated built-in functional verification feature, quarterly field performance testing will typically require a manual device “bump test”: applying a NIST-traceable gas to the device and recording the results. Completing this requires a NIST-traceable gas, an apparatus to apply it in a controlled manner, data acquisition equipment, a vehicle, and technician time. For a point-sensor network, we estimate a single technician can complete performance testing on 8-12 devices (2-3

sites) per day at a cost of roughly \$500-1,500 per day — not including the cost of any replacement sensors required when a test fails. Across a large deployment, this is a material, recurring cost.

We understand CARB has considered that some EDS incorporate built-in QA/QC methods and has not treated those methods alone as sufficient for long-term data quality. We agree that ongoing assurance of data quality is important, but recommend that an operator's LDRP be allowed to propose alternative programmatic approaches — subject to CARB approval — rather than being limited to manual quarterly bump testing alone. These approaches may include:

- A hybrid approach combining algorithmic drift-monitoring with periodic in-field performance testing or programmatic sensor replacement.
- Data demonstrating long-term data quality of the same sensor model deployed in similar in-situ settings.
- A rotational testing program under which a defined percentage of sensors are field-tested each quarter such that all sensors are tested at least once per year.
- A rotational testing program under which the tested percentage adjusts based on the failure rate observed in the prior quarter (more failures triggering more testing the following quarter).
- A proactive sensor replacement program in which a defined number of sensors are pulled from the field, replaced, and evaluated in a laboratory setting each quarter, with the number adjusted based on results.

4. Allow flexibility in the NIST-traceable test gas concentration used for performance testing (§ 93504(d)(3)(A)).

Proposed § 93504(e)(3) requires an operator to set the alert threshold at the site-specific REL for the toxic of highest concern. Because § 93504(d)(3)(A) requires performance testing using a NIST-traceable standard at a concentration equal to the alert threshold, each site will require its own custom test-gas concentration. While custom-concentration NIST-traceable gas can be procured, managing this on a site-by-site basis across a large portfolio of facilities, each with a unique threshold, is administratively burdensome. We recommend CARB allow alternative field performance testing that may include:

- The operator to define its performance test method, including test gas concentration(s), in its LDRP;
- Performance testing using NIST-traceable gas at commercially available (rather than custom) concentrations; and/or
- Standardized testing at a single point corresponding to the span of the sensor's calibration range.

IV. Comments on § 93504(g) — Establishing Baseline Conditions

“(g) Baseline conditions shall be established for EDS that detect leak plumes downwind of a source (e.g., point sensor network EDS, open-path EDS). The EDS shall remain capable of detecting and reporting leaks during the period in which baseline conditions are being established. The process to establish baseline conditions shall meet the following minimum requirements:

(1) The EDS shall collect 12 months of valid hourly measurements before establishing baseline detection target concentration(s). (A) Measurements shall be representative of normal operating conditions of the production equipment monitored by the EDS. Periods when maintenance activities, malfunctions, or leaks occur from production equipment monitored by the EDS shall be excluded from baseline conditions. (B) Days with incomplete data (five (5) or more hours of missing measurement values) shall be excluded from baseline conditions.

(2) An interim baseline value shall be calculated each calendar month and include all valid hourly measurements collected to date, until baseline detection target concentrations have been established pursuant to subparagraph 93504(g)(1).

(3) Measurements shall be made using the same averaging time as used for the EDS alert threshold(s) calculated pursuant to paragraph 93504(e).

(4) Baseline detection target concentration(s) shall be calculated as the arithmetic mean of baseline measurements made pursuant to subparagraph 93504(g)(1).

(5) The methodology used to establish baseline detection target concentration(s) shall be documented in the LDRP.” (Proposed § 93504(g))

1. State the purpose of baseline conditions directly in the text of § 93504(g).

As drafted, § 93504(g) specifies the procedure for establishing baseline conditions in detail but does not state what a baseline concentration represents or why it is required. The TSD explains this: baseline conditions exist to account for non-leak variability in detection target concentration caused by meteorology, ambient background sources other than the monitored production equipment, and routine emissions from permitted operations at the facility, so that an EDS can distinguish that non-leak signal from an actual leak (Performance Standards TSD, pp. 9, 35). None of this rationale currently appears in the regulatory text. We recommend the lead-in sentence of § 93504(g) be revised to state this directly, so the purpose of the requirement is clear from the rule text itself.

Suggested revised text:

“(g) Baseline conditions account for non-leak variability in detection target concentration caused by meteorological conditions, ambient background sources other than the production equipment monitored by the EDS, and routine emissions from permitted operations at the facility. Baseline conditions shall be established for EDS that detect leak plumes downwind of a source (e.g., point sensor network EDS, open-path EDS)...” [remainder of (g) unchanged]

V. Comments on § 93504(i) — Meteorological Monitoring System

Measurements of ambient temperature, ambient pressure, relative humidity, wind speed, and wind direction are important for assessing the potential impact of leaks detected by an EDS. Wind speed and wind direction are particularly important to assessing potential impact to sensitive receptors. Ambient temperature, ambient pressure, and relative humidity are useful in a different way: primarily for monitoring and diagnosing the operating performance of the sensor or monitor in a PSN, rather than for the real-time detection or localization function that wind data serves. We raise three related concerns below — data transmission cost, the feasibility of the referenced U.S. EPA standard, and internal consistency between the acquisition and reporting resolution requirements — and offer specific text recommendations for each.

1. The one-minute recording resolution for temperature, pressure, and humidity imposes data transmission costs that are not justified by a corresponding benefit to leak detection.

“The EDS shall include a meteorological monitoring system that shall have sufficient sensors to continuously measure representative meteorological conditions at the facility including ambient temperature, ambient pressure, relative humidity, wind speed, and wind direction, with the ability to continuously record measurements at a measurement resolution of one (1) minute or less.” (Proposed § 93504(i))

As drafted, this provision applies the same one-minute recording resolution to all five meteorological parameters. Wind speed and wind direction change rapidly and are directly used for near-real-time plume transport modeling and leak localization, so a fine recording resolution for those two parameters is well justified. Ambient temperature, pressure, and relative humidity, by contrast, vary far more slowly at a fixed site and are used primarily for quality-assurance context — including diagnosing sensor or monitor operating performance, as noted above — rather than for time-critical plume tracking. Notably, this proposed one-minute standard is finer than the resolution CARB requires for the EDS’s actual detection-target concentration data, which under the EDS definition in proposed § 93502(a)(5) need only achieve “measurement resolution one (1) hour or less.”

Requiring continuous one-minute recording (and, in practice, continuous transmission) of temperature, pressure, and humidity data multiplies the data volume that must be transmitted from the field — typically over cellular or satellite backhaul — by roughly 60 times relative to hourly reporting. Multiplied across the number of monitors an operator may deploy per facility and across all facilities subject to the rule, this creates a material, recurring data transmission cost to operators without a clear showing that sub-hourly temperature, pressure, or humidity data materially improves leak detection, localization, or health-risk characterization.

Recommendation: We recommend that CARB apply the one-minute-or-less recording resolution only to wind speed and wind direction, and allow temperature, ambient pressure, and relative humidity to be recorded at a resolution of one (1) hour or less, consistent with the storage resolution already proposed in § 93504(i)(2) and the general EDS resolution standard in § 93502(a)(5). Suggested revised text:

“The EDS shall include a meteorological monitoring system that shall have sufficient sensors to continuously measure representative meteorological conditions at the facility including ambient temperature, ambient pressure, relative humidity, wind speed, and wind direction. Wind speed and wind direction shall be recorded at a measurement resolution of one (1) minute or less. Ambient temperature, ambient pressure, and relative humidity shall be recorded at a measurement resolution of one (1) hour or less.”

2. CARB should not require adherence to the U.S. EPA Meteorological Measurements guidance, since it is infeasible at most oil and gas production sites.

“Meteorological sensor quality, siting, and quality assurance shall, to the extent site-specific conditions allow, adhere to the specifications and guidelines that are specified in the U.S. EPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV: Meteorological Measurements (March 24, 2008), which is incorporated herein by reference.” (Proposed § 93504(i)(1))

We understand the appeal of referencing an established, credible protocol for meteorological data quality. However, CARB’s own Performance Standards TSD acknowledges that full compliance with this protocol is unlikely to be achievable at most upstream oil and gas sites: “Few of the meteorological systems included with commercially available EDS would meet U.S. EPA guidance ... and the inclusion of

an additional meteorological system compliant with U.S. EPA guidance may be infeasible at many oil and gas production facilities and may not directly improve leak localization performance of the EDS” (Performance Standards TSD, p. 17). The EPA Volume IV siting criteria — for example, siting towers at ten times the height of the nearest obstruction and mounting wind sensors at least 10 meters above ground — were developed for regulatory dispersion modeling at fixed ambient monitoring stations, not for compact, multi-sensor EDS deployed among wellheads, tanks, and other production equipment.

Because the purpose of the EDS meteorological system — supporting leak detection and localization — differs materially from the purpose of the EPA Volume IV framework — regulatory ambient air quality modeling and NAAQS/NSR compliance determinations — we do not believe full EPA Volume IV adherence is a necessary or appropriate mandatory standard for this rule. Incorporating the handbook by reference as the default requirement, even with a site-specific carve-out, effectively asks nearly every operator to affirmatively justify non-compliance with a standard CARB’s own analysis indicates most facilities cannot meet. We think it is more workable, and more consistent with the actual purpose of this monitoring requirement, to treat the EPA guidance as an informative reference rather than an incorporated, mandatory standard.

Recommendation: We recommend CARB remove the mandatory, incorporated-by-reference status of the EPA Volume IV Handbook from proposed § 93504(i)(1), and instead base the siting and quality assurance requirement on manufacturer specifications and siting practices appropriate to the deployed EDS technology, with the EPA Volume IV Handbook retained only as optional, non-binding reference guidance. Suggested revised text:

“(1) Meteorological sensor quality, siting, and quality assurance should be based on the equipment manufacturer’s specifications and installation guidance for the deployed EDS. Operators may, where practicable, refer to the siting principles described in the U.S. EPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV: Meteorological Measurements (March 24, 2008) as additional guidance; adherence to that handbook is not required.”

VI. Comments on § 93504(j) — Automated Alerting Functionality

“(j) The EDS shall include automated alerting functionality.

(1) The EDS shall be programmed to automatically trigger the alarm system and generate and send a notification to the operator as soon as technically feasible, but no later than 15 minutes after the detection target identified in the approved LDRP exceeds an alert threshold determined pursuant to paragraph 93504(e) and identified in the approved LDRP.

(2) The EDS shall be programmed to send a notification to the operator in the event of a sensor or monitor failure.” (Proposed § 93504(j))

1. Confirm that “technically feasible” in the 15-minute notification standard accounts for data transmission constraints, consistent with § 93504(c)(2)(B) (§ 93504(j)(1)).

We recommend § 93504(j)(1) cross-reference the distinction we proposed in our comments on § 93504(c)(2)(B) between data collection and data transmission for purposes of downtime accounting. The same distinction is relevant here: where a sensor has on-board data storage and a transmission interruption delays delivery of a reading that would otherwise have triggered a notification, the 15-minute clock should run from when transmission is technically feasible, not from the time the underlying measurement was taken. We believe this is already implicit in the “as soon as technically

feasible” language, and recommend the text confirm it explicitly for internal consistency with § 93504(c)(2)(B).

Suggested revised text:

“(1) The EDS shall be programmed to automatically trigger the alarm system and generate and send a notification to the operator as soon as technically feasible, but no later than 15 minutes after the detection target identified in the approved LDRP exceeds an alert threshold determined pursuant to paragraph 93504(e) and identified in the approved LDRP. Where data reflecting an exceedance is delayed in transmission due to a loss of network connectivity consistent with paragraph 93504(c)(2)(B), the 15-minute period shall run from when transmission of that data is restored.”

2. Define “sensor or monitor failure” for notification purposes as a full day (twenty-four (24) hours) with no data, consistent with the downtime framework in § 93504(c) (§ 93504(j)(2)).

Section 93504(j)(2) requires a notification “in the event of a sensor or monitor failure” without defining what constitutes a failure for this purpose. Read literally, this could require a notification for even a brief, self-resolving data gap (e.g., a momentary connectivity interruption of the kind addressed in our § 93504(c)(2)(B) comment), which would generate notification volume disproportionate to the operational significance of the event and risks desensitizing operators to notifications that matter. We recommend CARB instead adopt a duration-based standard: a sensor or monitor that has produced no data for a full twenty-four (24) hours is treated as having failed for notification purposes. A defined, full-day threshold is straightforward for both operators and CARB to administer and verify against the EDS’s own data record, distinguishes routine, short-lived connectivity interruptions from a genuine equipment failure, and remains short enough to ensure operators are promptly alerted so repairs can begin well within the downtime and repair timelines discussed elsewhere in this subchapter.

VII. Comments on § 93504(m) — Confidentiality of Vendor-Specific LDRP Information

“(m) The operator shall submit the LDRP, including the following information with respect to the EDS, to CalGEM and the Executive Officer: ...

(7) A description of the EDS to be deployed including, but not limited to, the following information:

(A) Detailed lists and descriptions of EDS equipment and software specifications, including sensors and instruments used to measure the detection target and meteorological conditions. Descriptions shall include manufacturer and model information and any manufacturer specifications for the monitoring equipment, software, and data systems.

(B) A description of the EDS’s detection capabilities and thresholds, data resolution, detection and averaging times, spatial resolution, automatic alarming capabilities and timing, power source and backup systems, and known operational constraints that could cause the EDS to not operate continuously pursuant to paragraph 93504(c) of this subchapter (e.g., performance limitations under certain wind speeds, temperature ranges, precipitation, requirement for daylight operation, or specific maintenance intervals).

(C) A discussion of how the EDS is appropriate for the site-specific emission sources, meteorology, and facility layout. This discussion shall include relevant performance data and validation results, where validation results may include controlled release testing results or other field-based evaluations demonstrating that the system performs as expected under operating conditions representative of oil and gas production facilities.

(D) For EDS that track baseline concentrations of the detection target, the methodology used by the EDS to track baseline detection target concentrations pursuant to paragraph 93504(g).

(E) The number of monitors and/or sensors to be deployed and detailed descriptions of the expected installation locations including, but not limited to, the following information: 1. Latitude and longitude coordinates for all EDS equipment in decimal degrees to an accuracy and precision of five (5) decimals of a degree using the North American Datum of 1983. 2. A topographic map and plan of the production facility site that identify the expected locations of EDS equipment, including air quality and meteorological monitor or sensor locations and their distance from production equipment and operations. The topographic map must indicate any obstructions to air flow to the monitor(s) or sensor(s) and also show all roads and access ways within a half mile of the facility and any contiguous structures.

(8) A quality assurance project plan (QAPP) describing the necessary quality assurance, quality control, and other technical procedures that must be implemented to ensure proper performance of the EDS. At a minimum, these procedures shall include the following information:

(A) Installation procedures recommended by the equipment manufacturers including safety considerations.

(B) Protocol that will be used for acquiring, processing, and recording relevant concentration and meteorological data.

(C) Data system and operating protocol to be used for data collection and record management including, but not limited to, data logging, data processing, recording, downloading, backup and storage, and reporting.

(D) Routine maintenance requirements, including maintenance recommended by the equipment manufacturers.

(E) EDS calibration requirements including, but not limited to, the calibration procedures and calibration schedule for the detection systems and meteorology systems.

(F) Qualifications and training requirements recommended by the equipment manufacturers for personnel who will maintain, calibrate, and repair the EDS.

(G) Description of any specialized tools and supplies needed to maintain and calibrate EDS instrumentation.

(H) System Failure Plan that describes the measurements that would be taken in the event of a system failure or during routine maintenance activities and used until the EDS is restored to normal operating conditions.

(I) Quality assurance procedures, including: 1. Data quality indicators for the EDS, including the meteorological monitoring system. 2. When and what quality assurance checks are made to the data, including raw data, processed data, and output data. 3. Procedures for tracking data quality indicators and corrective actions for inclusion in annual reporting pursuant to subparagraph 93504(m)(8)(K). 4. Performance audit validation template for use in independent performance audits pursuant to paragraph 93504(n).

(J) Methods for compiling the EDS information reports specified by Public Resources Code section 3286(a) for submission to CalGEM.

(K) Methods for compiling the most recent calendar year of electronic historical data collected by the EDS for submission to CalGEM.

(L) Methods for retaining EDS data and records of EDS nonoperation or inactivation for 10 years pursuant to Public Resources Code sections 3283(f) and 3286 and paragraph 93504(c). The operator shall produce these retained records to any agency involved in the review of their LDRP upon request. ..."

(Proposed § 93504(m)(7)-(8))

1. Provide an optional pathway for confidential submittal of vendor-specific trade secret information included in the LDRP (§ 93504(m)(7) and (m)(8)).

The LDRP content requirements in § 93504(m)(7) and (m)(8) require disclosure of vendor-specific technical detail that may be commercially sensitive — including manufacturer specifications for “the monitoring equipment, software, and data systems” (§ 93504(m)(7)(A)), and manufacturer-recommended installation, maintenance, calibration, and training procedures (§ 93504(m)(8)(A), (D)–(F)). For EDS whose competitive value depends on proprietary methodology, this disclosure requirement raises a real concern: neither § 93504 nor the TSD includes any confidentiality or trade secret protection for LDRP content, and a document submitted to CalGEM and CARB is potentially subject to public disclosure absent a specific exemption. As drafted, an operator and its EDS vendor have no way to distinguish between LDRP content that is appropriate for public release and vendor-specific technical documentation that is not.

We recommend CARB provide operators — working with their EDS vendors — the option to designate specific vendor-provided technical documentation as confidential at the time of LDRP submission. This need not change what is disclosed to CalGEM and CARB for compliance review purposes; it would only address whether that specific content is subject to public release.

We thank CARB staff for the opportunity to comment on this discussion draft and would welcome the chance to discuss any of these points further before a formal rulemaking package is developed.

Sincerely,

Andrew Walsh
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References

California Air Resources Board, Monitoring and Laboratory Division. Evaluation of Potential Performance Standards for Continuous Emissions Monitoring Systems for Upstream Oil and Gas Production Sites in California. Draft, January 7, 2026.