John Borrego

The purpose of this letter is to provide comments on the Proposed Amendments to the Regulation on Methane Emissions from Municipal Solid Waste Landfills. We support and appreciate the overarching goals of the LMR. Our feedback targets what we believe will help move these goals forward as effectively as possible considering the intrinsic nuances and variability of landfill operations.

We at Yolo County Central Landfill appreciate the outreach and willingness to gather information from the experiences of those implementing the existing regulation by CARB staff.

COUNTY of YOLO
Department of Community Services
Division of Integrated Waste Management

Marissa Juhler
Division Director

44090 County Road 28H
Woodland, CA 95776
www.YoloCounty.gov
(530) 666-8852

November 10, 2025

Clerk's Office
California Air Resources Board
1001 I Street
Sacramento, California 95814

Subject: Comments on Proposed Amendments to the Regulation on Methane Emissions from Municipal Solid Waste Landfills,
Title 17 California Code of Regulations, Sections 95460 to 95476

Dear Members of the Air Resources Board:

The purpose of this letter is to provide comments on the Proposed Amendments to the Regulation on Methane Emissions from Municipal Solid Waste Landfills. We support and appreciate the overarching goals of the LMR. Our feedback targets what we believe will help move these goals forward as effectively as possible considering the intrinsic nuances and variability of landfill operations. There are two sections to this letter: (1) general comments to the LMR and LMR Goals, and (2) specific comments on CARBs proposed changes to the LMR regulations. In preparing this response, we reviewed the Staff Report: Initial Statement of Reasons, Appendix A – Proposed Regulation Order, Appendix B – Economic Analysis, and Appendix C – Analysis of Criteria Pollutant Emissions from Landfill Gas Control Devices.

General Comments on LMR and Goals

- While the County believes the proposed regulations will help provide needed accountability for landfill owners across the state, staff are equally concerned that the extra work involved to comply with some sections of the updated LMR will far exceed the limited and even questionable environmental benefit.
- The current proposed regulation updates would substantially increase the cost burden for landfills to comply with the LMR. The County believes this may have the unintended consequence of more illegal dumping in undeveloped and rural areas of the state.

- The County generally prefers this type of regulation to be goal and standard driven, rather than proscriptive requirement driven. Another County preference in regulation is a general ability for an alternative compliance program. While this does place additional burden on the regulatory agencies to review alternative requests, the site-specific nature of landfills warrants a general ability to propose a program that meets the goals of the regulation, while maybe not each of the proscriptive specifics.
- Timing for performing corrective action that involve substantial work/contractors. The general 120-day requirement is difficult for publicly owned landfills, as public works contracting requirements are difficult to meet with sufficient time to then do the work prior to the 120-day completion requirement. The County supports a 120-day requirement that starts from the date of the triggering exceedance.
- The County is generally in favor of the 120-day review timeline for alternatives, and other items that are not part of the 'standard' compliance (semi-continuous operation, etc.).

Comments on Specific Sections and Issues

The following section is organized with the text of the regulation section in Italics, and our comment or suggested changes below.

95464. Gas Collection and Control System Requirements.

(b) Gas Collection and Control System Requirements.

(3) Requirements for Gas Control Systems other than Flares. An owner or operator who operates a gas control device or system other than a flare shall satisfy one of the following requirements:

(A) Route the collected gas to an energy recovery device, or series of devices that meets the following requirements:

3) If an internal combustion engine or gas turbine is used as the gas control device, it shall be equipped with an oxygen sensor and a temperature sensor in the exhaust gas stream upstream of any add-on exhaust treatment equipment. The sensors shall record the oxygen content (in percent by volume) and temperature at least every 15 minutes and shall be installed, calibrated, maintained, and operated according to the manufacturers' specifications.

Comment:

For older gas control systems with internal combustion engines, this requirement may require an implementation schedule or flexibility by CARB. Installation of this monitoring equipment will require a substantial modification to the existing exhaust systems and addition of electronic recording equipment.

95464(b)(6) Cover Monitoring Plan: By <90 days after the effective date of the amendments – OAL to insert>, the MSW landfill owner or operator shall implement a plan to monitor cover integrity and implement any necessary cover repairs or maintenance monthly.

(A) The cover integrity monitoring plan shall include protocols and procedures to identify and address issues such as exposed waste, leachate breakouts, and erosion gullies.

(B) The cover shall conform with the requirements approved for the landfill by the California Department of Resources Recycling and Recovery (CalRecycle) pursuant to California Code of Regulations, Title 27, Division 2, Subdivision 1, Chapter 3, Subchapters 4 and 5.

Comment:
This section is redundant with existing regulation that landfills (open or closed) must already comply with. Regulations from the Regional Water Quality Control Board and CalRecycle have requirements for regular (weekly and monthly) monitoring of the landfill surface cover type/thickness, vegetative cover, erosion control, leachate seeps, and exposed waste.

95464. (e) Repairs and Temporary Shutdown of Gas Collection System Components: The requirements of sections 95464(b)(1)(A), 95464(b)(1)(B), and 95464(c), do not apply to individual landfill gas collection system components that must be temporarily shut down in order to repair the components, due to catastrophic events such as earthquakes, to connect new landfill gas collection system components to the existing system, to extinguish landfill fires, to perform construction activities, or to perform well raising provided the following requirements are met:

(1) Methane emissions are minimized during shutdown pursuant to section 95464(a)(1)(D). Potential mitigation measures may include, but are not limited to: using a synthetic membrane or spray-applied mortar; limiting the size of the construction or fill area; completing and capping work within a day; and use of vacuum box during drilling.

(2) Efforts to return the shut down component to operation are initiated and completed to minimize downtime, and the component is returned to operation no more than five calendar days following initial shutdown. In the event the component cannot be returned to operation within five calendar days following initial shutdown, the owner or operator shall submit a notification to the Executive Officer as specified in section 95470(b)(8) with the reason the component cannot be returned to operation within five calendar days, surface emissions monitoring records demonstrating the shutdown is not resulting in excess methane emissions, the estimated date of return to operation, and a description of the methane emissions minimization measures being used. This limitation does not apply to a well that is reconnected to vacuum at the end of each work day.

(3) No more than five wells or five percent of the total number of wells at the MSW landfill, whichever is greater, are offline at any one time, except in cases where wells are

being shut down to prevent or extinguish fire. Decommissioned wells do not count toward this limit or the total number of wells.
(4) For well raising, new fill is being added or compacted in the immediate vicinity around the well, all valves are closed to isolate the well, and once installed, a gas collection well extension is sealed or capped until the raised well is reconnected to a vacuum source.

Comment:
The notification requirement in (2) includes items that are unlikely to be available at the outset of a component operation that lasts longer than 5 days. It is unlikely that surface emissions monitoring will have been conducted in the shutdown area within 5 days of taking components offline. Generally, components are offline when there is filling or other construction that makes surface emissions monitoring more difficult also. We recommend changing this requirement to reporting the requested information in the Annual Report.

County staff's experience is that when a gas well is taken offline because it's within the active fill area, 5 days is an unrealistic timeline for reconnection. Staff believes an aggressive but achievable reconnection timeline would be between 14 and 21 calendar days from the date of disconnection. During the wet weather season, County staff recommends extending this to 5 weeks.

The number of wells offline being capped at 5% of the total, is very restrictive. In our operation this would be 7 or 8 wells. We often have 5 wells offline right around the active face area, if any other wells need to be offline (for other construction, expansion of LFG system) we could easily be over the 5% limit. We recommend either increasing the percentage able to be offline to 7% of total wells) or adding some flexibility for numbering wells on and offline.

95467. Semi-continuous Operation and Permanent Shutdown of the Gas Collection and Control System.

Comment:
This section is written as if only applicable to an entire landfill and the collection system. We recommend an addition to allow for closed areas of otherwise operating landfills to use the semi-continuous operation option. For example, we have some waste management units (WMUs) with final cover that are not contiguous to other WMUs. These should be allowed semi-continuous operation when they meet the criteria.

95468. Alternative Compliance Options.
We like this section, and the requirement for the Executive Officer to respond to a request within 120 days.

§ 95469. Monitoring Requirements.

(a) Surface Emissions Monitoring Requirements: Any owner or operator of a MSW landfill with a gas collection and control system shall conduct instantaneous and integrated surface monitoring of the landfill surface quarterly using the procedures specified in section 95471(c) or an alternative procedure (including potentially a different monitoring frequency) approved pursuant to section 95471(e). Unsafe-to-walk surface areas, as defined in section 95475(a)(40), that cannot be safely monitored using the procedures specified in section 95471(c) for an entire calendar quarter shall be monitored within the same quarter using the procedures specified in section 95471(d), unless those areas are monitored using an alternative surface emissions monitoring procedure approved pursuant to section 95471(e).

(1) Instantaneous Surface Monitoring: Any reading exceeding the limit specified in section 95465(a)(1) shall be recorded as an exceedance and the following actions shall be taken:

(A) The owner or operator shall record the date, location coordinates, and value of each exceedance, along with re-test dates and results.

(B) Corrective action shall be initiated by the owner or operator within three calendar days of a measured exceedance such as, but not limited to, cover maintenance or repair, or well vacuum adjustments and the location shall be re-monitored within 10 calendar days of the measured exceedance.

1. If the re-monitoring performed pursuant to section 95469(a)(1)(B) shows a second exceedance, additional corrective action shall be initiated within three calendar days after the second exceedance and the location shall be re-monitored again no later than 10 calendar days after the second exceedance.

a. If the re-monitoring shows that there is no longer an exceedance at the location, the location shall be re-monitored one month from the initial exceedance.

2. If the re-monitoring performed pursuant to section 95469(a)(1)(B) shows that there is no longer an exceedance at the location, the location shall be re-monitored one month from the initial exceedance.

a. If the one-month re-monitoring shows a second exceedance, additional corrective action shall be initiated within three calendar days after the second exceedance and the location shall be re-monitored again no later than 10 calendar days after the second exceedance.

3. If the re-monitoring shows a third exceedance, the owner or owner or operator shall notify the Executive Officer as specified in section 95470(b)(8) within 30 calendar days after detecting the third exceedance, and shall install a new or replacement well, unless an alternative remedy is approved pursuant to section 95469(a)(3), as determined to achieve compliance and as confirmed through re-monitoring no later than 120 calendar days after detecting the initial exceedance, or it is a violation of this subarticle.

(C) If all closed areas with final cover have no monitored exceedances of the limit specified in section 95465(a)(1) after four consecutive quarterly monitoring periods, the closed area with final cover may be monitored every three quarters (i.e., each monitoring event occurs three quarters after the previous monitoring event). Any exceedances of the limit specified in section 95465(a)(1) detected in the area being monitored every three quarters will result in a return to quarterly monitoring of the entire landfill surface.
(D) Any exceedances of the limit specified in section 95465(a)(1) detected during any compliance inspections will result in a return to quarterly monitoring of the landfill.

Comment:
The requirement in (B) to initiate corrective action within three calendar days should be changed to three working days, Monday through Friday. Depending on the time of day an exceedance is found on a Friday (example late afternoon), this would only allow for one business day (Monday) to initiate repairs and if there is a holiday then the three days might pass before staff to conduct corrective action or repairs are available.

For the requirement in (B)2. 'shall be re-monitored one month from the initial exceedance' is a bit confusing for application. If the 30 days falls on a weekend or weather conditions for wind and rain preclude surface emission monitoring, then meeting this requirement might be impossible. We recommend changing this 'between 30 days but no longer than 45 days from the initial exceedance.

The change in (B)3. of the 120-day new well requirement to "from initial exceedance", not "after 2nd failed re-monitoring" puts a substantial burden on publicly owned landfills. Conducting a public works solicitation for this sort of work takes most of the 120-day requirement, with required notices, contractor reviews, board approvals, and scope of work development. The County supports a 120-day requirement that starts from the date of the triggering exceedance.

In section C, there needs to be come clarification of 'entire landfill surface'. We have areas of final closure that are not contiguous with other areas of the landfill. The regulation should make clear that these types of areas should be treated individually as 'entire landfill surface' for the purposes of reduced monitoring and returns to regular monitoring after an exceedance.

95469(a)(2) Integrated Surface Monitoring: Any reading exceeding the limit specified in section 95465(a)(2) shall be recorded as an exceedance and the following actions shall be taken:
(A) The owner or operator shall record the average surface concentration measured as methane for each grid along with re-test dates and results.
(B) Corrective action shall be initiated by the owner or operator within three calendar days of a measured exceedance such as, but not limited to, cover maintenance or repair,

or well vacuum adjustments and the grid shall be re-monitored within 10 calendar days of the measured exceedance.

1. If the re-monitoring of the grid performed pursuant to section 95469(a)(2)(B) shows a second exceedance, additional corrective action shall be initiated within three calendar days after the second exceedance and the grid shall be re-monitored again no later than 10 calendar days after the second exceedance.

a. If the re-monitoring of the grid shows that there is no longer an exceedance, the grid shall be re-monitored one month from the initial exceedance.

2. If the re-monitoring of the grid performed pursuant to section 95469(a)(2)(B) shows that there is no longer an exceedance, the grid shall be re-monitored one month from the initial exceedance.

a. If the one-month re-monitoring of the grid shows a second exceedance, additional corrective action shall be initiated within three calendar days after the second exceedance and the grid shall be re-monitored again no later than 10 calendar days after the second exceedance.

3. If the re-monitoring shows a third exceedance, the owner or operator shall notify the Executive Officer as specified in section 95470(b)(8) within 30 calendar days after detecting the third exceedance, and shall install a new or replacement well, unless an alternative remedy is approved pursuant to section 95469(a)(3), as determined to achieve compliance and as confirmed through re-monitoring no later than 120 calendar days after detecting the initial exceedance, or it is a violation of this subarticle.

(C) If all closed areas with final cover have no monitored exceedances of the limit specified in section 95465(a)(2) after four consecutive quarterly monitoring periods, the closed area with final cover may be monitored every three quarters. Any exceedances of the limits specified in section 95465(a)(2) detected in the area being monitored every three quarters will result in a return to quarterly monitoring of the entire landfill surface.

(D) Any exceedances of the limits specified in section 95465(a)(2) detected during any compliance inspections will result in a return to quarterly monitoring of the landfill.

Comment:

The requirement in (B) to initiate corrective action within three calendar days should be changed to three working days, Monday through Friday. Depending on the time of day an exceedance is found on a Friday (example late afternoon), this would only allow for one business day (Monday) to initiate repairs and if there is a holiday then the three days might pass before staff to conduct corrective action or repairs are available.

For the requirement in (B)2. 'shall be re-monitored one month from the initial exceedance' is a bit confusing for application. If the 30 days falls on a weekend or weather conditions for wind and rain preclude surface emission monitoring, then meeting this requirement might be impossible. We recommend changing this 'between 30 days but no longer than 45 days from the initial exceedance.

The change in (B)3. of the 120-day new well requirement to "from initial exceedance", not "after 2nd failed re-monitoring" puts a substantial burden on publicly owned landfills. Conducting a public works solicitation for this sort of work takes most of the 120-day requirement, with required notices, contractor reviews, board approvals, and scope of work development. The County supports a 120-day requirement that starts from the date of the triggering exceedance.

In section C, there needs to be come clarification of 'entire landfill surface'. We have areas of final closure that are not contiguous with other areas of the landfill. The regulation should make clear that these types of areas should be treated individually as 'entire landfill surface' for the purposes of reduced monitoring and returns to regular monitoring after an exceedance.

95469 (a)(3) If an owner or operator that is obligated to install a new or replacement well by section 95469(a)(1)(B)3. or (2)(B)3. concludes that an alternative corrective action would be more effective, they may submit a request for an alternative corrective plan to the Executive Officer as specified in section 95470(b)(8) within 30 calendar days after the third exceedance.

(A) The request shall include a proposal for an alternative corrective plan, an explanation of why the alternative corrective plan would be more effective than a new or replacement well to repair the exceedance, a timeline for completing the plan that shall be no longer than 120 days after the initial exceedance, and the reason why that timeline is necessary to carry out the alternative corrective plan.

(B) The Executive Officer shall approve or disapprove within 30 calendar days of receiving the request based on whether the owner or operator demonstrates that the proposed alternative corrective plan will be more effective to repair the exceedance than a new or replacement well and the timeline proposed is no longer than necessary based on the actions in the plan and not longer than 120 days after the initial exceedance.

(C) If the Executive Officer approves, the owner or operator shall perform the actions outlined in their alternative corrective plan within their proposed timeline.

(D) If the Executive Officer disapproves, the owner or operator shall install a new or replacement well according to 95469(a)(1)(B)3. or (2)(B)3.

Comment:
In general, we like this flexibility for longer term corrective actions, rather than proscribing a 'new well' for all exceedance issues. We are concerned that the timelines for submission

and approval of alternatives may not leave enough time within the 120-day requirement from initial exceedance to complete remediation of exceedances.

95469(a)(4) Recurring Surface Exceedances: The owner or operator of a MSW landfill that experiences either five initial (i.e., not including re-monitoring) instantaneous exceedances or three initial integrated exceedances within a single grid over a rolling 12 month period, including exceedances detected during monitoring pursuant to section 95469(a)(1) and (2) and compliance inspections, shall do the following in the grid that exceeded the threshold and all adjacent grids (i.e., grids that share an edge or corner):

(A) Complete a collection system assessment as described in section 95471(j) and a cover integrity assessment as described in section 95471(k) within 30 calendar days after reaching the threshold in section 95469(a)(4) and correct any issues identified in the assessments that could be contributing factors to the surface exceedances within 60 calendar days after reaching the threshold.

(B) Increase the frequency of surface emissions monitoring performed pursuant to section 95469(a) to monthly. The first monthly monitoring shall occur within 30 calendar days of reaching the threshold in section 95469(a)(4). The frequency can be reverted to quarterly after six consecutive monthly monitoring periods show no exceedances in the area in which the monitoring frequency was increased.

Comment:
The requirement to include 'all adjacent grids' changes the area from 50,000 sf to review to 450,000 sf to review. We recommend changing this requirement to doing the assessments in (A) to the grid but not including the additional surface emissions monitoring in the adjacent grids.

In (B) decrease the monthly monitoring to 3 months with no exceedances. This seems like plenty of time to ensure that repairs/changes are holding, without creating excessive extra work.

95469(b) Remotely Detected Emission Plumes: When notified by the Executive Officer of a methane emission plume detection pursuant to section 95469(b)(1), any owner or operator shall perform the actions specified in sections 95469(b)(2)-(4).

(1) The Executive Officer may notify an owner or operator of a methane emission plume remotely detected at their facility through remote monitoring data.

(A) The remote monitoring data shall be generated by a remote monitoring technology approved by the Executive Officer if, in their best engineering judgment, the technology demonstrates a capability to detect methane emission plumes and meets all the following requirements:

1. Spatial resolution of 30 meters by 30 meters or better.

2. Data available to CARB within 72 hours of collection.

3. Produces a visualization of the emission plume.

(B) The Executive Officer will send the notification to the email address supplied pursuant to section 95470(b) within seven business days of CARB receiving the remote monitoring data. The notification shall contain all the following information:

1. A CARB-issued identification number.

2. An estimate of the latitude and longitude coordinates where the emission plume appears to be originating.

3. A visualization of the emission plume.

4. The date and time of the emission plume detection.

(2) If the facility is a controlled MSW landfill or a landfill gas control system, the following requirements apply:

(A) Within five calendar days of receiving a notification pursuant to section 95469(b)(1), the owner or operator shall perform surface emissions and component leak monitoring using the following methods:

1. The monitoring area shall be a square with dimensions 600 feet by 600 feet centered on the coordinates provided by CARB as the estimated plume origin, excluding the areas described as excluded in sections 95471(c)(1) and 95471(c)(1)(A) (for the latter, only during the period described therein).

2. The surface emissions monitoring shall follow the procedures in section 95471(c)(1)(B) and (c)(2), using a walking pattern with a 25-foot spacing interval, or an alternative surface emissions monitoring procedure approved pursuant to section 95471(e). Unsafe-to-walk surface areas can be monitored according to the procedures in section 95471(d).

3. The component leak monitoring shall be performed according to the requirements of section 95471(f) and include monitoring of all components in the monitoring area, regardless of whether the components are expected to be under positive or negative pressure.

(B) Upon discovering an exceedance of the instantaneous surface emissions limit specified in section 95465(a)(1), the owner or operator shall perform the actions specified in section 95469(a)(1)(B).

(C) Upon discovering a component leak, the owner or operator shall perform the actions specified in section 95469(c)(1) and (2).

(3) If the facility is an uncontrolled MSW landfill subject to section 95463(b)(2)(B), the following requirements apply:

(A) Within 30 calendar days after receiving a notification pursuant to section 95469(b)(1), the owner or operator shall perform instantaneous surface emissions monitoring according to the procedures in section 95471(c)(1) and (2) across the entire landfill surface.

(4) Within the timelines identified therein, the owner or operator shall report the information required pursuant to section 95470(b)(7).

Comment:
In section (2)(A) the requirement should be changed to investigate the plume source, which may include surface emissions monitoring, component monitoring, cover assessment or other activities. The required area of investigation required in (2)(A)(1) is very large. Based on results that we have received from these remote reports, the reports are not specific enough to warrant the prescriptive investigation identified here.

95469(d) Gas Control System Equipment Monitoring: The owner or operator shall monitor the gas control system using the following procedures:

(1) Record the composition of the gas collected in percent methane, carbon dioxide, and oxygen by volume at least monthly.

(2) Record the gas flow rate to each gas control device at least every 15 minutes using the equipment described in section 95464(b)(1)(D).

(A) If there is any 3-hour period of operation during which the total gas flow rate to all gas control devices changes by more than 20 percent over the average in the prior 12-month period (rolling), the cause shall be reported in the Annual Gas Collection and Control System Report.

(3) For enclosed flares, record the combustion temperature at least every 15 minutes using the equipment described in section 95464(b)(2)(A)2.

(A) Any 3-hour period of operation during which the average temperature difference was more than 28 degrees Celsius (or 50 degrees Fahrenheit) below the average combustion temperature during the most recent source test at which compliance with section 95464(b)(2) was determined is an exceedance of the combustion temperature parameter pursuant to section 95464(b)(2)(A)4. If the cumulative duration of exceedances is greater than 120 hours in a calendar year it is a violation of this subarticle.

(4) For internal combustion engines and gas turbines, record the oxygen content and temperature of the exhaust gas stream every 15 minutes using the equipment described in section 95464(b)(3)(A)3.

(A) If there is any 3-hour period of operation during which the average oxygen content or temperature in the exhaust stream was outside the range of the manufacturer's specifications for those parameters, it is a violation of this subarticle.

(5) For gas treatment systems that process the collected gas for subsequent use or sale, record the gas flow at standard conditions at least every 15 minutes and the methane content (in percent by volume) at least every 3 hours at all the measurement points and using the equipment specified in section 95464(b)(3)(B)1.

(6) For a gas control device other than an enclosed flare, demonstrate compliance by providing information describing the operation of the gas control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. Alternatives to this section shall be submitted as specified in section 95468. The Executive Officer may specify additional monitoring procedures.

Comment:
In Section (d)(2)(A), please note that 20 percent changes to gas control systems flow rate is a common occurrence. The County does not believe that this recordkeeping exercise would add any value to County efforts to manage the gas system effectively and recommends striking this section of text. The County would like to clarify that CARB intends that the 12-month rolling average would be based on monthly and not daily averages.

Additionally, the County landfill has heretofore been exempted from the requirement to install a Continuous Emissions Monitoring System. Adding this system will require a significant outlay of capital resources for the County.

95469(e) Wellhead Monitoring: The owner or operator shall monitor each individual wellhead monthly to determine the gauge pressure, temperature, flow rate, and gas composition in percent methane, carbon dioxide, and oxygen by volume of the landfill gas within the wellhead using the methods described in sections 95471(l)-(n).

(6) Recurring High Oxygen: If, within any 12-month period, there are three instances of oxygen content in landfill gas measured at or above five percent by volume in monthly monitoring at a particular well, the owner or operator shall conduct enhanced monitoring and downwell temperature monitoring within seven calendar days of the third oxygen content reading at or above five percent and conduct enhanced monitoring weekly thereafter. If four consecutive weekly carbon monoxide readings are under 100 ppmv, and temperature is under 131 degrees Fahrenheit, then enhanced monitoring and downwell temperature monitoring can be ceased. Enhanced monitoring shall be conducted according to the procedure in section 95471(o). Downwell temperature monitoring shall be performed every 10 vertical feet and can be monitored either with a removable thermometer or using temporary or permanent thermocouples installed in the well. This requirement does not apply to wells that collect gas in areas where waste has been in place for less than two years.

Comment:
Conducting enhanced monitoring on wells with recurring high oxygen measurements seems reasonable. Conducting downhole temperature monitoring seems excessive, if the well head temperature is not high. We recommend taking out the downhole temperature monitoring, unless required by the well head temperatures.

95469(e)(7) Wellhead Parameter Trend Analysis: The owner or operator shall examine monthly records for each well and take the following actions:

(A) If the temperature at a particular well increases by more than 20 degrees Fahrenheit (11 degrees Celsius) compared to the prior monthly measurement, begin enhanced monitoring and downwell temperature monitoring according to the same requirements as sections 95469(e)(3)(C)1. and 2. within seven calendar days.

(B) If the oxygen content at a particular well increases by more than two percentage points compared to the prior monthly measurement, perform a collection system assessment and cover integrity assessment in a 200-foot radius around the well according to sections 95471(j) and (k) within 30 calendar days.

(C) When the difference between the monthly parameter value and the average parameter value in the prior 12-month period (rolling) at a particular well is greater than the difference identified below, report the cause of the change in the Annual Gas Collection and Control System Report:

1. Gauge pressure changes (i.e., increases or decreases) by more than two inches of water at a well with a 12-month average vacuum of 10 inches of water or less, or by more than 20 percent at a well with a 12-month average vacuum of more than 10 inches of water.

2. Methane content changes by more than five percentage points at a well with a 12-month average methane content greater than 30 percent, or methane content changes by more than 10 percentage points at a well with a 12-month average methane content equal to or less than 30 percent.

3. The ratio of methane to carbon dioxide decreases by more than 10 percent or falls below 1.0.

4. Landfill gas flow rate changes by more than 30 percent.

Comment:

The entirety of Section (7)(C) is overly prescriptive and will create an enormous amount of needless recordkeeping. Rather than percentage changes of a set percent based on recent averages, the regulation should allow for trend evaluations that include what might be the normal fluctuation at an individual well due to other factors. In the County's over 30 years of landfill gas collection, County staff have observed the majority of the fluctuations at a wellhead, of the magnitude cited in this section, to be outside of normal operational control and often due to atmospheric conditions, longer term changes in gas generation, etc.

95469(f) Semiannual Well Liquid Level Monitoring: The owner or operator shall monitor the liquid level in each individual well twice per year, including one monitoring event between February and April and the other between September and November.

(1) If the liquid level exceeds 50 percent of the screened interval length, the owner or operator shall take corrective action to remove liquids or other obstructions, and re-monitoring shall demonstrate compliance within 120 calendar days. The frequency of liquid level monitoring at that well shall be increased to quarterly until four consecutive quarterly measurements do not exceed 50 percent of the screened interval length.

(A) If a well is determined to be pinched, broken, or otherwise compromised it shall be repaired, or a replacement well shall be installed.

(2) If the liquid level in a well exceeds 50 percent of the screened interval length for three consecutive monitoring events or 75 percent of the screened interval length for two consecutive monitoring events, the owner or operator shall install and operate a liquids pump within 120 calendar days of the third consecutive reading over 50 percent or the second consecutive reading over 75 percent.

Comment:
Section (f)(1) could be improved by allowing wells where water is not detected to move to an annual monitoring frequency if no liquid is detected, and to a longer frequency if water continues to not be detected. Section (f)(1)(A) should allow the operator to assess the gas system performance and select the most appropriate response in the case of a compromised well and not require repair or replacement as the only two alternatives. Section (f)(2) is redundant and more prescriptive than needed. If actions taken pursuant to Section 1 are not bringing the well into liquid level compliance within 120 days, Section (f)(2) doesn't really add anything that isn't already being done. Also, after the corrective action taken in Section (f)(1), the proper corrective action might be to abandon the well and put in another.

95469(g) Gas Collection System Pressure Monitoring: The owner or operator shall record the gas collection system gauge pressure on the vacuum (negative pressure) side of the blower at least every 15 minutes using the device described in section 95464(b)(1)(E).

(1) The owner or operator shall establish a gas collection system pressure setpoint. This setpoint can be changed as often as needed to respond to operational conditions. Each time the gas collection system pressure setpoint is changed, the owner or operator shall re-tune all wells within one calendar day of the system pressure change.

Comment:
This requirement is entirely impractical and unrealistic from a staffing standpoint. Please consider the proposed revision to the language below:

The owner or operator shall establish a gas collection system pressure setpoint. This setpoint can be changed as often as needed to respond to operational conditions. Each time the gas collection system pressure setpoint is changed <u>for a period of greater than 3 hours</u>, the owner or

operator shall re-tune all wells with flow rates greater than 5 SCFM within one calendar day of the system pressure change.

§ 95470. Recordkeeping and Reporting Requirements.
(b) Reporting Requirements.
(4) Quarterly Monitoring Data Report: Any owner or operator subject to the requirements of this subarticle, except section 95463(b), shall submit to the Executive Officer as described in section 95470(b)(8) the following monitoring data covering each calendar quarter within 15 calendar days of the end of each quarter (i.e., January 15, April 15, July 15, and October 15) in comma separated value (.csv) file format:
(A) Records of all surface emissions monitoring data as described in section 95470(a)(1)(D).
(B) Records of all component leak monitoring data as described in section 95470(a)(1)(F).
(C) Records of all wellhead monitoring data as described in section 95470(a)(1)(I).

Comment:
Fifteen days from the end of the quarter is a very tight schedule for reviewing the data and preparing the quarterly reporting. We suggest that it should be 30 days from the end of the quarter.

95470(b)(5) Scheduled Surface Emissions Monitoring Notification: Any owner or operator subject to the requirements of this subarticle shall report to the Executive Officer as specified in section 95470(b)(8) the scheduled date for each surface emissions monitoring event pursuant to section 95469(a) at least 15 calendar days prior to the event. This requirement does not apply to re-monitoring following the discovery of surface methane exceedances.

Comment:
Section (5) is entirely impractical. Surface emissions monitoring is conducted when wind and precipitation requirements are met. A 15-day notice will almost always have no relation to the conditions needed for monitoring and will not result in any improvement to the monitoring event or the landfill's compliance.

95470(b)(8) All reports, notifications, and requests to the Executive Officer shall be submitted electronically through the Landfill Methane Regulation reporting webpage at https://ww2.arb.ca.gov/our-work/programs/landfill-methane-regulation/reporting.

Comment:
The current web page for reporting is an email address to send notifications and reports to. Will CARB be developing a portal to help with required online report submissions similar to the State Water Resource Control Boards (SWRCB) GEOTRACKER? Otherwise, our fear is the required notifications reporting will be lost in an email box and ARB staff will not have sufficient time to review/respond/approve as needed.

§ 95471. Test Methods and Procedures.
(c) Surface Emissions Monitoring Procedures: The owner or operator shall measure the landfill surface concentration of methane using a hydrocarbon detector meeting the requirements of section 95471(a). The landfill surface shall be inspected using the following procedures:
(1) Monitoring Area: The entire landfill surface shall be divided into individually identified 50,000 square foot grids. The grids shall be used for both instantaneous and integrated surface emissions monitoring. The landfill surface areas with cover penetrations, distressed vegetation, cracks or seeps (including areas located away from the regularly spaced walking pattern) shall be inspected visually and with a hydrocarbon detector. Paved areas that do not have any cracks, potholes, or other penetrations can be excluded from monitoring, and the landfill surface does not include areas of undisturbed native soil where no waste has been disposed.
(A) The working face of the landfill can be excluded from the monitoring area for the first 180 calendar days after initial waste placement at that location where and so long as active filling and compacting operations are ongoing.
(B) Testing shall be performed by holding the hydrocarbon detector's probe within 3 inches of the landfill surface while traversing the grid.
(C) The walking pattern shall be no more than a 25-foot spacing interval and shall traverse each monitoring grid.
1. If all closed areas with final cover have no exceedances of the limits specified in section 95465 after any four consecutive quarterly monitoring periods, the walking pattern spacing may be increased to 100-foot intervals. in the closed area with final cover. The walking paths shall be offset by 25 feet each monitoring period such that after four monitoring periods the entire surface has been monitored every 25 feet. The walking pattern shall return to a 25-foot spacing interval across the entire landfill surface upon detecting any exceedances of the limits specified in section 95465 in the areas being monitored with a 100-foot spacing interval, whether detected by the owner or operator or during a compliance inspection.
(D) Surface testing shall be terminated when the average wind speed exceeds five miles per hour or the instantaneous wind speed exceeds 10 miles per hour. The Executive Officer may approve alternatives to this wind speed surface testing termination for MSW landfills consistently having measured winds in excess of these specified limits. Average

wind speed shall be determined on a 15-minute average using an on-site anemometer with a continuous recorder for the entire duration of the monitoring event.

(E) Surface emissions testing shall be conducted only when there has been no measurable precipitation in the preceding 72 hours.

Comment:
Section 95471(c)(1)(A) conflicts in part with Section 95469(a) on surface emissions monitoring. The allowance for 180 days prior to monitoring active fill areas, seems specifically not allowed in Section 95469(a).

In Section C, for grids that are not in final cover but have had a minimum of four consecutive quarters without active landfilling and been without an exceedance at the 25ft spacing, reduced monitoring of spacing to 100 ft at quarterly intervals should be allowed.

95471(c)(2) Instantaneous Surface Emissions Monitoring Procedures.

(A) All surface concentration readings, associated location coordinates, and associated date and time shall be electronically recorded at a frequency of at least one hertz (i.e., one measurement every second).

(B) Upon detecting an exceedance of the concentration limit specified in section 95465(a)(1), the area around the point of detection shall be inspected in all directions with a hydrocarbon detector to establish the entire contiguous area exceeding the concentration limit.

(C) Surface areas of the MSW landfill that exceed the methane concentration limit specified in section 95465(a)(1) shall be recorded, marked, and remediated pursuant to section 95469(a)(1).

(D) The wind speed and barometric pressure shall be recorded during the sampling period.

Comment:
In Section A the new requirement for 1 hz measurement frequency seems excessive. We have been doing 4 seconds (1/4 hz) since the beginning of the surface emissions monitoring program, and this process generates about 150 readings per 50,000 sf grid or one recorded reading every 300 to 350 sf. We recommend removing the frequency of data collection requirement.

95471(d) Surface Emissions Screening Procedures for Unsafe-to-Walk Surface Areas: In areas where the unsafe-to-walk surface emissions monitoring procedures are used pursuant to the allowance described in section 95469(a), the owner or operator shall perform surface emissions monitoring according to the following requirements:

(1) Screening may be performed using any type of sensor and platform that meets the requirements in section 95471(d)(2) while being used to detect and locate methane emissions in the inaccessible area. Examples include but are not limited to:

(A) A handheld instrument that measures methane column concentration between the user and a point on the landfill surface where the instrument is aimed.

(B) A drone-mounted instrument that measures methane column concentration in a downward-facing orientation.

(C) A rover-mounted instrument that measures methane volumetric concentration near ground-level.

(2) Instrument Requirements: The instrument shall satisfy the following requirements:

(A) Type of Measurement: The instrument shall measure either methane volumetric concentration or path-integrated methane column concentration.

(B) Response Time: The system response time, defined as the time interval from a step change in methane concentration at the input of the sampling system to the time at which 90 percent of the corresponding final value is reached as displayed on the instrument readout, shall be equal to or less than 30 seconds.

(C) Location and Sampling Rate: The instrument shall have the capability to record the latitude and longitude of the points where measurements are taken with an accuracy of no worse than ±2 meters, date, time, and methane concentration at a frequency of least one hertz.

(D) An instrument measuring volumetric concentration shall be capable of measuring methane in the range from zero to above 500 ppmv. An instrument measuring path-integrated column concentration (in the unit of parts-per-million-meter, or ppm-m) shall be capable of measuring methane in the range from zero to above 500 ppm-m.

(E) An instrument measuring volumetric concentration (ppmv), shall have a scale readable to ±2.5 percent of the increased meter reading level of 200 ppmv methane. An instrument measuring methane column concentrations (in the unit of ppm-m) shall have a scale readable to ±2.5 percent of the increased meter reading level of 50 ppm-m methane.

(3) Calibration Requirements: Calibrate the instrument in accordance with the manufacturer's recommendations. The instrument shall be calibrated prior to operation on each day of use. The calibration precision shall be equal to or less than 10.0% of the calibration gas value.

(4) Screening Procedure: The survey shall be conducted by a technician who has completed training or has the proper accreditation required by the instrument manufacturer. The technician shall operate the instrument in accordance with the manufacturer's recommendations (including any manufacturer-recommended maximum distance between the equipment and the point being measured) and use the following procedure:

(A) Design a monitoring pathway such that the technician can measure the entire unsafe-to-walk area from nearby accessible areas.

(B) Measure the landfill surface along a pathway with a coverage density having no more than 25-foot spacing interval. The measurement points along the pathway shall be equal to or less than 5 feet apart.

(C) Measure all surface areas with cover penetrations, distressed vegetation, cracks, or seeps.

(D) If measuring volumetric concentration, the point where the sample is taken (e.g., probe tip, nozzle, etc.) shall be held within 3 inches of the landfill surface. If measuring column concentration, the measurement width or pixel size shall be no larger than 3 meters in any dimension.

(E) Surface testing shall be terminated when the average wind speed exceeds five miles per hour or the instantaneous wind speed exceeds 10 miles per hour. The Executive Officer may approve alternatives to this wind speed surface testing termination for MSW landfills consistently having measured winds in excess of these specified limits. Average wind speed shall be determined on a 15-minute average using an on-site anemometer with a continuous recorder for the entire duration of the monitoring event.

(F) Surface emissions testing shall be conducted only when there has been no measurable precipitation in the preceding 72 hours.

(5) Upon detecting a location with a volumetric concentration measurement 200 ppmv or greater, or a column concentration 50 ppm-m or greater, monitor the location with a hydrocarbon detector meeting the requirements of 95471(a) within five calendar days.

(A) If personnel with specialized knowledge, experience, or equipment are needed to access the location and they are not available within the required timeline, monitoring shall occur within 10 calendar days and records shall be kept and included in the Annual Gas Collection and Control System Report as specified in section 9540(a)(1)(H).

(6) Upon detecting an exceedance of the standard in section 95465(a)(1) through the monitoring pursuant to section 95471(d)(5), perform the actions specified in section 95469(a)(1).

Comment:
This entire section is very proscriptive and doesn't allow for minor modifications to the procedure to meet the goal of surface emissions monitoring of the 'unsafe' areas.

95471(j) Collection System Assessment: Wellhead monitoring data from the previous 12 months shall be analyzed and the gas collection system shall be physically investigated. The analysis shall identify any unusual changes (outside the range of each well's typical historical month-to-month variation) in gas flow rate, gas composition, and gauge pressure and determine

the reasons for any changes. The investigation shall include checking for cracked, damaged, broken, pinched, plugged, watered-in, or otherwise impaired collection system components and wellbore seals. If a collection system component is determined to be pinched, broken, or otherwise compromised it shall be repaired or a replacement well shall be installed.

Comment:
CARB should provide quantitative definitions of "unusual changes" (e.g., >20% month-to-month deviation) to ensure consistent implementation across sites and avoid subjective enforcement.

95471(k) Cover Integrity Assessment: The surface cover and all cover penetrations shall be closely investigated for signs of cover integrity deficiencies. Deficiencies include thickness, grain size, and other specifications that do not meet requirements set forth in California Code of Regulations, Title 27, Division 2, Subdivision 1, Chapter 3, Subchapters 4 and 5 (July 18, 2025), which are incorporated by reference herein (for daily, intermediate, and final covers, as applicable); visible cracks, signs of erosion including channels or rills; animal burrows; penetrations that lack seals or have cracked or broken seals; and for engineered or synthetic covers, deficiencies include punctures, tears, or seam failures. The cover integrity assessment shall include at least measuring the thickness of cover, grain size of all materials comprising the cover, and for soil covers, classifying the material using ASTM D2487-17 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) (February 1, 2025), which is incorporated by reference herein.

(1) Deficiencies are considered corrected if one or more of the following actions are taken, as indicated by the finding of the cover integrity assessment, within the timeline specified by the section that required the assessment:

(A) If material is added and compacted to achieve double the required minimum thickness and eliminate cracks, repair and prevent erosion, or other action taken to prevent disturbance by animals, or if well boot seals are installed or replaced around all cover penetrations.

(B) For daily cover, if alternative daily cover is replaced with a soil daily cover, or if daily cover is replaced with intermediate cover.

(C) For intermediate cover, if material is added and compacted to achieve a fines content (passing a 0.075-millimeter sieve) greater than 30 percent by weight with a maximum particle size of three inches or less, achieve permeability of 1×10-5 centimeters per second, and achieve a minimum of 24 inches thickness; or if intermediate cover is replaced with final cover.

(D) For final cover, if organic amendments such as compost or biochar are incorporated into the top (vegetative) layer of soil and soil moisture is maintained above 10 percent by volume measured 10 centimeters below the surface; or erosion control blankets, vegetation, or geosynthetic materials are added to areas prone to erosion.

Comment:
This is redundant with the cover monitoring and repairs landfills are required to do by the RWQCB, and CalEPA. In addition, portions of this are quite prescriptive and may not always be the best practice to control the portions of the landfill surface.

95471(o) Enhanced Wellhead Monitoring Procedure: Enhanced wellhead monitoring shall be performed according to the following:

(4) Monitor and determine carbon monoxide concentrations, as follows:

(A) Collect the sample from the wellhead sampling port in a passivated canister or multi-layer foil gas sampling bag (such as the Cali-5-Bond Bag) and analyze that sample using U.S. EPA Method 10 (40 CFR Part 60, Appendix A-4, May 30, 2023, which is incorporated by reference herein), or an equivalent method with a detection limit of at least 100 ppmv of carbon monoxide in high concentrations of methane; or

(B) Collect and analyze the sample from the wellhead using U.S. EPA Method 10 (40 CFR Part 60, Appendix A-4, May 30, 2023) to measure carbon monoxide concentrations.

(C) When sampling directly from the wellhead, you shall sample for 5 minutes plus twice the response time of the analyzer. These values shall be recorded. The five 1-minute averages are then averaged to give you the carbon monoxide reading at the wellhead.

(D) When collecting samples in a passivated canister or multi-layer foil sampling bag, you shall sample for the period of time needed to assure that enough sample is collected to provide five (5) consecutive, 1-minute samples during the analysis of the canister or bag contents, but no less than 5 minutes plus twice the response time of the analyzer. The five (5) consecutive, 1-minute averages are then averaged together to give you a carbon monoxide value from the wellhead.

Comment:
The use of EPA Method 10 for carbon monoxide (CO) for well head monitoring is more detailed than needed and will not provide results in a timely manner compared to the direct reading methods used for the other parameters. A direct reading method for CO such as the alternative developed to comply with EPA Part 63, Subpart AAAA would provide faster results, with the same quality as the other wellhead readings required in this section. We recommend directly referencing the alternative method in the regulation, not requiring operators to apply for an alternative.

Appendix B – Economic Analysis
Comment:
The Economic Analysis significantly underpredicts the increased costs to landfills to comply with this regulation.

Appendix C – Analysis of Criteria Pollutant Emissions from Landfill Gas Control Devices
Comment:
Table C-2 is an estimate of the potential increase in methane collection and emissions of Nox, CO, PM, and SO2. The footnote to the table indicates that air districts without any additional estimated gas capture are not listed in the table. The evaluation that generated the table did not find an increase in collection in the Yolo Solano Air Quality Management District. This indicates that staff do not anticipate that the proposed regulation will generate additional landfill gas capture at YCCL. Considering this evaluation, we would like the regulation to allow for relaxed monitoring, relaxed data collection on control devices, and relaxed reporting requirements for landfills in Air Districts that are not anticipated to have substantial additional landfill gas collection from this regulation.

We at Yolo County Central Landfill appreciate the outreach and willingness to gather information from the experiences of those implementing the existing regulation by CARB staff. If you have follow up questions or would like clarification, please contact us via phone or email below.

Sincerely,

John C. Borrego P.G.
Associate Hydrogeologist,
Division of Integrated Waste Management
Community Services Department
County of Yolo
jborrego@yolocounty.gov
(530) 666-8854

Marissa Juhler
Director,
Division of Integrated Waste Management
Community Services Department
County of Yolo
mjuhler@yolocounty.gov
(530) 666-8813

cc: Anthy Alexiades, Short-Lived Climate Pollutant Policy Manager, California Air Resources Board