SWANA
SOLID WASTE ASSOCIATION OF NORTH AMERICA

Legislative Task Force
CALIFORNIA CHAPTERS

June 19, 2023

The California Air Resources Board
925 L Street, Suite 805
Sacramento, CA 95814

Summited Electronically

RE: Landfill Methane Regulation – Comments on May 18, 2023, workshop concepts

To Whom it May Concern:

On behalf of the California Chapters of the Solid Waste Association of North America's (SWANA) Legislative Task Force (LTF), we appreciate the opportunity to comment on the Public Workshop on Potential Improvements to the Landfill Methane Regulations (LMR) held on May 18.

SWANA is the world's largest association of solid waste (more than 10,000 members). SWANA's three California chapters represent nearly 1,100 of those members. SWANA represents the solid waste industry, including many of the local governments responsible for implementing waste diversion and recycling programs. The LTF is responsible for representing the California Chapters on legislative and regulatory issues and advocates for environmentally- and economically-sound management of municipal solid waste.

The solid waste industry worked closely with CARB in the development of the LMR and have been complying with this rule since 2010, and as such have valuable insight and expertise that would be critical for CARB as they consider potential revisions to the LMR. Now that CARB has presented its concepts at the May 18 workshop, we strongly recommend that moving forward, CARB invite industry to be part of a technical advisory group (similar to the one for the original rulemaking) for any subsequent rulemaking.

We agree that some elements of the LMR could be improved, but also believe that some of the proposed concepts will not significantly reduce methane emissions, as landfills are largely complying with the regulation and, as acknowledged by CARB, demonstrating the vast majority of landfill surface readings are below 200 ppm and even more so for the 500 ppm standard. More valuable changes can be made by supporting implementation of SB 1383 which would help achieve real, long-term methane reductions at landfills.

We respectfully offer the following comments on the concepts discussed at the May 18 workshop as listed below and in the Attachment 1.

<u>Surface Emissions Monitoring</u>

- Do not change the 500 ppm standard to 200. Data shows the vast majority of readings are below 200 ppm.
- Provide an analysis of the integrated monitoring data – it is likely to show overwhelming compliance, an indication of high landfill gas collection efficiency.

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- Do not change the spacing. This would require too much additional labor and expense; integrated monitoring will help fill in gaps.
- Support hybrid remote sensing to help detect additional problem areas.
- Data does not support reducing existing timeframes for remediation. This would require too much additional labor cost for little return on mitigation.
- The existing timeframes for installing a new collector for mitigation efforts are sufficient given that most exceedances are due to cover problems. Explore more streamlined financing options and allow installing gas collectors as a first mitigation solution.

Improved Cover Characteristics

- The current cover standards work for most landfills according to their own data.
- Recommend having more dialogs with landfill operators and consider existing data.
- Consider a more equitable approach of case-by-case cover requirements for problematic landfills rather than a one-size-fits all requirement that would be unnecessarily burdensome for compliant landfills.
- Consider a practical approach of working with local air districts to pinpoint problematic landfills and develop targeted mitigation(s).
- Focus efforts on the long-term solutions through SB 1383 implementation.

Remote Sensing

- Consider a hybrid approach that utilizes remote sensing technology as a screening tool.
- Investigate the ability of each type of remote sensing technology to meet the requirements of EPA Method 21.
- Work with operators to establish voluntary mitigation if remote sensing flyovers or satellites detect methane plumes.
- Support limited mandatory remote sensing only for problematic larger landfills.

SB 1383 as the Ultimate Methane Reduction Strategy

- Diverting organics from landfills has been identified by CARB as the most effective and cost-efficient long-term solution for reducing methane emissions from landfills.
- The landfill industry and wastewater sector have been attempting for years to work with regulators and legislators to address a host of issues and needs, such as increased funding for infrastructure, permit and regulatory streamlining, and programs for utilizing biomethane.
- These challenges have stalled efforts to meet the SB 1383 organic diversion mandates.
- The Little Hoover Commission in their recent report entitled “Reducing California’s Landfill Methane Emissions: SB 1383 Implementation – June 8, 2023” has urged the State to provide funding, improve coordination among State agencies and better share the responsibility for SB 1383 implementation, and expand market opportunities for recycled organic waste, including biomethane.

In conclusion, we believe that the LMR can be improved to further methane emissions reductions with the most effective change in the voluntary use of remote technologies. However, we recommend CARB's efforts focus primarily on work with other regulatory partners and industry/municipalities to support the implementation of SB 1383. We urge CARB to reach out to associations that have been at the forefront of promoting these issues to fully understand the efforts that will be needed. The LTF will gladly work with CARB staff on identifying these groups.

Thank you for the opportunity to provide the comments above and below.

Sincerely,

Christina Hanson
Chair
SWANA California Chapters Legislative Task Force

ATTACHMENT 1
DETAILED COMMENTS

General Comments

While we believe that there are areas of the LMR that can be improved leading to additional reductions in methane emissions, as further described below, we question the overall effectiveness this approach will have in helping CARB to achieve its Short-Lived Climate Pollutant methane reduction goals. As a review, during the development of the LMR, as reported at a December 18, 2008 Workshop, it was determined that landfills represented about 1% of the statewide GHG emissions and implementing the LMR was originally estimated to reduce those emission by 0.8 $MTCO_2E$, by 2020, but later revised to 1.5 $MTCO_2E$. Also, at a November 19, 2009, CARB Workshop on the AB32 Climate Change Scoping Plan Implementation Update, it was reported that all nine of the AB 32 Discrete Early Actions (including the LMR) had been approved along with other regulations that would provide approximately 70 $MTCO_2E$ reductions in 2020. Finally, in a December 16, 2016, Workshop on the Revised Proposed Short-Lived Climate Pollutant Reduction Strategy, it was reported that to achieve the 40% methane reduction target, from 2013 levels, 71 $MTCO_2E$ reduction was needed by 2030.

This review leads to two important points regarding the CARB Short-Lived Climate Pollutant Reduction Strategy. First, based upon CARB's assumptions, the projected methane reductions from implementing the LMR were estimated to be about 2.1% of the total reductions needed (assuming the overall needed reduction was 71 $MTCO_2E$) to achieve the methane reduction goals. Despite the small contribution of methane reduction that would be achieved by this program, implementation of the LMR successfully brought about 94% of the landfill gas generated in California under vacuum through a regulation that was now comparable to the SCAQMD Rule 1150.1, one of the most stringent landfill regulations in the world. Furthermore, implementing the more stringent landfill regulation statewide also provided greater reduction in toxics and VOC emissions, especially important considering that these pollutants have a local impact, unlike methane emissions, which are global pollutants. Given the magnitude of the LMR in regulating landfill emissions to such a high standard, it is clear the target methane emission reductions have been achieved. In the December 16. 2016 Workshop, it was emphasized that the primary focus for methane reductions at landfills in contributing to the Proposed Short-Lived Climate Pollutant Reduction Strategy had to be on the implementation of SB 1383 and support of Renewable Natural Gas, not improvements to the LMR; perhaps a silent acknowledgement that the LMR goals had been met.

As we have stated, we believe that improvements can be made to LMR, but question CARB's estimates on the impact of these improvements. Slide 5 of CARB's May 13, 2023 Workshop presentation seems to indicate that improved control measures will reduce methane emission in 2030 by almost 0.8 to 1.0 $MTCO_2E$ (reading off the graph). We strongly question how realistic this assumption is, especially as indicated above, implementation of the entire LMR was estimated to reduce methane emissions by about 1.5 $MTCO_2E$. This seems very unlikely; we would like to review this data and the reasonings used.

The second point relates back to the implementation of SB 1383. As indicated in the December 16, 2016, Workshop reducing organics disposed of in landfills is the ultimate long-term solution to reducing methane emissions from landfills. However, in a draft Little Hoover Commission Report (released June 2023) it was found that the organic diversion deadline of 50% diversion by 2020 was not met and the deadline for 75% diversion by 2025 is unlikely to be met. The Commission's recommendation, which is non-binding, is a pause in the regulation, but more importantly indicates the level of work and funding that will be needed to make SB 1383 work. Given

that diversion of organics from landfill is the ultimate solution to reducing methane emissions reductions from landfills, most of CARB's efforts should be directed to this goal.

Surface Emissions Monitoring

During the development of the LMR CARB had originally proposed reducing the instantaneous surface limit standard from 500 to 200 ppm. Industry proposed leaving the standard at 500 ppm but adding an integrated standard similar to the SCAQMD Rule 1150.1 standard of 50 ppm. CARB agreed but lowered the 50 ppm to 25 ppm. It was also agreed landfills would report readings between 200 and 500 ppm for CARB to evaluate for potential future rulemaking.

In the early development of SCAQMD Rule 1150.1 (late 1980s), studies had shown the importance of the two types of monitoring, instantaneous and integrated monitoring in achieving effective control of landfill gas emissions. Instantaneous monitoring provides a check on cover integrity. Typically, an exceedance of the 500 ppm standard is an indication of cracks in the cover that can lead to excess emissions at that point. These "leaks" are localized and generally do not impact the overall collection efficiency of the landfill despite the fact that if large enough, they can be detected by remote sensing. Integrated monitoring is an average measurement over a designated area and provides an indication of the overall health of gas collection in that area. Exceedances of the 25 ppm standard typically point to problems with the gas collection system in that area.

With that background, there are two important points from Slide 12 of CARB's May 13, 2023, Workshop presentation. First, the vast majority of emission readings during routine monitoring are below 200 ppm and even more so for the 500 ppm standard. Any measured exceedances, which are mostly from cracks in the cover, are mitigated within the allowable time frames; mostly by recompacting the cover. This data is a strong indication of the effectiveness of the program, and the LTF does not believe changing the 500 ppm standard is warranted. Finally, lowering the standard would lead to landfill operators increasing vacuum on the collection system which can lead to internal landfill fires if areas become aerobic.

A second point, there was no analysis performed of the integrated monitoring programs. If the data also indicated that the vast majority of the readings during routine monitoring were below the 25 ppm limit, which we suspect would be a strong indication that the landfills are operating at high landfill gas collection efficiencies.

CARB has questioned the spacing of landfill surface monitoring routes and whether the current standard misses potential leaks. One of the benefits of the integrated monitoring efforts is if leaks are more widespread, integrated monitoring would likely aid in detecting these problems.

Landfill gas technicians often will stop their walking pattern or mark an area for further investigation if a greater number of problems are suspected. Further training of the monitoring staff in these efforts can help in detecting problem areas. Adding a voluntary hybrid monitoring program (methane equipped drones followed up by surface monitoring) can also aid in this effort. Simply changing the spacing to less than 25-feet will not likely help in leak detection, but also cause an unreasonable increase in monitoring efforts, especially for larger landfills. Currently, satisfying the LMR monitoring requirements requires walking, sometimes hundreds of acres of landfill surface. California landfills are typically not flat but very tall, so walking routes in many cases are largely on slopes dealing with vegetation and other obstacles. In addition, other restrictions, such as ceasing monitoring at higher wind speed or during and after rain events, further restrict when technicians can conduct monitoring. The wind restrictions alone often restrict monitoring to morning hours only when winds are calmer and heavy periods of

rain require a technician staff to “catch up” when the weather improves. Therefore, placing a greater burden on monitoring staff by arbitrarily increasing monitoring density is not practical.

Finally, CARB questions whether existing time frames for mitigating exceedances or adding new gas collection wells should be shortened. The time frames contained in the LMR have been developed and tested over decades as allowing a balance between landfill resources and methane emissions mitigation. As shown in Slide 12 of CARB’s May 13, 2023, Workshop presentation, the 500 ppm exceedances are mostly remediated by the first re-monitoring event. The crews that work to repair cover issues face the same obstacles as the landfill monitoring technicians, as previously described; working on slopes, bringing in heavy equipment when shovels are not enough, transporting new soil to the area, etc. It is not practical to require more crew staffing when the vast majority of monitoring readings are well below the standards. With regard to the time frames for adding new collectors as mitigation for surface standard exceedances, several points need to be made. Adding a new gas collector to solve a surface standard exceedance is not the typical solution for mitigation; re-working the soil cover is the most effective mitigation in most cases. So, the landfill staff needs time to re-monitor areas (while keeping up with the routine monitoring) and then work with landfill crews to re-work the cover. This all simply takes time. When the only solution becomes adding a gas collector, smaller municipal landfills often face budget issues and other practical problems associated with mobilizing a contractor, so shortening the time period is not a real solution. One area that can be explored, which has been used by some larger landfill operators is having “on-call” contracts for well installation that can be mobilized quickly. This is a potential way to short-cut the problems faced by municipalities in developing contracts. While the need to add a collector for mitigation is not typical, there are situations where landfill operators quickly recognize a new collector will be the ultimate solution. The exiting time frames may lock out the ability for an operator to first jump to this solution. The SCAQMD has often been flexible in dealing with these situations. The LMR should be more flexible in its time frames to allow a collector to be installed first in-lieu of the standard re-monitoring efforts.

Changing Daily and Intermediate Cover Standards

Changing cover standards is a very complicated issue and needs to be evaluated very carefully considering cost effectiveness (additional cost to landfill operators per additional mass of methane reduction). At this time, the LTF will not provide specific recommendations on what path to take on this but encourage more dialog with landfill operators and consideration of existing data. Some points to consider include:

- Remote monitoring efforts by CARB and JPL examined 436 landfills with only 30 landfills showing methane plumes. Clearly, 406 landfills, using existing cover standards had non-detectable area-wide emissions. Would it be equitable to develop more costly cover standards for these landfills that are operating effectively?

- In the Short-Lived Climate Pollutant Reduction Strategy, the LMR methane reductions were projected to be only 2.1% of the needed overall reductions to achieve the Strategy’s methane reduction goals. Would it be cost effective to, in many cases, significantly increase landfill operating cost, to achieve reductions in only a limited amount of landfills; 30 out of 436 landfills? As discussed, should efforts be directed to the long-term solution for reducing methane emissions at landfills; SB 1383.

- Would a more practical approach be working with the local air districts to pinpoint problematic landfills with targeted requirements for additional mitigation? This could include examining operating practices, such as cover extent and density and/or inclusion of remote monitoring.

Remote Sensing

Remote sensing has the potential to aid landfill operators more completely detect surface methane leaks leading to more effective mitigation efforts. The LTF recommends CARB consider hybrid approaches that utilize methane remote sensing technology as a screening tool to identify elevated methane emissions followed by surface monitoring to pinpoint the causes of the elevated emissions. CARB should also work with operators to establish voluntary mitigation if remote sensing, such as flyovers or satellites detect methane plumes. In addition, CARB should investigate the ability of each type of remote sensing technology to meet the equivalent instrument requirements of *Calibration, Specifications, and Performance criteria for EPA Reference Method 21*, as required in Section 95471 (a) of Title 17 of the California Code of Regulations.

As discussed above with potential amendments to cover regulations, CARB should consider focusing on problematic landfills in taking advantage of remote sensing technologies. If CARB determines that revisions to existing regulations are appropriate to incorporate the use of methane remote sensing technologies, CARB, working with the local air districts may require the use of remote sensing technologies for landfill operators with landfill gas generation in excess of two million standard cubic feet of gas annually, and that have been in continuing non-compliance for more than two compliance periods with methane emissions requirements of their permit and have not addressed the cause of the non-compliance in a timely manner, in accordance with all of the following conditions:

- The use of methane remote sensing technology monitoring may be required to supplement surface gas monitoring at a frequency deemed appropriate by the Executive Officer of CARB, or local air pollution control or air quality management district;
- If the use of supplemental methane remote sensing technology is required, the Executive Officer of CARB, local air pollution control or air quality management district may also require that elevated methane emissions detected be investigated and remediated, but in so doing, provide a reasonable time period commensurate with the actions necessary for the landfill operator to remediate the elevated methane emissions; and,
- Once a landfill operator has remediated the elevated methane emissions, the operator shall be permitted to use methane remote sensing technology on an optional voluntary basis.
- If CARB determines that it is appropriate to incorporate the use of methane remote sensing technology into the methane emissions regulations but these technologies do not meet the requirements of Section 95471 of Title 17 of the California Code of Regulations, the regulations may only allow use of the methane remote sensing technologies as an optional voluntary screening tool and no enforcement action may be taken for violations of methane emissions standards based solely on data collected using the methane remote sensing technologies.

SB 1383 – Organic Diversion from Landfills

Diverting organics from landfills has been identified as the most effective long-term solution for reducing methane emissions from landfills. From the SB 1383 Initial Statement of Reasons:

Achieving these targets will reduce an increasing amount of greenhouse gas emissions, ultimately achieving annual reductions of at least 4 Million Metric Tons of CO2 equivalents (MMTCO2e) annually by 2030. In addition, one year of waste diversion avoids 14 MMTCO2e of emissions over the lifetime of waste decomposition.

This compared to the LMR methane reduction of 1.5 $MTCO_2E$ over a 10-year period. Further, in 2016 the Legislative Analyst Office (LAO) identified programs that promote organics recycling and digester research and development, as the most cost effective (cost per ton) greenhouse gas reduction strategy. As an example, the average cost effectiveness of the top 21 reduction strategies was determined to be $57 per ton reduced with numbers as high as $725 per ton reduced; organics and recycling loans were $4 per ton reduced. However, despite the obvious advantages of focusing on the organics diversion strategy the draft Little Hoover Commission Report (released June 2023) found that the organic diversion deadlines are not being met and efforts to achieve these mandates must involve significant increase in efforts by regulators working with municipal and industry partners. The landfill industry, along with their partners in the wastewater sector have been attempting to work with the regulators and legislators for many years on a host of issues, such as increased funding for infrastructure, permit and regulatory streamlining and programs for utilizing biomethane. Many of the most important efforts have been met with roadblocks that have stalled efforts to meet the SB 1383 organic diversion mandates. All the efforts and issues are too numerous to summarize here. The LTF strongly recommends that CARB reach out to associations that have been at the forefront of promoting these issues to fully understand the efforts that will be needed. The LTF will gladly work with CARB staff on identifying these groups.

Conclusions:

The LTF comments reflect the preliminary nature of the CARB effort, covering what we believe are the most important issues reflecting methane reduction at landfills at this time. We believe that the LMR can be improved to further methane emissions reductions with the most effective change in the voluntary use of remote technologies, likely in a hybrid monitoring approach or voluntary mitigation when a landfill operator is notified that a methane plume has been detected by aircraft flyovers or satellite technologies. Also, more mandatory measures can be taken to require remote technologies or other mitigation measures for larger landfills that have been found to be problematic. Other suggestions have been provided but their effectiveness should be evaluated carefully given the potential methane reductions that can be achieved and the cost effectiveness of these programs.

While LMR improvements can be effective in further reducing methane emissions from landfills the LTF recommends that CARB's efforts focus primarily on work with other regulatory partners and industry/municipalities to full support the implementation of SB 1383. SB 1383 will be the most effective program for reducing long-term methane emissions from landfills. Efforts need to focus on infrastructure funding, permit and regulatory streamlining and significantly reducing barriers to biomethane utilization.