

Standard Threshold Odor Management Plan (STOMP) Concept

Problem Statement: The following have been noted by some of those associated with the operating and regulating composting sites:

- 1) The existing odor standard in California Code of Regulations, Title 14 does not distinguish between odors that are a part of the day to day operations of a well-run composting site and those associated with inappropriate design and operations. Furthermore, there is no specific mechanism in the standard for identifying complaints that maybe without factual support;
- 2) The existing Odor Impact Minimization Plan (OIMP) process works well for a majority of the odor issues. However, relative to chronic cases, the OIMP process can result in a continuous check-and-adjust loop of operational and design changes with no parameters relative to feasibility and reasonableness.

The concept below is meant to:

- 1) Allow operators to opt into the STOMP approach when there is a need to address chronic odor complaints;
- 2) Provide the local enforcement agency (LEA) and the operator a tool to:
 - a. Document the operator's efforts to minimize odor
 - b. Document changes in odor, i.e. that it has been minimized/improved
 - c. Identify, implement, and analyze best management practices (BMPs) and their effectiveness
 - d. Allow time to gather data on changes in operations and the associated changes in odor to make decisions on how best to proceed
 - e. Determine which next steps are reasonable and feasible and which are not
 - f. Adjust the method for evaluating odors at a site that has implemented all feasible and reasonable measures
- 3) Provide an objective mechanism to use to determine the source of the odor (e.g., the compost facility versus other adjacent or nearby sources).

Summary of Proposed Concept:

What is the Standard Threshold Odor Management Plan (STOMP)?

- The STOMP can take the place of the OIMP
- STOMP = OIMP and a site specific **Enhanced Monitoring Plan (EMP)**, which will be implemented when the operator meets or exceeds the Standard Odor Dilutions-to-Threshold (SODT)
- If, and only if, the operator has a STOMP, will the LEA will use the Standard Odor Dilutions-to-Threshold (SODT) to determine if the operator is complying with the odor standard (14 CCR 17867 (a)(2))

Who would get a STOMP?

- The operator will either choose to use the STOMP and the STOMP process; OR
- The LEA will direct the operator to file a STOMP in situations where the OIMP is being followed, but odor impacts are still occurring. The regulations would provide explicit authority to the LEA to make this directive outside an enforcement action, or the LEA could choose to use existing authority to include the directive in a Notice and Order, as referenced in 14 CCR 17863.4(f).

What is the Standard Odor Dilutions-to-Threshold (SODT)?

The Standard Odor Dilutions-to-Threshold (SODT) is measured by a field olfactometer*, which is used to measure odor intensity in dilutions of volume of filtered air to volume of odorous air it takes to no longer detect the odor. The olfactometer measures the lowest number of dilutions of filtered air it takes for the inspector to still detect and odor in a measurement of “Dilutions-to-Threshold (D/T).”

- CalRecycle proposes to set the Standard Odor Dilutions-to-Threshold (SODT) at equal or greater than:
 - 7 D/T** in non-agriculturally zoned areas and 15 D/T** in agriculturally zoned area, AND
 - 3 verified odor events with 30 days where there are equal or more than 7 D/T** (non-ag, or 15 D/T** (ag); AND
 - LEA determines verified odor is generated by compost operation or facility.
 - In determining the odor source is the composting site, the LEA will use the odor characteristic/nature of odor, wind direction, activity at the composting site prior to and during the odor complaint and to the extent possible trace the odor back to the site.
 - If the LEA determines that the odor was not caused by the composting site, then the LEA shall refer the complaint to the local Air District with in X time frame of its determination.
 - Odor event is defined as verified complaint(s) within a 24 hour period of time. The event begins with the first complaint and includes all complaints received during the next 24

Issue 4 – Odor Complaints

hours. After 24 hours any new complaints received will be associated with a new odor event.

* Note: A Field Olfactometer creates a calibrated series of discrete dilutions by mixing the odorous ambient air with odor-free (carbon) filtered air. Field olfactometry defines each discrete dilution level as a “Dilution-to-Threshold,” D/T, ratio. The “Dilution-to-Threshold” ratio is a measure of the number of dilutions needed to make the odorous ambient air “non-detectable”. Field olfactometry calculates the “Dilution-to-Threshold” (D/T) ratio as:

$$D/T = \frac{\text{Volume of Carbon-Filtered Air}}{\text{Volume of Odorous Air}}$$

** Note: The D/T readings on the nasal ranger in order of strongest odor to lowest odor are 60, 30, 15, 7, 4, and 1

References:

- o *The Science of Smell Part 3: Odor detection and measurement, Iowa State University, University Extension, 2004,* <http://www.extension.iastate.edu/Publications/PM1963C.pdf>
- o *Measuring Composting Odors for Decision Making, St. Croix Sensory, Inc., 2005,* <http://www.fivesenses.com/Documents/Library/46%20Measuring%20Composting%20Odors%20for%20Decision%20Making.pdf>

Why is it called Dilutions-to-Threshold?

Between 1958 and 1960, the U.S. Public Health Service sponsored the development of an instrument and a procedure for field olfactometry. The U.S. Public Health Service method defines the dilution factor as Dilution-to-Threshold, D/T. The Dilution-to-Threshold ratio is a measure of the number of dilutions needed to make the odorous ambient air non detectable.

How and when will the Standard Odor Dilutions-to-Threshold (SODT) be applied?

If the operator has a STOMP (instead of an OIMP), and the LEA receives a complaint, then the Standard Odor Dilutions-to-Threshold (SODT) will be applied.

The Standard Odor Dilutions-to-Threshold (SODT) will be applied by the LEA measuring the D/T with a field olfactometer AT THE COMPLAINANTS LOCATION. If the LEA notes readings at complainants locations that are equal to 7 D/T (non-ag zoned) or 15 D/T (ag zoned), associated with 3 odor events within 30 days, then the operator will be found in violation of the odor minimization standard and will be directed to implement its **Enhanced Monitoring Plan (EMP)** and a **Phase Enhanced Monitoring, Operations and Reporting (PEMOR) Process**.

What is the “Phase Enhanced Monitoring, Operations and Reporting (PEMOR) Process”?

- The **Phase Enhanced Monitoring, Operations and Reporting (PEMOR) Process** is triggered by the LEA determining the Standard Odor Dilutions-to-Threshold (SODT) has been reached.
- The first step of **Phase Enhanced Monitoring, Operations and Reporting (PEMOR) Process** is for the operator to implement their **Enhanced Monitoring Plan (EMP)** for 30 days. During this time the operator will gather data about the odor, including making an assessment of the sources of odor, and identify and rank which sources are creating the most odor.

Issue 4 – Odor Complaints

- After monitoring for 30 days, following the **Enhanced Monitoring Plan (EMP)**, the operator will propose a plan (**Enhanced Operations Plan (EOP)**) describing/proposing operational enhancements/changes that they will put in place to address the most odorous sources onsite.
 - Example: The operator may note that the receiving and grinding area is the highest source of odor, and therefore propose to process incoming material in 7 days instead of the normal 15 days and use a misting system when grinding during specific weather conditions.
- The operator will implement the **Enhanced Operations Plan (EOP)**, i.e. the processing of 7 days, for 90 days. The operator will continue to monitor the odor and collect data according to the **Enhanced Monitoring Plan (EMP)**.
- During this time the LEA will continue to respond to complaints and collect the results of their investigations.
- At the end of the 90 days, the operator will compile and submit to the LEA (within X days) a final report on the data from the **Enhanced Monitoring Plan (EMP)** while implementing the **Enhanced Operations Plan (EOP)**. The **Enhanced Monitoring, Operations and Reporting Report (EMOR Report)** will include odor trends, and show which, if any, of the operational changes reduced odor generation at the onsite sources.
- If odor has been reduced to below the Standard Odor Dilutions-to-Threshold (SODT) then the operator need not take any additional actions.
- If odor is equal to or greater than the Standard Odor Dilutions-to-Threshold (SODT, as determined by the LEA, then the operator would need to provide a revised **Enhanced Operations Plan (EOP)** to address the highest ranking odor source on site, including additional operational changes the operator will make and any operational change(s) they will abandon due to its failure to minimize odor (based on the data provided).
 - Example: The operator may note that the receiving area is still the highest source of odor but the grinding is not generating much odor now that the misting system is in place. The operator may then propose that the incoming material be covered instead of increasing the processing frequency from 7 days instead of the normal 15 days since this change showed little or no effect on the odor generation at that source. The operator would then continue to use a misting system when grinding during specific weather conditions, since the data supports there was a reduction in odor generated at that source.
- This approach will allow for several phases of the Phase Enhanced Monitoring, Operations and Reporting (PEMOR) process. During this time the operator is building a record for what has been tried to reduce odor and if that operational change/BMP was effective (as determined by the operator and supported by data and concurred in by LEA).
 - During this time the operator is making changes based on data and monitoring the result of each operational change.
 - After two or more phases, the operator will be building a case for which operational changes (or BMPs) are working and which are not. It will also help identify the source of the odor, and the additional associated operational changes that would be appropriate

Issue 4 – Odor Complaints

for each of the remaining odor sources. Based on this information the operator will be able to clearly identify what remaining operational change/BMP are possible and then evaluate if they are feasible and if they are reasonable for each of the remaining onsite odor sources, using the Comprehensive Compost Odor Response Project (C-CORP) as a guideline. At this point the operator will enter into **Phase III, Demonstration of Reasonable and Feasible**, which provides for an end point.

- See attached charts for for a demonstration of the basic flow of the STOMP process.

How does the operator demonstrate that measures are or are not reasonable and feasible?

- After two or more phases, the operator will document the following:
 - What are the onsite odor sources that are generating odor
 - What BMPs they have tried. Which ones worked (the operator may still be implementing these at the site), which ones did not work and the data collected by the **Enhance Monitoring Plan (EMP)** to support these determinations.
 - Based on the above, there will be a list of BMPs listed in the C-CORP that have not been tried for the odor source(s) that remains to be a problem.
 - The operator will list each of these remaining BMPs, the operational feasibility of them, the potential cost of implementing them, and the potential benefit from implementing them.
 - Based on the above analysis, the operator will provide a list in priority of the BMPs that they will try. Of the remaining BMPs, the operator will explain which are not operationally feasible or reasonable, which are not economically feasible or reasonable, or which would provide little or no increased benefit and why.
 - The operator will implement the measures on the list of priority BMPs, and continue the **Enhanced Monitoring, Operations and Reporting Report (EMOR Report)** until the odor is reduced below the Standard Odor Dilutions-to-Threshold (SODT) for a period of time (for at least three monthly inspection periods and possible much longer, since we would want to establish that the operational changes did indeed address the impacts for during varied seasons and climate conditions at this point in the process) or until the list of appropriate BMPs has been exhausted.
 - If all of the reasonable and feasible BMPs on the list have been tried and odor is still equal to or exceeds the Standard Odor Dilutions-to-Threshold (SODT), then the operator has demonstrated reasonable and reasonable and may request a different D/T for the site.
 - It is expected that changing the D/T would necessitate new and/or revised site-specific permit conditions, which would require a permit revision.

Issue 4 – Odor Complaints

- The operator will not have to address the BMPs in the C-CORP that are related to an odor source on site that is not causing a problem, as long as the data show that the source is insignificant to the generation of the offsite odor impacts (by testing odor intensity at those locations throughout their *Enhanced Monitoring Plan (EMP)*).

While the operator is in the Phase Enhanced Monitoring, Operations and Reporting (PEMOR) Process will they remain in violation of the odor minimization standard?

If the Phase Enhanced Monitoring, Operations and Reporting (PEMOR) process is being implemented violations will not be noted as every effort is being made to minimize odors at the site. However, if the Phase Enhanced Monitoring, Operations and Reporting (PEMOR) process is not being implemented the LEA can note a violation for the odor standard and begin enforcement to require complete implementation of the Phase Enhanced Monitoring, Operations and Reporting (PEMOR) process. Failure to comply with enforcement could result in penalties. The LEA will still respond to complaints and document the result on the inspection report and/or the facility file.

What role will the LEA have to review the STOMP and associated Enhanced Monitoring, Operations and Reporting submittals?

As currently proposed the LEA would have 15 days provide comments or deny the Enhanced Monitoring, Operations and Reporting Report (EMOR Report - the Operation Plan and the report at the end of the 90 days) for the initial submittal and any subsequent revisions. The LEA's actions would be based on very specific criteria, such as it does not meet the prescriptive requirements or the operator's data do not support its proposed operational changes or conclusions. This would allow the process to continue, but allow the LEA to assure that the requirements was being met and that the Enhanced Operations Plan (EOP) legitimately addressed the actual problem and is supported by data collected.

Will there be any variances in timeframes associated with the Phase Enhanced Monitoring, Operations and Reporting (PEMOR) Process?

The intent is to allow the LEA to approve alternative timeframes (shorten or lengthen) to implement a particular BMP.

Will there be any changes suggested to address "frivolous" complaints?

Discussions continue to address this question. One approach has been offered that suggests limiting the type of response to be taken after a number (to be determined) of non-verified complaints are received from specific complainants and/or during a specific timeframe.