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# Department of Pesticide Regulation

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Environmental Protection

## **PESTICIDE REGISTRATION AND EVALUATION COMMITTEE (PREC) Meeting Minutes – September 17, 2021**

### **Committee Members/Alternates in Attendance:**

Brian Gress – California Department of Food and Agriculture (CDFA)  
Fabiola Estrada – United States Environmental Protection Agency (EPA)  
Garrett Keating – Department of Industrial Relations (DIR)  
Jaime Rudd – Department of Fish and Wildlife (DFW)  
James Seiber – University of California (UC), Davis, Department of Environmental Toxicology  
Jeff Fowles – Department of Public Health (CDPH)  
Katherine Sutherland-Ashley - Office of Environmental Health Hazard Assessment (OEHHA)  
Lynn Baker – Air Resources Board (ARB)  
Matt Hengel – University of California (UC), Davis, IR-4 Program  
Ruben Arroyo – CA Agricultural Commissioners and Sealers Association (CACASA)  
Tulio Macedo – Department of Pesticide Regulation (DPR)  
Valerie Hanley – Department of Toxic Substances Control (DTSC)

### **Visitors in Attendance:**

*Note: Only attendees who identified themselves using their full name are listed below*

Anne Katten – California Rural Legal Assistance Foundation  
Diala Diab  
Emily Bryson  
Eric Lauritzen  
George Naugles  
James Nakashima – Office of Environmental Health Hazard Assessment (OEHHA)  
Jyoti Taneja  
Michael Zeiss  
Ouahiba Laribi - Office of Environmental Health Hazard Assessment (OEHHA)  
Suzanne Hume

### **DPR Staff in Attendance:**

Andrew Turcotte – Pesticide Registration Branch  
Aron Lindgren – Pesticide Registration Branch  
Brenna McNabb – Pesticide Registration Branch  
Brittanie Clendenin – Pesticide Registration Branch  
Jag Sahota – Worker Health & Safety Branch  
Jazmin Gonzalez – Environmental Monitoring  
Kara James – Pesticide Registration Branch  
Lucy Graham – Worker Health & Safety Branch  
Maziar Kandelous – Environmental Monitoring  
Michel Oriol – Worker Health & Safety Branch

**DPR Staff in Attendance Continued:**

Minh Pham – Environmental Monitoring Branch  
Nan Singhasemanon – Pesticide Programs Division  
Shafeesha Ali – Worker Health & Safety Branch  
Yvan Delgado – Environmental Monitoring Branch

**1. Introductions and Committee Business – Tulio Macedo, Chair, DPR**

- a. Approximately thirty-five (35) people attended the meeting.
- b. The comment period for the citrus/bee protection area regulations closed on June 2nd, and the rulemaking file is currently being finalized by DPR.
- c. The comment period for the carbon monoxide pest control device regulations closed on September 8th, and DPR will review comments received during the comment period.
- d. On September 15, DPR submitted emergency regulations concerning registration fees to the Office of Administrative Law for review. A five-day public comment period will be open until September 20th, and if approved, the emergency regulations are set to become effective on October 1st, 2021.

**2. Ambient Air Monitoring Results for 2020 – Maziar Kandelous, Yvan Delgado & Jazmin Gonzalez, DPR**

***1,3-D Mitigation Pilot Study***

1,3-dichloropropene (1,3-D) is a pre-plant fumigant used for a variety of crops in California and is currently registered and managed as a restricted material. The 1,3-D mitigation pilot study has three goals. The first goal is to develop feasible alternative mitigation practices. The second goal is to provide flexibility to growers and applicators in choosing those alternatives and practices to achieve emission reductions comparable to Total Impermeable Film (TIF) tarping. The third goal is to support future mitigation development in addressing acute exposure of 1,3-D.

With the goals of the 1,3-D pilot study in mind, there have been six studies conducted to estimate the emissions of 1,3-D from applications. Three of these studies were independent of the pilot study and conducted by Professor Ajwa of UC Davis. The rest of the studies were conducted by DPR's air program. The studies conducted by Professor Ajwa were in line with the purpose of the 1,3-D mitigation pilot study, and DPR plans to use those results for future mitigation development. DPR was able to secure grower collaboration for studies in Kern and Stanislaus counties, and is currently in the coordination and planning stages for two more studies in Merced and Sutter counties. Factors that were included in developing mitigation measures included higher soil moisture, deeper injections, and partial TIF tarping. DPR has evaluated higher soil moisture and deeper injections, and is looking into evaluating 50% TIF tarping.

There were eight Air Monitoring Network (AMN) sampling sites at the beginning of 2020, and that number was reduced to four by the end of the year. There were 36 pesticides monitored

throughout the year. In study 309, there were two sampling sites in Merced and Fresno counties. 1,3-D is one of the 36 chemicals monitored by the AMN, and study 309 monitored for 1,3-D in 2020.

In 2020, funding from the Budget Act of 2016 ended. The California Air Resources Board completed their two-year commitment to assist DPR with its air monitoring stations. This also coincided with the beginning of the pandemic, which imposed health concerns and travel restrictions. In addition, because of the pandemic, the California Air Resource Board Laboratory, which was analyzing a portion of DPR's samples, halted its entire operations. The CDFA lab, on the other hand, continued the operation, but at a reduced scale. DPR's Air Program responded to these unforeseeable changes by continuing their weekly monitoring at a reduced scale as well. The number of sites in the AMN was reduced to four, and with the exception of the Santa Maria station, monitoring was focused on 1,3-D, which was a priority active ingredient for DPR. In 2021, DPR resumed operations at full capacity and started sampling for all 36 pesticides in the AMN.

No state or federal agency has established health standards for pesticides in the ambient air. Therefore, DPR developed health screening levels (SL), following consultation with OEHHA on human health risk assessments. DPR estimates the potential for adverse health effects by comparing the air concentration to health SLs or regulatory targets (RTs). SLs are based on a preliminary assessment of possible health effects. It should be noted that a measured concentration that is above the SL does not necessarily indicate a health concern; however, it does indicate the need for a refined evaluation. RTs are established after a formal risk assessment of a chemical's toxicity and potential exposures and supersede SLs. DPR puts measurements in place based on RTs to limit exposures in order to avoid adverse health effects. Four of the pesticides monitored in the AMN (chloropicrin, methyl bromide, MITC, 1,3-D) have regulatory targets for one or more exposure periods.

### ***2020 Air Monitoring Network Results***

Established in 2011, the AMN collects 24-hour samples weekly at each monitoring site and analyzes for 36 pesticides. The Budget Act of 2016 provided temporary funding to increase the number of monitoring sites from 3 to 8. DPR operated 3 sites: Chualar, Santa Maria, and Watsonville. CARB operated 5 sites: Cuyama, Lindsay, Oxnard, San Joaquin, and Shafter.

In 2020, funding from the Budget act lapsed and CARB completed their two-year commitment, and monitoring was reduced beginning in March 2020. From January to March, all 36 pesticides were monitored across all sites. From March to December, monitoring was prioritized for 1,3-D in Shafter and Watsonville. Through the entire year, the Santa Barbara County Agriculture Commissioner's office continued monitoring for all 36 pesticides at the Santa Maria site on behalf of DPR.

There are three types of detections that are referred to in the 2020 AMN report. Quantifiable detections refer to pesticide concentrations above the limit of quantitation. Trace detections refer

to concentrations below the limit of quantitation but above the method detection limit. Non-detections are those below the method detection limit.

In 2020, 10 pesticides were detected at quantifiable levels, 26 pesticides were detected at trace levels, and seven pesticides were not detected in 2020. The number of possible detections in the report represents the number of chemicals multiplied by the number of monitoring sites. The highest numbers and percentages of quantifiable and trace detections were reported in Santa Maria and Shasta. The AMN report measures the highest detected concentrations for acute sub-chronic and chronic SLs. For 24-hour acute concentrations, measurements were less than one percent of SLs. For sub-chronic 4-week average measurements, chloropicrin concentrations measured at 35 percent of SLs. The highest sub-chronic measurement for MITC was 47 percent of SLs. For chronic one-year measurements, chloropicrin concentrations were at 18 percent of SLs, while MITC concentrations were at five percent. The report also measured pesticide concentrations by location. Acute 24-hour concentration levels for all pesticides were at less than one percent of SLs in all locations. Sub-chronic four-week average concentrations were highest in San Joaquin, at 47 percent of SLs, and in Santa Maria at 35 percent of SLs. Annual average concentrations for chloropicrin measured at 18 percent of SLs and MITC measured at five percent in Santa Maria. Annual averages were only calculated in locations where pesticides were sampled throughout the entire year.

Cumulative exposures were estimated for pesticides classified as organophosphates. Organophosphates are a class of chemical compounds that can cause adverse health effects on humans, such as inhibiting cholinesterase, an enzyme in the nervous system. Cumulative exposures are calculated for 14 organophosphate pesticides included in the AMN report. Cumulative exposure is estimated using a Hazard Quotient (HQ) for each pesticide. This is calculated by dividing the air concentration detected by the SL. Once this is done for each pesticide, all HQs are added to determine a hazard index (HI) value at each monitoring site. HQs or HIs higher than a value of one suggest the need for further evaluation. The AMN report shows the acute, sub-chronic and chronic HIs for 2020. All indices for the year measured below a value of one. HIs for the last ten years measured beneath a value of one as well. The highest HI was reported in Shafter at 0.77 in 2011.

The AMN program monitors seven pesticides that are designated as known or probable carcinogens. The Cancer Risk estimate is the probability of an additional case of cancer over a 70-year period. This is calculated by multiplying the normalized breathing rate (nBR) of a human adult, mean lifetime air concentration (LAC), and the cancer potency factor in humans (CPF<sub>H</sub>). In the absence of 70-year monitoring data, LAC is taken as the mean annual concentration for all available monitoring years. DPR uses the default nBR for an adult of 0.28 m<sup>3</sup>/kg/day. Out of the seven designated pesticides, 1,3-D, Chlorothalonil, and DDVP were detected in 2020, and their potency factors in humans (CPF<sub>H</sub>) have been established by DPR. Cancer risk estimates for chlorothalonil were well below one percent relative to its target in all monitoring sites. Estimates for DDVP were at 13 percent of targets in San Joaquin and less than five percent in all other sites.

### ***1,3-D Ambient Air Monitoring Results***

In 2020, DPR allocated 1,3-D monitoring sites across two different monitoring studies, each similar but varying slightly in their objectives. The two studies were the AMN and Study 309. Ten communities and seven counties were monitored in 2020 from January to March. Due to lab closures and travel restrictions in the pandemic, monitoring was conducted in three of the AMN sites and for both Study 309 sites from March until December.

The objective of Study 309 is to monitor 1,3-D in high-use areas of the Central Valley and to evaluate the effectiveness of 1,3-D mitigation measures that were implemented in 2017. Monitoring locations were selected based on historical 1,3-D use from 2012 to 2014 in communities within Fresno and Merced counties. The sites that were selected were Delhi in Merced county and Parlier in Fresno county, and monitoring has been ongoing at both of these locations since 2016. One 24-hour sample is collected at each site on a randomly selected day of the week. The reporting limit for 1,3-D in this study is 0.01 parts per billion.

Included in the ambient air monitoring results are the percentages of quantifiable detections for each site. Chualar, Cuyama, Lindsay and Oxnard sites all had nondetections for the period they were monitored. All other sites had detection rates ranging between 22 and 88 percent. SLs for acute, sub-chronic and chronic 1,3-D concentrations are 110 parts per billion. In 2020, the highest observed acute 24-hour concentration level was 34 percent of SLs. Sub-chronic 1,3-D concentrations are calculated using a rolling average of 90 days, and that value is compared to three parts per billion. The highest sub-chronic concentration was at 151 percent of SLs in Shafter. SLs for chronic exposure are two parts per billion, and chronic concentrations in Shafter measured at 90 percent of SLs.

In the state of California, 1,3-D is recognized as a human carcinogen, and DPR has determined a cancer risk regulatory target for exposure levels. In the 2016 risk management directive, DPR established a cancer risk goal of one in 100,000. The cancer risk equation can be rearranged to solve for the mean lifetime air concentration (LAC) by inserting that cancer risk goal, and inserting that cancer risk goal results in a target LAC of 0.56 parts per billion. Data on annual concentrations over the last ten years are compiled and calculated to find an overall average concentration by sampling location, and those averages are then compared to the target LAC.

### ***Next Steps***

DPR will continue to monitor ambient air to understand pesticide use patterns, develop feasible mitigation options and assess current mitigation measures to ensure their effectiveness over time. All of the data collected by the AMN and Study 309 feed into a database that DPR uses to make risk management decisions regarding mitigation measures and various other regulations. DPR is working to address acute and cancer risk for 1,3-D through rulemaking, and results from the 1,3-D Mitigation Pilot Project will assist in decision making. Preliminary data collected from the pilot project have provided encouraging results.

DPR will soon release the final 2020 air monitoring report for Study 309, and will soon release the draft for volume 10 of the 2020 AMN results for public comment. Upon release, DPR will accept comments on the AMN draft report for 30 days.

Comments should be sent in writing to:

Maziar Kandelous  
Department of Pesticide Regulation  
P.O. Box 4015  
Sacramento, CA 95812-4015  
Email: [Maziar.Kandelous@cdpr.ca.gov](mailto:Maziar.Kandelous@cdpr.ca.gov)

Additional questions can also be sent to:

Minh Pham  
Chief  
Environmental Monitoring Branch  
(916) 445-0979  
[Minh.Pham@cdpr.ca.gov](mailto:Minh.Pham@cdpr.ca.gov)

Additional information can be found at DPR's [Air Program website](http://cdpr.ca.gov/docs/emon/airinit/airmenu.htm) <cdpr.ca.gov/docs/emon/airinit/airmenu.htm> as well as the [Air Monitoring Network site](http://cdpr.ca.gov/docs/emon/airinit/air_network.htm) <cdpr.ca.gov/docs/emon/airinit/air\_network.htm>

### ***Committee Comment***

Lynn Baker suggested that use patterns around the Delhi monitoring site should be evaluated if monitoring were to continue in the site beyond the current year. Lynn noted that sites were picked based on aging 2012 to 2014 pesticide use data, and that more recent use data may be required to evaluate the efficacy of mitigation measures. Minh Pham replied that DPR recently did a re-evaluation of all of its communities, and re-selected Delhi due to a variety of factors including environmental justice parameters from CalEnviroScreen and the ability to procure a safe site in which equipment can be stored.

Garrett Keating clarified that Cal/OSHA does have Permissible Exposure Limits (PELs) for pesticides, but they are outdated, so DPR and OEHHA are the leading edge for these numbers. Garrett then asked if air sampling was done in the breathing zone. Minh clarified that this presentation was focused on ambient air monitoring, and the health standards mentioned are for ambient air, rather than worker exposure. Minh added that DPR uses fairly standard air monitoring equipment and collection is done at six feet, in the breathing zone, with most monitoring sites located at schools that are surrounded by agricultural areas.

Matt Hengel noted that there were detections of malathion, and asked if DPR was looking for the malathion metabolite malaoxon. Jazmin Gonzalez replied that DPR does measure for the oxon,

and that it is one of the degradates referenced. Matt followed up and asked clarification on whether the detection for malathion includes the oxon, or if only malathion was detected. Minh Pham replied that the oxons are listed separately in the data, so the detection was only for malathion, and not the oxon. Matt also asked for an explanation as to why 1,3-D concentration numbers at the Parlier monitoring site were substantially higher in 2018 than in previous years. Minh replied that the Parlier numbers were driven by one specific high data point out of 52 samples, and this drove DPR's decision to move forward with acute and chronic mitigation work efforts.

Mike Zeiss asked which month Santa Maria detected its peak concentration of chloropicrin in 2020, and how that timing compares with historical peaks in reported use for chloropicrin. Maziar Kandelous replied that chloropicrin was first detected in Santa Maria on October 2<sup>nd</sup>. Mike asked to clarify if October was a month in which most sites were no longer monitoring for chloropicrin, and Maziar confirmed that most sites were not. Minh Pham clarified that there are also seasonal detections of MITC throughout the different regions, and that Santa Maria is an area with notably high annual detection levels for MITC. Minh then replied that the timing of the detection falls within historical trends. Mike then asked if the 1,3-D cancer risk target of one in 100,000 is a standard target that DPR uses for all pesticides. Jazmin Gonzalez replied that the one in 100,000 number is DPR's current cancer risk threshold, and she is not aware if that target number is related to other pesticides. Lynn Baker commented that the Air Resources Board and DPR have conducted air monitoring for soil fumigants for several years. Lynn added that most of the 1,3-D use in Santa Maria is prior to planting strawberries, which happens in autumn.

Jeff Fowles asked if the presenters believed 2018 was anomaly year for 1,3-D detection in Parlier and if there are any mitigation efforts underway. Jazmin Gonzalez replied that the data is an annual average, which has a different threshold than the lifetime (70-year) average. Jazmin added that this was an anomaly, but DPR is working on mitigation measures to address some these concerns. Minh Pham added that DPR tracks usage along with monitoring results and the team is aware of the unexpected spikes. Minh further added that DPR does not necessarily have localized mitigation measures, but the counties may implement more restrictive measures. Jeff asked for clarification that the county would be the entity to implement mitigation efforts and asked if the counties were aware of this data. Minh replied that DPR works closely with the County Agricultural Commissions and shares this data with them.

Jim Seiber asked if DPR has any plans to integrate student interns into the program to follow-up on some of the information gathered through the study. Minh Pham responded that in general, the Air Program is open to collaboration, and currently works closely with UC Davis and UC Riverside. Jim suggested advertising the PREC meetings to students. Tulio Macedo responded that DPR can work in collaboration with the universities to spread the word about PREC meetings.

***Public Comment***

Anne Katten asked for elaboration on how close the application was to the high detection level in Shafter. Minh Pham replied that based on the modeling, the application was roughly 3 miles away, but the modeling is not meant to be investigatory and it could be the result of other applications. Anne added that DPR used to have a cancer risk level of 0.14ppb, which is still supported by OEHHA, and has been greatly exceeded at both the Shafter and Parlier sites. Anne further added that DPR's risk assessment includes both cancer potency risk levels, and does not feel that that the chosen target is an appropriate public health decision.

George Naugles asked for clarification on how air monitoring samples are collected and whether it is possible that the Oxnard sampling is happening out of phase with pesticide applications or in other ways that could skew the data. Minh Pham replied that DPR's ambient air monitoring is conducted using one 24-hour sample per week, on a randomly selected day, which has not shown a correlation with applications. Minh added that ambient air monitoring conducted with the AMN and Study 309 is not meant to target specific application emissions, but rather provide an account of potential pesticides present in the normal breathing zone in ambient air. Minh clarified that DPR conducts application site-specific monitoring as part of the 1,3-D Pilot Project, as well as seasonal studies in collaboration with CARB that focus on specific chemicals within regions of high use.

George Naugles asked what statistics DPR has for endocrine disruption and neurotoxicity relevant to subpopulation genotype relevant to pesticide and pesticide metabolite detoxification. Minh Pham replied that this is beyond the scope of the presentation and would be a question for DPR's toxicologists.

James Nakashima asked if 2021 monitoring continues to be constrained in the number sites that can be sampled. Minh Pham replied that DPR is down to four AMN sites, but that those sites are now back to full capacity, monitoring for 31 pesticides and 5 breakdown products.

Justine Weinberg asked if any analysis is conducted to tie quantifiable results temporally and geographically to applications. Minh Pham replied that DPR takes a preliminary look at that data, but the models used are not conducive to that type of analysis. Minh added that the team is constantly refining techniques and looking at other models that may be more appropriate for that type of analysis.

Ione Yuen asked if all of the sites were in areas where there is tarping only, and if mitigation measures will consider non-tarped situations. Minh Pham replied that sites are spread throughout the central coast and central valley, specifically due to the different application methods used in these regions. Minh added that DPR tries to capture all uses and ensure that mitigation is effective for all. Ione's email also included the following comment:

Our county growers need 1,3-D for nematode control for a lower value crop so the costs for tarping will put this material out of reach. Our growers have been using the deep



injection (18-inch-deep) option. The water capping is not possible because of limited water in our area.

I just wanted to ask that 1,3-D remains available in San Mateo County with a deep shank option or another option without tarping. Only 1000 acres are fumigated annually and our locations are on the coast with regular off shore breeze.

**3. Regulatory Proposal to Amend 3 CCR 6728 (Medical Supervision Program) – Shafeesha Ali, DPR**

The California Medical Supervision Program (Program) was established in 1974. DPR jointly administers this program with the Office of Environmental Health Hazard Assessment (OEHHA) and the Department of Public Health. The goal of the Program is to prevent cumulative inhibition of cholinesterase (ChE) activity resulting from multiple exposures to organophosphate (OP) and carbamate (CB) pesticides with the signal word “DANGER” or “WARNING” in certain pesticide handlers.

An employee requires medical supervision if the employee mixes, loads, or applies OP and/or CB pesticides used for production of an agricultural plant commodity for more than six days in a 30-day period, and the pesticide has the signal word “DANGER” or “WARNING”. Under Title 3 of the California Code of Regulations (3 CCR) section 6728, employers shall have a written agreement with a physician who agrees to provide medical supervision of his/her employees who require medical supervision, and employers shall keep the written agreement and send a copy to the County Agricultural Commissioner.

Medical supervisors are responsible for establishing pre-exposure baseline levels of red blood cell (RBC) and plasma ChE activities in these pesticide handlers. The medical supervisor also measures the ChE activity levels in follow-up tests at certain intervals after the employee begins working with these pesticides. Any follow-up test indicating an excessive exposure would result in recommended actions from the medical supervisor to be taken by the employer to prevent further exposure until the employee’s ChE activity levels fully recover.

There are thresholds for the recommended actions. If the follow-up tests indicate ChE activity levels to be less than 80 percent of either RBC or plasma baseline values, then the medical supervisor would recommend that the employer conduct a review of the workplace practices, including safety equipment used and its condition, and employee work practices. If the follow-up test shows that ChE activity levels are less than or equal to 70 percent of RBC or less than or equal to 60 percent of plasma baseline values, then the medical supervisor would recommend that the employer remove the employee from further exposure to ChE-inhibiting pesticides. The employee can return to work with ChE-inhibiting pesticides only after recovery to 80 percent or more of both RBC and plasma baselines.

Overall, baseline is established prior to the employee's exposure to ChE-inhibiting pesticides with signal word "DANGER" or "WARNING". A baseline test order measures both RBC and plasma ChE activity levels. The baseline is verified every two years.

OEHHA created guidelines for physicians to assist medical supervisors in understanding their requirements for compliance. For the baseline, OEHHA recommends using the average of two exposure-free tests, taken three to 14 days apart, after the employee has not been exposed to any ChE-inhibitors for at least 30 days.

DPR proposes to amend 3 CCR section 6728(c)(1) to add a 30-day exposure-free period in order to align the current employers' responsibility with the recommendations made to physicians by OEHHA. The rationale behind the 30-day exposure-free period is that it takes RBC ChE one to three months and plasma ChE several days to a few weeks to recover after inhibition, as stated in U.S. EPA Recognition and Management of Pesticide Poisoning manual. Washington State, which also has a ChE monitoring program, specifies the 30-day exposure-free period in its code of regulations (WAC 296-307-14820). There is also a guidance from the UK in 2016 that recommends a minimum 60-day exposure-free period.

DPR also proposes to amend 3 CCR section 6728(b) to specify that the physician be registered as a medical supervisor with OEHHA. In 2017, Health and Safety Code section 105206 was updated to require physicians under the Program to register with OEHHA as medical supervisors. The current proposed change would be consistent with this update.

This proposal is currently in the pre-notice stage, which involves consultations with UC Davis, the Department of Industrial Relations, and the Department of Food and Agriculture. DPR anticipates noticing these regulations for public comment later this year or early next year, and continues to look for ways to improve the Medical Supervision Program.

#### **4. Agenda Items for Next Meeting**

James Seiber commented on concerns about paraquat exposure and suggested a future agenda item pertaining to current or potential changes in paraquat regulations due to recent medical allegations regarding paraquat exposure.

James Nakashima commented on a recent notice on the DPR website about ongoing work on a notification program and mentioned that the committee may be interested in exploring such a program in the future.

The next meeting is scheduled for November 19, 2021 at 10:00 a.m. This meeting will be held virtually on the Zoom platform and broadcast live on the [CalEPA webcast page](https://video.calepa.ca.gov/).  
<video.calepa.ca.gov/>

#### **5. Adjourn**