

Central Valley Regional Water Quality Control Board

**Meeting Summary FOOD SAFETY
EXPERT PANEL – PUBLIC MEETING
January 24, 2018
10 a.m. to 3 p.m.**

Attendees

Panel Member	Title & Affiliation
Dr. Seth Shonkoff	Executive Director, PSE Healthy Energy; Visiting Scholar, Environmental Science, Policy and Management, UC Berkeley; Lawrence Berkeley National Laboratory (LBNL), Energy Technologies Area
Dr. Barbara Petersen	Principal Scientist, Chemical Regulation and Food Safety, Exponent
Dr. Dave Mazzera	Chief, Food and Drug Branch, CA Department of Public Health
Dr. Ken Kloc (by phone)	Staff Toxicologist, CA Office of Environmental Health Hazards Assessment
Dr. Andrew Gordus	Staff Toxicologist, CA Department of Fish and Wildlife (CDFW)
Mark Jones	Staff Toxicologist, US Army Corps of Engineers
Dr. Stephen Beam	Branch Chief, California Department of Food Agriculture (CDFA)

Affiliated Parties	Title & Affiliation
Dr. Karl Longley	Chair of the Board, Central Valley Regional Water Quality Control Board (Water Board)
Raji Brar	Board Member, Water Board
Stephanie Yu	Office of Chief Counsel, Water Board
Clay Rodgers	Assistant Executive Officer, Water Board
W. Dale Harvey	Supervising Engineer, Water Board
Rebecca T. Asami	Engineering-Geologist, Water Board
Josh Mahoney	Water Resource Control Engineer, Water Board
Dr. William Stringfellow	Science/Technical Advisor, University of the Pacific, LBNL
Dave Ceppos	Associate Director, Center for Collaborative Policy (CCP)
Alex Cole-Weiss	Assistant Facilitator, CCP

Note: Panel members Dr. Ludwig and Dr. Macler were not able to attend the meeting.

Action Items

1. **CCP** to develop draft meeting summary of January 24th public meeting and distribute to Water Board staff and Panel members for review.
2. **CCP** to correct Panel record of attendance on the November 7th, 2017 meeting summary to reflect Dr. Gordus' attendance.
3. **Panel member Dr. Petersen** to compile existing commodity/crop consumption-related data to inform the exposure assessment.
4. **Water Board** to follow up with Panel members about the time frame specified in the Assembly Bill (AB) 1328 orders regarding period of chemical use.
5. **Water Board** to review the publicly available data on the concentrations of certain compounds associated or correlated with particular soil types, and put together a short memorandum to present to the Panel for input and comments.
6. **Dr. Stringfellow** to finalize the citrus report and share with Panel members.
7. **Water Board staff** to set a deadline for the completion of the white paper.

Introductions and Agenda Review

Dave Ceppos, CSUS Center for Collaborative Policy, reviewed the meeting agenda and conducted introductions. Dr. Stringfellow was delayed by traffic and as a result, the agenda item pertaining to his presentation on crop sampling results was moved to slightly later that morning.

Mr. Ceppos reminded all attendees that this is working meeting of the Panel open to the public, and that comments and questions from members of the public viewing the webcast can be sent in by email, to be read by Mr. Ceppos or Ms. Asami during public comment periods in the meeting.

Materials List

The following items were posted on the Water Board's Oil Fields Food Safety [web page](#) and hard copies were made available to all participants.

1. [Meeting Agenda](#)
2. [Meeting Summary from November 7, 2017 Public Meeting](#)

Review of November Panel Meeting

The Panel held a public working meeting on November 7, 2017. A draft summary of the November meeting was made available on the project webpage the week prior to the January 24th, 2018 meeting. Mr. Ceppos asked Panel members if there were any additional comments or revisions that needed to be made on the summary. There was one comment from a Panel member about noting an error in the Panel record of attendance. Panel members adopted the summary as final, pending the correction.

Food Safety Project Update Update from Cawelo Water District on Memorandum of Understanding (MOU) Task Implementation

Clay Rodgers, Water Board, gave an update on the implementation of Tasks 1, 2, and 3 under the MOU. The Water Board provided Dr. Stringfellow's comments on Tasks 1 and 2 to the operators and irrigators

and the Water Board expects to move forward with completing Tasks 1 and 2 (the literature review and toxicity assessment, respectively) in the next couple of weeks. The next crop sampling for citrus is tentatively scheduled for the end of February or early March. The Water Board received comments from the operators on Task 3, regarding administrative issues and interactions between the Water Board, permit holders, irrigators, and consultants. The MOU stipulates that operators and irrigators will pay for the sampling work, but the Water Board will retain all oversight responsibilities with regard to the contractors. The Water Board is moving forward with the contractor selection process. There may be unavoidable delays, and if so, the Water Board is prepared to move forward with the citrus sampling process as conducted last year in order to not miss the harvesting window. This is not a preferred approach however.

David Ansolabehere, General Manager, Cawelo Water District, said the District and other MOU partners are in conversation with the Water Board about Task 3 and have submitted comments. Scopes for Tasks 1 and 2 have been shared with the group of MOU signatories for their final approval to move forward with implementation for those Tasks. The harvest time for Task 3 is coming up quickly, but he said he was confident a consultant will be selected within the timeline. The District is currently reviewing potential consultants for the sampling work.

Questions and Comments from the Panel

There were none.

Long-term Critical Path: White Paper

Dale Harvey, Water Board, said that Water Board staff expects to share an updated white paper with substantial content for the Panel to consider at and prior to the next public meeting in April. Mr. Rodgers commented that there have been more conversations on the MOU than anticipated and that the Water Board has needed to address other issues associated with produced water. With the completion of additional sampling in 2018, the Water Board will be in the position to document project progress in the white paper, determine next steps, and outline the timeline for wrapping up the Panel.

Mr. Ceppos said the next public meeting is April 25 in Rancho Cordova, and quarterly public meetings are scheduled for the rest of 2018. There will also be periodic internal working meetings of the Panel.

Public Communications to the Water Board

Mr. Ceppos shared that the Water Board received a form letter from 123 individuals expressing concern about Panel composition. Mr. Ceppos read portions of the letter specifically germane to the form letter request, to be entered into the public record. The standard letter reads as follows:

"I am writing about the Central Valley Regional Water Quality Control Board's "Food Safety – Oil Field Wastewater Reuse Expert Panel". I have a serious concern about the make-up of the Panel and preserving the integrity of the Panel's work. In particular, I am concerned about the apparent conflicts of interest regarding two members of the Panel -- Mark Jones and Barbara Petersen. Given these panel members' present and past employment, I question whether they can provide an objective scientific review of the issues. I therefore request that these two panel members be removed immediately. It is a clear conflict to have Mr. Jones on a panel that is charged with evaluating the merits of evidence that he previously produced, on behalf of the oil and gas industry. Dr. Petersen also has direct conflicts and should not serve on the Panel. These conflicts were not disclosed when Dr. Petersen joined the Panel, but only came to light at the 4/21/17 Food Safety Expert Panel meeting, through a short written note at the very end of the Revised Project Charter (drafted by CVRWQCB staff). The note stated that Dr. Barbara Petersen's participation on the Panel has been funded by Chevron through the majority of 2016, and that she is now being paid to participate by CalFLOWS, an oil and gas and agribusiness industry trade group whose directors include representatives from Chevron, Aera Energy, and certain large agricultural firms. CalFLOWS openly states that its purpose is to defend and promote the reuse of produced water in agriculture, and the corporations behind the group have a clear financial interest in the outcome of the Panel's findings and recommendations. Dr. Petersen's associations with Chevron and CalFLOWS represent clear conflicts that make her unsuitable to serve on the Panel. By including candidates with a history of working for industry against government regulation, the CVRWQCB jeopardizes the scientific reliability and public credibility of this process."

Questions and Comments from the Public

- Keith Nakatani, Clean Water Action. Please address the status of the literature review. It seems there is an overarching issue with regard to the capacity of the Water Board to move forward on this project in a timely fashion. Are there any efforts to increase staff capacity to move this process along more quickly?
 - o Response – Clay Rodgers: The Water Board's budget is set by the Governor and California Legislature, not by staff. We are not aware of any new positions in the Governors' proposed budget issued in January. The white paper has been delayed since there are other issues to address first, such as the sampling and analysis, in which Water Board

staff has been involved. With regard to Tasks 1 and 2, we are working on moving that forward. I do not think a lack of staff has delayed the issue, but has made the Water Board prioritize what is most important to work on. Oilfield activities are receiving more attention than they have in the past. We are working with 22.5 staff, which is ten times more staff than we had several years ago, and we have directed resources to staff to carry on the Oilfield Program. It takes time to hire and train the best individuals for the work we do. For all of our work, we have to look at the bottlenecks and critical paths, and prioritize. So far, the end result and overall objective—which is to get a robust sample set over at least two years—is not delayed.

- o Follow up: Can you clarify what the delay is with the MOU Tasks? Does the MOU address the soil sampling issue that has been raised before?

Response – Clay Rodgers: We are working on the finalization of the scopes of work for the Tasks. The MOU outlines the agreement between the irrigators and the Water Board, i.e. responsibilities of all parties, the process for developing and negotiating the scopes of works for Tasks, and the process for funding the work. The MOU addressed Tasks 1, 2, and 3, which did not address soil sampling, but the MOU does not preclude additional work to be decided upon by the Water Board with input from the Panel. Some soil-related issues may be beyond the scope of the Panel, such as long-term research. The primary question has been and continues to be about the safety of consuming crops irrigated with produced water. If we get into soil sampling in detail, the Water Board may need to bring in expertise beyond who currently serves on the Panel to address soil issues, particularly inorganics.

If the Panel were to recommend the Water Board pursue soil sampling, would it be correct to say that soil sampling would be more likely to happen?

- Response – Clay Rodgers: The Panel is here to help provide input on potential, additional tasks.
- Bill Allayaud, Environmental Working Group (EWG).
 - o I'm glad that there are more staff dedicated to these issues and that the Water Board is moving forward. With regard to Panel composition, we also sent a letter with regard to conflict of interest. Will there be a response to this?

Response – Clay Rodgers: The Water Board has looked at viable potential conflict of interest matters. In forming the Panel, we

looked for a breadth of expertise to address the span of issues. We wanted expertise in food safety and formed the Panel to help support an area outside the direct purview of the Board. We wanted to form a group that was representative of all the stakeholders and diverse issues. No one single member controls the results or recommendations of the Panel. We were aware that Mark Jones had done work with CRC, and we found it to be solid technical work with the data available. Regarding Dr. Petersen, she had been recommended to us. We looked at the work she had done with the World Health Organization; her knowledge and expertise is unique. The Water Board wants to know that the food is safe. The irrigators and growers have to know the food is safe—they carry even greater risk. The composition of the Panel reflects the key interests and knowledge at hand. In the past, complaints were given to the Board about Dr. Shonkoff. The Water Board has heard the complaints and there is no plan by the Water Board to change the composition. We think with diverse perspectives, we will get the best results.

Comment from Dr. Longley: The Panel is a distinguished group of people. We continue to be transparent in this process. There are many individuals who would like to serve on this Panel for their own reasons.

Mr. Ceppos commented that in his role as neutral facilitator, he has observed that the Panel has always worked in a collegial manner and never has one person tried to steer the Panel in a particular direction.

Update – Results of 2017 Crop Sampling Events

Dr. William Stringfellow, Science Advisor to the Water Board, reviewed the preliminary results from crop sampling performed in 2017. (See [meeting materials](#) webpage for full [presentation](#).) Preliminary analysis and results were also shared with Panel members on January 16, 2018.

Sampling events completed in 2017 were collected by Advanced Environmental Concepts, Inc. Water Board staff provided oversight, took possession of samples at the sampling sites, and assumed responsibility for shipping the samples to Weck Labs, a state certified environmental laboratory, where the primary analysis was performed. Berkeley National Laboratory also participated in split sampling.

There were ten sampling days conducted in 2017 that covered all major crops in the district and region. Citrus samples included lemons, oranges, and mandarins; samples from almonds, grapes, pistachios and garlic were also collected. All samples were collected by hand. For garlic, the root mass was clipped off. Crops were collected at the point of harvest (i.e., crops were ready for consumption). Samples were collected at

treated and control sites. Treated sites were those that received some produced water (produced water represents a fraction of total water supply in the region). Control sites received irrigation from surface and groundwater sources, and were located outside the Cawelo Water District where treated sites were located, but within the region. There were a total of 110 samples and 22 duplicates collected. Dr. Stringfellow showed a map of the distribution of sample sites in the region.

Once collected, samples were shipped by Water Boardstaff to the certified lab (Weck Labs). Analysis was performed on the edible portion of the fruit (i.e., oranges were peeled, pistachios were shelled), for known contaminants of concern (COCs) in the petroleum industry. Dr. Stringfellow reviewed the list of organic and inorganic analytes that were tested for, including 26 organic compounds (PAHs, BTEX, carbazole, pyridine, acetone, and methanol); 64 other compounds were also analyzed including chlorinated solvents, miscellaneous volatile and semi-volatile organics. In addition to organic compounds, analysis included 18 metals. The list of metals included those commonly found in relationship / use to the petroleum industry and as well as others not commonly associated with the petroleum industry. Dr. Stringfellow reviewed the methods used for sample analysis for organic compounds and metals.

Crop samples were measured and analyzed for a total of 108 organic and inorganic compounds. Of that total, only 16 compounds or elements were detected in any of the crop samples (six inorganic compounds and ten organic compounds). All compounds that were detected were found at low or very low concentrations, well within safe ranges.

Dr. Stringfellow reviewed results for several of the organic analytes found determined to be of low interest in the context of the food safety study:

- Methanol was found only in one control sample (garlic), and phenol was found in one control citrus sample. Since they were found in control samples, they are not related to the safety of food irrigated with produced water.
- Sec-Butylbenzene was found in one treated sample (citrus). As a lone detection, there is not much evidence for the existence or prevalence of this compound.
- Bis(2-ethylhexyl)phthalate was found in one control garlic sample, one control and one treated grape sample, and one treated pistachio sample. This compound is not associated with oilfields activities. Since the compound was found in both control and treated samples indicates this indicates it not associated with produced water.

Dr. Stringfellow reviewed results for organic analytes found (as also discussed at previous Food Safety Panel public meetings:

- 1,2,4 trimethylbenzene was found in both treated and control citrus samples. It was determined to be a false positive, with interference from terpenes naturally occurring in the fruit.
- Acetone was found in both treated and control samples for citrus, garlic, and

pistachios. This compound is naturally occurring in fruit and associated with ripening.

- P- Isopropyltoluene (p-Cymene) was found in both treated and control citrus samples. This compound is naturally occurring in fruit.
- Naphthlaene was found in treated and control citrus samples. It was determined to be a false positive due to the use of a method that was not as sensitive. It was not found when a more sensitive analytical method was used.

Dr. Stringfellow reviewed new information on compounds detected in the most recent sampling events:

- 2-hexanone was found only in grape samples, in both treated and control locations. This compound is not on the list of compounds associated with oilfield activities and not on the target list of COCs. Having been found in the control samples suggests it is naturally occurring.
- Acrolein was found in control grape samples (3 out of 24), and in all treated and control garlic samples (7 out of 7). This compound may be naturally occurring, and is a common combustions byproduct for oils. These results need to be further investigated.
- Several trace nutrients needed for plant growth were detected:
 - o Copper was found in almond, citrus, garlic, grape, and pistachio sample at concentration levels well within safe ranges. There were higher concentrations of copper found in control samples for both citrus and pistachio. There was a significant difference between control and treated citrus samples—control citrus samples were higher in copper than treated citrus samples.
 - o Molybdenum was detected in small number of samples for almonds, garlic, and pistachios; it was detected in both treated and control samples.
 - o Zinc was found in almond, garlic, and pistachios. For pistachios, the control samples were slightly higher in zinc.
 - o Nickel was found more frequently in control samples than treated for garlic.
- Barium was detected in almond, garlic, and pistachio samples. Results show the concentration of barium in the treated samples to be slightly higher than in the control samples. Barium is a natural element and is not an essential nutrient. It is associated with the oil and gas industry in that is it used in the construction of oil and gas wells and some agricultural wells.
- Strontium was detected in all crops sampled. Results show slightly higher concentrations in treated versus control samples for citrus, garlic, and grape samples. Strontium is a natural element associated with groundwater and is not an essential nutrient.

Dr. Stringfellow provided additional context for the results. Barium and strontium could be coming from many sources other than produced water, as barium and strontium are naturally occurring elements. Differences in treated and control crops could be reflective of natural differences and variation in soils in the different areas, or could be an effect of different agricultural practices, and/or could be a subtle effect of different source waters (not necessarily from produced water). He explained that the results for strontium and barium do not raise concern, but should be further investigated. He emphasized that concentrations for all compounds tested were within the accepted safe ranges for consumption. The concentrations found are thousands of times lower than risk-based comparison levels.

Next steps include:

- Complete a full second year of sampling and analysis (crops include almonds, citrus, garlic, grape, pistachio).
- Investigate soil conditions and other factors potentially influencing elemental concentrations.
 - o GIS analysis of soils and water chemistry using existing data
 - o Soil studies under consideration, if warranted.
- Continue investigation of oil field chemicals as potential organic contaminants in fruit
 - o New disclosure of information as available
- Start MOU Task implementation
 - o Task 1: Selection of Chemicals of Interest for Further Evaluation
 - Need to insure full evaluation is considered.
 - Needed for analysis of oil field disclosures.
 - o Task 2: Literature Review for Produced Water Reuse in Agriculture
 - Includes more complete evaluation of chemicals in crops.

Questions from the Panel

Mr. Ceppos asked for members of the Panel for comments and questions.

- A Panel member asked Dr. Stringfellow to clarify the standard deviation ranges (represented as green diamonds on the graphs) since several appeared to go below zero. Dr. Stringfellow clarified that the standard deviation calculations were just to zero and not below.
- What was the measure of strontium that was used—presumably not strontium 90, but stable strontium?
 - o Response: Presumably it is stable strontium. I can do more investigation to see where it came from.
- How does the list of 108 compounds compare to the list of potential disclosures

under AB 1328?

- o Mr. Rodgers indicated this would be addressed later in the meeting.

Risk and Exposure Assessment

Panel members discussed how the data will be used to address risk. Dr. Petersen suggested conducting an exposure assessment based on consumption estimates. She commented that there are existing data on consumption estimates for different crops. Per capita and per user estimates could be calculated for each commodity, and it is possible to look at body weight in comparison with toxicology information. The food consumption data is used by US EPA and the Federal Drug Administration. With regard to factoring in consumption patterns and multiple sources of the crops, one approach is to assume a worst case scenario that all fruit comes from these sources. She volunteered to compile existing consumption-related data to share with the Panel to begin to develop an exposure assessment. Dr. Stringfellow commented that he would welcome additional risk and exposure analysis to provide more context for the general public to better understand impacts at the personal level. Panel members agreed to this approach, with the understanding that in addition to incorporating existing sampling results on strontium and barium, for example, more data can be incorporated later. A Panel member commented that it is important to remember samples sizes are limited by costs, and some of the statistical analysis was performed on very small sample sizes in relation to the geographic scope. More data collection and larger sample sizes are important to draw robust conclusions.

Questions and Comments from the Public

Mr. Ceppos asked for members of the public for comments and questions.

- Bill Allayaud, EWG.
 - o Why was boron not tested for?

Response – Clay Rodgers: Boron does not usually become a human health issue, since it is more toxic to plants than to people—growers would not be able to use water that was high in boron since it would kill their plants.
 - o With regard to sample size, how would the public know that the sample size is sufficient? How is change in water source and usage over time being accounted for?

Response – Dr. Stringfellow: We are still working to address those issues. Regarding the latter question, we are trying to obtain land and water use history for the sites and we are receiving more information from water districts.

Response – Mr. Rodgers: We are sampling the fields that have been receiving produced water the longest.
 - o It seems like the question is not about a point in time measurement of maximum contaminant load levels, but about accumulation of

compounds in the soil over time.

- o Are chemicals that do not have regulatory maximum contaminant loads being addressed?

Response: Yes, we are looking at those chemicals.

- Deb Wirkman (by email).

- o How frequently is produced water being monitored for radioactive materials? Why is mercury not being monitored?

Response: The dischargers measure quarterly for mercury and radioactive materials.

- o Why was mercury not included on the list of analytes for the crops?

Response: Water Board staff and the Panel have addressed mercury in prior meetings. Water Board staff has done a lot of work on this issues, and mercury is not considered an important constituent at this time. Mercury is not a constituent commonly associated with oilfield activities. The regular water quality monitoring program does include mercury. Since the program was updated to include mercury, there have been no detections.

- Dave Ansolabehere commented on the Cawelo Water District system and sampling results.

- o Oilfield produced water comes into the Cawelo system at the main blending reservoir. All waters that are distributed out go through that reservoir. If you are taking surface water from Cawelo, you are getting blended produced water. Areas that might not receive that water were not included in the test sampling. Sample sites are only within areas that have received blended produced water. North Kern was not sampled because they have not used produced water for a very long time. Last year, none of the produced water was used for irrigation, which is why Cawelo Water District did not sample there.

- o Regarding Dr. Stringfellow's presentation, different soil types will accumulate metals differently. We have not discussed other irrigation waters that are used throughout Cawelo and the Valley. Cawelo has taken samples of other waters used for irrigation and compared those waters to produced water. Barium levels in produced waters in Cawelo Water District are one-fifth of drinking water standards. Barium and strontium levels in the Kern River are a little lower than produced water, but not by a lot. Both are well below drinking water standards. We are concerned about a potential decision to test soils based on concentrations that are well below maximum contaminant loads for drinking water. We are

concerned about increased standards for produced water sources, despite the fact that concentrations are below drinking water standards.

Response – Mr. Rodgers: The primary issue is to know if there is any problem with consuming fruit grown with produced water, which, for the most part, meets maximum contaminant levels for drinking water. We still need to know what is in the water, and if we determine that soils needs to be addressed to address the primary issue, we will pursue options to do so.

Follow up: We are concerned about the regulatory implications just because the water is coming from oil companies, rather than the Kern River, even though constituents are below drinking water standards.

Water Board Comments on Soils Information

Mr. Rodgers said that Water Board staff is examining the soil types associated with the sample site locations using publicly available Natural Resource Conservation Service data from the US Department of Agriculture. He showed a map of soil types and the concentrations of tested compounds at different sample locations. The Water Board is determining if the concentrations of certain compounds are associated or correlated with particular soil types. Over the next few weeks, Water Board staff will review the publicly available data and put together a short memorandum to present to the Panel for input and comments. Dr. Stringfellow commented that he is looking into other biogeochemical factors to make sure there are not clear other factors that could explain the results.

Questions and Comments from the Panel

- What does naturally occurring mean in this context?
 - o Response: Soils form over geologic time periods, and changes usually occur over very long periods of time. Depending on the composition of the soil, constituents are more or less likely to be able to accumulate easily.

Citrus Report Update

Dr. Stringfellow gave an update on the citrus report which will be completed soon. He is working on incorporating comments received to date from the Water Board and Panel members on the draft analysis report. Suggestions included:

- Add more explanatory text to provide context
- Add a detailed background section
- Provide further explanation of mass spectra results
- Discuss limitations, detection levels, etc.
- Add details on sampling procedures, site background, etc.
- Add appendix including all analytical results

Dr. Stringfellow highlighted several edits and revisions he has made, including conducting a nonparametric analysis in addition to normal statistical analysis. Nonparametric analysis is a different statistical approach and does not rely on normal distributions of data. So far the results have been the same from both parametric and nonparametric analyses. The report will also discuss limitations with regard to detection and reporting limits. Dr. Stringfellow said his team did an evaluation of the data gaps and examined analytical measurements in context of what is known about oilfield constituents. The report includes a list of compounds that were included in the analysis, and those that were not with notes about why a compound was not included.

Questions from the Panel

- Will the report include an exposure assessment?
 - o Response: It does not include exposure assessment. This report was first imagined as just a report on the citrus sampling, but has been expanded to include and address several issues that need to be included in the final white paper.

Questions from the Public

- With regard to the list of chemicals tested for, how were trade secret chemicals addressed, if at all?
 - o Response: AB 1328 is hopefully going to help us resolve this issue.
 - o Panel member comment: Previous analysis of compounds released under similar Water Board orders were limited due to the fact that not all compounds had Chemical Abstracts Service Registry Numbers (CASRNs). AB 1328 may or may not be able to address all of the issues.

Update on Implementation of AB 1328

The Water Board now has the regulatory authority to obtain trade secret information. Mr. Rodgers said the Water Board sent out orders in later December mandating reporting on all the chemicals that have the potential to end up in produced water. The deadline for responses was January 12. The orders require contact information for chemical suppliers and companies be shared with the Water Board in the case of trade secret information. The Water Board is in conversation with suppliers to obtain the information, ideally in a format that can be publicly shared for full transparency. If the information truly is a trade secret, the Water Board will be legally bound to keep that confidential.

Full information on chemicals is needed for the Food Safety project literature review and toxicological assessment. CASRNs are required to be included as part of the information. The Water Board has made it clear that if the information is not made available within the time frame of citrus sampling, then the project will go through another round of sampling to include all the constituents. The Water Board expects responses to information requests by early February. By the end of February, the Water Board will determine if any modification of analyses is appropriate. Dr. Stringfellow commented that he is archiving samples for future analysis if necessary.

Questions from the Panel

- What was the time period in the orders—i.e. how far back will the information on chemicals go?
 - o Response: The letters do not specify a time period, but the intention is to obtain information about the past two years. If products change, we will also be asking for that information. The orders do not ask for a list of all compounds that were ever used. Water Board staff will clarify with operators the period of use to which the chemical disclosure request refers.
- Will CASRNs be required to be included with future compounds? This information is critical.
 - o Response: This is something the Water Board will consider.

General Public Comment

Mr. Ceppos asked for general public comment from members of the audience. Water Board staff read aloud comments received by email.

- Deb Wirkman (by email). I would like to know about radioactive compounds other than naturally occurring radioactive materials (NORMs) that are used as radiotracers in oilfield operations that may be present in the recycled produced water being used for agriculture. I want to know whether these compounds are being studied by the Panel.
 - o Response: We are considering these issues. Hopefully information to be released under the AB 1328 orders will address any radioactive tracers being used. We will be evaluating information as it is shared with us and will continue to investigate.
 - o Follow up comment from audience: There is a study from Pennsylvania that showed there was accumulation of radioactive materials in soils. I will send to the Water Board for distribution to the Panel.
- Chris Valdez (by email). On behalf of the California Fresh Fruit Association, I write to express the following comment: At present, the link between a known hazard and the likelihood of adulteration does not appear to have been established as evidenced, thus far, from the series of uptake studies (and literature acknowledged by the Panel) that have been conducted. So, we encourage the panel to move forward and produce the white paper answering the primary food safety questions. If there exists an interest and further reason to conduct research in other areas, which fall outside of the direct scope of the quality of produced water and its effect on the safety of food irrigated with this water, then such interest should be clearly framed for its nexus to the discharge permit, or more specifically, its use as a source of water for irrigating crops, and the role of the Regional Board to approve (or not), in its permit conditions, irrigation use as an appropriate end use for this water. If the research interest is beyond any causal framework for the food safety question that has been

opened by the Panel, then please do not allow interests to delay the work of this Panel from moving forward to produce its opinion over whether produced water creates a food safety concern to human health in the actual food that's consumed.

- Bill Allayaud, EWG. Thanks to Panel members and staff for allowing comment throughout the meeting.

Closing

Mr. Longley thanked Panel members for their participation and patience in comprehensively addressing the issues. He commented that AB 1328 is great progress and moves this effort forward, and the white paper is a critical component that needs to be scientifically robust. Mr. Ceppos thanked participants for attending and adjourned the meeting at 2:30 pm.