



# Science Update

FSP November 07, 2017  
(Revised & Corrected Nov. 8)

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**EARTH &  
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# Agenda Items



- Draft analysis report from citrus sampling in March/April 2017
- Sampling activities since April

# Draft Analysis Report



- Preliminary results on citrus sampling results presented to Food Safety Panel (FSP) at public meeting June 28<sup>th</sup>
- Draft technical report on citrus samples sent to Food Safety Panel on September 16<sup>th</sup>
- Discussed draft report at FSP working meeting September 20<sup>th</sup>
- FSP delivered comments and suggestions on draft report in October
- Draft technical report being revised to address comments

# Draft Analysis Report (Summary)



- All conclusions in draft report were same as those of public presentation on June 20<sup>th</sup>
- Detection of 1,2,4-trimethyl benzene was confirmed as a “false positive”
  - Probably limonene, naturally occurring flavonoid
- Citrus from produced water irrigated and control areas were not different for elements or compounds measured
- Except strontium, which was slightly higher in the fruit from areas irrigated with produced water
  - In all cases, the concentrations of strontium were within normal limits by Agency for Toxic Substances & Disease Registry (2004)

# Strontium

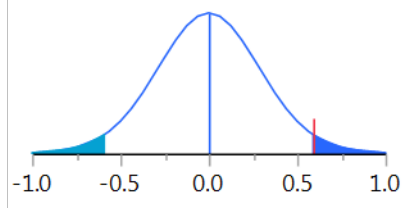
- Oneway Analysis
- Strontium, Total  
– mg/kg

## t Test

Treated-Control

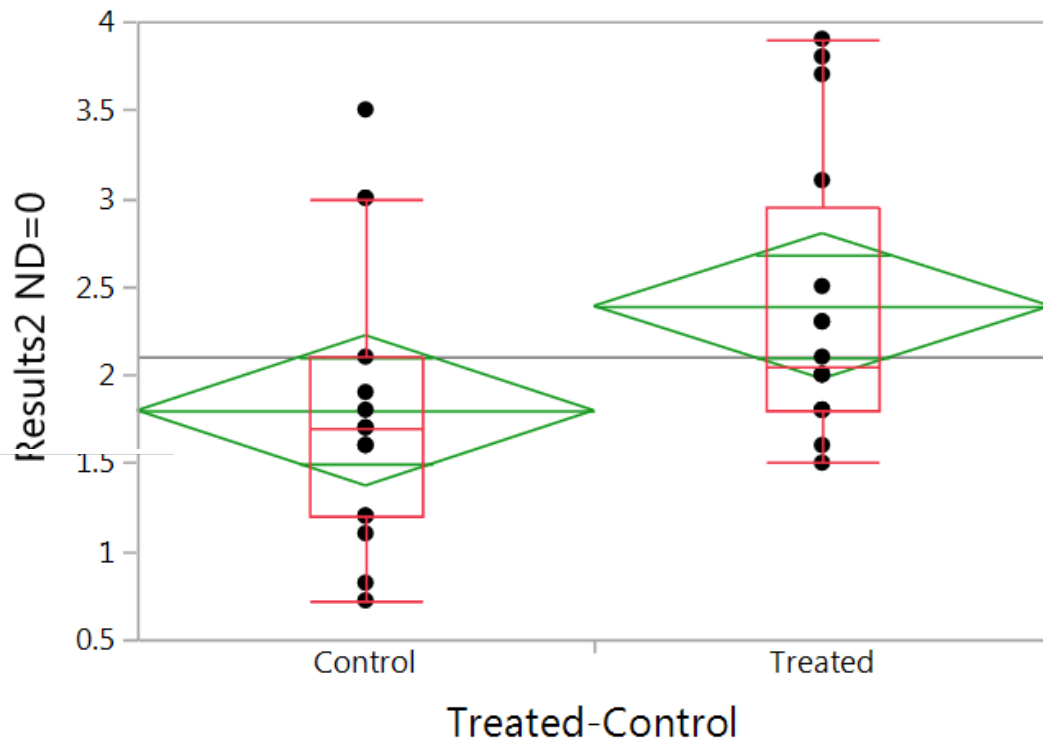
Assuming equal variances

Difference	0.5915	t Ratio	2.042781
Std Err Dif	0.2896	DF	29
Upper CL Dif	1.1837	Prob >  t	0.0503
Lower CL Dif	-0.00071	Prob > t	0.0251*
Confidence	0.95	Prob < t	0.9749



## Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Treated-Control	1	2.708688	2.70869	4.1730	0.0503
Error	29	18.824060	0.64911		
C. Total	30	21.532748			



- May reflect differences in soil strontium concentrations?

# FSP & CVRWQCB Comments (Briefly)



- Expand Introduction, Results & Discussion
  - Add more explanatory text
  - Add detailed background section
    - Project goals & objectives, selection of analytes, etc.
  - Further explain mass spectra results
  - Discuss limitations, detection levels, etc.
- Specific comments on Methods section
  - Add details on sampling procedures, site background, statistical methods, add CASRN, etc.
- Add appendix including all analytical results



# **SAMPLING & ANALYSIS ACTIVITIES**

# Sampling & Analysis



Date Sampled	Water District	Type of sample	Analytical Results Received
2017-07-18	Cawelo	Garlic	2017-09-19
2017-08-08	Cawelo	Garlic, Grape, Almond	2017-10-24
2017-08-09	Cawelo	Grape, Almond	2017-10-24
2017-08-10	Cawelo	Grape, Almond	2017-10-24
2017-09-06	Cawelo	Pistachio	Not yet received
2017-09-07	Cawelo	Pistachio	Not yet received

- Processing, compiling, coding, & analyzing results received in September
- Started processing, compiling, & coding results received in October

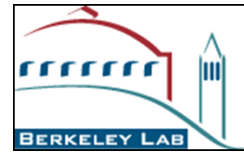


# List of Organic Analytes Requested



- 1,2,4-Trimethylbenzene
- Acetone
- Benzene
- Ethylbenzene
- Methanol
- Toluene
- o-, m-, and p-Xylene
- 2-Methylnaphthalene
- Acenaphthene
- Acenaphthylene
- Anthracene
- Benzo (a) anthracene
- Benzo (a) pyrene
- Benzo (b) fluoranthene
- Benzo (g,h,i) perylene
- Benzo (k) fluoranthene
- Chrysene
- Dibenzo (a,h) anthracene
- Fluoranthene
- Fluorene
- Indeno (1,2,3-cd) pyrene
- Naphthalene
- Phenanthrene
- Pyrene
- Carbazole
- Pyridine

# List of Inorganic Analytes Requested



- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium (total)
- Cobalt
- Copper
- Lead
- Lithium
- Molybdenum
- Nickel
- Selenium
- Silver
- Strontium
- Thallium
- Vanadium
- Zinc



# Contact information

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# References



- ATSDR 2007, Toxicological Profile for Barium & Barium Compounds
- ATSDR 2004, Toxicological Profile for Copper
- ATSDR 2004, Toxicological Profile for Strontium
- ATSDR 1994, Toxicological Profile for Acetone
- OEHHA 2000, Proposed Action Levels for sec-Butylbenzene and tert-Butylbenzene
- NIH PubChem Database 2017, p-Cymene (p-Isopropyltoluene)
- NIH PubChem Database 2017, D-Limonene
- Haminiuk, C.W.I. et al. 2012, Phenolic compounds in fruits – an overview, *Intern. J. Food Sci. and Technol.*, 47, 2023–2044
  
- NIH = National Institute of Health
- OEEHA = Office of Environmental Health Hazard Assessment (California Department of Health Services)
- ATSDR = Agency for Toxic Substances and Disease Registry (U.S. Public Health Service)