



Report on

## 2011 Bottled Water Quality Study

Prepared by

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Department of Agricultural Commissioner/Weights and Measures  
Los Angeles County

November 29, 2011

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## Executive Summary

### 2011 Bottled Water Quality Study

On July 26, 2011, the Los Angeles County Board of Supervisors instructed the Environmental Toxicology Bureau of the Department of Agricultural Commissioner/Weights and Measures to conduct a study of bottled water in the marketplace throughout Los Angeles County to test for presence of bacteria, general physical properties (color, odor, turbidity), total dissolved solids, trace metals (aluminum, arsenic, barium, cadmium, chromium, chromium+6, copper, iron, lead, manganese, mercury, selenium, silver, and zinc), total trihalomethanes, volatile organic chemicals and pesticides and to report back to the Board in 60 days.

This study is a follow-up to a 1999 Bottled Water Quality Study for which a report was issued on February 28, 2000. In this 2011 study, a total of 120 samples representing 60 different brands of bottled water were purchased and tested. Two samples of each representative brand were acquired, each from different locations within the county.

#### **Heterotrophic Plate Count Bacteria**

Of the 120 samples, eighty percent (96 individual bottles) were found to contain no detectable heterotrophic plate count (HPC) bacteria. Water samples from the 24 other bottles was found to contain bacteria levels in concentrations ranging from 2 to 738 colony forming units per milliliter of sample (cfu/ml).

- **State and Federal governments do not regulate HPC bacteria in bottled water.**
  - **No regulatory standards set acceptable levels of HPC bacteria in bottled water.**
- While the California Health and Safety Code requires bottled water to be subjected to germicidal treatment, the requirement is waived for bottled waters with sources outside the United States. Therefore, bottled water sold in stores may or may not be disinfected, depending upon the country of origin.

#### **Coliform Bacteria**

None of the 120 samples were found to contain Coliform bacteria. Coliform bacteria are not likely to cause illness. However, their presence in drinking water indicates that disease-causing organisms (pathogens) may be in the water.

#### **Total Dissolved Solids**

None of the 120 bottles tested were found to exceed State water quality standards, established at 500 parts per million (ppm). The amount of total dissolved solids present in bottled water is proportional to the concentration of its mineral ion content. The highest concentration of TDS found was 335mg/L.

### **General Physical Properties**

None of the 120 samples were found to have detectable levels of color or odor.

Twenty (20) samples, representing 16.7% of all bottles analyzed, had detectable turbidity, but each was significantly below the State limit of five (5) nephelometric turbidity units (NTU). The most turbid sample produced a result of 0.26 NTU.

### **Total Trihalomethanes**

Total Trihalomethanes (TTHM) are by-products of the process of disinfecting water with chlorine and may or may not be present in bottled water. If water used for bottling originates from a chlorinated source, or if the bottler employs chlorine to disinfect the water before bottling, the resulting bottled water may potentially contain total trihalomethanes.

- The **State standard** regarding the Maximum Contaminant Level (MCL) for TTHM in bottled water is **10 parts per billion (ppb)**.
- The **Federal standard** for TTHM in bottled water is **80 parts per billion (ppb)**

Thirteen (13) of the 120 bottled water samples tested were found to contain limited amounts of TTHM, with concentrations ranging from 0.62 ppb to 20.5 ppb.

- Two (2) samples were found to exceed the State MCL with concentrations of 13.9 and 20.5 ppb, respectively.
- No samples were found to exceed the Federal limit of 80 ppb.

### **Trace Metals**

All samples were tested for presence of 14 different metals, including aluminum, arsenic, barium, cadmium, chromium, chromium+6, copper, iron, lead, manganese, mercury, selenium, silver and zinc.

No samples were found to contain any metals exceeding the respective MCL.

### **Volatile Organic Chemicals / Pesticides**

None of the 120 bottled water samples were found to contain detectable volatile organic chemicals or pesticides.

## **Board Directive**

On July 26, 2011, on a motion by Supervisor Michael Antonovich and unanimously passed by the Los Angeles County Board of Supervisors, the Board instructed the Environmental Toxicology Bureau of the Department of Agricultural Commissioner/Weights and Measures to test bottled water quality throughout Los Angeles County for various chemicals and contaminants and report back to the board within 60 days.

## **Marketplace Sampling of Bottled Waters**

**Sixty (60) different brands** of bottled water were sampled, with two samples of each brand purchased and tested. A complete listing of brands and individual sample test results is attached to this report as **Attachment A**.

## **Sampling Protocols**

Bottled water was purchased during the period from August 1, 2011, through September 30, 2011, from retail outlets throughout Los Angeles County. Samples of any single brand were purchased from different locations at different times. All samples were kept in cool storage immediately after purchased and until they were tested. Analyses for Bacteria, Heterotrophic Plate Count (HPC), and Chromium+6 were performed within 24 hours of collection. Two representative samples from each brand were collected for the testing. All samples collected were pure bottled drinking water, containing no flavorings, colorings, or any other added substances.

## Testing Procedures

### Total Coliform and HPC Bacteria

The analytical method used to test for Total Coliform Bacteria was IDEXX Colilert-18. The method used for Heterotrophic Plate Count (HPC) bacterium was IDEXX SimPlate. **There is no established Maximum Contaminant Level (MCL) for HPC bacteria.** HPC bacteria do not necessarily pose health risks to humans, but may be employed as an indicator of the overall sanitation conditions existing during the bottling process. Presence of high numbers of non-coliform HPC bacteria may inhibit the detection of coliform bacteria during testing.

### General Physical Properties (Color, Odor and Turbidity)

The method used to test for Color is Standard Method 2120B, which involves a visual comparison of a water sample with de-ionized filtered water. Color in water typically indicates a presence of natural metallic ions, present in the water as suspended matter. **The State-established Maximum Contaminant Level (MCL) for Color is 15.**

The method used to test for Odor is Standard Method 2150B, which employs a two-fold dilution method.

**The State-established MCL for Odor is Threshold Odor No. 3.**

The method used to test for Turbidity is Standard Method 2130B, which measures the cloudiness of water resulting from suspended solids present in the water. Turbidity in water may cause or allow for bacteria growth. A contaminant, such as a virus or bacteria, can become attached to the suspended solid and can interfere with water disinfection processes (chlorine or UV sterilization), as the particles can act as shields for microorganisms.

**The State-established MCL for Turbidity is 5 NTU (Nephelometric Turbidity Units).**

### Total Dissolved Solids (TDS)

The method use to test for Total Dissolved Solids (TDS) is Standard Method 2540C, which measures the combined content of inorganic and organic substances in the water. Glass fiber filter discs are used to sieve out substances less than two micrometers in diameter. TDS is not generally considered a primary pollutant, but is used as an indication of the aesthetic character of the water.

**The State MCL for Total Dissolved Solids is 500 parts per million (ppm).**

## Metals

Metals for which analyses were performed in this study include aluminum, arsenic, barium, cadmium, chromium, chromium+6, copper, iron, lead, manganese, mercury, selenium, silver, and zinc.

- The method used to test for Chromium+6 was EPA 218.6
- The method used to test for Mercury was EPA 245.1
- The method used to test for all other metals was EPA 200.8

Metals are detected and reported in terms of parts per billion (ppb)

**State MCLs applicable to the individual Metals range from 2 ppb to 5,000 ppb.**

## Total Trihalomethanes (TTHM)

The method used to test for Total Trihalomethanes was EPA 524.

Total Trihalomethanes (TTHM) levels include the sum of measurements of chloroform, bromodichloromethane, chlorodibromomethane, and bromoform. Trihalomethanes are volatile organic chemicals that may be created when water is disinfected with chlorine. If bottled water originates from a chlorinated source, or the bottled water was disinfected by chlorine before bottling, the resulting bottled water may potentially be contaminated with Trihalomethanes.

**The State-established MCL for TTHM is 10 ppb**

**The Federal MCL for TTHM is 80 ppb.**

## Volatile Organic Chemicals (VOC)

The method used to test for regulated Volatile Organic Chemicals is EPA 524. Regulated Volatile Organic Chemicals consist of 22 substances, including TTHM.

**State-established MCLs for the individual substances range from 2 to 10,000 ppb.**

## Pesticides

The method used to test for Organohalide Pesticides is EPA 505.

Organohalide Pesticides consisted of 11 chemical substances that are nonvolatile synthetic organic chemicals.

**State-established MCLs for the individual substances range from 0.2 to 50 ppb.**

## Results

All 120 bottled water samples (representing 60 brands) collected for this study were tested for Total Coliform, E-coli, Heterotrophic Plate Count Bacteria, General Physical Properties (color, odor, turbidity), Total Dissolved Solids, Metals (including Chromium+6 and Mercury), Total Trihalomethanes, Volatile Organic Chemicals and Pesticides.

**Attachment A** contains specific, tabulated results for each sample tested.

The Environmental Toxicology Laboratory is responsible for producing test results by using State- or EPA-approved methods. The Laboratory established an automatic alert system, along with immediate direct notification, when any test result was found to be above the regulatory limits. The Los Angeles County Department of Public Health, Environmental Health, Drinking Water Division was the direct contact and the Food and Drug Branch (FDB) of the California Department of Public Health is the regulatory agency with enforcement authority for bottled water. The Los Angeles County Department of Public Health, Environmental Health Division, Drinking Water Program, notified the FDB of the Environmental Toxicology Bureau bottled water study results and provided the FDB with a copy of the bottled water report. The findings in the report will be reviewed by the FDB to determine the appropriate actions to be taken.

### Total Coliform and HPC Bacteria

**No samples** were found to have **presence of Total Coliform or E-Coli Bacteria**.

**Ninety six (96) samples (80%)** were found to contain **no detectable HPC bacteria**.

**Twenty four (24) samples** were found to have **HPC bacteria levels at concentrations ranging from 2 to 738 colony forming units per milliliter of sample (cfu/ml)**.

**There is no established Maximum Contaminant Level (MCL) for HPC bacteria.** HPC bacteria do not necessarily pose health risks to humans, but may be employed as an indicator of the overall sanitation conditions existing during the bottling process. Presence of high numbers of non-coliform HPC bacteria may inhibit the detection of coliform bacteria during testing.

Table 1 displays analyses results for HPC bacteria found among all 120 bottles tested. Table 2 displays the highest counts of HPC bacteria found according to brand.

**Table 1: Overall Results.**

Contaminant	Detection Limit cfu/ml	Samples with Detectable Level	% with Detectable Level	Remark
HPC bacteria	2	24	20%	No MCL



**Table 2: Highest HPC Bacteria found by Brand**

Brand Name	Bacteria Count (cfu/ml)	Remark
Nestle-1	738	No MCL
Essence-2	623	No MCL
Essence-1	555	No MCL
Nika-2	392	No MCL
Jana-1	311	No MCL

**HPC has no health effects;** it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is. HPC measures a range of bacteria that are naturally present in the environment.

**NOTE: No Maximum Contaminant Level is established for HPC Bacteria. Hence, no samples exceeded any regulatory standard.**

**General Physical Properties (Color, Odor and Turbidity)**

**No samples were found to have any detectable Color or Odor.**

20 samples (16.7%) were found to have detectable presence of Turbidity at levels equal to or higher than the Detection Limit of 0.1 nephelometric turbidity units (NTU).

**All (120) samples were found to be significantly below the State limit of 5 NTU.**

The most turbid sample was found to have Turbidity at a level of 0.26 NTU.

Table 3 displays a summary of detectable Turbidity found among all 120 bottles tested. Table 4 displays the highest Turbidity units measured according to brand.

**Table 3: Overall Results Re: Turbidity.**

Contaminant	Detection Limit NTU	Samples with Detectable Levels	% with Detectable Level	Remark
Turbidity	0.1	20	16.7%	None above MCL of 5 NTU

**Table 4: Highest Turbidity Levels According to Brand**

Brand Name	Turbidity Unit (NTU)	Remark
Essence-2	0.26	MCL = 5 NTU
Jana-1	0.17	MCL = 5 NTU
Deja Blue-2	0.17	MCL = 5 NTU
Voss-1	0.15	MCL = 5 NTU
Enhanced-1	0.15	MCL = 5 NTU
Nika-2	0.15	MCL = 5 NTU
Voss-2	0.15	MCL = 5 NTU

**NOTE:** No sample was found to have Turbidity levels exceeding the Maximum Contaminant Level (MCL) of 5 NTU.

### **Total Dissolved Solids (TDS)**

**Thirteen (13) samples (10.8%)** were found to have **no detectable TDS**.

**One hundred seven (107) samples (89.2%)** had **detectable presence of TDS** in the water (at a level equal to or higher than the Detection Limit of 1 ppm).

**The State MCL** for Total Dissolved Solids in bottled drinking water is **500 ppm**.

Table 5 displays results reflecting detectable levels of TDS found among 120 samples. Table 6 displays results reflecting highest TDS concentrations according to brand.

**Table 5: Overall Results Re: Total Dissolved Solids.**

Contaminant	Detection Limit ppm	Samples with Detectable Level	% with Detectable Level	Remark
Total Dissolved Solids	1.0	107	89.2%	None above MCL of 500 ppm

**Table 6: Highest TDS Levels According to Brand**

<b>Brand Name</b>	<b>Total Dissolved Solids (ppm)</b>	<b>Remark</b>
Evian-1	335	MCL = 500 ppm
Pure American-1	305	MCL = 500 ppm
Evian-2	302	MCL = 500 ppm
Jana-2	265	MCL = 500 ppm
Arrowhead-3	262	MCL = 500 ppm

**NOTE: No sample was found to have Total Dissolved Solids exceeding the Maximum Contaminant Level (MCL) of 500 ppm.**

## **Metals**

All 120 bottled water samples were tested for presence of any of 14 different Metals, including aluminum, arsenic, barium, cadmium, chromium, chromium+6, copper, iron, lead, manganese, mercury, selenium, silver, and zinc.

**No samples were found to have any Metals above the respective State MCL.**

**No samples were found to have detectable concentrations of Cadmium, Selenium, Silver or Mercury.**

**Two (2) bottled water samples** were found to have **detectable levels of Aluminum** at respective concentrations of 63.8 ppb and 67.7 ppb, however each concentration was **significantly below the State-established MCL of 200 ppb.**

**Two (2) bottled water samples** were found to have **detectable levels of Zinc** at respective concentrations of 292 ppb and 383 ppb, however each concentration was **significantly below the State-established MCL of 5000 ppb.**

**Analyses for other metals** (Arsenic, Barium, Chromium, Chromium+6, Copper, Iron, Lead and Manganese) **resulted in some findings of limited detectable levels,** however, **each was significantly below the respective State MCL.**

Summaries are displayed in Tables 7 through 15, below.

**Table 7: Overall Results Re: Metals**

Contaminant	Detection Limit (ppb)	Samples with Detectable Levels	% with Detectable Level	Remarks
<b>Arsenic</b>	1	14	11.7%	<b>None above MCL of 10 ppb</b>
<b>Barium</b>	50	7	5.8%	<b>None above MCL of 2000 ppb</b>
<b>Chromium</b>	2.5	4	3.3%	<b>None above MCL of 100 ppb</b>
<b>Chromium+6</b>	0.25	26	21.7%	<b>-- No established MCL --</b>
<b>Copper</b>	10	3	2.5%	<b>None above MCL of 1000 ppb</b>
<b>Iron</b>	50	8	6.7%	<b>None above MCL of 300 ppb</b>
<b>Lead</b>	1	3	2.5%	<b>None above MCL of 5 ppb</b>
<b>Manganese</b>	20	3	2.5%	<b>None above MCL of 50 ppb</b>

**Table 8: Highest Arsenic Levels According to Brand**

Brand Name	Arsenic (ppb)	Remark
Trader Joe water-2	3.48	MCL = 10 ppb
Volvic-2	3.27	MCL = 10 ppb
Volvic-1	3.14	MCL = 10 ppb
Crystal Geyser-2	2.88	MCL = 10 ppb
Gelsons-2	2.56	MCL = 10 ppb

**NOTE: No sample was found to have Arsenic concentrations exceeding the Maximum Contaminant Level (MCL) of 10 ppb.**

**Table 9: Highest Barium Levels According to Brand**

Brand Name	Barium (ppb)	Remark
Evian-2	118	MCL = 2000 ppb
Evian-1	116	MCL = 2000 ppb
Acqua Panna-2	76.7	MCL = 2000 ppb
Acqua Panna-1	76.7	MCL = 2000 ppb
Pure American-1	62.9	MCL = 2000 ppb

**NOTE: No sample was found to have Barium concentrations exceeding the Maximum Contaminant Level (MCL) of 2000 ppb.**

**Table 10: Highest Chromium Levels According to Brand**

Brand Name	Chromium (ppb)	Remark
Mountain Valley-2	3.80	MCL = 100 ppb
Mountain Valley-1	2.89	MCL = 100 ppb
Pure American-1	2.80	MCL = 100 ppb
Evian-2	2.62	MCL = 100 ppb

**NOTE: No sample was found to have Chromium concentrations exceeding Maximum Contaminant Level (MCL) of 100 ppb.**

**Table 11: Highest Chromium+6 Levels According to Brand**

Brand Name	Chromium+6 (ppb)	Remark
Mountain Valley-2	2.35	No established MCL
Mountain Valley-1	1.68	No established MCL
Hawaiian Springs-1	1.26	No established MCL
Hawaiian Springs-2	1.23	No established MCL
Gelsons-1	1.05	No established MCL

**NOTE: No Maximum Contaminant Level has been established for Chromium +6. Hence, none exceeded an established standard.**

**Table 12: Highest Copper found by Brand**

Brand Name	Copper (ppb)	Remark
Niagra-1	108	MCL = 1000 ppb
Valaria-1	84.9	MCL = 1000 ppb
Gelsons-1	22	MCL = 1000 ppb

**NOTE: No sample was found to have Copper concentrations exceeding the Maximum Contaminant Level (MCL) of 1000 ppb.**

**Table 13: Highest Iron Levels According to Brand**

Brand Name	Iron (ppb)	Remark
Essentia-2	209	MCL = 300 ppb
Crystal Lake-2	209	MCL = 300 ppb
Function Water-1	152	MCL = 300 ppb
Roxane-1	86	MCL = 300 ppb
Voss-2	85.1	MCL = 300 ppb

**NOTE: No sample was found to have Iron concentrations exceeding the Maximum Contaminant Level (MCL) of 300 ppb.**

**Table 14: Highest Lead Levels According to Brand**

Brand Name	Lead (ppm)	Remark
Essentia-2	4.03	MCL = 5 ppb
Stater Bros.-1	1.73	MCL = 5 ppb
Nestle-2	1.13	MCL = 5 ppb

**NOTE: No sample was found to have Lead concentrations exceeding the Maximum Contaminant Level (MCL) of 5 ppb.**

**Table 15: Highest Manganese Levels According to Brand**

Brand Name	Manganese (ppb)	Remark
Dasani-1	46.1	MCL = 50 ppb
Voss-2	39.4	MCL = 50 ppb
Voss-1	31.8	MCL = 50 ppb

**NOTE: No sample was found to have Manganese concentrations exceeding Maximum Contaminant Level (MCL) of 50 ppb.**

## **Total Trihalomethanes (TTHM)**

**107 samples (89.2%) were found to have no detectable Total Trihalomethanes.**

**Thirteen (13) samples (10.8%) were found to have detectable presence of TTHM** (at levels equal to or higher than the applicable Detection Limit of 0.5 ppb).

The **State MCL** for Total Trihalomethanes in bottled drinking water is **10 ppb**.

**Two (2) samples were found to slightly exceed the State MCL of 10 ppb for TTHM** with respective concentrations of 13.9 and 20.5 ppb, however, in each example, **levels were significantly below the federal limit of 80 ppb.**

Table 16 displays results reflecting detectable TTHM found among 120 bottles tested. Table 17 displays results reflecting highest TTHM concentrations according to brand.

**Table 16: Overall Results Re: Total Trihalomethanes**

<b>Contaminant</b>	<b>Detection Limit ppb</b>	<b>Samples with Detection Level</b>	<b>% with Detectable Level</b>	<b>Remarks</b>
Total Trihalomethanes	0.5	13	10.8%	Two (2) above MCL of 10 ppb

**Table 17: Highest Total Trihalomethane Levels According to Brand**

<b>Brand Name</b>	<b>Total Trihalomethanes (ppb)</b>	<b>Remarks</b>
Function Water-1	20.5	<b>Exceeded MCL of 10 ppb</b>
Function Water-2	13.9	<b>Exceeded MCL of 10 ppb</b>
Real Water-1	5.26	MCL = 10 ppb
Essence-2	4.29	MCL = 10 ppb
Essence-1	3.87	MCL = 10 ppb

**NOTE: Two samples were found to have TTHM concentrations exceeding the Maximum contaminant Level (MCL) of 10 ppb.**

## **Volatile Organic Chemicals (VOC) and Pesticides**

**None of the bottled water samples were found to have detectable levels of Volatile Organic Chemicals or Pesticides.**

## Discussion

All 120 bottled water samples (representing 60 brands) collected for this study were tested for Total Coliform, E-coli, Heterotrophic Plate Count Bacteria, General Physical Properties (color, odor, turbidity), Total Dissolved Solids, Metals (including Chromium+6 and Mercury), Total Trihalomethanes, Volatile Organic Chemicals and Pesticides.

A listing of brands and individual test results are displayed in **Attachment A**.

**Total Coliform and E-coli bacteria**, an indicator of water quality, **were not found to be detectable in any of the 120 samples of bottled water tested in this study.** Heterotrophic Plate Count (HPC) bacteria include any bacteria that are able to multiply and form colonies in an organic-rich environment. Such may or may not be pathogenic. No correlation has been established between the presence of HPC bacteria and illness. HPC bacteria in bottled water are not regulated by state government.

**No standards exist to define an acceptable level of HPC bacteria in bottled water.** The study found 24 of the 120 bottled water samples tested (20%) to have some detectable level(s) of HPC bacteria count.

**No samples were found to have detectable Color or Odor.**

**Twenty (20) samples (16.7%) were found to have detectable Total Turbidity. All were significantly below State limit of 5 nephelometric turbidity units (NTU).**

The amount of mineral ions present in water is proportional to the concentration of its Total Dissolved Solids (TDS). Total Dissolved Solids in bottled drinking water may not exceed 500 ppm according to State standards.

**No samples exceeded the MCL of 500 ppm for Total Dissolved Solids.**

**No individual Metal was detected exceeding the respective State MCL.**

All samples were tested for presence of 14 different metals, including aluminum, arsenic, barium, cadmium, chromium, chromium+6, copper, iron, lead, manganese, mercury, selenium, silver and zinc. Among these, cadmium, selenium, silver and mercury were not detected in any sample. Of the 120 bottled water samples tested, the following were found to have detectable levels of the respective metal:

- Two (2) samples: Aluminum
- Fourteen (14) samples: Arsenic
- Seven (7) samples: Barium
- Four (4) samples: Chromium
- Twenty six (26) samples: Chromium+6 **Note: No MCL Established re: Cr+6**
- Three (3) samples: Copper
- Eight (8) samples: Iron,
- Three (3) samples: Lead
- Three (3) samples: Manganese
- Two (2) samples: Zinc

**All Metals found in concentrations significantly below the respective State MCLs.**



Total Trihalomethanes are by-products of the process of disinfecting water with chlorine. Their presence in domestic tap water that uses chlorine for disinfection is expected. They may or may not be present in bottled water. If the water used for bottling comes from a chlorinated source, or if the water bottler uses chlorine to disinfect the water before bottling, then the bottled water may potentially contain Trihalomethanes. The State MCL for TTHM in bottled water is 10 ppb.

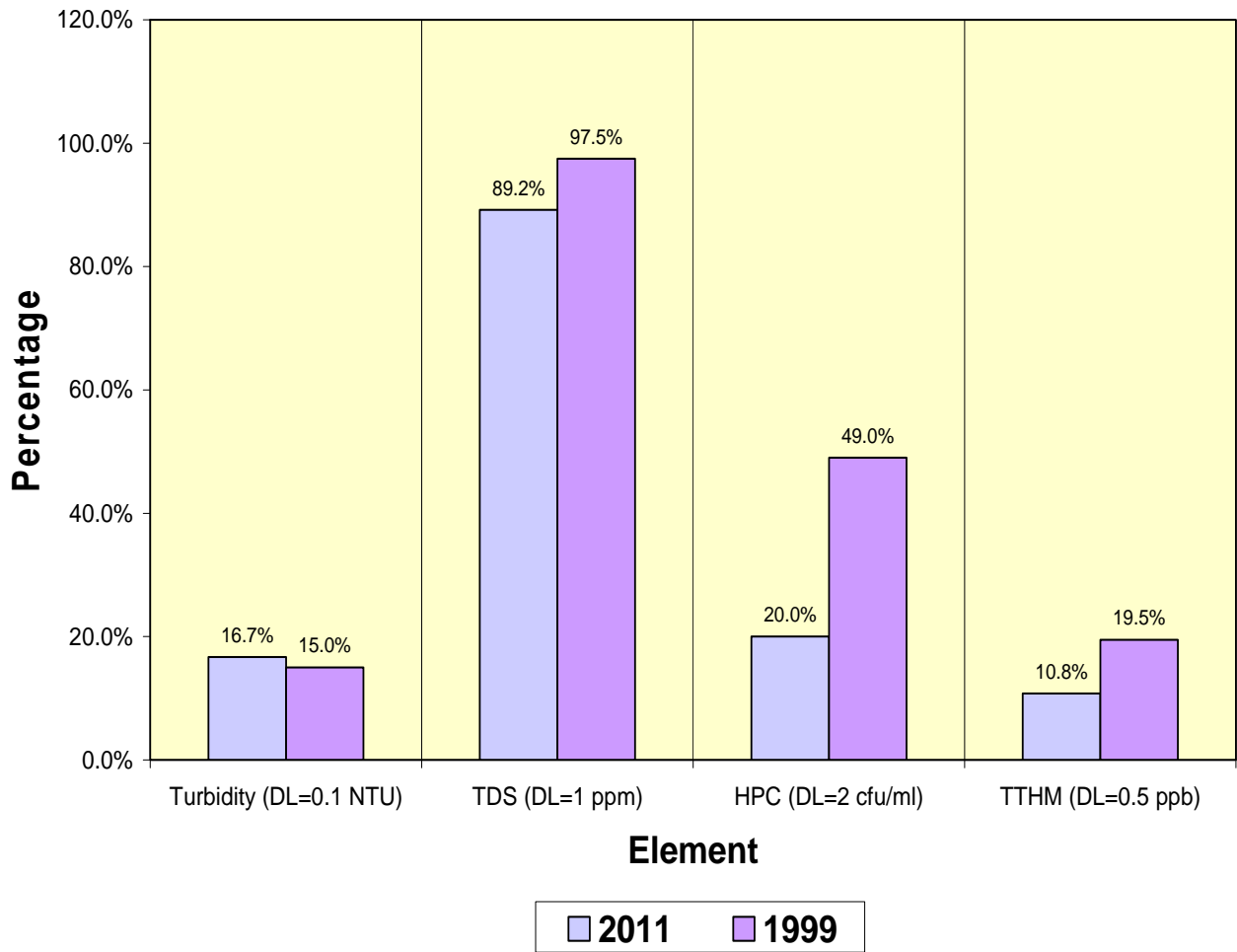
- **Thirteen (13) samples contained detectable amounts of TTHM.**
- **Two (2) samples were found with TTHM levels exceeding State MCL of 10 ppb** with concentrations of 13.9 and 20.5 ppb, respectively, however each sample was **significantly below the federal MCL of 80 ppb for Total Trihalomethanes.**

**No samples were found to have detectable levels of Volatile Organic Chemicals or Pesticides.**

The Environmental Toxicology Laboratory established an automatic email alert system, along with immediate direct notification, when any test result was found to be above the regulatory limits. The Los Angeles County Department of Public Health, Environmental Health, Drinking Water Division was the direct contact and the Food and Drug Branch (FDB) of the California Department of Public Health is the regulatory agency with enforcement authority for bottled water. The Los Angeles County Department of Public Health, Environmental Health Division, Drinking Water Program, notified the FDB of the Environmental Toxicology Bureau bottled water study results and provided the FDB with a copy of the bottled water report. The findings in the report will be reviewed by the FDB to determine the appropriate actions to be taken.

Of the 120 bottled water samples analyzed for presence of the above discussed contaminants, only two (2) samples resulted in findings of contaminants in excess of established bottled water standards. ("Function Water," with Total Trihalomethane concentrations of 20.5 and 13.9 ppb, respectively, exceeding the State MCL of 10 ppb). Each result which exceeded the State MCL was reported to the Department of Public Health for any further action.

## Percentage Comparison of Bottled Water With Presence of Elements (2011 vs 1999)



Comparisons of 2011 and 1999 results indicate an overall trend of decreasing contaminant levels in the bottled water marketed in Los Angeles County region. Turbidity presence shows a small percentage increase while TDS and TTHM presences show moderate percentage decreases. A most obvious trend revealed by the study regards decreases in the detectable presence of HPC Bacteria in bottled water, with analyses results reflecting detection rates less than half that of the twelve-year-past study.

## Comparisons Between 2011 Vs. 1999 Studies Detectable Presence

	<b>2011</b>	<b>1999</b>
<b>Total Samples Collected:</b>	120	202
<i>Note: 41 of 202 samples were analyzed for <u>all</u> contaminants</i>		
<b>Sample Above Lab Detection Limit</b>		
HPC >= 2 cfu/ml	24 (20.0%)	99 of 202 (49%)
Coliform = Absent	0	0
E.coli = Absent	0	0
Color > 0	0	0
Odor > 0	0	0
Turbidity >= 0.1 NTU	20 (16.7%)	31 of 202 (15%)
TDS >= 1 ppm	107 (89.2%)	197 of 202 (97.5%)
Aluminum >= 50 ppb	2 (1.7%)	2 of 41 (4.88%)
Arsenic >= 1.0 ppb	14 (11.7%)	0*
Barium >= 50 ppb	7 (5.8%)	0*
Cadmium >= 1 ppb	0	0*
Total Chromium >= 2.5 ppb	4 (3.3%)	0*
Chromium+6 >= 0.25 ppb	26 (21.7%)	0*
Copper >= 10.0 ppb	3 (2.5%)	0*
Iron >= 50 ppb	8 (6.7%)	0*
Lead >= 1.0 ppb	3 (2.5%)	0*
Manganese >= 20 ppb	3 (2.5%)	0*
Mercury >= 0.5 ppb	0	0*
Selenium >= 5 ppb	0	0*
Silver >= 1 ppb	0	0*
Zinc >= 50 ppb	2 (1.7%)	0*
TTHM >= 0.5 ppb	13 (10.8%)	8 of 41 (19.5%)
VOCs >= 0.5 ppb	0	0
Pesticides Range 0.01-10 ppb	0	0

\* Data not available for comparison

## Comparisons Between 2011 Vs. 1999 Studies Exceedances

	<u>2011</u>	<u>1999</u>
<b>Total Sample Collected:</b>	120	202
<i>Note: 41 of 202 samples were analyzed for <u>all</u> contaminants</i>		
<b>List of MCL &amp; Brand Exceeding</b>		
HPC = No MCL Set	<b>--No MCL Established--</b>	<b>--No MCL Established--</b>
Color = 15	<b>None Above MCL</b>	<b>None Above MCL</b>
Odor = Threshold Odor No.3	<b>None Above MCL</b>	<b>None Above MCL</b>
Turbidity = 5 NTU	<b>None Above MCL</b>	<b>None Above MCL</b>
TDS = 500 ppm	<b>None Above MCL</b>	<b>None Above MCL</b>
Aluminum = 200 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>
Arsenic = 10 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>
Barium = 2000 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>
Cadmium = 5 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>
Total Chromium = 100 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>
Chromium+6 = No MCL Set	<b>--No MCL Established--</b>	<b>--No MCL Established--</b>
Copper = 1000 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>
Iron = 300 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>
Lead = 5 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>
Manganese = 50 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>
Mercury = 2 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>
Selenium = 50 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>
Silver = 100 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>
Zinc = 5000 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>
TTHM = 10 ppb	<b>"Function Water" Above MCL of 10 ppb</b>	<b>"Ross Swiss" Above MCL of 10 ppb</b>
VOCs Range 2 - 10000 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>
Pesticides Range 0.2 - 50 ppb	<b>None Above MCL</b>	<b>None Above MCL</b>

**MCL= Maximum Contaminant Level**

## References

1. [water.epa.gov/drink/contaminants/basicinformation/upload/Chromium6inDrinkingWater.pdf](http://water.epa.gov/drink/contaminants/basicinformation/upload/Chromium6inDrinkingWater.pdf)
2. [cdph.ca.gov/programs/Pages/fdbBVW.aspx](http://cdph.ca.gov/programs/Pages/fdbBVW.aspx)
3. [standardmethods.org](http://standardmethods.org)
4. [cdph.ca.gov/pubsforms/Documents/fdbBVWgde08](http://cdph.ca.gov/pubsforms/Documents/fdbBVWgde08)
5. [safewater.supportportal.com/link/portal/23002/23015/ArticleFolder/869/Bottled-Water](http://safewater.supportportal.com/link/portal/23002/23015/ArticleFolder/869/Bottled-Water)



Brand Name	Color	Odor	Turbidity	TDS	Cr+6	Al	As	Ba	Cd	Cr	Cu	Fe	Pb	Mn	Se	Ag	Zn	Hg	Coliform	E.coli	HPC	TTHM	VOCs	Pesticide
Lab Detection Limit			0.1 NTU	1 ppm	0.25ppb	50ppb	1ppb	50ppb	1ppb	2.5ppb	10ppb	50ppb	1ppb	20ppb	5ppb	1ppb	50ppb	0.5ppb			2 cfu/ml	0.5 ppb	0.5 ppb	0.01-10ppb
Sparkletts-1	0	0	ND	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Evian-2	0	0	ND	302	ND	ND	ND	118	ND	2.62	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	71	ND	ND	ND
Gerber-1	0	0	ND	96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Voss-1	0	0	0.15	49	ND	ND	ND	ND	ND	ND	ND	ND	ND	31.8	ND	ND	ND	ND	ND	ND	77	ND	ND	ND
Aquafina-1	0	0	ND	9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fresh & Easy-1	0	0	ND	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volvic-1	0	0	ND	123	ND	ND	3.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	146	ND	ND	ND
Nursery Water-2	0	0	ND	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pure American-2	0	0	ND	33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Essence-2	0	0	0.26	92	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	292	ND	ND	ND	623	4.29	ND	ND
Eco2O-1	0	0	ND	35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Great Value-1	0	0	ND	108	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dasani-2	0	0	0.12	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Glaceau-1	0	0	ND	32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sparkletts-2	0	0	0.12	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Real Water-2	0	0	ND	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Crystal Lake-1	0	0	0.13	109	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ice Age-1	0	0	ND	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.62	ND	ND
Naya-1	0	0	ND	250	ND	ND	1.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nika-1	0	0	ND	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iceland-1	0	0	ND	49	0.84	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Enhanced-1	0	0	0.15	134	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Earth2O-1	0	0	ND	155	0.93	ND	2.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	ND
Essence-1	0	0	ND	73	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	383	ND	ND	ND	555	3.87	ND	ND
7-Eleven-2	0	0	ND	121	ND	ND	ND	59.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Classic Selection-1	0	0	ND	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Stater Bros.-2	0	0	ND	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Function Water-1	0	0	ND	42	ND	ND	ND	ND	ND	ND	ND	152	ND	ND	ND	ND	ND	ND	ND	ND	ND	20.5	ND	ND
Roxane-1	0	0	ND	165	0.38	ND	1.53	ND	ND	ND	ND	86.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Waiwera-2	0	0	ND	101	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
World Market-1	0	0	ND	104	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sprouts-1	0	0	ND	159	0.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nika-2	0	0	0.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	392	ND	ND	ND
Ice Age-2	0	0	ND	42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.63	ND	ND

Brand Name	Color	Odor	Turbidity	TDS	Cr+6	Al	As	Ba	Cd	Cr	Cu	Fe	Pb	Mn	Se	Ag	Zn	Hg	Coliform	E.coli	HPC	TTHM	VOCs	Pesticide
Lab Detection Limit			0.1 NTU	1 ppm	0.25ppb	50ppb	1ppb	50ppb	1ppb	2.5ppb	10ppb	50ppb	1ppb	20ppb	5ppb	1ppb	50ppb	0.5ppb			2 cfu/ml	0.5 ppb	0.5 ppb	0.01-10ppb
Jana-2	0	0	ND	265	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	276	ND	ND	ND
Naya-2	0	0	ND	253	ND	ND	1.60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8	ND	ND	ND
CVS Infant-1	0	0	ND	34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
B Purified-1	0	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ice Canyon-1	0	0	ND	42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jeju-1	0	0	ND	54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metro Electro-2	0	0	ND	92	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Activate-2	0	0	ND	9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bristol Farm-2	0	0	ND	56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.32	ND	ND
Arrowhead-2	0	0	ND	262	0.42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Crystal Geyser-2	0	0	ND	142	0.37	ND	2.88	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
World Market-2	0	0	ND	85	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
365 Springwater-2	0	0	ND	150	0.30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fiji-2	0	0	ND	231	0.28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hawaiian Springs-2	0	0	ND	76	1.23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Gelsons-2	0	0	ND	82	0.97	ND	2.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Echo-2	0	0	ND	71	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Earth2O-2	0	0	ND	149	0.93	ND	2.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33	ND	ND	ND
Trader Joe water-2	0	0	ND	156	0.36	ND	3.48	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Niagra-2	0	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Valaria-2	0	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Glaceau-2	0	0	ND	32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Great Value-2	0	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nestle-2	0	0	ND	91	ND	ND	ND	ND	ND	ND	ND	64.7	1.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acqua Panna-2	0	0	ND	147	0.42	ND	ND	76.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Essentia-2	0	0	ND	73	ND	ND	ND	ND	ND	ND	ND	209	4.03	ND	ND	ND	ND	ND	ND	ND	ND	3.74	ND	ND
Gerber-2	0	0	ND	81	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Refreshe-2	0	0	ND	60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.86	ND	ND
CVS Infant-2	0	0	ND	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	ND
B-Purified-2	0	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ice Canyon-2	0	0	ND	33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iceland-2	0	0	ND	54	0.78	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jana-1	0	0	0.17	229	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	311	ND	ND	ND
Aquafina-2	0	0	0.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	ND	ND	ND



