



Pasadena Water and Power

## **12 Theses on ELAP**

Presented by  
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Presented to

**EXPERT REVIEW PANEL**

at the

Southern California Coastal Water Research Project  
3535 Harbor Blvd. Costa Mesa, CA 92626

**March 17, 2015**





# 12 Theses

## Pasadena Water and Power

- 1) **THE GOAL OF LABORATORY ACCREDITATION IS TO HELP PROTECT PUBLIC HEALTH AND SAFETY.**
- 2) **ELAP'S JOB IS TO ENSURE THAT ALL ACCREDITED LABORATORIES ARE USING APPROVED METHODS WITH THE NECESSARY QUALITY CONTROL AND ASSURANCE PROCEDURES IN A CONSISTENT FASHION.**
- 3) **EVERY LABORATORY THAT IS USING THE SAME METHOD AND INSTRUMENTS SHOULD BE ACCREDITED AND ASSESSED IN EXACTLY THE SAME WAY TO THE SAME SET OF STANDARDS.**
- 4) **ELAP NEEDS STATUTES AND REGULATIONS IN PLACE THAT ENABLES THEM TO ACCREDIT ONLY THOSE LABORATORIES THAT MEET THE ESTABLISHED STANDARDS AND DENY OR REVOKE ACCREDITATION TO THOSE THAT DO NOT.**
- 5) **ELAP NEEDS INTERNAL POLICIES THAT ENSURE THAT ALL ELEMENTS OF THE ACCREDITATION PROCESS ARE CARRIED OUT IN A UNIFORM FASHION THE RULE OF LAW NEED TO APPLIED CONSISTENTLY TO ALL ASPECTS OF ELAP OPERATIONS.**
- 6) **INTERNAL POLICIES NEED TO BE WRITTEN AND SUBJECT PUBLIC REVIEW. THESE SHOULD INCLUDE STANDARD OPERATING PROCEDURES (SOP) FOR EACH ASPECT OF THE ACCREDITATION PROCESS INCLUDING ALL PROCESS IDENTIFIED ABOVE.**



# 12 Theses

## Pasadena Water and Power

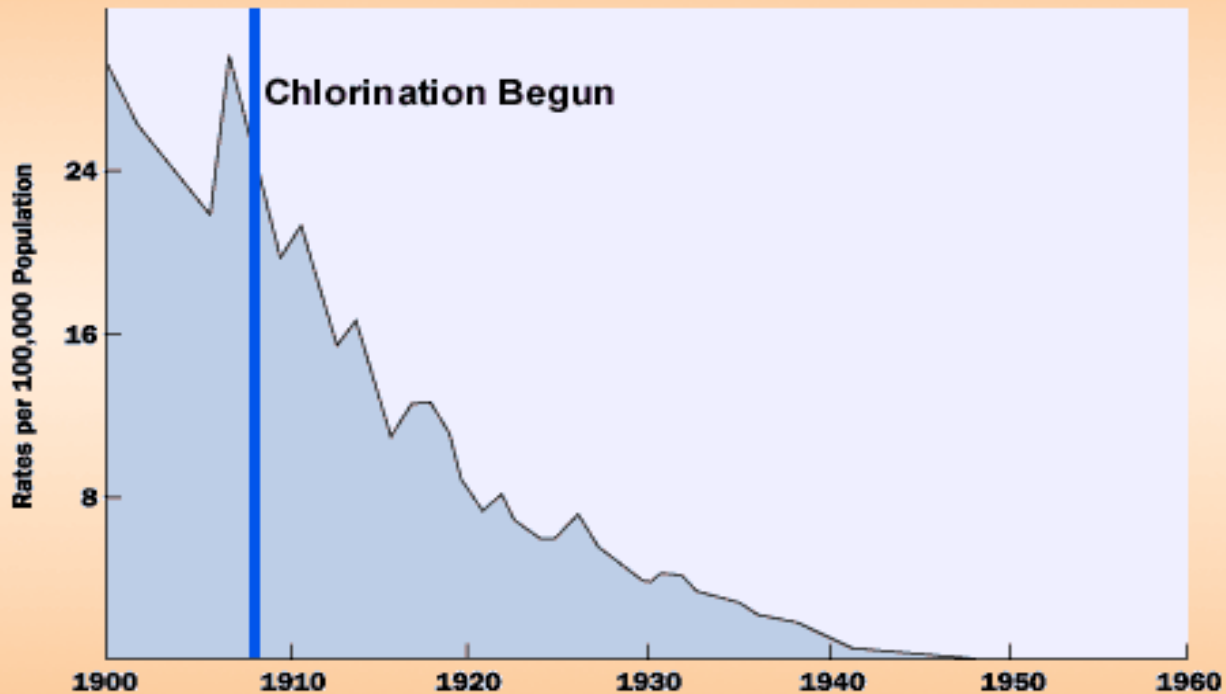
- 7) **ELAP NEEDS INTERNAL POLICIES THAT ENSURES THAT ALL STAFF ASSOCIATED WITH THE ACCREDITATION PROCESS ARE TRAINED TO FOLLOW THE POLICIES, SOPS, AND PRACTICES AND APPLY LABORATORY ACCREDITATION STANDARDS IN A UNIFORM FASHION.**
- 8) **THE COMPUTER HARDWARE AND SOFTWARE NECESSARY FOR ASSESSMENT OF PERFORMANCE TESTING SAMPLES (PTSS) IS READILY AVAILABLE AND CURRENTLY IN USE BY A NUMBER OF STATE AGENCIES (E.G. THE CLINICAL LABORATORY ACCREDITATION PROGRAM AND THE DMR-QA PROGRAM).**
- 9) **ELAP HAS AN EFFECTIVE ADVISORY BODY, THE ENVIRONMENTAL LABORATORY TECHNICAL ADVISORY COMMITTEE (ELTAC).**
- 10) **ELAP NEEDS TO ESTABLISH A MORE REGULAR AND EQUITABLE FEE SCHEDULE TO PRODUCE PREDICTABLE FUNDING.**
- 11) **THE MAJORITY OF ACCREDITED LABORATORIES HAVE NO NEED OR DESIRE FOR EITHER THIRD PARTY ACCREDITATION OR NELAP ACCREDITATION.**
- 12) **MORE IMPORTANT THAN ANY OTHER POINT, ELAP STAFF NEED TO ADOPT THE SPIRIT OF THE PROTECTION OF PUBLIC HEALTH, TRANSPARENCY, RULE OF LAW, AND COOPERATION. WITHOUT THIS NOTHING ELSE WILL WORK.**



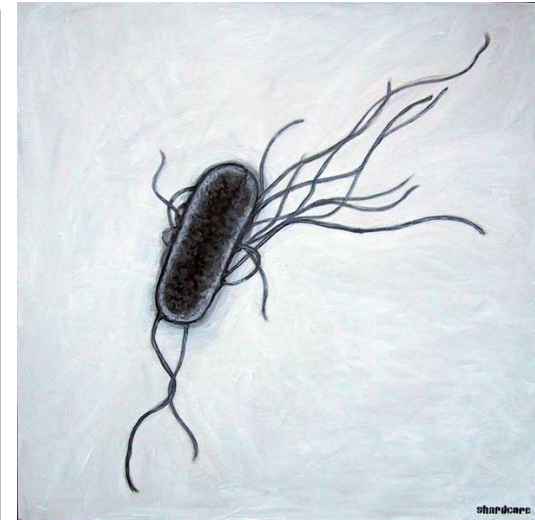
# Public Health

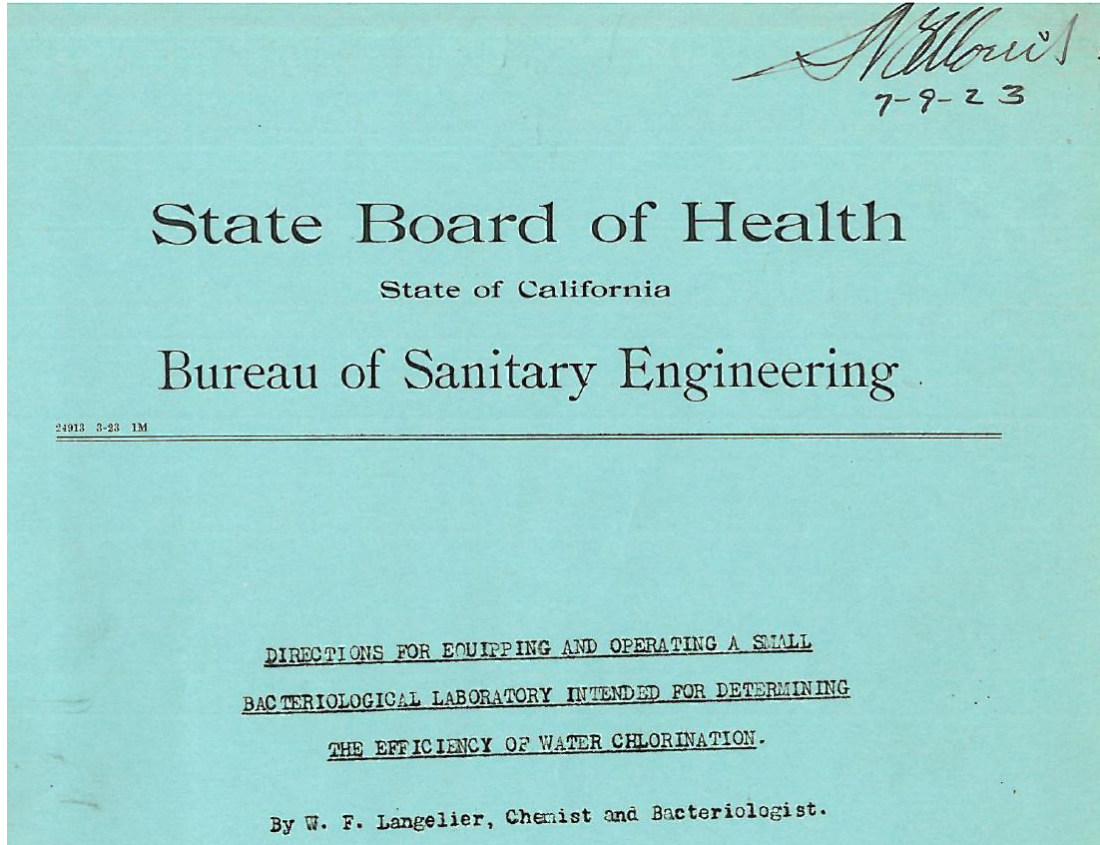
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### Death Rate for Typhoid Fever United States, 1900-1960



Source: U.S. Centers for Disease Control and Prevention, Summary of Notifiable Diseases, 1997.





***“It should be understood that without comparative bacterial counts in both the raw water and treated water bacterial counts may be of little or no value in ascertaining the purity of drinking water”***



# Public Health

## Pasadena Water and Power

**This is why the State of California Began Approving Laboratories For the Analysis of Drinking and Waste Water in 1951.**

STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC HEALTH

Sanitation Laboratory  
2151 Berkeley Way, Berkeley 4, Calif.

Non-Public Health Laboratories Approved for Water Analysis by the  
California State Department of Public Health  
as of June 14, 1956.

Non-Commercial Laboratories

County and city	Name of laboratory	Date approval given	Determinations covered by Certificate of Approval include			
			Bacteriological	Bacteriological*	Chemical	Chemical*
ALAMEDA						
Oakland	East Bay Muni. Utility Dist., Water Lab, San. and Pumping Section	9-18-52	X		X	
	East Bay Muni. Utility Dist., Lab of Sewage Disp. Div.	5-14-53	X		X	
CONTRA COSTA						
Antioch	Antioch Water Trmt. Plant Lab.	4-21-52	X			X
Oakley	Oakley County Water Dist.	2-21-56	X			X
Pittsburg	Pittsburg Muni. Water Works, Filtration Plant Lab.	1-31-52	X			X
HUMBOLDT						
Eureka	Parkside Lab., City of Eureka	9-22-55	X			X
LOS ANGELES						
Beverly Hills	Beverly Hills Water Dept. Lab	2-18-52	X		X	
Harbor City	County Sanit. Dists. of L.A.	1-16-56	X		X	
Lakewood	Lakewood Water and Power Co. Laboratory	8-17-55	X			
La Verne	F.E. Weymouth Mem. Softening and Filtr. Plant Lab.	4-30-52	X		X	
Los Angeles	L.A. City Dept. of Water and Power, Water Lab.	9-12-51	X		X	
	Sparkletts Drinking Water Corp. Lab.	10-20-54	X		X	
	Valley Settling Basin Lab.	2-1-55		X		X
Pasadena	Pasadena Water Dept. Lab.	11-29-54			X	
Venice	Hyperion Trtmt. Plant Lab.	5-12-54	X		X	
MARIN						
San Rafael	Marin Muni. Water Dist. Lab.	3-26-52	X			
ORANGE						
Santa Ana	Lab. of the County Sanitation Districts of Orange County	6-18-54	X		X	
RIVERSIDE						
Riverside	State Div. of Water Resources	11-13-53				X

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# Public Health

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- 1) The goal of laboratory accreditation is to help protect public health and safety.
  - a) Data users, public health and safety officials, water utilities, waste water utilities, hazardous waste handlers, and others need to know that the laboratory results are accurate and precise.
  - b) The degree of accuracy and precision needs to be enough to make public policy decisions that help protect public health and safety.

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# Approved Methods

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- 2) ELAP's job is to ensure that all accredited laboratories are using approved methods with the necessary quality control and assurance procedures in a documented and consistent fashion.
  - a) Methods Approved by the United States Environmental Protection Agency and the State of California.
  - b) Including USEPA Methods, Standard Methods, ASTM Methods, and others.

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# Approved Methods & Quality Control

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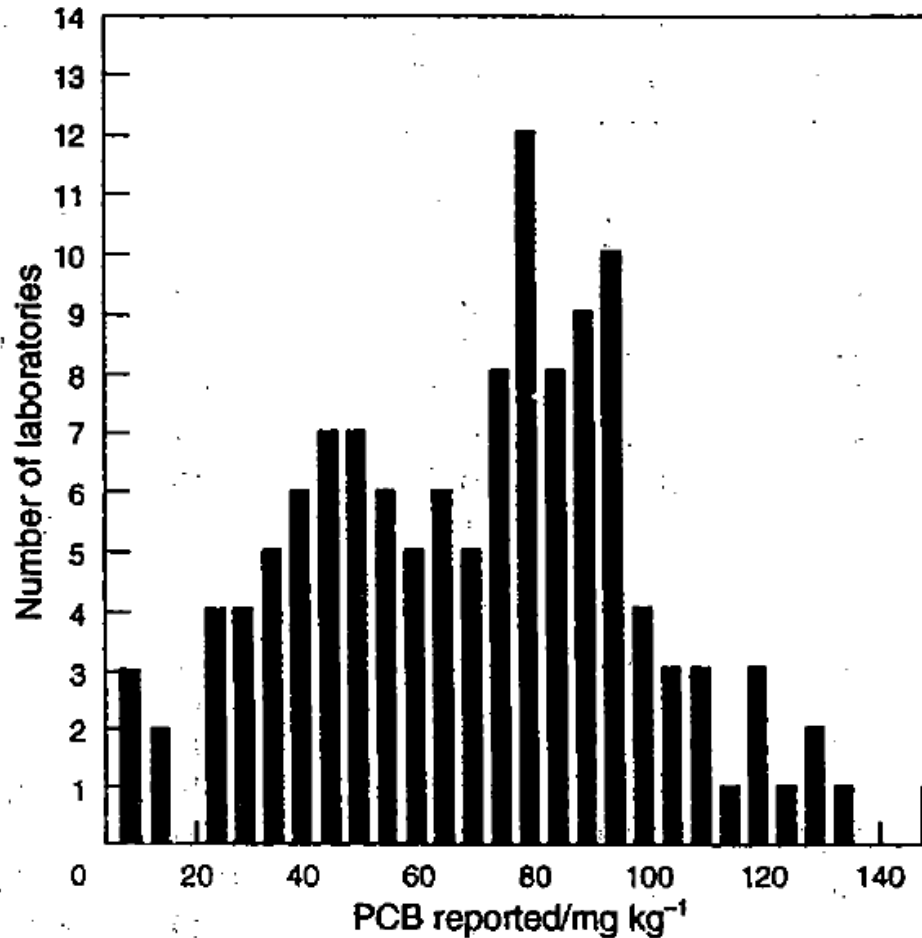


Fig. 1 Distribution of results for sample F (spiked value 100 mg kg<sup>-1</sup>).

**These are the Results from  
129 Laboratories  
Analyzing the same soil  
which contains  
100 mg/kg Arochlor 1260  
(PCB)**

Kimbrough, D.E., Chin, R.,  
Wakakuwa, J.;  
"Wide and Systematic Errors  
In the Analysis of  
PCBs Part 3: Gas  
Chromatography";  
The Analyst, June 1994,  
119, 1293 - 1301

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# Uniform Assessment

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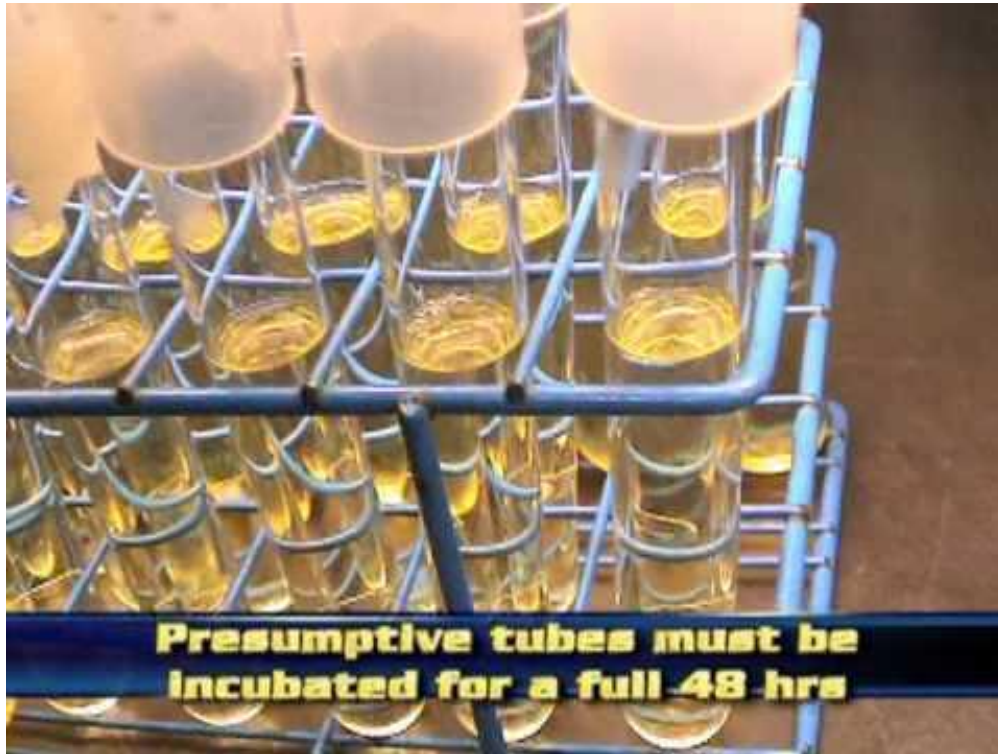
- 3) Every laboratory that is using the same method and instruments should be accredited and assessed in exactly the same way to the same set of standards.
  - a) This is what is not happening
  - b) Different Laboratories are being held to different standards
  - c) Labs that do not measure up may not lose accreditation

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# On Site Assessment: SM 9020B, 9050 & 9221

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9221 MULTIPLE-TUBE  
FERMENTATION TECHNIQUE  
FOR MEMBERS OF THE  
COLIFORM GROUP

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# On Site Assessment: SM 9020B & 9050

## Pasadena Water and Power

Prepare culture media in batches that will be used in less than 2 weeks unless otherwise specified by the method. However, if the media are contained in screw-capped tubes they may be stored for up to 3 months. See Table 9020:V for specific details. Store media out of direct sunlight and avoid excessive evaporation.

TABLE 9020:V. HOLDING TIMES FOR PREPARED MEDIA

Medium	Holding Time
Broth in screw-cap flasks*	96 h
Poured agar in plates with tight-fitting covers*	2 weeks
Agar or broth in loose-cap tubes*	2 weeks
Agar or broth in tightly closed screw-cap tubes†	3 months
Poured agar plates with loose-fitting covers in sealed plastic bags*	2 weeks
Large volume of agar in tightly closed screw-cap flask or bottle*	3 months

\* Hold under refrigerated conditions 2–8°C.

† Hold at <30°C.



# On Site Assessment Microbiology Checklist

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Standard Methods says to store "out of direct sunlight"

5.1 STORAGE AND HOLDING TIMES OF PREPARED MEDIA		(1) SM 9050A (2) EPA 815-B-97-001,V.5.1.7
a.	Broth media in loose-cap tube stored in dark at <30°C and held no longer than 2 weeks.	(1) (2) V.5.1.7; V.5.3.2; V.5.5.3
b.	Broth media in screw-cap tubes stored in dark at <30°C and held no longer than 3 months.	(1); (2) V.5.1.7; V.5.3.2; V.5.5.3; V.5.4; (3)141.74(a)(1) A-1 broth

2011 Checklist

Loose Cap Tubes are stored 2 – 8 °C

5.1 STORAGE AND HOLDING TIMES OF PREPARED MEDIA		(1) SM 9050A (2)
a.	Agar or Broth media in loose-cap tube stored at 4°C and held no longer than 2 weeks. Media must be at RT for use.	(1) (2)
b.	Broth media in screw-cap tubes or in loosed-capped in sealed plastic bag or other tightly sealed container to prevent evaporation held no longer than 3 months. Monitor for loss. Discard ≥ 10%.	(1);9020B.4.i.4) 20 <sup>th</sup> , online

2013 Checklist



# Statutes & Regulations

## Pasadena Water and Power

- 4) ELAP needs Statutes and Regulations in place that enables them to accredit only those laboratories that meet the established standards and deny or revoke accreditation to those that do not.
  - a) Draft regulations and statutes already exist which had been written by professional permit writing staff and which have been vetted by the accredited laboratory community.
  - b) Copies of these regulations (Feb 2005) and statutes have been submitted as part of the public discourse and record.
  - c) The established standards are those found in State and Federal regulation and statute.



# Statutes & Regulations

## Pasadena Water and Power

100860.1. (a) At the time of application and annually thereafter, from the date of the issuance of the certificate, a laboratory shall pay an ELAP certification fee. This fee shall consist of a base or administrative fee and a fee for each of the ELAP fields of testing listed below for which the laboratory has requested ELAP certification. These fees shall be nonrefundable and adopted in regulations, and shall be sufficient to allow the ELAP program to be fully fee-supported. The fields of testing for ELAP certification and their code numbers are the following:

**(E101) Microbiology of drinking water.**

- (E102) Inorganic chemistry of drinking water.
- (E103) Toxic chemical elements of drinking water.
- (E104) Volatile organic chemistry of drinking water.
- (E105) Semi-volatile organic chemistry of drinking water.
- (E106) Radiochemistry of drinking water.
- (E107) Microbiology of wastewater.
- (E108) Inorganic chemistry of wastewater.
- (E109) Toxic chemical elements of wastewater.
- (E110) Volatile organic chemistry of wastewater.
- (E111) Semi-volatile organic chemistry of wastewater.
- (E112) Radiochemistry of wastewater.
- (E113) Whole effluent toxicity of wastewater.
- (E114) Inorganic chemistry and toxic chemical elements of hazardous waste.
- (E115) Extraction test of hazardous waste.
- (E116) Volatile organic chemistry of hazardous waste.
- (E117) Semi-volatile organic chemistry of hazardous waste.
- (E118) Radiochemistry of hazardous waste.
- (E119) Toxicity bioassay of hazardous waste.
- (E120) Physical properties of hazardous waste.
- (E121) Bulk asbestos analysis of hazardous waste.
- (E122) Microbiology of food.
- (E123) Inorganic chemistry and toxic chemical elements of pesticide residues in food.
- (E124) Organic chemistry of pesticide residues in food (measurements by MS techniques).
- (E125) Organic chemistry of pesticide residues in food (excluding measurements by MS techniques).
- (E126) Microbiology of recreational water.
- (E127) Air quality monitoring.
- (E128) Shellfish sanitation.

### Article 12. Subgroups for Fields of Testing

#### §64823. Fields of Testing.

- (a) Field of Testing 1 consists of those methods whose purpose is to detect the presence of microorganisms in the determination of drinking water or wastewater quality and encompasses the following Subgroups: detection of total coliform, fecal coliform, or Escherichia coli (E. coli) organisms by Multiple Tube Fermentation techniques; detection of total coliform, fecal coliform, or Escherichia coli (E. coli) organisms by Membrane Filter techniques; Heterotrophic Plate Count techniques; detection of both total coliforms and Escherichia coli (E. coli) organisms by the Minimal Medium ortho-nitrophenyl-beta-D-galactopyranoside - 4-methylumbelliferyl-beta-D-glucuronide (MMO-MUG) techniques; detection of total coliform, fecal coliform, or Escherichia coli (E. coli) organisms by use of Clark's Presence/Absence medium; Fecal streptococci and Enterococci by Multiple Tube Fermentation techniques, Fecal streptococci and Enterococci by Membrane Filter techniques; detection of total coliforms and fecal coliforms other than for drinking water or wastewater quality.
- (b) Field of Testing 2 consists of those analytes or methods whose purpose is to detect the presence of inorganic substances in the determination of drinking water quality and whose methods require the use colorimetric, gravimetric, titrimetric, electrometric, or ion chromatographic technique; and encompasses the following Subgroups: alkalinity; calcium (titrimetric techniques); chloride; corrosivity; fluoride; hardness (direct determination); magnesium (titrimetric techniques); methylene blue active substances (MBAS); nitrate; nitrite; sodium (flame emission techniques); sulfate; total filterable residue and conductivity; iron; manganese; orthophosphate; silica; cyanide; potassium (flame emission techniques).
- (c) Field of Testing 3 consists of those methods whose purpose is to detect the presence of trace metals, or asbestos in the determination of drinking water quality and whose methods require the use of an atomic absorption, inductively coupled plasma, inductively coupled plasma/mass spectrophotometer, or electron microscope device and encompasses the following Subgroups: arsenic; barium; cadmium; total chromium; copper; iron; lead; manganese; mercury; selenium; silver; zinc; aluminum; asbestos; antimony; beryllium; nickel; thallium; calcium; magnesium; sodium; potassium.



# Statutes & Regulations

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## Article 6. Required Test Methods

### §64811. Test Methods.

- (a) Laboratories certified for any Subgroup within Fields of Testing 1 through 6, as identified in Section 64823, shall employ those methods found in 40 Code of Federal Regulations Part 141 as amended **July 17, 1992**, 57 Federal Register 31776.
- (b) Laboratories certified for any Subgroup within Fields of Testing 9 through 14, as identified in Section 64823, shall employ those methods found in Article 5, Section 66260.11, Title 22, California Code of Regulations.
- (c) Laboratories certified for any Subgroup within Fields of Testing 8 or 16 through 19, as identified in Section 64823, shall employ those methods found in 40 Code of Federal Regulations Part 136, amended September 11, 1992, 57 Federal Register 41830, or methods stated in any permit issued by a California Regional Water Quality Control Board. If no method is stated in the permit and there is no method cited for the substance in Part 136, the laboratory is to seek approval for the use of the method from the Regional Board issuing the permit.

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# Policies & Procedures

## Pasadena Water and Power

- 5) ELAP needs internal policies that ensure that all elements of the accreditation process are carried out in a uniform fashion, including but not limited to:
  - a) Processing of applications
  - b) Assessment of Performance Testing Samples
  - c) On-Site Assessments
  - d) Appeals Process
  - e) Revocation of Accreditation.
  - f) Consistently apply the principles of transparency, cooperation, and the rule of law need to applied consistently to all aspects of ELAP operations.
  - g) Timely review and response of applications, PTSs, letters of deficiency, and all aspects of accreditation.



# Standard Operating Procedures

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- 6) Internal policies need to be written and subject to public review. These should include Standard Operating Procedures (SOP) for each aspect of the accreditation process including all processes identified above.
  - a) These SOPs should be periodically updated to account for timely accuracy.
  - b) Any changes to policies and procedures should be promptly communicated to the affected labs to avoid discrepancies.

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# Uniform Training for ELAP & Labs

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- 7) ELAP needs internal policies that ensure that all staff associated with the accreditation process are trained to follow the policies, SOPs, and practices and apply laboratory accreditation standards in a uniform fashion.
  - a) This includes all ELAP employees, external parties, or contractors working for ELAP
  - b) ELAP should conduct regular workshops and training for the staff of the accredited laboratories on their standards and SOPs.

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# Performance Testing Samples

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- 8) The computer hardware and software necessary for assessment of PTSs is readily available and currently in use by a number of State agencies (e.g. the Clinical Laboratory Accreditation Program and the DMR-QA Program).
  - a) ELAP needs to obtain or update the necessary hardware and software and implement its use.
  - b) There is no policy or technical reason that ELAP could not now be routinely assessing laboratory performance with PTSs.



- 9) ELAP has an effective advisory body, the Environmental Laboratory Technical Advisory Committee (ELTAC).
  - a) ELAP needs to do nothing more than to make use of this body, which represents ELAP stakeholders, to greatly expand its effectiveness.
  - b) ELAP has historically failed to make use of the resources available. For example, the ELTAC created a large number of on-site assessment method check-lists ([http://www.waterboards.ca.gov/drinking\\_water/services/boards/elta c/MethodAuditChecklists.shtml](http://www.waterboards.ca.gov/drinking_water/services/boards/elta c/MethodAuditChecklists.shtml)) but never had its assessors use them or provide them to laboratories.
  - c) ELAP can use ELTAC meetings as an open forum to take into advisement technical questions and facilitate their timely resolution using feedback from the regulated community



### ELTAC - Method Audit Checklists

Last Update: April 21, 2009

The following checklists were prepared by the [Environmental Laboratory Technical Advisory Committee's](#) (ELTAC's) subcommittee on analytical methods checklists. Part of ELTAC's charge is to play a role in the exchange of technical information.

The checklists have not been reviewed or endorsed by the [Environmental Laboratory Accreditation Program](#) (ELAP) management, and thus do not represent an official statement of ELAP's views or policy. Posting these materials does not indicate ELAP adoption or endorsement of the information contained herein.

Checklists are posted for informational purposes only and are offered as providing the environmental laboratory community a common set of procedures/standards to conduct internal quality control reviews and as tools to help prepare for audits from ELAP and other external auditing authorities or regulatory authorities.

Some checklists are for analytical methods that may no longer be EPA-recognized or approved.

ELAP has provided the following comments related to these checklists:

The checklists are not part of the Department's requirements for certification. The checklists could be used by laboratories on a routine basis for checking on the performance of the analytical methods used. The lists, however, are not comprehensive and do not cover all methods used nor their recent updates. Laboratories should not misinterpret the posting of these checklists as being officially approved by the Department.

Furthermore, these checklists are no substitutes for the on-site inspection and audits conducted by ELAP when all aspects of the diverse functions of environmental testing laboratories are reviewed for compliance with the law, including but not limited to documentation related to laboratory operations and quality assurance, methods and SOPs used, accuracy and reliability of data, data review, supervisor review, corrective actions, records, and reporting requirements. (see statutes, regulations, and draft revised regulations on the [ELAP website](#).)

A checklist for microbiological methods is also included. It is 2004 ELAP document that is to be updated and revised. Nonetheless, it can be used as a guidance document for laboratories to check their practices. ELAP will replace it when an updated version is available.

#### EPA 100 Series

- [USEPA 120.1 Conductivity \(Excel, New Window\)](#)
- [USEPA 150.1 pH \(Excel, New Window\)](#)
- [USEPA 160.1 TFR \(Excel, New Window\)](#)
- [USEPA 160.2 NPR \(Excel, New Window\)](#)
- [USEPA 160.3 TR \(Excel, New Window\)](#)
- [USEPA 160.4 VR \(Excel, New Window\)](#)
- [USEPA 180.1 Turbidity \(Excel, New Window\)](#)

#### EPA 200 Series FOT 103-109

- [USEPA 200.2 ICP-AES \(Excel, New Window\)](#)
- [USEPA 200.8 ICP-MS \(Excel, New Window\)](#)
- [USEPA 200.9 GFAAS \(Excel, New Window\)](#)
- [USEPA 218.6 CdO4 \(Excel, New Window\)](#)
- [USEPA 245.1 CVAAS \(Excel, New Window\)](#)
- [USEPA 245.2 CVAAS \(Excel, New Window\)](#)

#### EPA 300 Series FOT 102-108

- [USEPA 300.0 \(Excel, New Window\)](#)
- [USEPA 300.1 \(Excel, New Window\)](#)
- [USEPA 305.1 Acidity \(Excel, New Window\)](#)
- [USEPA 310.1 Alkalinity \(Excel, New Window\)](#)
- [USEPA 310.2 Automated Alkalinity \(Excel, New Window\)](#)
- [USEPA 314.0 ClO4 \(Excel, New Window\)](#)
- [USEPA 335.4 Cyanide \(Excel, New Window\)](#)
- [USEPA 353.2 NO2-NO3-N \(Excel, New Window\)](#)
- [USEPA 356.1 Phosphorus \(Excel, New Window\)](#)
- [USEPA 375.3 Sulfate \(Excel, New Window\)](#)

#### Microbiology

- [Microbiological Methods \(Word, New Window\)](#)
- This 2004 ELAP document is to be updated and revised, but can be used as guidance.

#### EPA 500 Series FOT 104

- [USEPA 502.2 VOC CG \(Excel, New Window\)](#)
- [USEPA 504.1 EDB, DBCP, 1,2,3,4-DCP GC-ECD Rev. 1.1 \(Excel, New Window\)](#)
- [USEPA 505.2 EDB, DBCP, 1,2,3,4-DCP GC-ECD Rev. 2.1 \(Excel, New Window\)](#)
- [USEPA 524.2 VOC GC-MS \(Excel, New Window\)](#)

#### FOT 110

- [SM 6210B VOC GC-MS \(Excel, New Window\)](#)
- [SM 6220B Aromatics GC-FID \(Excel, New Window\)](#)
- [SM 6230B Halocarbons GC-ECD/MCP \(Excel, New Window\)](#)
- [USEPA 601 Halocarbons GC-ECD/MCP \(Excel, New Window\)](#)
- [USEPA 602 Aromatics GC-FID \(Excel, New Window\)](#)
- [USEPA 603 Acrolein-Acrylonitrile GC-FID \(Excel, New Window\)](#)
- [USEPA 624 Purreables GC-MS \(Excel, New Window\)](#)
- [USEPA 1624 VOCs-ID GC-MS \(Excel, New Window\)](#)

#### SM 2000 & 5000 Series FOT 102-108

- [SM 2130 Turbidity \(Excel, New Window\)](#)
- [SM 2130B Acidity \(Excel, New Window\)](#)
- [SM 2320 Alkalinity \(Excel, New Window\)](#)
- [SM 2340B Hardness \(Excel, New Window\)](#)
- [SM 2340C Hardness \(Excel, New Window\)](#)
- [SM 2510B Conductivity \(Excel, New Window\)](#)
- [SM 2540E SS \(Excel, New Window\)](#)
- [SM 2540B TS \(Excel, New Window\)](#)
- [SM 2540C TPR \(Excel, New Window\)](#)
- [SM 2540D TSS \(Excel, New Window\)](#)
- [SM 2540E PVS \(Excel, New Window\)](#)
- [SM 5310B TOC Combustion \(Excel, New Window\)](#)
- [SM 5310C TOC Persulfate-UV \(Excel, New Window\)](#)
- [SM 5310D TOC Wet Oxidation \(Excel, New Window\)](#)
- [SM 5540C Surfactants Colorimetry \(Excel, New Window\)](#)
- [SM 5910 UV 294 Absorbance \(Excel, New Window\)](#)

#### HAZMAT

- [5W846 6010B ICP-AES \(Excel, New Window\)](#)
- [5W846 6020B ICP-MS \(Excel, New Window\)](#)
- [5W846 5050 Conductivity \(Excel, New Window\)](#)
- [5W846 5056 Ion Chromatography \(Excel, New Window\)](#)

#### SM 3000 Series FOT 103-109

- [SM 3111B Air FAAS \(Excel, New Window\)](#)
- [SM 3111D NO2 FAAS \(Excel, New Window\)](#)
- [SM 3112B CVAAS \(Excel, New Window\)](#)
- [SM 3113B GFAAS \(Excel, New Window\)](#)
- [SM 3114B HGAAS \(Excel, New Window\)](#)
- [SM 3114B HGAAS-As \(Excel, New Window\)](#)
- [SM 3114B HGAAS-Se \(Excel, New Window\)](#)
- [SM 3120B ICP-AES \(Excel, New Window\)](#)
- [SM 3125B ICP-MS \(Excel, New Window\)](#)
- [SM 3500-Ca D Titration \(Excel, New Window\)](#)
- [SM 3500-Cr Ion Chromatography \(Excel, New Window\)](#)
- [SM 3500-K B Flame Photometry \(Excel, New Window\)](#)

#### SM 4500 Series FOT 103-109

- [SM 4110 Ion Chromatography \(Excel, New Window\)](#)
- [SM 4500 H+ pH \(Excel, New Window\)](#)
- [SM 4500-CI B Titration \(Excel, New Window\)](#)
- [SM 4500-CI D Potentiometry \(Excel, New Window\)](#)
- [SM 4500-CI F Titration \(Excel, New Window\)](#)
- [SM 4500-CI G Colorimetry \(Excel, New Window\)](#)
- [SM 4500-ClO2 E Titration \(Excel, New Window\)](#)
- [SM 4500-CN E Colorimetry \(Excel, New Window\)](#)
- [SM 4500-CN F SIP \(Excel, New Window\)](#)
- [SM 4500-CN G Distillation \(Excel, New Window\)](#)
- [SM 4500-F C SIP \(Excel, New Window\)](#)
- [SM 4500-F D Colorimetry \(Excel, New Window\)](#)
- [SM 4500-F E Auto-Colorimetry \(Excel, New Window\)](#)
- [SM 4500-NH3 D SIP \(Excel, New Window\)](#)
- [SM 4500-NO2 B Colorimetry \(Excel, New Window\)](#)
- [SM 4500-NO3 D SIP \(Excel, New Window\)](#)
- [SM 4500-NO3 E Cd-Reduction \(Excel, New Window\)](#)
- [SM 4500-NO3 F Auto-Cd-Reduction \(Excel, New Window\)](#)
- [SM 4500-PCH E Colorimetry \(Excel, New Window\)](#)
- [SM 4500-PCH F Auto-Colorimetry \(Excel, New Window\)](#)
- [SM 4500-SIO2 D Colorimetry \(Excel, New Window\)](#)
- [SM 4500-UV D 2-mercurimetry \(Excel, New Window\)](#)

**Board Chair**  
**Felicia Marace**  
Visit her Website

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### 10) ELAP needs to establish a more regular and equitable fee schedule to produce predictable funding.

- a. The smallest accredited laboratories do not even have full time laboratory staff and are accredited for only one or two Units of Accreditation while the largest laboratories have scores of scientists and thousands of UOAs.
- b. The smallest laboratory can pay no less than 1,391 USD while the largest laboratory will pay no more than 12,755 USD, a ratio of 1:10, although few, if any laboratories are accredited for all 26 available Fields of Testing.
- c. The amount of work that ELAP must expend on the accreditation of the smallest and the largest laboratories are much greater than 1:10.
- d. Laboratories that are accredited using NELAC standards involve a great deal more work by ELAP staff than other laboratories. Should ELAP again offer NELAC accreditation to laboratories, the fees should be proportionately larger for NELAC accreditation.

- A. A Laboratory that has only one Gas Chromatograph and only Analyzes the Four Trihalomethanes
- B. A Laboratory with a dozen Gas Chromatographs and Analyzes Hundreds of Analytes
- C. Both of these laboratories pay the same fees.





- 11)** The majority of accredited laboratories have no need or desire for either third party accreditation or NELAC accreditation.
- a. If ELAP elects to offer NELAC, it should be on an entirely voluntary basis.
  - b. If some laboratories would like to have NELAC accreditation, and the establishment of a dual program of NELAC and ELAP accreditation that does not interfere with the accreditation process, then there is no reason that that cannot be established.
  - c. The desire for Third Party Accreditation only arises when ELAP does not do it's job



12) More important than any other point, ELAP staff need to adopt the spirit of the protection of public health, transparency, rule of law, and cooperation. Without this, nothing else will work.