

State of Maryland
Department of Health and Mental Hygiene
LABORATORIES ADMINISTRATION

A GUIDE TO
ENVIRONMENTAL LABORATORY SERVICES

<http://www.dhmh.state.md.us/labs>
Division of Environmental Chemistry
Division of Microbiology
201 West Preston Street
Baltimore, Maryland 21201

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PREFACE

The Laboratories Administration's mission is to promote, protect, and preserve the health and well-being of the people in Maryland from the consequences of communicable diseases and from unsafe food, drugs, and consumer products by promoting and enforcing standards of care and quality in cooperation with both public and private agencies at the local, state, and federal levels. This mission shall be accomplished with maximum public benefit at a minimum cost to the people of Maryland.

This enviroguide helps accomplish this mission by listing both general sampling procedures and laboratory services available to and needed by local, county, and State public health and environmental officers and departments that are responsible for enforcement of regulations and standards and for ongoing surveillance of the environment and the food supply. The integrity of the sample and the quality of laboratory test data are greatly enhanced if one follows the instructions in the enviroguide on sample requirements, preservation and transport.

The operational philosophy of the Laboratories Administration is to promote programs and laboratory services that improve health and prevent diseases against which the citizens of Maryland can not protect themselves.

If you should have any suggestions to improve the usefulness of this Enviroguide, they will be gratefully received.

J. Mehse Joseph, Ph.D.
Director
Laboratories Administration
Department of Health & Mental Hygiene

TABLE OF CONTENTS

<u>Title</u>	<u>Page No</u>
KEY PEOPLE TO CONTACT	
< Division of Environmental Chemistry	
< Division of Microbiology	
1.0 MISSION STATEMENT	1
2.0 INTRODUCTION	1
3.0 SAMPLING GUIDELINES	1
3.1 General Procedures	1
3.2 Chain-of-Custody	2
4.0 PART 1: DIVISION OF ENVIRONMENTAL CHEMISTRY	5
4.1 Program Services	5
4.1.1 Operational Format	5
4.1.2 Accreditation/Certification	5
4.1.3 Quality Assurance	5
4.1.4 Sample Management Area	5
4.2 Analytical Services	7
4.2.1 Air Quality, Radiation, & Occupational Health Section	7
4.2.2 Inorganics Section	11
4.2.3 Multi-Element Section	14
4.2.4 Pesticides Section	16
4.2.5 Trace Organics Section	18
4.2.6 Food and Pharmaceutical Section	20
5.0 PART II: DIVISION OF ENVIRONMENTAL MICROBIOLOGY	22
5.1 Program Services	22
5.1.1 Organizational Chart	22

TABLE OF CONTENTS (Cont=d)

<u>Title</u>	<u>Page No</u>
5.1.2 Quality Assurance	22
5.1.3 Sample Management	22
5.1.4 Sampling Procedures	25
5.2 Analytical Services	25
5.2.1 Water and Wastewater Microbiology	25
5.2.2 Food & Shellfish, Outbreak Investigations Microbiology	26
5.2.3 Dairy Microbiology	26
5.2.4 Dairy Chemistry	26
6.0 PART III: TEST DIRECTORY	32
6.1 Abbreviations	32
6.2 Directory	33

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Nutrients Laboratory	(410) 767-6188
Wastewater Laboratory	(410) 767-6192

<i>Pesticides Section</i>	(410) 767-8185
Drinking Water Laboratory	(410) 767-6193
Toxic Waste Laboratory	(410) 767-6196

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1.0 MISSION STATEMENT

The mission of the Environmental Chemistry and Microbiology Laboratories is to provide a wide array of chemical and microbiological testing and technical services in support of programs and policies essential to the environmental quality and public health of the citizens of the State of Maryland.

2.0 INTRODUCTION

The purpose of this guide is to familiarize users of the services provided by the Division of Environmental Chemistry and Environmental Microbiology with all their analytical capabilities and to facilitate the use of these services.

The *Enviroguide* is organized into three parts: Part I: Environmental Chemistry; Part II: Environmental Microbiology; Part III: Test Directory. Parts I and II give a brief description of each division and their respective sections including tables of all the tests performed by each section. These tables provide information on the required containers, sample size, preservation techniques, holding times, and prescribed analytical method for each test. Part III, Test Directory, contains the list of tests and the name of the laboratory which performs the test. There are some tests not included on the directory and are no longer routinely performed. If non-routine analyses are desired, the appropriate laboratories should be consulted.

Phone numbers of all areas in the Division are included on the AContactA page. Users of the services are strongly encouraged to telephone the appropriate area for any additional information. Users of these services are also strongly encouraged to visit the laboratories. Such visits can be very informative and can help improve communication between the laboratory and its users.

The users are encouraged to consult the guide to help in their planning prior to sampling. The proper collection, handling and preservation of samples is critical in order to produce accurate and defensible data.

3.0 SAMPLING GUIDELINES

3.1 General Procedures

The Laboratories Administration analyzes samples that affect the quality of the environment and human health. It is therefore of great importance that all samples submitted for laboratory analysis are collected and preserved according to prescribed procedures. Failure to do so may result in rejection of the samples or in the invalidation of the test data. For information on established and prescribed procedures for collecting, preserving and transporting samples, consult the part of the *Enviroguide* dealing with the particular sample of interest. Field personnel should not hesitate to consult the appropriate laboratories for information on sampling procedures for routine or non-routine analysis.

Each sample submitted should be accompanied by a Laboratory Analysis Request form

with the following information:

- < Collector=s name and phone number
- < Source and location of sampling
- < Bottle/container number
- < Date and time of collection
- < Type of preservation
- < Test(s) required
- < Description of sample, if applicable
- < Other pertinent sample information
- < Where results should be sent

3.2 Chain-of-Custody Samples

There are instances when the results of an analysis may become involved in criminal or civil litigation. In such cases, the samples are considered physical evidence and special procedures must be strictly adhered to:

- < The sample must be legally obtained.
- < There must be a full description of how the sample was collected.
- < A complete identification must be placed on the sample container and any shipping containers.
- < Each sample must be securely sealed to prevent leakage, spills, or co-mingling of individual items.
- < A "chain-of-custody" document (form) must accompany the sample. The document will contain the names and signatures of all individuals handling the samples and the dates and times the samples were under their custody. Use the Division of Environmental Chemistry=s form for environmental chemistry samples and the Laboratories Administration=s chain-of-custody form for microbiology samples.
- < When the samples are not under the direct control of any individual, they must be placed in a secured area.

CHAIN OF CUSTODY RECORD

Collector: _____ Sample Source: _____ Project: _____

Agency & Address: _____

Phone No.: _____ Fax No.: _____

Regulatory Program: NPDES RCRA CERCLA Other _____

Preserv. Used					
Tests Requested					

Lab No.	Sample Identification	Date	Time	Sample Matrix	No. of Containers				Remarks

I, the undersigned, hereby certify that the sample submitted in this case and listed above, while in my custody, remained and was delivered in essentially the same condition as when I received it, except that material or portion thereof consumed in the analytical process at the laboratory, and that I received and delivered it to the person indicated on the date and time stated.

Collected/Relinquished by: (1)	Date:	Time:	Received by:
Relinquished by: (2)	Date:	Time:	Received by:
Relinquished by: (3)	Date:	Time:	Received by:
Relinquished by: (4)	Date:	Time:	Received for Testing by:
Special Instructions (i.e., storage condition, sample released to, etc.):		Send Reports to:	

PRESS FIRMLY WHEN YOU WRITE - YOU ARE MAKING FOUR COPIES

MARYLAND STATE DEPARTMENT OF HEALTH AND MENTAL HYGIENE

Laboratories Administration

201 W. Preston Street

Baltimore, Maryland 21201

CHAIN OF CUSTODY LOG

1. SAMPLE	2. DATE COLLECTED	3. STATE CASE NO.	4. COUNTY CASE NO.
5. I.R. NO.	6. COUNTY	7. COLLECTED BY	8. LAB NO.
9. SAMPLE DESCRIPTION (Quote pertinent labeling, firm name and address, pkg., etc.)			

I, the undersigned, hereby certify that the sample submitted in this case and listed above, while in my custody, remained and was delivered in essentially the same condition as when I received it, except that material or portion thereof consumed in the analytical process at the laboratory, and that I received and delivered it to the person indicated on the date and time stated.

10. SAMPLE ACKNOWLEDGEMENT				
Sample received from	Date/time	Sample received by	Date/Time	Remarks

11. SAMPLE RELEASED TO:

Name: _____ Date: _____ Time: _____

Address: _____

Received by: _____ Date: _____

Witnessed by: _____ Date: _____

12. SAMPLE STORAGE CONDITIONS

4.0 PART I: DIVISION OF ENVIRONMENTAL CHEMISTRY

4.1 Program Services

The Division of Environmental Chemistry provides analytical data for environmental and consumer product samples of multi-media matrices such as drinking water, wastewater, sediments, soils, sludge, indoor air from worksites, ambient air, aquatic tissues, pharmaceuticals, foods, and dairy products. Tests are performed for metals, inorganics, organics, asbestos, PCBs, pesticides, industrial solvents, radionuclides, direct and indirect food additives, nutritional labeling, consumer product tampering, and forensic investigations. The laboratory serves as a resource for Maryland Department of the Environment (MDE), Maryland Occupational Safety and Health Administration (MOSH), counties and Local Environmental Health departments, DHMH-Divisions of Food Control and Drug Control, other state agencies, citizens and special interest groups.

4.1.1 *Operational Format* - see Figure 1

4.1.2 *Accreditation/Certification*

The professional staff possesses a broad range of experience in the performance of environmental chemical analyses in a variety of matrices. The laboratories involved in the analysis of drinking water and wastewater are certified by the USEPA for metals, volatile organics, pesticides, inorganics, and radiation. The Air Quality Laboratory is certified for particulate matter in ambient air and maintains NVLAP certification for the analysis of bulk asbestos. The Occupational Health Laboratory maintains accreditation by AIHA for analyses of metals, organics, and asbestos in workplace indoor air.

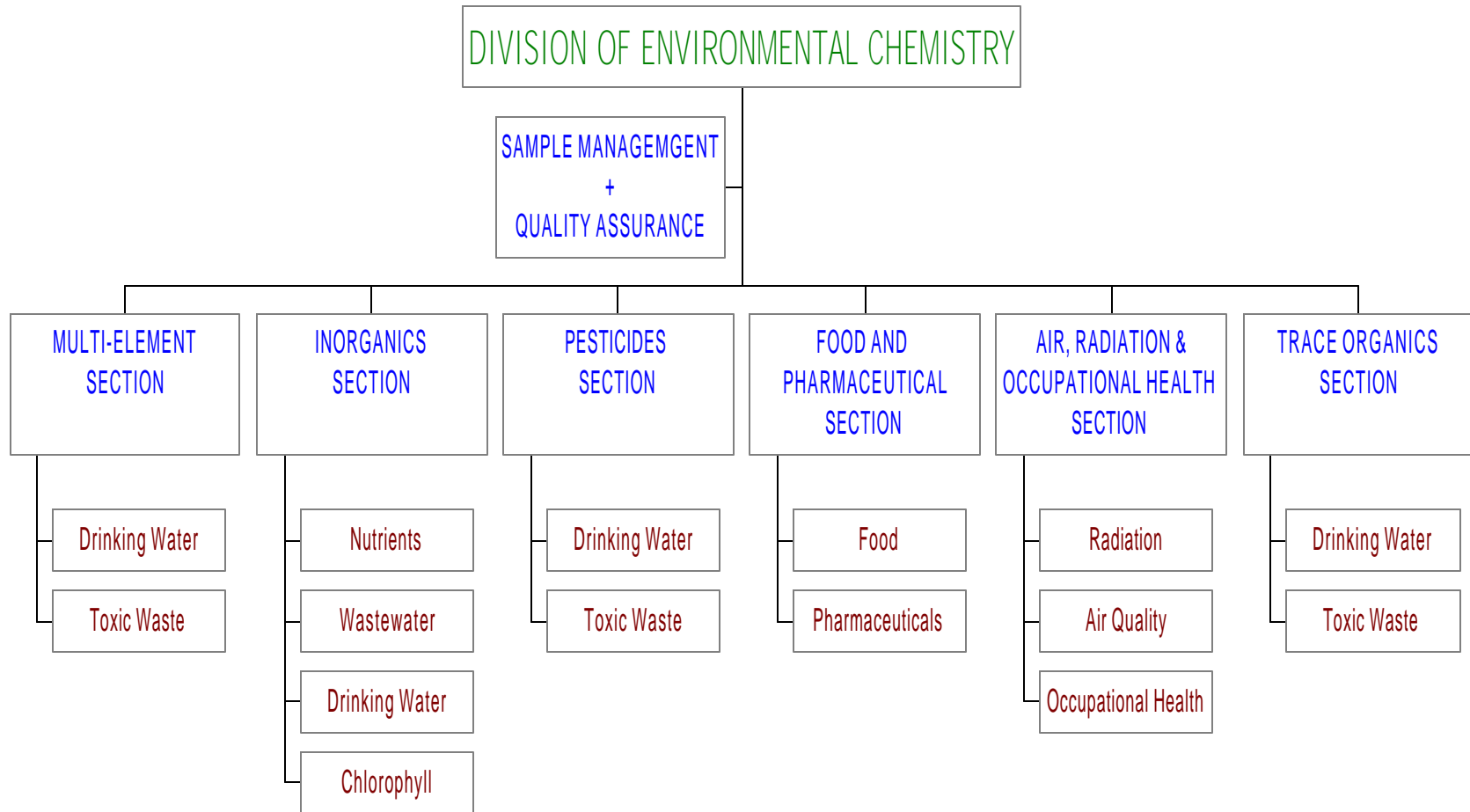
4.1.3 *Quality Assurance Program*

The Quality Assurance Program manages, coordinates and monitors the division's quality assurance/quality control activities and laboratory safety protocols; serves as a liaison between federal and state regulatory agencies and the laboratory staff for advice on technical and QA/QC issues; promotes bi-directional communication with the various workstations in the Sections; develops and implements data quality objectives and tracks the status of the various projects; evaluates the overall analytical performance of the laboratory.

4.1.4 *Sample Management Area*

The Sample Management Area provides a centralized area that ensures all samples are collected, preserved, and transported as specified by standard procedures and regulations; performs sample log-in/registration, chain-of-custody, storage and distribution to the respective laboratories for chemical analysis; communicates with the laboratories about sample results and other

OPERATIONAL FORMAT - Figure 1



pertinent information; mails all completed laboratory reports to sample submitters and appropriate program agencies and maintains files of all completed reports; tracks each laboratory's productivity by monitoring daily workload, backlog, inquiries, and complaints; serves as the central clearing house for tracking all samples submitted for chemical analysis with bi-directional communication with the Sections.

The normal turnaround time for sample analysis is 3 - 15 working days from receipt of the samples. Turnaround times, however, may vary depending on the type of test(s) requested, number of samples, and the regulatory criteria. In emergencies, rush/priority sample analysis can be performed with the consent of the Division Chief and the appropriate Section Head.

During laboratory working hours (Monday - Friday, 8:00 AM - 4:30 PM) all environmental chemistry samples and the accompanying request forms should be delivered to Sample Management Area, Room 1D-8. Between 4:30 PM and 8:00 AM and on weekends or holidays, samples and laboratory request forms should be left in the walk-in refrigerator, Room 1D-2.

Follow the information regarding collection, preservation, and holding times for the samples you are collecting. This information is summarized under each laboratory.

4.2 Analytical Services

4.2.1 Air Quality, Radiation and Occupational Health Section

This section is composed of three laboratories and a description of their functions are listed. The following customers are supported by the services of this section: Air and Radiation Management Administration - MDE (ARMA); Department of General Services; Engineering and Maintenance Division - DHMH; Radiological Health Program - MDE; Public Drinking Water Program - MDE; and Maryland Occupational Safety and Health Administration - DLR (MOSH). Most of the samples tested in this section can be collected only by trained personnel working with the supported State programs. Questions about sampling procedures and policies should be directed to this section.

The AIR QUALITY LABORATORY provides analytical and technical services to Maryland Department of the Environment (MDE), MOSH, and other state and local officials involved in the evaluation of air quality in the state as prescribed in the federal Clean Air Act. The laboratory is accredited by the National Voluntary Laboratory (NVLAP) for bulk asbestos analysis and by the American Industrial Hygiene Association (AIHA) for analysis of airborne asbestos. The major instruments used are the atomic absorption spectrophotometer, analytical balance, polarized light microscope, and phase contrast microscope.

The principal services offered are measurement of total suspended particulate on quartz filters and respirable dust on PM10 and PM2.5 filters, analysis of filters for airborne asbestos, analysis of bulk asbestos, determination of levels of lead and other metals in ambient outdoor air, and microscopic identification of airborne particulate such as soot, coal dust, grain dust, pollen, KISH, etc.

The RADIATION LABORATORY provides analytical and technical services to Maryland Department of the Environment and any State agency involved in radiation protection programs. These programs include surveillance of nuclear power plants, monitoring of public drinking water, and enforcement of regulations for licensed users of radioactive materials.

This laboratory has the capability to analyze radioactive material in air, water, food, soil, and vegetation. Methods of analysis are radiochemical separations, alpha/beta counting, liquid scintillation spectrophotometry, and gamma isotopic spectrometry.

The OCCUPATIONAL HEALTH LABORATORY, accredited by the American Industrial Hygiene Association, provides laboratory services in support of Maryland Occupational Safety and Health regulatory programs. Analyses routinely performed by this laboratory include volatile organic solvents, heavy metals, dust, asbestos, coal tar pitch, volatile compounds, inorganic ions, acid mists, and a variety of other toxic compounds. Methods used for these analyses are gas chromatography, gas chromatography/mass spectrometry, liquid chromatography, ion chromatography, atomic absorption, and UV/visible spectrometry. Any occupational health issues must be referred to Maryland Occupational Safety and Health Administration (MOSH) consultation section (410-880-4899) or the compliance section (410-767-2363) for further guidance and possible problem resolution.

AIR QUALITY LABORATORY

Test	Container	Sample Size	Preservation	Holding Time	Method
Total suspended particulates (TSP)	glass fiber	2000 L air	na	na	EPA 600/4-77-027a Section 2.1 Section 2.2
PM10	quartz filter	2000 L air	na	na	
PM2.5	teflon filter	24 L	4ECV2E	30 days ¹	
Metals (air)*	glass fiber	2000 L air	na	na	EPA 500/4-77-027a Section 2.8
Asbestos (air)	0.45 µm cellulose ester membrane, 25 mm dia.	400-1200 L air	na	na	NIOSH 7400
Asbestos (bulk)	tightly sealed plastic or glass vial	3-4 sq.in. floor files or 1 cub. in. loose-fill insulation	na	na	EPA 600/R.93/116
Particle identification	tightly sealed plastic bag or glass vial	1 cub. in.	na	na	

* Metals performed after total suspended particulates (TSP) analysis is completed;
¹From pre-sampling weight to final exposed weight. Exposed filters unrefrigerated are stable for 10 days.
na = not applicable

RADIATION CHEMISTRY LABORATORY

Test/Matrix	Container	Sample Size	Preservation	Holding Time	Method
Gross alpha & beta (air)	pump head	50 m ³	na	1 week	EPA 900.0
Gross alpha & beta (water, diss)	plastic	4 L	HNO ₃ , pH <2	2 weeks	EPA 900.0
Gross alpha & beta (water, susp)	plastic	4 L	na	3 months	EPA 900.0
Gross alpha & beta (wipes)	coin env.	100 cm ²	na	variable**	EPA 900.0
Gamma isotope (air particle)	pump head	50 m ³	na	1 month	HASL
Gamma isotope (water)	plastic	4 L	HNO ₃ , pH <2	3 months	HASL
Gamma isotope (milk)	plastic	4 L	4 EC, formaldehyde	3 months	HASL
Gamma isotope (oyster)	polybag	100 cm ³	freeze	2 weeks	HASL
Gamma isotope (sediment/sand)	polybag	4000 cm ³	freeze	months	HASL
Gamma isotope (soil)	polybag	1000 cm ³	na	variable**	HASL
Gamma isotope (wipes)	coin envelope	100 cm ²	na	variable**	HASL
Gamma isotope (vegetation)	polybag	4000 cm ³	4 EC	2 weeks	HASL
I-131 (charcoal filter)	pump head	50 cm ³	na	2 days	HASL
Strontium 90 & 89 (water)	plastic	4 L	HNO ₃ , pH <2	1 month	EPA 905.0
Strontium 90 & 89 (milk)	plastic	4 L	4 EC, formaldehyde	1 month	AOAC EPA 905.0
Tritium (water)	plastic	1 L	na	3 months	EPA 906.0
Radon 222 (water)	boro vial	15 mL	4 EC	2 days	EPA 913.0
Liquid scint. (wipes)	coin env.	100 cm ²	na	variable**	EPA 906.0

* Volume requirements may be determined by sensitivity desired.

** Variable = the maximum holding time as determined by isotope and sensitivity desired.

na = not applicable

4.2.2 *Inorganics Section*

The Inorganics Section carries out a wide array of tests on water from diverse sources throughout Maryland. The sources include drinking water, wastewater, water from hazardous sources, and water from the Chesapeake Bay and its tributaries. Programs supported by this Section include the Safe Drinking Water Act (SDWA), National Pollution Discharge and Elimination System (NPDES) of the Clean Water Act, Resource Conservation and Recovery Act (RCRA), Superfund, and the Chesapeake Bay Initiative Program. This section is subdivided into four laboratory units as described below.

The NUTRIENTS LABORATORY analyzes drinking water, waste water and waters from the Chesapeake Bay for nutrients such as nitrate, nitrite, ammonia, total phosphorus, orthophosphate, etc. The nutrient composition of water is a good indicator of its ability to support the growth of algae and other harmful organisms.

The WASTEWATER/SOLID WASTE LABORATORY analyzes waste water and waters from the Chesapeake Bay for biological oxygen demand, total organic carbon and TSS, etc. These tests help determine the effectiveness of water treatment systems, and the quality of the Chesapeake Bay waters. It also analyses for total petroleum hydrocarbons, oil and grease, cyanide and ignitability, etc. on samples suspected of having toxic or hazardous effects. Such samples include wastewater, oils, sediments, sludges, and soils. The results of these tests can result in legal action.

The DRINKING WATER LABORATORY performs tests for turbidity, alkalinity, chloride, total solids and dissolved solids, etc. on drinking water and wastewater. These tests help determine the suitability of drinking water for human consumption.

The CHLOROPHYLL LABORATORY measures the chlorophyll content of water from the Chesapeake Bay and its tributaries. The chlorophyll content of water is an important indication of the activity of algae and other organisms whose growth has harmful effects on water and wildlife.

INORGANICS SECTION

Test	Container	Sample Size	Preservation	Holding Time	Method
‣ Alkalinity	P	500 mL	4 EC	14 days	EPA 310.1
‣ Bioch. oxy. demand	P	1000 mL	4 EC	48 hours	EPA 405.1
‣ Chem. oxy. demand	P	500 mL	4 EC, H ₂ SO ₄ , pH<2	28 days	EPA 410.4
‣ Chloride	P	500 mL	None	28 days	EPA 325.2
‣ Chlorophyll	Filter	na	4 EC, lt.protect.	30 days	EPA 10200
‣ Color	P	500 mL	4 EC	48 hours	EPA 110.2
‣ Conductance	P	500 ml	4 EC	28 days	EPA 120.1
‣ Conductance	P	500 mL	4 EC	28 days	EPA 846,9050
‣ Corrosivity	G	8 oz.	4 EC	24 hours	EPA 846/7.2
‣ Cyanide					
Amenable	P	500 mL	NaOH, pH>12	14 days	EPA 335.1
Total	P	500 mL	NaOH, pH>12	14 days	EPA 335.2
‣ Fluoride	P	1L	None	28 days	EPA 340.2
‣ Hardness	P	500 mL	H ₂ SO ₄ or HNO ₃ pH <2	6 months	EPA 130.1
‣ Ignitability	G	8 oz.	4 EC	14 days	EPA 846/1020
‣ MBAS (detergents)	P	500 mL	4 EC	48 hours	EPA 425.1
‣ Nitrogen					
Total Ammonia	P	1 L	4 EC, H ₂ SO ₄ , pH<2	28 days	EPA 350.1
Total Kjeldahl	P	1 L	4 EC, H ₂ SO ₄ , pH<2	28 days	EPA 351.2
Total Nitrate/Nitrite	P	1 L	H ₂ SO ₄ , pH<2	28 days	EPA 353.2
Total Nitrite	P	1 L	4 EC	48 hours	EPA 353.2
‣ Oil and Grease	G,Teflon cap	1 L	4 EC, H ₂ SO ₄ , pH<2	28 days	EPA413.1/1664
‣ pH, soil	G	8 oz.	4 EC	Immediately	EPA 150.1
‣ Phenol	G, Teflon cap	1L	4 EC, H ₂ SO ₄ , pH<2	28 days	EPA 420.1
‣ Phosphorus					
Ortho	P	1L	4 EC	48 hours	EPA 365.1
Total	P	1L	4 EC, H ₂ SO ₄ , pH<2	28 days	EPA 365.4

INORGANICS SECTION (Cont=d)

Test	Container	Sample Size	Preservation	Holding Time	Method
▸ Residue (solids)					
Filterable	P	500 mL	4 EC	7 days	EPA 160.1
Non-filterable	P	500 mL	4 EC	7 days	EPA 160.2
Settleable	P	500 mL	4 EC	48 hours	EPA 160.5
Total	P	500 mL	4 EC	7 days	EPA 160.3
Volatile	P	500 mL	4 EC	7 days	EPA 160.4
▸ Silica	P	1 L	4 EC	28 days	EPA 370.1
▸ Sulfate	P	500 mL	4 EC	28 days	EPA 375.2
▸ Total Org. Carbon	P	500 mL	4 EC, HCl, pH<2	28 days	EPA 415.2
▸ Total Petroleum	G	1 L	4 EC, H ₂ SO ₄ or		
▸ Hydrocarbons			HCl, pH<2	28 days	EPA 413.2
▸ Turbidity	P	500 mL	4 EC	48 hours	EPA 180.1

P = plastic; G = glass; mL = milliter; L = liter; oz = ounce.

4.2.3 *Multi-Element Section*

This Section performs the analyses of trace metals in drinking water, wastewater, aquatic tissues and hazardous wastes in support of the Safe Drinking Water Act (SDWA), the National Pollutant Discharge Elimination System (NPDES) of the Clean Water Act, Superfund (CERCLA) and the Resource Conservation and Recovery Act (RCRA) Also, it determines toxic metals concentration in consumer products for possible tampering. This Section is subdivided into two laboratory units as described below.

The DRINKING WATER LABORATORY analyzes metals in public drinking water and private well water samples. Analysis is carried out using inductively coupled plasma atomic emission could spectrometer (ICP), inductively coupled plasma-mass spectrometer (ICP-MS), and cold vapor atomic absorption spectrophotometry (CVAA).

The TOXIC WASTE LABORATORY analyzes metals in wastewater, groundwater, and hazardous wastes such as soils, sediments, leachates, and sludges. The results of these tests could frequently result in legal action. This laboratory also analyzes metals in fish and shellfish indigenous to Maryland. The results are used for mapping the concentrations of trace and heavy metals in Maryland's water systems.

MULTI-ELEMENT SECTION

Test	Container	Sample Size	Preservation	Holding Time	Method
Aluminum	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7
Antimony	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7/200.8
Arsenic	P	1 L	HNO ₃ , pH<2	6 month	EPA 200.7/200.8
Barium	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7/200.8
Beryllium P	1 L	HNO ₃ , pH<2	6 months		EPA 200.7/200.8
Cadmium	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7/200.8
Calcium	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7
Chromium, hexavalent	P	300 mL	4 EC, no acid	24 hours	USGS I-1230-85
Chromium	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7/200.8
Cobalt	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7
Copper	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7/200.8
Iron	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7
Lead	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7/200.8
Magnesium	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7
Manganese	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7/200.8
Mercury	P	1 L	HNO ₃ , pH<2	28 days	EPA 245.1
Molybdenum	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7
Nickel	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7/200.8
Potassium	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7
Selenium	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7/200.8
Silver	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7/200.8
Sodium	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7
Thallium	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7/200.8/200.9
Vanadium	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7
Zinc	P	1 L	HNO ₃ , pH<2	6 months	EPA 200.7/200.8
<i>Fish</i>	F	na	Freeze	na	FDA
<i>Soils/Sediments</i>	G	50 g	4 EC	na	SW846
<i>TCLP (Liquid)</i>	P	1 L	4 EC, no acid	24 hours	SW846
<i>TCLP (Solid)</i>	G	250 g	None	6 months	SW846

P=plastic; G=glass; F=aluminum foil; L=liter; mL=milliter; HNO₃=conc. nitric acid (Ultra pure); na = not applicable

4.2.4 Pesticides Section

This Section performs the analysis of insecticides, herbicides and polychlorinated biphenyls (PCBs) in drinking water, wastewater, aquatic tissues and hazardous wastes in support of the Safe Drinking Water Act (SDWA), the National Pollutant Discharge Elimination System (NPDES) of the Clean Water Act, Superfund (CERCLA) and the Resources Conservation and Recovery Act (RCRA). This Section is subdivided into two laboratory units as described below.

The DRINKING WATER LABORATORY analyzes pesticides and PCBs in public drinking water and private well water samples. The laboratory utilizes capillary column gas chromatographs with electron capture detectors (GC/ECD) or mass spectrometers (GC/MS), and high performance liquid chromatograph (HPLC) with a fluorescence detector.

The TOXIC WASTE LABORATORY analyzes pesticides and PCBs in wastewater, groundwater, aquatic tissues and hazardous waste such as soils, sediments, leachates, sludges and oils using capillary gas chromatographs equipped with electron capture detectors or mass spectrometers.

PESTICIDES SECTION

Matrix/Test	Container*	Sample Size	Preservation	Holding Time	Method
- Drinking Water					
<EDB, & DBCP	glass vial	40 mL	4 EC, 1:1 HCl, pH<2 ascorbic acid	14 days	EPA 504.1
<Chlorinated pesticides & PCBs	glass amber bottle	1 L	4 °C, sodium thiosulfate	14 days	EPA 508
<Chlorinated acid herbicides	glass amber bottle	1 L	4 °C, sodium thiosulfate	14 days	EPA 515.1
<Semi-volatile pesticides	glass bottle	1 L	4 EC, pH<2 sodium sulfite	14 days	EPA 525.2
<Carbamate pesticides	glass amber vial	60 mL	4 °C, monochloroacetic acid, pH<3, sodium thiosulfate	28 days	EPA 531.1
- Wastewater					
<Chlorinated pesticides & PCBs	glass bottle	1 L	4 EC	7/14 days	EPA 608
- Hazardous Wastes					
<Chlorinated pesticides & PCBs	glass bottle	1 L	4 EC	7/14 days	EPA 8081

* Glass vials must have Teflon-lined septum caps; glass bottles must have Teflon-lined caps

4.2.5 Trace Organics Section

This Section analyzes multi-media matrices such as drinking water, ground water, surface water, wastewater, sediments, sludges, soils, beverages, etc. for volatile and semi-volatile organic compounds in support of State and federal environmental and consumer products regulations. Federal environmental regulations supported include but are not limited to the Clean Water Act (NPDES and Chesapeake Bay), Safe Drinking Water Act, Superfund, and Resource Conservation and Recovery Act. Customers served include but not limited to Maryland Department of the Environment, County Health Departments, DHMH Division of Engineering and Maintenance, and other State agencies/program offices. This Section is subdivided into two laboratory units as described below.

The DRINKING WATER LABORATORY provides technical and analytical services to various State agencies program offices involved in volatile organic compounds and haloacetic acids testing for compliance and/or enforcement.

The TOXIC WASTE LABORATORY provides technical and analytical services to various State agencies/program office involved in volatile and semi-volatile organic compounds testing for regulatory compliance and/or enforcement.

These laboratories have the capability to determine volatile and semi-volatile organics in a variety of sample matrices using state-of-the-art chromatographic instruments and approved EPA methodologies with appropriate QC data packages.

TRACE ORGANICS SECTION

Matrix/Test	Container*	Sample Size	Preservation	Holding Time	Method
- Drinking Water					
▸ Volatile organics	glass vial	40 mL	4 EC, 1:1 HCl, pH<2 ascorbic acid	14 days	EPA 502.2/524.2
▸ Trihalomethanes	glass vial	40 mL	4 EC, 1:1 HCl, pH<2 ascorbic acid or sodium thiosulfate	14 days	EPA 502.2/524.2
▸ Haloacetic acids	glass amber bottles	60 mL	4 EC, 6 mg NH ₄ Cl	14 days	EPA 552.2
- Wastewater					
▸ Volatile organics	glass vial	40 mL	4 EC, 1:1 HCl, pH<2 ascorbic acid	14 days	EPA 624
▸ Base neutral/acid extractable organics (semi-volatile organics)	glass bottle	1 L	4 EC	7 days	EPA 625
- Hazardous Wastes					
▸ Volatile organics	glass vial	40 mL	4 EC, 1:1 HCl, pH<2 ascorbic acid	14 days	EPA 8260
▸ Base neutral/acid extractable organics (semi-volatile organics)	glass bottle	1 L	4EC	7 days	EPA 8270

* Glass vials must have Teflon-lined septum caps; glass bottles must have Teflon-lined caps

4.2.6 Food and Pharmaceutical Section

The Food and Pharmaceutical Section determines whether foods and drugs manufactured, prepared, packaged and/or sold in Maryland comply with State and federal laws and regulations. This Section is subdivided into two laboratory units as described below.

The FOOD CHEMISTRY LABORATORY analyzes foods for compliance monitoring, adulteration, labeling, and unknown (forensic) samples and consumer products for possible tampering.

Examples of key services offered:

- < Examination of miscellaneous food products, as consumer complaints for filth, insects and
- < Organoleptic analysis of foods for decomposition.
- < Calibration of thermometers.
- < Analysis of foods for chemical contaminants.
- < Analysis of food samples collected from food establishments.
- < Presumptive blood tests performed on stains on food samples.
- < Specification of uncooked meat samples.
- < Identification of insects and insect fragments found in food products.

The PHARMACEUTICAL LABORATORY analyzes medicines, drugs, and health care remedies submitted by the Maryland Board of Pharmacy and the DHMH-Division of Drug Control. These analyses determine whether these substances comply with federal and State regulations. Requests for product testing should be made by authorized personnel (Drug Inspectors) of the Division of Drug Control - DHMH. These trained individuals will respond and make the necessary arrangements to secure specimens and obtain the required information. A complete list of analyses performed by this laboratory is listed in the Test Directory (PART III).

Examples of key services offered:

- < Analysis of prescription and non-prescription drugs for purity and possible eviden
- < Identification of contaminants which may constitute a hazard to public health.
- < Detection of deterioration and evidence of instability of a pharmaceutical
- < Evaluation of medicinals prepared by pharmacists as requested by the Maryland Boar

- < Investigation of consumer complaints regarding prescription drugs dispensed by pl
- < Chemical analysis of stock solutions and dosage units prepared in the State drug abus
- < Quality control of medicinals used in State hospitals and other State agencies.

5.0 PART II: ENVIRONMENTAL MICROBIOLOGY

5.1 Program Services

The Environmental Microbiology Section of the Division of Microbiology analyzes samples originating from diversified ecological origins. At Central Laboratory the program is divided into three groups, Dairy, Food/Shellfish, Water Microbiology, and Dairy Chemistry. The three regional laboratories: Eastern Shore Regional Laboratory, Southern Maryland Regional Laboratory, and Western Maryland Regional Laboratory - all perform water microbiology analysis. The Western Maryland Regional laboratory also analyzes dairy microbiology samples while the Eastern Shore Regional Laboratory performs some analysis of shellfish samples.

5.1.1 *Organizational Chart* - see Figures 1 and 2

5.1.2 *Quality Assurance*

Quality Assurance is a set of operating principles that if strictly followed will produce data of known and defensible quality. To accomplish these goals each laboratory has a written Quality Control plan that outlines the procedures to be followed in sample collection, transport, and analysis. Corrective action procedures, which are a part of the Quality Assurance plan, are instituted to address possible deviations, and may require input from the sample provider.

5.1.3 *Sample Management*

At CENTRAL LABORATORY, during normal working hours, water samples should be delivered to the Water Microbiology Laboratory, Room 3D-2. Dairy products samples are to be transported to Room 3D-1 for log-in. Food and shellfish products samples should be delivered directly to Room 3D-5. For further information, contact the laboratory at (410) 767-6145.

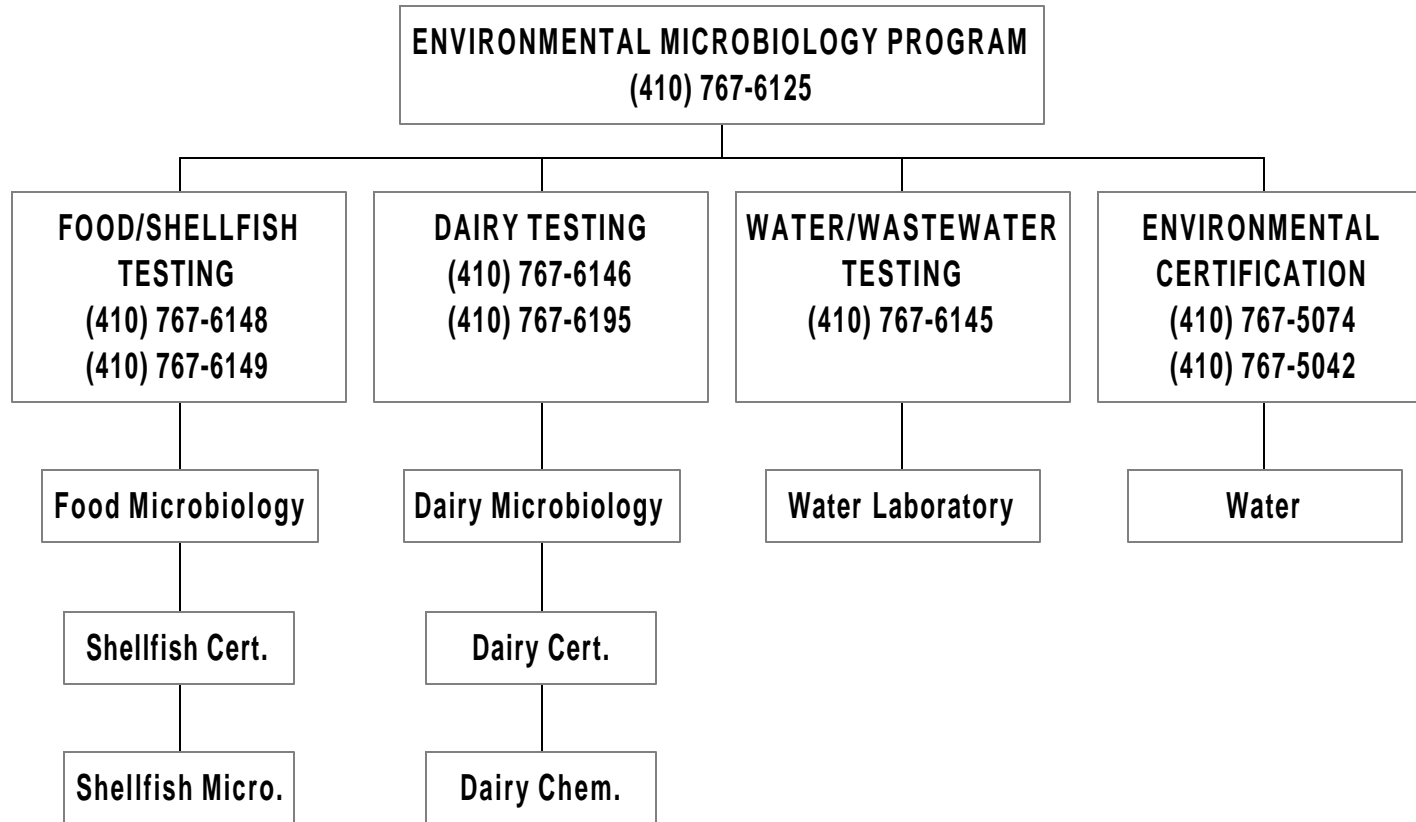
Samples transported to the laboratory between 4:30 p.m. - 8:30 p.m. should be delivered to Registration in the lobby. If samples are brought in after 8:30 p.m., they should be stored in the refrigerator units in Room 3D-2.

For sample management procedures at the regional laboratories, contact the specific laboratory.

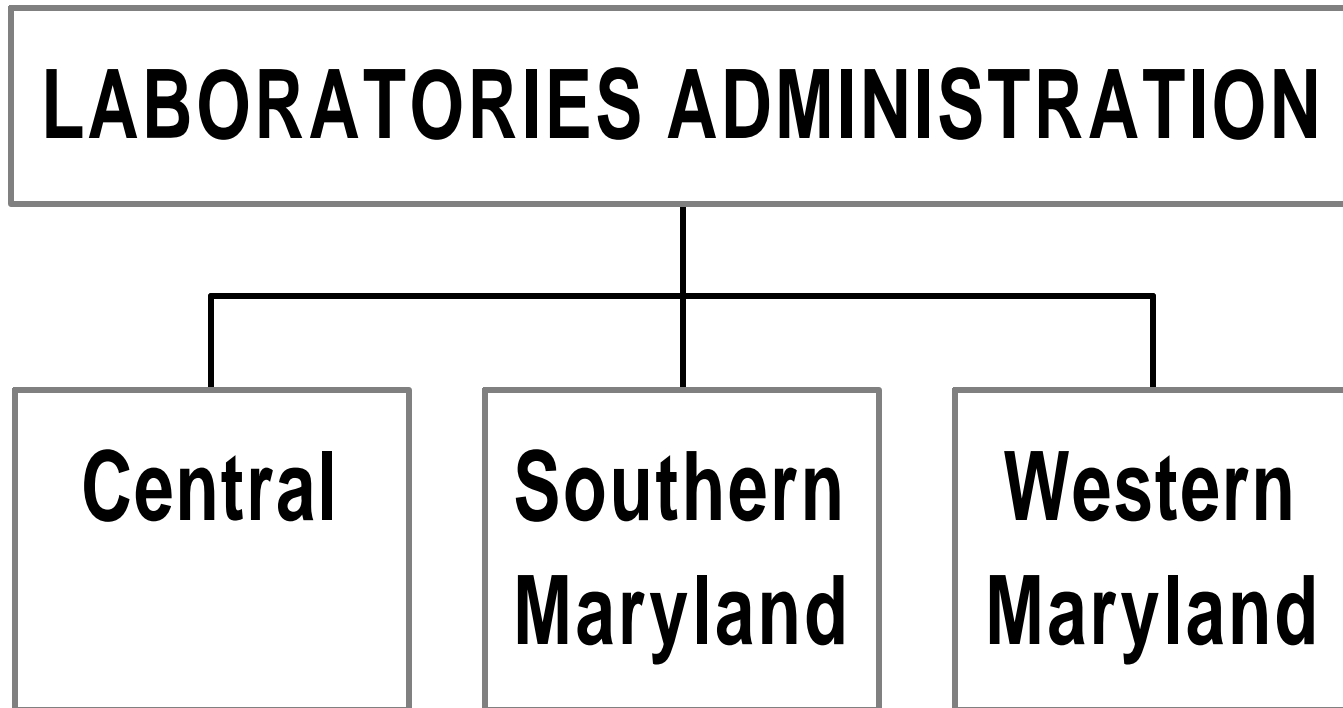
Eastern Shore	(410) 219-9005 / (410) 749-1174
Southern Maryland	(301) 386-0207
Western Maryland	(301) 777-2115 or 2116

ate of Maryland
Department of Health and Mental Hygiene
Laboratories Administration
Division of Microbiology

ORGANIZATIONAL CHART - FIGURE 1



ORGANIZATIONAL CHART - FIGURE 2



5.1.4 Sampling Procedures

For sample collection protocols please refer to the specific methods or contact the appropriate laboratory.

5.2 Analytical Services

The Environmental Microbiology Laboratory Program responds to client requests for lab support in the areas of environmental and consumer products compliance monitoring. The functions of the program are performed in four testing units at the Central Laboratory and integrated into the functions of three regional laboratories.

The Environmental Microbiology Laboratory Program has the responsibility of overseeing the compliance of commercial and municipal laboratories with established federal standards through their participation in the environmental laboratory certification programs that govern water, dairy and seafood testing.

These functions summarize the mission of the Laboratories Administration: to provide accurate and reliable data that can be used to support the public health goals of the state's monitoring agencies.

5.2.1 Water and Wastewater Microbiology

The water MICROBIOLOGY LABORATORY'S primary function is to analyze public and private drinking waters, sewages, streams, dairy waters, and recreational waters, which include natural bathing areas, swimming pools, and spas, for organisms indicative of fecal contamination and bacterial densities. The laboratory also analyzes water from swimming pools, spas, and therapeutic baths (Whirlpools) for the presence of pseudomonads. This laboratory is certified by the U.S. Environmental Protection Agency for the analysis of drinking waters.

5.2.2 *Food and Shellfish Microbiology*

The FOOD AND SHELLFISH LABORATORY'S workload addresses the analysis of food and shellfish suspected of being associated with potential food borne illness. The laboratory analyzes food, commercially prepared crabmeat, harvested and imported shellfish, and shellfish waters in support of the state's monitoring and enforcement activities. Inspections are performed on containers of various food products for sterility. Clostridium botulinum toxin assays are conducted on various matrices including food, stools, serum/blood, and culture isolates. Assays of environmental samples, i.e., soil or sludge, and surfaces are done for potential pathogens. The shellfish laboratory is certified by the U.S. Food and Drug Administration.

5.2.3 *Dairy Microbiology*

The DAIRY MICROBIOLOGY LABORATORY tests a variety of dairy products to determine compliance with state and federal laws and regulations. The laboratory performs microbiological tests such as SPC (general microbial counts), coliform counts, yeast and mold count, and listeria identification. The other tests performed in this laboratory include inhibitor testing (antibiotic concentration), and somatic cell counts. This laboratory is certified by the U.S. Food and Drug Administration.

5.2.4 *Dairy Chemistry*

The DAIRY CHEMISTRY LABORATORY is a regulatory laboratory that analyzes milk and milk products to ensure complete pasteurization and to monitor quality standard by physical and chemical methods. The testing is in accordance with the federally recommended Pasteurized Milk Ordinance (PMO) compiled by U.S. Public Health/Food and Drug Administration which the State of Maryland has adopted. This document provides for the safe handling of milk to prevent the transmission of disease and prevents the mislabeling and adulteration of milk products. This laboratory is certified by the U.S. Food and Drug Administration.

WATER AND WASTEWATER MICROBIOLOGY

Sample Test	Analytical Test	Minimum Quantity Required	Sample Container Specifications	Turn-Around Time	Transport Conditions	Maximum Allowable Holding Time
<u>Water</u>						
Wastewater effluents	Fecal coliforms	7 oz.	Sterile 8 oz. bottle containing 0.8 ml of a combination of sodium thiosulfate & EDTA	2 - 5 days	Water Samples should be transported in coolers containing crushed ice filled no higher than the shoulders of the water containers in order to hold the temperature of the samples between 1.0°C to 10°C from the time of collection to the time of examination. Use of "Cool-Pack" alone without ice is not sufficient to maintain the required temperature. Water containers should be protected with barriers so as to be transported in upright positions and not be submerged in ice or slush.	6 hrs.
Stream Samples	Fecal coliforms; <i>Escherichia coli</i> ; Enterococci	3-3/4 oz.	Sterile 4 oz. bottle containing 0.1 ml of a 10% sodium thiosulfate solution.	2 - 5 days		6 hrs.
Swimming pool and/or man-made tanks	Total & Fecal coliforms ; Standard plate count	3-3/4 oz.	"	5 - 7 days		6 hrs.
Bathing beach areas, quarries and other natural bathing areas	Fecal coliforms; <i>Escherichia coli</i> ; Enterococci	3-3/4 oz.	"	2 - 5 days		6 hrs.
Shellfish-producing waters	Fecal coliforms	3-3/4 oz.	"	2 days		30 hrs.
Private & other public drinking waters	Total & Fecal coliforms; <i>Escherichia coli</i>	3-3/4 oz.	"	2 - 5 days		30 hrs.
Public drinking water	Total coliforms; Standard plate count	3-3/4 oz.	"	2 - 5 days		30 hrs.
Bottled water	Total & Fecal coliforms <i>Escherichia coli</i> ; Standard plate count	3-3/4 oz. In original, unopened container	Not applicable.	4 days	Uniced.	Not applicable.

FOOD AND SHELLFISH MICROBIOLOGY

Sample Type	Analytical Test	Minimum Quantity Required	Sample Container Specifications	Turn-Around Time	Transport Conditions	Maximum Allowable Holding Time
Food	Sterility; coliforms; <i>E. coli</i> ; <i>Staphylococci</i> ; Standard plate count; Yeast & Mold; <i>Salmonella</i> ; Other etiologic agents	100 g (1/4 lb.)	Original unopened container. Clean, dry, leakproof, wide-mouth, sterile container of a size suitable for samples, e.g., --plastic jars --plastic bags with suitable closures --metal cans	5 days *	In ice/water medium on racks in sample chest. 0-4°C. temp. should be maintained	36 hrs.
Crabs (cooked)	Total & Fecal Coliform; <i>E. coli</i> ; Standard Plate Count; <i>Staphylococci</i>	100 g	Do not use felt pen on plastic for identification markings because the ink might penetrate the container.	6 days *	0 - 4° C	24 hrs.
Shellfish (routine)	Total & Fecal Coliform; Standard Plate Count	Shellstock-12 sound animals (approx. 200 g of shell, liquor, and meat)	<u>Shellstock</u> -- Clean, sterile containers, e.g., plastic bags, tin cans with tight lids. <u>Shellfish</u> --sterile wide-mouth jars.	4 days *	<u>Shellstock</u> --kept in dry storage at a temperature above freezing but lower than 10°C. Shellstock should not come in contact with ice. <u>Shucked shellfish</u> -- kept refrigerated by packing in crushed ice.	24 hrs.
Shellfish Water	Fecal coliform	200 mls	<u>Shellfish water</u> -- Sterile wide-mouth plastic containers.	1 day	<10°C	30 hrs.

* Additional time may be required.

DAIRY MICROBIOLOGY

Sample Type	Analytical Test	Minimum Quantity Required	Sample Container Specifications	Turn-Around Time	Transport Conditions	Maximum Allowable Holding Time
<u>Dairy</u>						
Temperature Control		1	Container similar to samples in size and product type.	none	Transport under same conditions as samples.	none
Raw milk	Standard plate count; Inhibitory substances; DMSCC	1	Must be in sterile container, at least 2 oz. volume	2 days	Transport in coolers containing crushed ice filled to the shoulder of container. Each cooler accompanied by a temperature control	48 hrs.
Pasteurized milk and cream	Standard plate count; Coliform count; Inhibitory substances	1	Must be in unopened, full container.	3 days	"	48 hrs.
Ultra-pasteurized products	Standard plate count; Coliform count; Anaerobic count; Inhibitory substances	2	"	9 days	"	48 hrs.
Cultured products	Coliform count; Yeast & Mold count	1	"	5 days	"	24 hrs.
Acidophilus milk	Coliform Count; Inhibitory substances; Yeast & Mold count	1	Must be either in unopened container or sample container supplied by environmental bacteriology unit.	5 days	Must be transported in cooler containing crushed ice. Avoid complete submersion of container. Must be accompanied by temperature control.	24 hrs.

DAIRY MICROBIOLOGY

Sample Type	Analytical Test	Minimum Quantity Required	Sample Container Specifications	Turn-Around Time	Transport Conditions	Maximum Allowable Holding Time
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Frozen desserts	Standard plate count; Coliform count	1	Must be either in sterile, unopened container or sample container supplied by Environmental Bacteriology Unit.	3 days	Must be transported in cooler chest accompanied by frozen CO ₂ . Temperature control not necessary.	3 days
Frozen dessert mixes or soft-serves	Standard plate count; Coliform count	1	“	3 days	Must be transported in coolers covered with crushed ice and accompanied by temperature control. May not be frozen.	36 hrs.
Empty containers	Residual bacterial count; Residual coliform count	1	“	3 days	Room temperature.	None: reasonable holding time
Powdered Milk	Standard plate count*; Coliform count; Inhibitory substances	1	Submitted in Division of Milk Control approved plastic bags.	3 days	Room temperature.	None: reasonable holding time
Cheese	Coliform count;Yeast and Mold Count * Modified procedure.	1	Submitted in unopened original package.	5 days	Must be transported in chilled condition, preferably in cooler containing ice.	None: reasonable holding time

DAIRY CHEMISTRY

Sample Type	Analytical Test	Minimum Quantity Required	Sample Container Specifications	Turn-Around Time	Transport Conditions	Maximum Allowable Holding Time
<u>Dairy</u>						
Pasteurized fluid milk or cultured products (can also be performed on frozen desserts/novelty)	Phosphates	100 ml	Original container or sterile container.	72 hrs.	_ 4.4 °C	48 hrs.
Raw milk or unflavored fluid milk (only)	Freeze point	25 ml	Original container or sterile container.	48 hrs.	_ 4.4 °C	Before spoilage.
All dairy products	Fat	100 ml homogeneous mix.	Original container or sterile container.	Average 10 days (including confirmation if needed).	_ 4.4 °C	7-14 days under proper storage conditions.
Powder milk and cottage cheese	Moisture	10 grams homogeneous sample.	Original container or paper storage bag (Division of Milk Control).	48 hrs.		None.
Reconstituted powders (routinely); (Can be performed as confirmation for suitability for freeze point on any fluid product.)	Acidity	25 grams (powders); 100 ml (fluids).	Dry product in approved paper bag; appropriate container.	72 hrs.		Powder: unlimited shelf life based on proper storage.
Powdered milk (only)	Scorched particles	75 grams	Dry product in approved paper bag.	72 hrs.		Powder: unlimited shelf life based on proper storage.

6.0 PART III: TEST DIRECTORY

6.1 Abbreviations

<u>Lab Abbreviation</u>	<u>Laboratory</u>
AROHS	AIR, RADIATION & OCCUPATIONAL HEALTH SECTION
DM	DAIRY MICROBIOLOGY
DC	DAIRY CHEMISTRY
FC	FOOD CHEMISTRY
FSM	FOOD SAFETY MICROBIOLOGY
IS	INORGANICS SECTION
MES	MULTI-ELEMENT SECTION
PRS	PESTICIDES RESIDUE SECTION
PHC	PHARMACEUTICAL CHEMISTRY
TOS	TRACE ORGANICS SECTION
WM	WATER MICROBIOLOGY

6.2 Directory

A

Acenaphthene
Acenaphthylene
Acetone
Acidity
Alachlor
Aldrin
Alkalinity (total)
Alpha, gross (air, wipes)
Alpha, gross (water, dissolved, suspended)
Alpha-BHC
Aluminum
Ammonia
Animal Hair
Anthracene
Antibiotic Residue Tests (dairy)
Antimony
Arsenic
Asbestos (air, bulk)
Aspartame

B

Bacillus Cereus Count
Bacteriological Water Suitability
Barium
Benzene
Beryllium
Benzo (a) anthracene
Benzo (a) pyrene
Benzo (b) fluoranthene
Benzo (k) fluoranthene
Benzo (g,h,i) perylene
Benzoate
Beta-BHC
Beta, gross (air, wipes)
Beta, gross (water dissolved, suspended)
Beverage
Biochemical Oxygen Demand
Bis (2-chloroethyl) methane
Bis (2-chloroisopropyl) ether
Bis (2-ethylhexyl) phthalate
Blood, presumptive test
Botulism
Bromide
Bromoacetic Acid

LAB

TOS, PRS
TOS, PRS
TOS
FC, DC
PRS
PRS
IS
AROHS
AROHS
TOS
MES
FC, IS
FC
TOS, PRS
DM
MES
MES
AROHS
FC

FSM
WM
MES
TOS
MES
TOS, PRS
TOS
TOS, PRS
TOS, PRS
TOS, PRS
FC
TOS
AROHS
AROHS
FC
IS
TOS
TOS
PRS
FC
FSM
FC
TOS

Bromobenzene	TOS
Bromochloroacetic Acid	TOS
Bromochloromethane	TOS
Bromodichloromethane	TOS
Bromoform	TOS
Bromomethane	TOS
4-Bromophenylether	TOS
Butachlor	PRS
2-Butanone (MEK)	TOS
Butterfat	DC
<i>n</i> -Butylbenzene	TOS
<i>sec</i> -Butylbenzene	TOS
<i>tert</i> -Butylbenzene	TOS
Butylbenzyl phthalate	TOS
2,4,6- <i>sec</i> -Butyl-dinitrophenol	TOS

C

Cadmium	MES
Caffeine	FC
Calcium	MES
Campylobacter Identification	FSM
Canned Foods	FC
Carbon Tetrachloride	TOS
Chemical Oxygen Demand	IS
Chlordane	TOS
Chloride	FC, IS
Chlorinated Hydrocarbons	TOS, PRS
Chloroacetic Acid	TOS
Chlorobenzene	TOS
Chloroethane	TOS
2-Chloroethyl vinyl ether	TOS
Chlorophyll	IS
Chloroform	TOS
Chloromethane	TOS
4-Chloro-3-methylphenol	TOS
2-Chloronaphthalene	TOS
2-Chlorophenol	TOS
4-Chlorophenyl phenyl ether	TOS
<i>ortho</i> -Chlorotoluene	TOS
<i>para</i> -Chlorotoluene	TOS
Chlorpyrifos (dursban)	PRS
Chromium	MES
Chromium (air)	AROHS
Chrysene	TOS, PRS
Clostridium Botulinum (toxin assay)	FSM
Clostridium Perfringens (identification)	FSM
Clostridium Perfringens (count)	FSM
Coliform Count (pasteurized milk)	DM
Coliform, Total & Fecal, MPN (water drinking)	WM
Coliform, Total & Fecal, MPN (food)	FSM

Coliform, Total & Fecal MF (water sewage)	WM
Coliform, Total & Fecal, ONPG-MUG (water rereational)	WM
Coliform, Total & Fecal, P-A (water, stream)	WM
Coliform, Total & Fecal, P-A (water, farm/dairy)	WM
Coliform, Total & Fecal, P-A (water, other)	WM
Color	IS
Commercial Sterility (canned foods)	FSM
Conductance	IS
Consumer Complaints	FC
Copper	MES
Corn (canned)	FC
Corrosivity	IS
Crabs (decomposition)	FC
Crabmeat (decomposition)	FC
Cyanide (amenable to chlorination)	IS
Cyanide (reactive)	IS
Cyanide (total)	IS
Cyclamate	FC

D

2,4-D	PRS
Dalapon	PRS
2,4-DB	PRS
DDD	PRS
DDE	PRS
Delta-BHC	TOS
DDT	PRS
Diazinon	PRS
Dibenzo (a,h) anthracene	PRS
Dibromoacetic Acid	TOS
Dibromochloromethane	TOS
1,2-Dibromo-3-chloropropane	TOS
1,2-Dibromoethane (EDB)	TOS
Dibromomethane	TOS
Dicamba	PRS
Dichloroacetic Acid	TOS
1,2-Dichlorobenzene	TOS
1,3-Dichlorobenzene	TOS
1,4-Dichlorobenzene	TOS
Dichlorofluoromethane	TOS
1,2-Dichloroethane	TOS
<i>cis</i> -1,2-Dichloroethene	TOS
<i>trans</i> -1,2-Dichloroethane	TOS
1,1-Dichloroethylene	TOS
<i>trans</i> -1,2-Dichloroethylene	TOS
Dichlorofluoromethane	TOS
1,1-Dichloroethene	TOS
2,4-Dichlorophenol	TOS
2,6-Dichlorophenol	TOS
1,1-Dichloropropene	TOS

Diphenylamine	TOS
Di-methylaminoazobenzene	TOS
1,2-Dichloropropane	TOS
1,3-Dichloropropane	TOS
2,2-Dichloropropane	TOS
<i>cis</i> -1,3-Dichloropropene	TOS
<i>trans</i> -1,3-Dichloropropene	TOS
Dichlorodifluoromethane	TOS
Difluoromethane	TOS
Dieldrin	PRS
Diethyl phthalate	TOS
7,12-Dimethylbenz(a)anthracene	TOS
2-4-Dimethyphenol	TOS
Dimethyl phthalate	TOS
Di-n-butyl phthalate	TOS
Di-n-octyl phthalate	TOS
2,4-Dinitrophenol	TOS
2,4-Dinitrotoluene	TOS
2,6-Dinitrotoluene	TOS
4,6-Dinitro-2-methylphenol	TOS
1,3 Dinitrobenzene	TOS
Dinoseb	PRS
1,2-Diphenyl hydrazine	TOS
Diphenyl nitrosamine	TOS
Di-isopropyl Ether (DIPE)	TOS
Dissolved Solids (total)	IS
Drained Weight (canned vegetables)	FC
Drinking Water	TOS, IS, PRS
Drinking water (private, public supplies)	TOS, PRS
Drug Product	PHC
Dustfall Bucket	AROHs

E

E. Coli Count, MPN (shellfish)	FSM
E. Coli 0517:H7 Identification (fresh crab meat)	FSM
EP Toxicity	IS
Endosulfan I	TOS
Endosulfan II	TOS
Endosulfan Sulfate	TOS
Endrin	PRS
Endrin Aldehyde	TOS
Endrin Ketone	TOS
Enterobacteriaceae Identification (canned food)	FSM
Ethion	PRS
Ethylbenzene	TOS
Ethyl- <i>tert</i> -butyl-ether (ETBE)	TOS
Extractable Organics	TOS
Extraneous Material (food)	FC

F

Filth (food)	FC
Finfish (heavy metals)	MES
Fish (decomposition)	FC
Fluoranthene	TOS, PRS
Fluorene	TOS
Fluoride	IS
Fly Ash	AROHS
Food Quality	FC
Food Standards	FC
Foreign Material (food)	FC
Formaldehyde	AROHS
Freezing Point (added water)	DC
Fuel Oil, #2	IS

G

Gamma Emitting Isotopes	AROHS
Gasoline	TOS
Glass (foods)	FC

H

Hair	FC
Haloacetic Acids	TOS
Hardness	IS
Health Care Remedies	PHC
Heavy Metals	MES
Heptachlor	PRS/TOS
Heptachlor Epoxide	PRS/TOS
Herbicides, Chlorinated Acids	PRS
Hexachlorobenzene	PRS
Hexachlorobutadiene	TOS
Hexachlorocyclopentadiene	PRS
Hexachloroethane	TOS
2-Hexanone	TOS
Hexachloropropylene	TOS
Hydrocarbons (chlorinated)	TOS, PRS
Hydrogen Chloride	AROHS
Hydrogen Ion	IS

I

Ignitability	IS, AROHS
Indeno (1,2,3-ed)pyrene	TOS, PRS
Industrial Waste	TOS, PRS
Infant Botulism (anaerobe culture)	FSM

Inhibitory Substances (powdered milk)	FSM
Iodine-131 (air)	AROHS
Insect Identification	FC
Isophorone	TOS
Isopropylbenzene	TOS
<i>para</i> -Isopropyltoluene	TOS
Iron	MES
Iron (air)	AROHS

J

K

Kjeldahl, N	IS
Kjeldahl (total nitrogen)	IS

L

Lead	MES
Lead (air)	AROHS
Lindane	TOS
Liquid Scintillation (wipes)	AROHS
Listeria Identification (foods, environmental)	FSM

M

MBAS	IS
Maggots (foods)	FC
Malathion	PRS
Manganese	MES
Magnesium	MES
2-Methylphenol	TOS
3-Methylphenol	TOS
4-Methylphenol	TOS
Methapyrilene	TOS
Meat (speciation of uncooked Meat)	FC
Medicinal Product	PHC
Medicine	PHC
Mercury	MES
Mercury (fish)	MES
Metals, Dissolved	MES
Metals, Total	MES
Methoxychlor	PHC
Methyl Parathion	PHC
4-Methyl-2-pentanone (MIBK)	TOS
Methyl- <i>tert</i> -butyl ether (MTBE)	TOS
Methylene Chloride	TOS
Methylene Diphenyl Isocyanate	AROHS

Metolachlor	PRS
Metribuzin	PRS
Moisture (percent)	DC
Mold (food)	FC
Molybdenum	MES
Monobromoacetic Acid	TOS
Monochloroacetic Acid	TOS

N

Naphthalene	TOS, PRS
Nickel	MES
Nitrate-Nitrite, N	IS
Nitrite, N	IS
Nitrobenzene	TOS
Nitrogen Ammonia	IS
Nitrogen, Total Kjeldahl	IS
Nitrophenol	TOS
4-Nitrophenol	TOS
4-Nitroquinoline-N-oxide	TOS
Nutrients	IS

O

Oil	IS
Oil (fuel)	IS
Oil & Grease	IS
Organic Carbon, Dissolved	IS
Organic Chemical (stream sample)	TOS
Organoleptic Analysis (food)	FC
Orthophosphate	IS
Oxamyl (Vydate)	PRS
Oyster	FC, MES

P

pH	IS
PM 2.5	AROHS
PM 10	AROHS
Particulates (industrial pollution)	AROHS
Pentachlorobenzene	TOS
Phenanthrene	TOS
Phenacetin	TOS
Pentachloronitrobenzene	TOS
Pentachlorophenol	PRS
Pesticides	PRS
Pesticides (food)	FC, PRS
Phenol	TOS, IS
Photon Emitters	AROHS
Phosphatase (alkaline)	DC

Phosphatase (microbial)	DC
Phosphatase (reactivated)	DC
Phosphorous, Ortho	MES
Phosphorous, Total	IS
Physical Condition (food)	FC
Picloram	PRS
Polychlorinated Biphenyl (PCB)	PRS
Polynuclear Aromatic Hydrocarbons (PAH)	TOS, PRS
Potassium	MES
Presumptive Blood Test	FC
Priority Pollutants	TOS, PRS
Propachlor	PRS
<i>n</i> -Propylbenzene	TOS
Purgeable Aromatics	TOS
Purgeable Halocarbons	TOS
Pyrene	

Q

Quartz (filters)	AROHS
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R

Radiological Tests	AROHS
Radium	AROHS
Radon (water)	AROHS
Residue (solids)	IS
Residue (filterable)	IS
Residue (non-filterable)	IS
Residue (total)	IS
Residue (volatile)	IS
Residual Bacterial Count (molded containers)	DC
Respirable Diesel	IS

S

Saccharin	FC
Scorched Particles	DC
Selenium	MES
Semi-Volatile Organic Compounds	TOS
Sewage Effluents	TOS, PRS
Silica	IS, AROHS
Silver	IS
Silvex (2,4,5-TP)	PRS
Simazine	PRS
Shellfish	FC
Soda	FC
Sodium	MES
Soil	IS
Soil Sample	TOS, PRS

Somatic Cell Counts (non-dairy products)	DC
Speciation of uncooked meat	FC
Standard Plate Count	WM, FSM, DC
Staphylococcus Count (pasteurized)	FSM
Streams	TOS, IS
Strontium (milk, water)	AROHS
Styrene	TOS
Sugar-free Beverages	FC
Sulfate	IS
Sulfide	IS
Sulfide (reactive)	IS
Sulfite	IS
Suspended Solids	IS

T

2,4,5-TP (Silvex)	PRS
<i>Tert</i> -Amyl-Methyl-Ether (TAME)	TOS
<i>Tert</i> -Butyl-Alcohol (TBA)	TOS
1,2,4,5 Tetrachlorobenzene	TOS
1,1,1,2-Tetrachloroethane	TOS
1,1,2,2-Tetrachloroethane	TOS
Tetrachloroethene	TOS
2,3,4,6 Tetrachlorophenol	TOS
Thallium	MES
Therapeutic Drug Monitoring	PHC
Thermometer Calibrations	FC
Toluene	TOS
Tomatoes	FC
Total Dissolved Solids	IS
Total Petroleum Hydrocarbons	IS
Total Phosphate	IS
Total Residue	IS
Total Solids	IS
Total Suspended Particulates	AROHS
Total Suspended Solids	IS
Toxaphene	TOS/PRS
Toxicological Study	PHC
1,2,3-Trichlorobenzene	TOS
1,2,4-Trichlorobenzene	TOS
1,1,1-Trichloroethane	TOS

1,1,2-Trichloroethane	TOS
Trichloroethene	TOS
Trichlorofluoromethane	TOS
2,4,6-Trichlorophenol	TOS
1,2,3-Trichloropropane	TOS
Trihalomethanes, Total	TOS
1,2,4-Trimethylbenzene	TOS
1,3,5-Trimethylbenzene	TOS
Tritium (water)	AROHS
Turbidity	IS

U

Urea	FC
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V

Vibrio cholera Identification	FSM
Vibrio parahaemolyticus Count	FSM
Vinyl Chloride	TOS
Volatile Organic Compounds	TOS
Volume	FC

W

Water	TOS, PRS, IS
Water (public drinking)	TOS, PRS, IS

X

<i>ortho</i> -Xylene	TOS
<i>meta</i> -Xylene	TOS
<i>para</i> -Xylene	TOS
Total Xylenes	TOS

Y

Yeast & Mold Count	FSM
Yersinia Identification	FSM

Z

Zinc	MES
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In accordance with Title VI of the Civil Rights Act of 1964 and Regulation 504 of the Rehabilitation Act of 1973, the Department of Health and Mental Hygiene prohibits discrimination against anyone because of race, color national origin or because of physical or mental handicap. This prohibition includes the provision of Departmental services and benefits, the operation of its facilities and Departmental employment practices.