CWEA TECHNICAL CERTIFICATION PROGRAM

Gap Analysis Tool

Laboratory Analyst Grade 1

In the rows below, select "Do It All The Time", "Limited Experience" or "Never Do This" based on your current knowledge and experience. Based on your responses, you can asses your overall preparedness for each Domain.

	Do It All The Time	Limited Experience	Never Do This
101. Understands the basic knowledge of physical properties and methods for analysis of water and wastewater: Color, Turbidity, Odor, Alkalinity, Hardness, Conductivity, Solids, Temperature, pH. (13%)			
102. Understands the basic knowledge of chemical properties and methods for analysis of water and wastewater: Dissolved oxygen, Biochemical Oxygen Demand, Chemical Oxygen Demand, Chlorine residual (Total and Free), Sulfide. (10%)			
103. Understands the basic knowledge of microbiological properties and methods for analysis of water and wastewater: Coliform by Multiple Tube Fermentation, Coliform by Enzyme Substrate Test, Heterotrophic Plate Count (HPC). (8%)			
104. Collection of samples of wastewater, sludge, receiving water and industrial waste in accordance with established lab procedures: Chain of custody, Sample type (grab and composite), Container type and preparation, Preservation, Hold time, Sampling techniques, Proper labeling, Storage condition. (13%)			
105. Utilizes techniques and equipment used in laboratory analysis: Gravimetric (balance weighing), Titrimetric/volumetric (burette, pipette, graduated cylinder),Sterilization (autoclave, Bunsen burner, oven), Colorimetric (visual observation, spectrophotometer/colorimeter), Electrometric (meters, probes/electrodes), Turbidimetric (Nephelometer), Thermometers (ranges and max temp). (7%)			
106. Operates, maintains and performs routine calibration on basic test equipment: Turbidimeters, Dissolved oxygen meters, pH meters, Balances (analytical and top-loading), Conductivity meters. (8%)			
107. Recognizes laboratory hazards and follows proper safety procedures: Chemical handling, storage, disposal, and spill response; Personal Protective Equipment (PPE), Biological and chemical hygiene, Engineering controls (fume hoods, etc.), Safety Data Sheet (SDS), Physical hazards (burns, sharps, compressed gas, electrical safety, fire, etc.), Good housekeeping. (10%)			
108. Prepares solutions and essential laboratory supplies: Dilution of concentrated solutions, Preparation of filters and dishes for residue testing, Preparation of bacteriological culture media. (5%)			
109. Performs accurate calculations: Significant figures: proper rounding, Unit conversion, Basic algebraic and statistical calculations, Solution preparation (dilution factors, normality, molarity), Sample dilution, Scientific notation. (5%)			
110. Understands and practices proper laboratory ethics. (4%)			

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111. Documents and maintains accurate and complete laboratory records: Routine documentation, including worksheet/log sheet entries; Sample documentation, Chain-of-custody forms, Record data accurately, Report non-conforming data, Awareness of LIMS (Laboratory Information Management Systems), Data integrity and legal defensibility. (10%)			
112. Understands basic concepts of Quality Assurance/Quality Control: Control charts, Data quality, Standard and reagent quality, Reagent water quality, DOC (Demonstration of Competency). (7%)			
Total Per Category			
You may want to focus your studying in the areas where you selected "Limited Experience" or "Never Do This". See Laboratory Analyst Candidate Handbook.			

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Laboratory Analyst Grade 2

In the rows below, select "Do It All The Time", "Limited Experience" or "Never Do This" based on your current knowledge and experience. Based on your responses, you can asses your overall preparedness for each Domain.

	Do It All The Time	Limited Experience	Never Do This
201. Understanding of physical, chemical and microbiological properties of wastewater.			
202. General understanding of basic wastewater processes.			
203. Principles and practices of qualitative and quantitative chemistry, biology and bacteriology.			
204. Basic knowledge of pertinent federal and state codes and regulations involved in discharge permit, ELAP certification.			
205. Methods of handling, storing and disposal of hazardous chemicals and wastes.			
206. Perform standard quantitative laboratory analysis. (50%)			
207. Communicate clearly and concisely, both orally and in writing, in the English language. (30%)			
208. Establish and maintain effective working relationships with those contacted in the course of work. (20%)			
209. Perform analyses for subject matter in Essential Duty 201. (50%)			
210. Recommend or devise corrective action for analytical or instrumentation procedures (i.e., trouble shoot). (15%)			
211. Conduct more advanced wastewater mathematics. (15%)			
212. Prepare clear, concise and technical reports. (15%)			
213. Train and supervise the work of others. (5%)			
Total Per Category			
You may want to focus your studying in the areas where you selected "Limited Experience" or "Never Do This". See Laboratory Analyst Candidate Handbook.			

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Laboratory Analyst Grade 3

In the rows below, select "Do It All The Time", "Limited Experience" or "Never Do This" based on your current knowledge and experience. Based on your responses, you can asses your overall preparedness for each Domain.

	Do It All The Time	Limited Experience	Never Do This
300. Knowledge, skill and ability identified on the Test Content Specifications for Laboratory Analysis Grades I and II.			
301. The services, operations and activities of a wastewater treatment laboratory testing program.			
302. The modern and complex principles and practices of chemistry, bacteriology and biology.			
303. Chemical, biological, bacteriological and physical characteristics of wastewater, biosolids, soils, and industrial pretreatment samples.			
304. Principles and practices of supervision, training and personnel management.			
305. Pertinent federal and state codes and regulations. (Federal Environmental Protection Agency, State Department of Health, and State Water Resources Quality Control Standards regarding water and waste water).			
306. Occupational hazards and standard safety practices, including chemical hygiene plan.			
307. Perform analyses in Essential Duty 301.			
308. Establish and maintain effective working relationships with those contacted in the course of work (i.e., employees, governmental agencies and the public).			
309. Communicate clearly and concisely, both orally and in writing, in the English language.			
310. Supervise, train and evaluate the activities of a staff.			
311. Evaluate, interpret, and apply the results of laboratory testing, including advanced mathematical calculations, such as statistics			
312. Conduct chemical, biological, and physical analyses of environmental samples.			
Total Per Category			
You may want to focus your studying in the areas where you selected "Limited Experience" or "Never Do This". See Laboratory Analyst Candidate Handbook.			

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Laboratory Analyst Grade 4

In the rows below, select "Do It All The Time", "Limited Experience" or "Never Do This" based on your current knowledge and experience. Based on your responses, you can asses your overall preparedness for each Domain.

	Do It All The Time	Limited Experience	Never Do This
400. Knowledge, skill and ability identified on the Test Content Specifications for Laboratory Analysis Grades I, II, and III.			
401. Current technological developments in wastewater treatment/control and principles and practices as applied to the treatment and disposal of treated wastewater and biosolids.			
402. Federal, state and local laws and regulations applicable to analytical procedures.			
403. Analytical techniques (such as GC/MS, ICP/MS), equipment, procedures, sampling techniques, methods of statistical analysis and data processing as applied to laboratory data management.			
404. Management principles including planning, organizing, staffing, directing, controlling and budgeting.			
405. Conventional quality assurance/quality control (QA/QC) practices for the wastewater laboratory, including the preparation of QA/QC charts.			
406. Wastewater treatment processes and expected operating parameters to recognize and pursue atypical test results and treatment process performance.			
407. Develop and maintain effective working relationships and understand and carry out verbal and written instructions. (45%)			
408. Communicate effectively with regulatory, plant, and member agency staffs and with the general public, in the English language. (45%)			
409. Perform analytical procedures as required. (10%)			
410. Plan, organize, direct, coordinate, and review the work of laboratory personnel.			
411. Analyze, interpret and effectively apply results of laboratory tests.			
412. Read, interpret and apply pertinent regulations.			
413. Prepare clear and concise technical reports.			
Total Per Category			
You may want to focus your studying in the areas where you selected "Limited Experience" or "Never Do This". See Laboratory Analyst Candidate Handbook.			