

Exam Blueprint

Environmental Compliance Inspector Certification

Exam Blueprint & Suggested References



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Effective March 2019

CWEA’s Technical Certification Program Environmental Compliance Inspector Grade 4 exam is based on an exam blueprint that outlines the exam content and is periodically reviewed by CWEA Subject Matter Experts. This exam blueprint is based on a job task analysis that includes research of the essential duties of an Environmental Compliance Inspector at a representative cross-section of systems and facilities in California. The Environmental Compliance Inspector Grade 4 exam was last reviewed by Subject Matter Experts in 2017.

The exam content outline that follows presents content covered on the Environmental Compliance Inspector Grade 4 exam and shows the amount of the exam devoted to each Knowledge, Skills and Abilities (KSA) area in the column labeled “% on exam.” Following the outline, you’ll find a list of suggested references and a link to a free self-evaluation you can take to help you identify your strengths and areas to work on as a candidate. You will also find an Equivalent & Formula Sheet which will be available on screen during the exam.

Please be sure to review CWEA's Technical Certification Program Candidate Handbook, which contains CWEA's certification procedures and policies. Applicants and certification holders are responsible for understanding all certification policies. The TCP Candidate Handbook can be downloaded for free in our [Online Store](#).

KSA	Exam Content Outline	% on exam
401	<p>Plan, organize, direct, and review the work of environmental compliance inspectors, division supervisors, technical, and office support staff.</p> <ul style="list-style-type: none"> ● Understand the importance of following inspection guidelines and procedures for POTW inspectors. ● Understand compliance requirements and disclosure policies with regard to Significant Industrial Users. ● Ability to properly manage and delegate tasks to employees. 	5%
402	<p>Provide technical services to users with non-domestic waste and groundwater discharges.</p>	6%



KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> ● Understand all aspects of activated sludge and cyanide treatment. ● Familiarity with groundwater treatment and discharge requirements to a POTW. ● Familiarity with chemical feed systems and calculations. ● Understand how a wastewater treatment plant operates and the ability to identify problems. 	
403	<p>Review and approve waste discharge plans and permits.</p> <ul style="list-style-type: none"> ● Calculate alternative concentration limits. ● Familiarity with managing and writing permits. ● Recognize the control mechanisms a Control Authority can utilize for Industrial Users. ● Understand reporting requirements and compliance schedules for POTWs. 	6%
404	<p>Meet with users to inform them of any changes in Ordinance, State and Federal laws, and ensure compliance with waste discharge ordinances and state and federal requirements; manage enforcement activities.</p> <ul style="list-style-type: none"> ● Familiarity with The General Construction Storm Water Permit and POTW Pretreatment Program requirements per 40 CFR 403. ● Understand the specific requirements in an Annual Report. ● Ability to develop and execute an Enforcement Response Plan. ● Ability to analyze sampling results and determine compliance. 	6%
405	<p>Execute, and prepare reports on, special studies requiring technical expertise and project management skills, such as local limits development, industry-specific industrial waste overviews, and potential impacts of new discharges.</p> <ul style="list-style-type: none"> ● Knowledge of the agencies a POTW must submit compliance reports to. ● Ability to evaluate, calculate, and develop Local Limits. ● Understand the Combined Wastestream Formula. ● Familiarity with inspection procedures and proper documentation. 	6%
406	<p>Manage special internal programs such as responses to program inspections and audits, inspection and monitoring program reviews, regulations reviews, and development of Best Management Practices (BMPs) and public outreach projects.</p>	7%



KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> ● Understand proper hazardous waste discharge recovery and reporting requirements. ● Familiarity with EPA’s authority on regulating a Pretreatment Program. ● Describe proper analytical methods according to 40 CFR 136. ● Understand the essential components of a Slug Discharge Control Plan. 	
407	<p>Establish organizational controls to measure performance against approved objectives. Initiate improvements in work methods and procedures.</p> <ul style="list-style-type: none"> ● Ability to identify effective components necessary to manage a wastewater treatment plant. 	1%
408	<p>Establish and ensure proper implementation of divisional goals and objectives.</p> <ul style="list-style-type: none"> ● Develop work schedules and department goals and objectives. ● Ability to calculate overtime hours. 	2%
409	<p>Establish program methods to monitor and control industrial and commercial wastewater sources entering the collection system.</p> <ul style="list-style-type: none"> ● Develop and manage a POTW inspection schedule. ● Understand 40 CFR 136. 	5%
410	<p>Review the work of consultants and administer various professional contracts.</p> <ul style="list-style-type: none"> ● Understand the purpose and essential elements of an Environmental Impact Report. 	1%
411	<p>Disseminate management policies and division activities to staff and ensure compliance with management and administrative policies and procedures.</p> <ul style="list-style-type: none"> ● Familiarity with team workflow steps. ● Understand the best practices in approaching employees who are not performing up to standard. 	4%
412	<p>Plan, develop, and participate in a variety of ongoing division-specific training programs and ensure that employees receive all other agency mandatory training.</p> <ul style="list-style-type: none"> ● Ability to develop effective employee training. ● Familiarity with OSHA training requirements for common health hazards. 	4%
413	<p>Direct and participate in the selection, review, and evaluation of division staff.</p>	3%



KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> Ability to delegate and discuss work performance with an employee. 	
414	<p>Encourage professional growth, and investigate employee relations issues, implementing corrective actions or referrals as appropriate.</p> <ul style="list-style-type: none"> Understand how to effectively manage employees and effectively execute policies. 	3%
415	<p>Coordinate activities with other divisions and agencies and with outside organizations.</p> <ul style="list-style-type: none"> Familiarity with all aspects of a Pretreatment Program and how the program is funded. Ability to determine the number of inspections for an Industrial User. Understand the essential elements of a Safety Data Sheet. Familiarity with managing an effective public relations program. 	6%
416	<p>Represent the program in meetings with governmental and regulatory agencies, technical committees and public and private organizations.</p> <ul style="list-style-type: none"> Familiarity with Categorical and Non-Categorical Industrial Users. 	3%
417	<p>Provide information, data and technical advice to staff, outside agencies and the public. Present data and other information related to the work of the division.</p> <ul style="list-style-type: none"> Ability to interpret laws, regulations, and develop legal documentation and presentations. 	4%
418	<p>Administer the division's safety program.</p> <ul style="list-style-type: none"> Ability to develop effective training. Understand all aspects of a successful safety program. 	3%
419	<p>Coordinate field inspections for safety conformance and direct investigations of incidents.</p> <ul style="list-style-type: none"> Familiarity with hazardous waste exposure requirements. Understand OSHA terms and definitions relating to work space atmospheres. 	3%
420	<p>Manage the overall implementation of new regulated/mandated programs to protect or improve stormwater and wastewater quality. Monitor technical and regulatory developments in the field of environmental compliance.</p>	4%



KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> ● Familiarity with all aspects of Clean Water Act. ● Understand how to investigate unregulated pollutants in wastewater. 	
421	<p>Monitor economic, environmental, sociopolitical, and technological developments that impact programs and services.</p> <ul style="list-style-type: none"> ● Understand terms and definitions relating to storm water conveyance systems as outlined in Federal Regulations. 	3%
422	<p>Direct recordkeeping activities and preparation of a variety of periodic and special reports.</p> <ul style="list-style-type: none"> ● Familiarity with Waste Discharge Requirements. ● Identify a SSO and its reporting requirements. 	6%
423	<p>Develop and administer the annual budget and routinely monitor expenditures and fiscal performance.</p> <ul style="list-style-type: none"> ● Understand terms and definitions relating to managing budgets and expenses. ● Determine the appropriate budgeting for items essential to program operations. 	4%
424	<p>Understand the regulatory requirements and participate in the administration of the Stormwater pollution prevention management.</p> <ul style="list-style-type: none"> ● Familiarity with the NPDES permits. 	3%
425	<p>Participate in the plan check of new construction projects to ensure regulatory compliance with Municipal Separate Storm Sewer Systems (MS4) and pretreatment requirements.</p> <ul style="list-style-type: none"> ● Understand the Industrial General Permit. ● Understand all aspects of a Storm Water Pollution Prevention Plan. 	3%



Suggested References

CWEA’s exam is based on a job task analysis that includes research of the essential duties of an Environmental Compliance Inspector at a representative cross-section of systems and facilities in California. CWEA’s exams do **not** correspond directly to any specific textbook, educational course, or program; instead, the exams are based on an analysis of the duties commonly performed in actual practice. In developing the exam, CWEA subject matter experts used their years of experience in the field along with the key textbooks and reference materials listed below. Candidates should understand that the references listed do not necessarily cover all exam content. Candidates who meet the minimum qualifications for this exam may find these suggested references useful when preparing for this exam; however, these suggested references are not required reading and should not be interpreted as constituting the sole source of all exam questions.

This list does **not** include all the available textbooks and materials for studying for this exam. Candidates are strongly encouraged to seek additional material, training, and experience, especially in content areas for which the candidate is not adequately prepared. Candidates are encouraged to prepare for CWEA certification exams using as many different study materials as possible plus education events and on-the-job training. Candidates are encouraged to develop their own personal study plan based on individual needs and knowledge. Taking our free self-evaluation can help identify strengths and areas to work on; the link to that self-evaluation tool follows at the end of this document.

KSA	Suggested References <i>This list is not intended to be an endorsement of any of the publications listed.</i>
401	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 1 • Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 4
402	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6, Chapter 8
403	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic • 40 CFR 403 • 40 CFR 469 • Industrial User Permitting Guidance Manual, September 2012, U.S. Environmental Protection Agency



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404	<ul style="list-style-type: none"> • Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency • 40 CFR 403 • 40 CFR 136
405	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic • Utility Management: A Field Study Training Program, 2nd Edition, 2004. Lesson 3 • Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency • Local Limits Development Guidance, July 2004, U.S. Environmental Protection Agency
406	<ul style="list-style-type: none"> • 40 CFR 403 • Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency • Pretreatment Compliance Inspection and Audit Manual for Approval Authorities, July 1986, U.S. Environmental Protection Agency
407	<ul style="list-style-type: none"> • Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 8
408	<ul style="list-style-type: none"> • Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 4
409	<ul style="list-style-type: none"> • Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency • 40 CFR 403 • 40 CFR 136 • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6
410	<ul style="list-style-type: none"> • California Department of Transportation website – Chapter 36, Environmental Impact Report (EIR)
411	<ul style="list-style-type: none"> • Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 1, Chapter 8
412	<ul style="list-style-type: none"> • Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 5 • Training Requirements in OSHA Standards, Occupational Safety and Health Administration, U.S. Department of Labor
413	<ul style="list-style-type: none"> • Utility Management: A Field Study Training Program, 2nd Edition, 2004. Lesson 1



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414	<ul style="list-style-type: none"> • Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 1, Chapter 6, Chapter 12
415	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5 • 40 CFR 403 • Utility Management: A Field Study Training Program, 2nd Edition, 2004. Lesson 2 • Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 11
416	<ul style="list-style-type: none"> • 40 CFR 428
417	<ul style="list-style-type: none"> • Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 2, Chapter 7 • Industrial Users Inspection and Sampling Manual for POTWs, January 2017, U.S. Environmental Protection Agency
418	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5 • Training Requirements in OSHA Standards, Occupational Safety and Health Administration, U.S. Department of Labor • Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 12
419	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5, Chapter 11 • Training Requirements in OSHA Standards, Occupational Safety and Health Administration, U.S. Department of Labor
420	<ul style="list-style-type: none"> • 40 CFR 403 • U.S. Environmental Protection Agency website – Summary of the Clean Water Act
421	<ul style="list-style-type: none"> • 40 CFR 403 • 40 CFR 122
422	<ul style="list-style-type: none"> • Industrial Users Inspection and Sampling Manual for POTWs, January 2017, U.S. Environmental Protection Agency • 40 CFR 403 • 40 CFR 122



KSA	Suggested References <i>This list is not intended to be an endorsement of any of the publications listed.</i>
	<ul style="list-style-type: none"> • State Water Resources Control Board Order No. 2006-0003-DWQ
423	<ul style="list-style-type: none"> • Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 9
424	<ul style="list-style-type: none"> • General Permit For Storm Water Discharges Associated With Industrial Activities, National Pollutant Discharge Elimination System (NPDES) • 40 CFR 122
425	<ul style="list-style-type: none"> • General Permit For Storm Water Discharges Associated With Industrial Activities, National Pollutant Discharge Elimination System (NPDES)

Publications in the Suggested Reference list:

- 40 CFR 403
- 40 CFR 122
- 40 CFR 469
- 40 CFR 136
- 40 CFR 428
- [State Water Resources Control Board Order No. 2006-0003-DWQ](#)
- [Utility Management: A Field Study Training Program, 2nd Edition, 2004](#)
- [Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005](#)
- [Pretreatment Compliance Inspection and Audit Manual for Approval Authorities, July 1986, U.S. Environmental Protection Agency](#)
- [Local Limits Development Guidance, July 2004, U.S. Environmental Protection Agency](#)
- [California Department of Transportation website – Chapter 36, Environmental Impact Report \(EIR\)](#)
- [General Permit For Storm Water Discharges Associated With Industrial Activities, National Pollutant Discharge Elimination System \(NPDES\)](#)
- [U.S. Environmental Protection Agency website – Summary of the Clean Water Act](#)
- [Training Requirements in OSHA Standards, Occupational Safety and Health Administration, U.S. Department of Labor](#)
- [Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency](#)



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- [Industrial Users Inspection and Sampling Manual for POTWs, January 2017, U.S. Environmental Protection Agency](#)
 - [Industrial User Permitting Guidance Manual, September 2012, U.S. Environmental Protection Agency](#)
 - [Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010](#)

Gauge your readiness with this self-evaluation Gap Analysis Tool

Help identify the knowledge, skills, and abilities you are confident in and those you might need to spend more time on by using this self-evaluation tool.

<https://www.cwea.org/tcp/pdf/ECI1-4%20KSA%20Gap%20Tool.pdf>

Equivalents & Formula Sheet

Familiarity with the following formula sheet is important. There is no need to memorize it, as it can be accessed on screen during the exam.



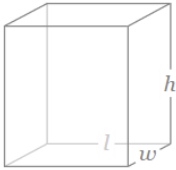
Environmental Compliance Inspector Grades 1-4 Equivalents & Formulas

Conversions

3.785 L/gal	453.6 g/lb	8.34 lb/gal	7.48 gal/ft ³
28.35 g/oz	43,560 ft ² /acre	$\pi = 3.14159$	

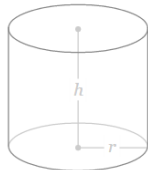
Volumes

Rectangular Solid



$$V = lwh$$

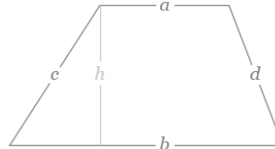
Right Cylinder



$$V = \pi r^2 h$$

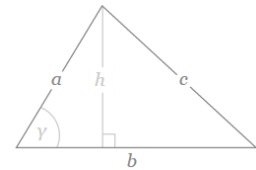
Areas

Trapezoid



$$A = \frac{a + b}{2} h$$

Triangle



$$A = \frac{hb}{2}$$

Formulas

Manning

$$Q = \frac{1.49 AR^{2/3} S^{1/2}}{n}$$

Q = flow rate (CFS)

A = cross-sectional area of flow (ft²)

R = hydraulic radius (ft)

S = slope of the hydraulic radius

n = Manning roughness coefficient

Counterflow
Rinsing

$$R^n = \frac{C_p}{C_n}$$

R = rinse ratio (ratio of rinse water volumetric flow rate to the drag out volumetric flow rate)

C_p = plating bath metal concentration

C_n = metal concentration in the nth rinse tank

n = number of rinse tanks

Combined Waste
Stream

$$C_T = \frac{[\sum_{i=1}^N C_i F_i][F_T - F_D]}{[\sum_{i=1}^N F_i][F_T]}$$

C_T = alternative concentration limit

C_i = concentration limit for stream i

F_i = average daily flow of stream i

F_T = F_i + F_D

F_D = average daily flow of dilute wastestream

Periodic Properties of Elements					
Element	Symbol	Atomic Weight (grams/mole)	Element	Symbol	Atomic Weight (grams/mole)
Hydrogen	H	1.0	Potassium	K	39.1
Carbon	C	12.0	Calcium	Ca	40.1
Nitrogen	N	14.0	Chromium	Cr	52.0
Oxygen	O	16.0	Iron	Fe	55.8
Fluorine	F	19.0	Nickel	Ni	58.7
Sodium	Na	23.0	Copper	Cu	63.5
Magnesium	Mg	24.3	Zinc	Zn	65.4
Aluminum	Al	27.0	Arsenic	As	74.9
Phosphorus	P	31.0	Silver	Ag	107.9
Sulfur	S	32.1	Cadmium	Cd	112.4