



PSI  
3210 E Tropicana  
Las Vegas, NV 89121  
www.psiexams.com



# COMMONWEALTH OF VIRGINIA DEPARTMENT OF PROFESSIONAL AND OCCUPATIONAL REGULATION

## MASTER ONSITE SEWAGE SYSTEM PROFESSIONALS EXAMINATION CANDIDATE INFORMATION BULLETIN

- The contents of the Soil Evaluator Exams change on July 11, 2018
- The contents of the Installer and Operator Exams change on July 25, 2018

Examinations by PSI .....	1	Required Identification .....	3
Examination Eligibility and Approval Process .....	1	Security Procedures .....	3
Scheduling Procedures .....	1	Taking the Examination by Computer .....	4
Examination Fee .....	1	Identification Screen .....	4
On-line Registration .....	1	Tutorial .....	4
Telephone Registration .....	1	Test Question Screen .....	4
Canceling an Examination Appointment .....	1	Examination Review .....	4
Missed Appointment or Late Cancellation .....	2	Score Reporting .....	4
Exam Accommodations .....	2	Duplicate Score Reports .....	4
Examination Site Closing for an Emergency .....	2	Sample Questions .....	4
Computer Examination Center Locations .....	2	Examination Content Outlines .....	6
Reporting to the Examination Center .....	3	License Application Instructions .....	21
		Exam Accommodations Form .....	22

EFFECTIVE 6/29/18 A NEW SITE IN VIENNA WILL BE REPLACING THE EXISTING FALLS CHURCH AND TYSONS CORNER SITES. BOTH WILL BE CLOSED EFFECTIVE 6/23/18.

PSI - Vienna  
1919 Gallows Rd, Suite 360  
Vienna, VA 22182

Please refer to [www.psiexams.com](http://www.psiexams.com) for the latest updates to this bulletin.



## EXAMINATIONS BY PSI

This Candidate Information Bulletin provides you with information about the examination and application process for becoming licensed as a Master Onsite Sewage System Professional in the Commonwealth of Virginia. To be licensed, you must pass an examination to confirm that you have attained at least a minimum level of knowledge regarding the principles, practices, statutes and regulations. The Department of Professional and Occupational Regulation (DPOR) has contracted with PSI to conduct its examination program. PSI provides examinations through a network of computer examination centers. PSI works closely with DPOR to be certain that examinations meet local, national and international requirements in basic principles and examination development standards.

The following examinations are offered by PSI.

- Master Alternative Onsite Soil Evaluator
- Master Conventional Onsite Soil Evaluator
- Master Alternative Onsite Sewage System Installer
- Master Conventional Onsite Sewage System Installer
- Master Alternative Onsite Sewage System Operator
- Master Conventional Onsite Sewage System Operator

Questions regarding applications for licensure should be directed to the:

Department of Professional and  
Occupational Regulation  
Board for Waterworks and Wastewater Works Operators and  
Onsite Sewage System Professionals  
9960 Mayland Drive, Suite 400  
Richmond, VA 23233  
(804) 367-8595  
[www.dpor.virginia.gov](http://www.dpor.virginia.gov)

email: [waterwasteoper@dpor.virginia.gov](mailto:waterwasteoper@dpor.virginia.gov)

All questions regarding the scheduling of your examination should be directed to:

PSI  
3210 E Tropicana  
Las Vegas, NV 89121  
(800) 733-9267 • Fax (702) 932-2666 • [www.psiexams.com](http://www.psiexams.com)

## EXAMINATION ELIGIBILITY AND APPROVAL PROCESS

In order for a candidate to become eligible to take an examination, you must submit a the appropriate application to DPOR.

**APPLICATION FORM.** This application can be found online at <http://www.dpor.virginia.gov>, or you may send an email request to [waterwasteoper@dpor.virginia.gov](mailto:waterwasteoper@dpor.virginia.gov) or by calling (804) 367-8595.

Your eligibility is valid for one year. If you fail you may retest unlimited during the one year period. If you do not pass the examination within the one year period you will need to reapply and meet all current requirements with DPOR.

Upon approval of eligibility, you will be mailed a confirmation notice containing instructions for scheduling an appointment to take the examination. If you are determined to be ineligible, DPOR will notify you.

## SCHEDULING PROCEDURES

Examination Fee                      \$80

**NOTE: EXAMINATION FEES ARE NOT REFUNDABLE OR TRANSFERABLE. THE EXAMINATION FEE IS VALID FOR ONE YEAR FROM THE DATE OF PAYMENT**

### ON-LINE ([WWW.PSIEXAMS.COM](http://WWW.PSIEXAMS.COM))

For the fastest and most convenient test scheduling process, PSI recommends that candidates register for their exams using the Internet. Candidates register online by accessing PSI's registration website at [www.psiexams.com](http://www.psiexams.com). Internet registration is available 24 hours a day.

- Log on to PSI's website and create an account. Please enter your email address and first and last name. This information must match exactly with the information DPOR has on file. Be sure to check the box next to "Check here to attempt to locate existing records for you in the system"
- You will be asked to select the examination and enter your social security or driver's license number (you must use the same number that was submitted on the application to DPOR). Your record will be found and you will now be ready to pay and schedule for the exam. Enter your zip code and a list of the testing sites closest to you will appear. Once you select the desired test site, available dates will appear.

### TELEPHONE

PSI registrars are available at (800) 733-9267 to receive payment and to schedule your appointment for the examination. Please call Monday through Friday between 7:30 am and 10:00 pm, or Saturday-Sunday between 9:00 am and 5:30 pm, Eastern Time.

To register by phone, you will need a valid credit card (VISA, MasterCard, American Express or Discover.)

### CANCELING AN EXAMINATION APPOINTMENT

You may cancel and reschedule an examination appointment without forfeiting your fee if your *cancellation notice is received two days before the scheduled examination date*. For example, for a Monday appointment, the cancellation notice would need to be received on the previous Saturday. You may call PSI at (800) 733-9267.

**Note: A voicemail or email message is NOT an acceptable form of cancellation. Please use the PSI Website or call PSI to speak directly to a Customer Service Representative.**

## SCHEDULING A RE-EXAMINATION

It is not possible to make a new examination appointment on the same day you have taken an examination; this is due to processing and reporting scores. A candidate who tests unsuccessfully on a Wednesday can call the next day, Thursday, and retest as soon as Friday, depending upon space availability. In order to retest, you must follow the steps for scheduling as outlined earlier.

## MISSED APPOINTMENT OR LATE CANCELLATION

*You will not be able to take the examination as scheduled, and you will forfeit your examination fee, if you:*

- Do not cancel your appointment two days before the scheduled examination date; or
- Do not appear for your examination appointment; or
- Arrive after Examination Start Time; or
- Do not present proper identification when you arrive for the examination.

## EXAM ACCOMMODATIONS

All examination centers are equipped to provide access in accordance with the Americans with Disabilities Act (ADA) of 1990, and exam accommodations will be made in meeting a candidate's needs. Applicants with disabilities must fill out the form at the end of this Candidate Information Bulletin and fax to PSI (702) 932-2666.

## EXAMINATION SITE CLOSING FOR AN EMERGENCY

In the event that severe weather or another emergency forces the closure of an examination center on a scheduled examination date, your examination will be rescheduled. PSI personnel will attempt to contact you in this situation; however, you may check the status of your examination schedule by calling (800) 733-9267. Every effort will be made to reschedule your examination at a convenient time as soon as possible.

## COMPUTER EXAMINATION CENTER LOCATIONS

### FALLS CHURCH LEESBURG PIKE

#### MCILVAINE BUILDING

6201 Leesburg Pike, Suite 404  
Falls Church, VA 22044

*From I-495, take new exit 47 (old exit 10) (Leesburg Pike) and proceed east past Little Falls. Leesburg becomes Broad St. Proceed on Broad St thru Falls Church. Broad St turns back into Leesburg Pike (Rte 7 East). Follow Rte 7-East signs through the Seven Corners Intersection. Building is on the corner of Leesburg Pike and Patrick Henry Drive. Turn right onto Patrick Henry Dr and right into the building parking lot, then left on the up ramp to the main parking lot. Parking and entrance to the back of the building.*

### TYSONS CORNER AREA

1651 Old Meadow Rd, Suite B01  
McLean, VA 22102

*From the Beltway take the McLean Exit (Route 123 North). Turn right on Old Meadow Road (the first traffic light). The site is the first building on the left. Use the back entrance. Visitor parking for Tysons Corner is in the front of the building (closest to Old Meadow Road).*

### RICHMOND

Moorefield VI Building  
620 Moorefield Park Drive  
Suite 205  
Richmond, VA 23236

*From I-64E, take the Parham Rd exit and turn right. N Parham Rd/VA-73 S becomes VA-150 S/Chippenham Pkwy. Merge onto VA-76 S/Powhite Pkwy. Merge onto Midlothian Turnpike West. Turn left on Moorefield Park Dr.*

### VIRGINIA BEACH

Pembroke IV Building  
291 Independence Blvd, Suite 140  
Virginia Beach, VA 23462

*From I-264 merge onto Independence Blvd/VA-225 via Exit 17B. Proceed across Va Beach Blvd and make a left turn onto Broad Street (across from Sears). The site is located within the Pembroke Four office building.*

### CHARLOTTESVILLE

2114 Angus Road, Suite #105-B  
Charlottesville, VA 22901

*If going West on US-250, turn right onto US-29N/N Emmet St. Continue on Emmet Street and turn left on Angus Rd. If going East on US-250, turn left onto US-29N/N Emmet St. Continue on Emmet Street and turn left on Angus Rd.*

### ROANOKE AREA

Fralin and Waldron Office Park  
2847 Penn Forest Blvd  
Building D, Suite 200  
Roanoke, Virginia 24018

*From 81 - take 220 Exit (Downtown Roanoke). From 220 take the Franklin Road Exit (not the Franklin Bus Exit). At the stop light make a right. Franklin Road will turn into Electric Road. Keep going straight until you come to Chaparral Dr and go left. You will see the Fralin & Waldron Bldg to your left. At the next stop light go left.*

*If you are traveling from 220 take the first exit, Franklin Road. Follow directions above.*

### EASTERN SHORE AREA

Beaglin Park Plaza  
1323 Mt. Hermon Rd., Suite 2A  
Salisbury, MD 21801

*The complex is south of Route 50 and west of the 13 By-pass. From Route 50, turn south on Beaglin Park Drive. Turn left at the first light, Mt Hermon Rd. Turn left into Beaglin Park Plaza.*

### JOHNSON CITY

904 Sunset Drive, Ste 7A  
Johnson City, TN 37604

Take I-26 to Exit 19 (Old number 36). Go South on Highway 381 (North State of Franklin Road) approximately 2.2 miles. At the 4th light turn left (this is Sunset Drive), go approximately .7 tenths of a mile. There is a large building on the left-hand side of the road. This is 904 Sunset Drive. Suite 7A is in the row of office spaces behind this building.

Additionally, PSI has examination centers in many other regions across the United States. You may take this examination at any of these locations by filling out the exam accommodations form found at the end of this Candidate Information Bulletin.

## REPORTING TO THE EXAMINATION CENTER

On the day of the examination, you should arrive at least 30 minutes before your appointment. This extra time is for sign-in and identification and familiarizing you with the examination process. If you arrive late, you may not be admitted to the examination center and you will forfeit your registration fee.

### REQUIRED IDENTIFICATION

You must provide two (2) forms of **VALID (not expired) identification**. One must be a **VALID** form of government-issued identification (Driver's License, State ID, Passport, Military ID) which bears your signature and has your photograph. The second ID must have your signature and preprinted legal name. **All identification provided must match the legal name that you that was submitted on the application to DPOR. If the name in the PSI system does not match the name on your government-issued ID and 2<sup>nd</sup> form of ID, you will not be permitted to take the examination and the examination fee will be forfeited.**

Failure to provide ALL of the required identification at the time of the examination without notifying PSI is considered a missed appointment and you will not be able to take the examination at that time.

### SECURITY PROCEDURES

- You will be given an LCD Writing tablet at check-in that will be returned at check-out. This is to be used for notes or calculations.
- Candidates may bring reference books. Sample examinations and study guides that primarily provide test questions are not permitted. Reference books may be highlighted, underlined, and/or indexed prior to the exam. They must be otherwise UNMARKED (not written in).
- Only non-programmable calculators that are silent, battery-operated, do not have paper tape printing capabilities, and do not have a keyboard containing the alphabet will be allowed in the examination site.
- Candidates may take only approved items into the examination room.

- All personal belongings of candidates, with the exception of close-fitting jackets or sweatshirts, should be placed in the secure storage provided at each site prior to entering the examination room. Personal belongings include, but are not limited to, the following items:
  - 0 **Electronic devices of any type**, including cellular / mobile phones, recording devices, electronic watches, cameras, pagers, laptop computers, tablet computers (e.g., iPads), music players (e.g., iPods), smart watches, radios, or electronic games.
  - 0 **Bulky or loose clothing or coats** that could be used to conceal recording devices or notes, including coats, shawls, hooded clothing, heavy jackets, or overcoats.
  - 0 **Hats or headgear not worn for religious reasons** or as religious apparel, including hats, baseball caps, or visors.
  - 0 **Other personal items**, including purses, notebooks, reference or reading material, briefcases, backpacks, wallets, pens, pencils, other writing devices, food, drinks, and good luck items.
- Person(s) accompanying an examination candidate may not wait in the examination center, inside the building or on the building's property. This applies to guests of any nature, including drivers, children, friends, family, colleagues or instructors.
- No smoking, eating, or drinking is allowed in the examination center.
- During the check-in process, all candidates will be asked if they possess any prohibited items. Candidates may also be asked to empty their pockets and turn them out for the proctor to ensure they are empty. The proctor may also ask candidates to lift the ends of their sleeves and the bottoms of their pant legs to ensure that notes or recording devices are not being hidden there.
- Proctors will also carefully inspect eyeglass frames, tie tacks, or any other apparel that could be used to harbor a recording device. Proctors will ask to inspect any such items in candidates' pockets.
- If prohibited items are found during check-in, candidates shall put them in the provided secure storage or return these items to their vehicle. PSI will not be responsible for the security of any personal belongings or prohibited items.
- Any candidate possessing prohibited items in the examination room shall immediately have his or her test results invalidated, and PSI shall notify DPOR.
- Any candidate seen giving or receiving assistance on an examination, found with unauthorized materials, or who violates any security regulations will be asked to surrender all examination materials and to leave the examination center. All such instances will be reported to DPOR.
- Copying or communicating examination content is violation of a candidate's contract with PSI, and federal and state law. Either may result in the disqualification of examination results and may lead to legal action.
- Once candidates have been seated and the examination begins, they may leave the examination room only to use the restroom, and only after obtaining permission from the proctor. Candidate will not receive extra time to complete the examination.

## TAKING THE EXAMINATION BY COMPUTER

The examination will be administered via computer. You will be using a mouse and computer keyboard.

### IDENTIFICATION SCREEN

You will be directed to a semiprivate testing station to take the examination. When you are seated at the testing station, you will be prompted to confirm your name, identification number, and the examination for which you are registered.

### TUTORIAL

Before you start your examination, an introductory tutorial is provided on the computer screen. The time you spend on this tutorial, up to 15 minutes, DOES NOT count as part of your examination time. Sample questions are included following the tutorial so that you may practice answering questions, and reviewing your answers.

### TEST QUESTION SCREEN

The "function bar" at the top of the test question provides mouse-click access to the features available while taking the examination.



The screenshot shows a web-based examination interface. At the top, there is a navigation bar with icons for Mark, Comments, Goto, Help, and End. Below this, a status bar displays: Question: 3 of 40, Answered: 2, Unanswered: 1, Marked: 0, View: All, and Time Left(Min): 359. The main question area contains the text: "3. What do the stars on the United States of America's flag represent?" Below the question, it says "(Choose from the following options)" and lists four options: "1. Presidents", "2. Colonies", "3. States", and "4. Wars". Each option has an unchecked checkbox. At the bottom of the question area, there are two buttons: "<< Back" and "Next >>".

One question appears on the screen at a time. During the examination, minutes remaining will be displayed at the top of the screen and updated as you record your answers.

**IMPORTANT:** After you have entered your responses, you will later be able to return to any question(s) and change your response, provided the examination time has not run out.

### EXPERIMENTAL ITEMS

In addition to the number of examination items specified in the "Examination Content Outlines", a small number (5 to 10) of "experimental" questions may be administered to candidates during the examinations. These questions will not be scored and the time taken to answer them will not count against examination time. The administration of such unscored, experimental questions is an essential step in developing future licensing examinations.

## EXAMINATION REVIEW

PSI, in cooperation with DPOR, will be consistently evaluating the examinations being administered to ensure that the examinations accurately measure competency in the required knowledge areas. Comments may be entered by clicking the Comments link on the function bar of the test question screen.

Comments will be analyzed by PSI examination development staff. While PSI does not respond to individuals regarding these comments, all substantive comments are reviewed. If an error affecting examination scores is discovered as a result, which occurs very rarely, the examination scores of all affected candidates will be automatically adjusted. **This is the only review of the examination available to candidates.**

## SCORE REPORTING

Your score will be given to you immediately following completion of the examination. The following summary describes the score reporting process:

**On screen** - Your result will appear immediately on the computer screen. This will happen automatically at the end of the time allowed for the examination.

If you **pass**, you will immediately receive a successful notification.

If you **do not pass**, you will immediately receive an unsuccessful notification on the screen along with a diagnostic report indicating your strengths and weaknesses by examination type.

**On Paper** - An official result report will be printed at the examination center.

## DUPLICATE SCORE REPORTS

You may request a duplicate score report after your examination by emailing [scorereport@psionline.com](mailto:scorereport@psionline.com) or by calling 800-733-9267.

## SAMPLE QUESTIONS

The following questions are offered as examples of the types of questions you will be asked during the course of the examinations. The examples do not represent the full range of content or difficulty levels found in the actual examinations. They are intended to familiarize you with the types of questions you can expect to find in the examinations. (The answer key is found below.)

### Evaluator

1. If the flow rate to a tank decreases, the hydraulic detention time will
  - a. decrease.
  - b. stay the same.
  - c. first decrease and then increase.
  - d. increase.

2. What is the most important concern when raw sewage enters a receiving stream?
  - a. nuisance odors
  - b. protection of aquatic life
  - c. protection of public health
  - d. DO depletion in the receiving stream
3. Distribution systems containing 1,800 or more linear feet of percolation piping shall be split into multiple systems containing a maximum of how many linear feet of percolation piping per system?
  - a. 600 feet
  - b. 900 feet
  - c. 1,200 feet
  - d. 1,260 feet
4. Shallow-placed systems may use system designs similar to in-ground systems. However, timed dosing is required when shallow-placed systems are installed at less than how many inches from the ground surface?
  - a. 8 inches
  - b. 12 inches
  - c. 18 inches
  - d. 24 inches
5. When is an excavation permitted underneath the base of any foundation or retaining wall that could pose a danger to employees?
  - a. when the excavation is in stable clay
  - b. when benching is performed and employees wear OSHA approved hard hats
  - c. when there is no other alternative and the excavating will take less than 30 minutes
  - d. when a support system, such as underpinning, is provided or the excavation is in stable rock
4. What do grey colors in the soil usually indicate in a soil profile?
  - a. a good installation depth for a sewage disposal trench
  - b. quartz minerals are present in the soil
  - c. fast water movement through the soil
  - d. a seasonal or high water table
5. What range in size of crushed stone is suitable for bedding gravity percolation lines?
  - a. 1 inch to 2 inches
  - b. 1/2 inch to 1 inch
  - c. 1/2 inch to 1-1/2 inches
  - d. 3/4 inch to 1 inch

Answers: 1. b. 2. b. 3. a. 4. d. 5. c.

#### Operator

1. Water loving trees such as maples, sycamores, and willows must be removed if they come within what distance of a conventional drainfield site?
  - a. 50 feet
  - b. 20 yards
  - c. 10 yards
  - d. 10 feet
2. What is a LGMI (Lateral Groundwater Movement Interceptor) used for?
  - a. to keep water softener backflush out of the septic system
  - b. to keep ground water away from the absorption area
  - c. to keep surface water away from the septic and pump tank area
  - d. to keep ground water away from the septic and pump tank area
3. Temporary pump and haul permits are good for how many years?
  - a. 3 years
  - b. 2 years
  - c. 1-1/2 years
  - d. 1 year
4. Which organisms are principally disease causing in wastewater?
  - a. autotrophs
  - b. rotifers
  - c. coliforms
  - d. pathogens
5. Which gas has a rotten egg odor?
  - a. methane
  - b. carbon dioxide
  - c. chlorine
  - d. hydrogen sulfide

Answers: 1. D. 2. B. 3. D. 4. D. 5. D.

#### Installer

1. What is the minimum set back distance that the pump chamber must be from a well?
  - a. 100 feet
  - b. 50 feet
  - c. 25 feet
  - d. 15 feet
2. Each pumping station shall be provided with controls for automatically starting and stopping the pumps based on what criteria?
  - a. scum level
  - b. water level
  - c. the size of the pump chamber
  - d. the strength of the effluent
3. Which soil component usually percolates the fastest?
  - a. sand
  - b. silt
  - c. clay
  - d. loam

## EXAMINATION CONTENT OUTLINE

If a test question answer could differ because of conflicting information in test reference sources, a legal requirement such as a code, law or regulation overrides any other reference. If two legal requirements appear to conflict, the state-specific code, law or regulation overrides the national one. Information from sources on the test reference list overrides information from other sources or persons.

The Examination Content Outline has been approved by DPOR. This outline reflects the minimum knowledge required by an Master Onsite Sewage Professional to perform their duties to the public in a competent and responsible manner. Changes in the examination content will be preceded by changes in the published examination content outline.

Use the outline as the basis of your study. The outline lists the topics that are on the examination and the number of items for each topic. Do not schedule your examination until you are familiar with all topics in the outline.

NOTE: All examinations are open-book. You must bring your own references as they are not provided at the test site. You may use any reference materials related to the content outlines. You may use later editions of references as they become available, however, all code examination questions will be based on the edition of the code book that is listed.

References are listed under each examination content outline.

Study guides that primarily provide test questions are not permitted. Sample examinations are not permitted.

Candidates may bring into the examination room any references that are related to the profession including textbooks and training manuals. Formulas included as part of a textbook or training manual are allowable. Formulas are also provided with the examination booklets. Candidates may highlight and tab textbooks and training manuals prior to entering the exam room.

Candidates may not bring handwritten notes, legal pads or notepads of any kind, or loose papers into the examination room. Handwritten notes inserted into training manuals must be removed prior to entering the examination room or they will be confiscated by the proctor. Handouts provided by the trainers and made part of the training manual are allowed.

If candidates have written notes covering the inside covers and/or any blank pages in the reference books or manuals, they must be erased, scratched through or covered prior to entering the examination room or those references will be confiscated by the proctor. If there are notes written in the margins of reference books and training manuals, they will be allowed in the examination room. It is difficult for proctors to tell whether candidates are copying questions and answers or bringing in previously written questions and answers into the exam. To have proctors examine every page of a reference or note would delay the exam administration and create a burden on both candidates and proctors. For this reason, we expect candidates to refrain from bringing in any handwritten notes on separate papers and limiting the notes in reference materials, as described above.

The following list of tabs may be used. These items may be purchased at local office supply stores.

### Acceptable Tabs

Avery Swift Tabs Self-Adhesive Permanent Plastic Tabs  
Redi-Tag Self-Stick Permanent Adhesive Index Tabs

### Unacceptable Tabs

Post-It Index Flags  
Post-It Flags

In order to pass the examination, you must achieve the minimum score listed below.

Exam Class	# of Items	Passing Score	Length of Exam
Master Alternative Onsite Soil Evaluator	60	75%	150 Minutes
Master Conventional Onsite Soil Evaluator	75	75%	180 Minutes
Master Alternative Onsite Sewage System Installer	60	75%	150 Minutes
Master Conventional Onsite Sewage System Installer	75	75%	180 Minutes
Master Alternative Onsite Sewage System Operator	60	75%	150 Minutes
Master Conventional Onsite Sewage System Operator	75	75%	180 Minutes

---

## MASTER ALTERNATIVE ONSITE SOIL EVALUATOR EXAMINATION (EFFECTIVE THROUGH 7/10/2018)

### Site and Soil Evaluation (11 Items)

- Describing land characteristics
- Describing soil characteristics
- Documentation of characteristics
- Landscape characteristics
- Limiting features
- Record search
- Sanitary surveys
- Soil characteristics

### Perform Security and Safety Procedures (3 Items)

- Pathogens
- Personal protective equipment
- Source contamination

### System Design (11 Items)

- Controls for pumps, systems, etc.
- Conveyance
- Dispersal
  - Conventional dispersal
  - Alternative dispersal
- Distribution
- Documentation of the design
- Inspection of system
  - Inspect equipment for abnormal conditions
  - Inspection of the depth and location of dispersal system
- Loading rates
  - Conventional loading rates
  - Alternative loading rates
- Operation maintenance requirements
  - Biochemical oxygen demand
  - Coliform
  - Dissolved oxygen
  - Nitrogen (ammonia, nitrate, nitrite, total Kjeldahl)
  - Total suspended solids
- Predict head loss

### Reference Materials

- Soil Profile Description Manual, Virginia Department of Health, <http://www.vdh.virginia.gov/content/uploads/sites/20/2016/05/soil-manual-edmunds.pdf>
- OSHA PART 1926, Code of Federal Regulations - 29, Parts 1900 to 1910.999 - Revised as of July 1, 2004, [https://www.osha.gov/pls/oshaweb/owasrch.search\\_form?p\\_doc\\_type=STANDARDS&p\\_toc\\_level=0](https://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=STANDARDS&p_toc_level=0)
- Virginia Private Well Regulations, 12 VAC Section 5-630, Commonwealth of Virginia Sewage Handling & Disposal Regulations, Virginia Department of Health, 2012, <https://law.lis.virginia.gov/admincode/title12/agency5/chapter630/>
- Virginia Sewage Handling and Disposal Regulations - 12 VAC 5-610, Commonwealth of Virginia Sewage Handling and Disposal Regulations, Virginia Department of Health, <https://law.lis.virginia.gov/admincode/title12/agency5/chapter610/>  
<http://www.vdh.virginia.gov/EnvironmentalHealth/ONSITE/regulations/documents/2012/pdf/12%20VAC%205%20610.pdf>
- Residential Onsite Wastewater Treatment Systems: An Operation and Maintenance Service Provider Program; Consortium of Institutes for Decentralized Wastewater Treatment (2008), <https://www-mwps.sws.iastate.edu/catalog/soil-air-water/residential-onsite-wastewater-treatment-systems>
- Operation of Wastewater Treatment Plants: A Field Study Training Program, Volume 1, 2004, California State University, Sacramento Foundation, <https://www.amazon.com/operation-wastewater-treatment-plants-volume/dp/1593710054>

### Treatments

- Conventional treatments
- Alternative treatments

### Wastewater treatment processes

Dissolved solids

Microbiological

Chemical oxygen demand

### Inspections (4 Items)

Evaluate/maintain equipment

- Blowers & compressors
- Check and evaluate capacity of equipment
- Pipes
- Read Charts
- Tanks and infrastructure

### Fittings

### General Science and Mathematical Principles (9 Items)

Chemistry

- pH and the pH scale

Mathematics

- Basic arithmetic
- Unit conversions
- Usage of formulas

Measurement principles

Mechanical principles

### Administrative Knowledge and Procedures (7 Items)

Monitoring/reporting requirements

Recordkeeping

Record and evaluate data

Respond to complaints

### Laws and Regulations (15 Items)

Standard practices for quality

State laws relating to licensure

Wastewater regulations

- Conventional

- Alternative

Well water regulations



---

## MASTER ALTERNATIVE ONSITE SOIL EVALUATOR EXAMINATION (EFFECTIVE STARTING 7/11/2018)

### Site and Soil Evaluation (11 Items)

Describing land characteristics  
Describing soil characteristics  
Documentation of characteristics  
Limiting features  
Sanitary surveys

### Perform Security and Safety Procedures (3 Items)

Pathogens  
Personal protective equipment  
Source contamination  
Trench and excavation Safety

### System Design (11 Items)

Controls for pumps, systems, etc.  
Conveyance  
Dispersal  
- Conventional dispersal  
- Alternative dispersal  
Distribution  
Documentation of the design  
Loading rates  
- Conventional loading rates  
- Alternative loading rates  
Wastewater characteristics  
Treatments  
- Conventional treatments  
- Alternative treatments  
Wastewater treatment processes  
Setbacks

### Inspections (4 Items)

Evaluate equipment  
- Blowers and compressors  
- Check and evaluate capacity of equipment  
- Pipes and fittings  
- Tanks and infrastructure

### General Science and Mathematical Principles (9 Items)

Mathematics  
- Basic arithmetic  
- Unit conversions  
- Usage of formulas  
Mechanical principles  
General science

### Administrative Knowledge and Procedures (7 Items)

Monitoring/reporting requirements  
Recordkeeping  
Record and evaluate data

### Laws and Regulations (15 Items)

Standard practices for quality  
State laws relating to licensure  
Wastewater regulations  
- Conventional  
- Alternative  
Well water regulations

### Reference Materials

- OSHA PART 1926, Code of Federal Regulations - 29, Parts 1900 to 1910.999  
[https://www.osha.gov/pls/oshaweb/owasrch.search\\_form?p\\_doc\\_type=STANDARDS&p\\_toc\\_level=0](https://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=STANDARDS&p_toc_level=0)
- Virginia Private Well Regulations, 12 VAC Section 5-630, Commonwealth of Virginia Sewage Handling & Disposal Regulations, Virginia Department of Health, <https://law.lis.virginia.gov/admincode/title12/agency5/chapter630/>
- Code of Virginia, Title 54.1, Chapter 4, section 54.1-402, <https://law.lis.virginia.gov/vacode/title54.1/chapter4/section54.1-402/>
- Virginia Sewage Handling and Disposal Regulations - 12 VAC 5-610, Commonwealth of Virginia Sewage Handling and Disposal Regulations, Virginia Department of Health, <https://law.lis.virginia.gov/admincode/title12/agency5/chapter610/>
- Residential Onsite Wastewater Treatment Systems: An Operation and Maintenance Service Provider Program; Consortium of Institutes for Decentralized Wastewater Treatment, 2008  
<https://www-mwps.sws.iastate.edu/catalog/water-septic-systems/residential-onsite-wastewater-treatment-systems>
- Virginia Administrative Code Title 12, Agency 5, Chapter 613. Regulations for Alternative Onsite Sewage Systems  
<https://law.lis.virginia.gov/admincode/title12/agency5/chapter613/>
- Code of Virginia, Title 32.1, <https://law.lis.virginia.gov/vacode/title32.1/>
- Virginia Wastewater Treatment Examination Formula Sheet, [http://water.me.vccs.edu/exam\\_prep/wastewater\\_formulas.htm](http://water.me.vccs.edu/exam_prep/wastewater_formulas.htm)
- Virginia Administrative Code Title 18, Agency 160, Chapter 40. Onsite Sewage System Professionals Licensing Regulations, <https://law.lis.virginia.gov/admincode/title18/agency160/chapter40/>
- National Resources Conservation Service Field Book for Describing and Sampling Soils, version 3.0, 2012  
[https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2\\_054184](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_054184)

---

## MASTER CONVENTIONAL ONSITE SOIL EVALUATOR EXAMINATION (EFFECTIVE THROUGH 7/10/2018)

### Site and Soil Evaluation (13 Items)

Describing land characteristics  
Describing soil characteristics  
Documentation of characteristics  
Job Staging  
Landscape characteristics  
Limiting features  
Record search  
Sanitary surveys  
Soil characteristics

### Perform Security and Safety Procedures (3 Items)

Pathogens  
Personal protective equipment  
Source contamination

### System Design (14 Items)

Controls for pumps, systems, etc.  
Conveyance  
Dispersal  
- Conventional dispersal  
Distribution  
Documentation of the design  
Inspection of system  
- Inspect equipment for abnormal conditions  
- Inspection of the depth and location of dispersal system  
Loading rates  
- Conventional loading rates  
Operation maintenance requirements  
- Biochemical oxygen demand  
- Coliform  
- Total suspended solids  
Treatments  
- Conventional treatments  
Wastewater treatment processes  
Dissolved solids  
Microbiological  
Nitrogen (ammonia, nitrate, nitrite, total Kjeldahl)

### Inspections (5 Items)

Evaluate/maintain equipment  
- Check and evaluate capacity of equipment  
- Pipes  
- Read Charts  
- Tanks and infrastructure  
- Chemical feeders

### Fittings

### General Science and Mathematical Principles (12 Items)

#### Mathematics

- Basic arithmetic  
- Unit conversions  
- Usage of formulas

#### Measurement principles

#### Mechanical principles

### Administrative Knowledge and Procedures (8 Items)

Monitoring/reporting requirements  
Recordkeeping  
Record and evaluate data

### Laws and Regulations (20 Items)

Standard practices for quality  
State laws relating to licensure  
Wastewater regulations  
- Conventional  
Well water regulations

### Reference Materials

- Soil Profile Description Manual, Virginia Department of Health  
<http://www.vdh.virginia.gov/content/uploads/sites/20/2016/05/soil-manual-edmunds.pdf>
- OSHA PART 1926, Code of Federal Regulations - 29, Parts 1900 to 1910.999 - Revised as of July 1, 2004, (866) 512-1800,  
[https://www.osha.gov/pls/oshaweb/owasrch.search\\_form?p\\_doc\\_type=STANDARDS&p\\_toc\\_level=0](https://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=STANDARDS&p_toc_level=0)
- Virginia Private Well Regulations, 12 VAC Section 5-630, Commonwealth of Virginia Sewage Handling & Disposal Regulations, Virginia Department of Health, 2012 <https://law.lis.virginia.gov/admincode/title12/agency5/chapter630/>
- Code of Virginia, Title 54.1, Chapter 4, section 54.1-402, <https://law.justia.com/codes/virginia/2006/toc5401000/54.1-402.html>
- Virginia Sewage Handling and Disposal Regulations - 12 VAC 5-610, Commonwealth of Virginia Sewage Handling and Disposal Regulations, Virginia Department of Health, <https://law.lis.virginia.gov/admincode/title12/agency5/chapter610/>

---

## MASTER CONVENTIONAL ONSITE SOIL EVALUATOR EXAMINATION (EFFECTIVE STARTING 7/11/2018)

### Site and Soil Evaluation (13 Items)

Describing land characteristics  
Describing soil characteristics  
Documentation of characteristics  
Limiting features  
Sanitary surveys

### Perform Security and Safety Procedures (3 Items)

Pathogens  
Personal protective equipment  
Source contamination  
Trench and excavation safety

### System Design (14 Items)

Controls for pumps, systems, etc.  
Conveyance  
Dispersal  
- Conventional dispersal  
Distribution  
Documentation of the design  
Loading rates  
- Conventional loading rates  
- Alternative loading rates  
Wastewater characteristics  
Treatments  
- Conventional treatments  
- Alternative treatments  
Wastewater treatment processes  
Setbacks

### Inspections (5 Items)

Evaluate equipment  
- Check and evaluate capacity of equipment  
- Pipes and fittings  
- Tanks and infrastructure

### General Science and Mathematical Principles (12 Items)

Mathematics  
- Basic arithmetic  
- Unit conversions  
- Usage of formulas  
Mechanical principles  
General science

### Administrative Knowledge and Procedures (8 Items)

Monitoring/reporting requirements  
Recordkeeping  
Record and evaluate data

### Laws and Regulations (20 Items)

Standard practices for quality  
State laws relating to licensure  
Wastewater regulations  
- Conventional  
- Alternative  
Well water regulations

### Reference Materials

- OSHA PART 1926, Code of Federal Regulations - 29, Parts 1900 to 1910.999, [https://www.osha.gov/pls/oshaweb/owasrch.search\\_form?p\\_doc\\_type=STANDARDS&p\\_toc\\_level=0](https://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=STANDARDS&p_toc_level=0)
- Virginia Private Well Regulations, 12 VAC Section 5-630, Commonwealth of Virginia Sewage Handling & Disposal Regulations, Virginia Department of Health, <https://law.lis.virginia.gov/admincode/title12/agency5/chapter630/>
- Code of Virginia, Title 54.1, Chapter 4, section 54.1-402, <https://law.lis.virginia.gov/vacode/title54.1/chapter4/section54.1-402/>
- Virginia Sewage Handling and Disposal Regulations - 12 VAC 5-610, Commonwealth of Virginia Sewage Handling and Disposal Regulations, Virginia Department of Health, <https://law.lis.virginia.gov/admincode/title12/agency5/chapter610/>
- Residential Onsite Wastewater Treatment Systems: An Operation and Maintenance Service Provider Program; Consortium of Institutes for Decentralized Wastewater Treatment, 2008, <https://www-mwps.sws.iastate.edu/catalog/water-septic-systems/residential-onsite-wastewater-treatment-systems>
- Virginia Administrative Code Title 12, Agency 5, Chapter 613. Regulations for Alternative Onsite Sewage Systems, <https://law.lis.virginia.gov/admincode/title12/agency5/chapter613/>
- Code of Virginia, Title 32.1, <https://law.lis.virginia.gov/vacode/title32.1/>
- Virginia Wastewater Treatment Examination Formula Sheet, [http://water.me.vccs.edu/exam\\_prep/wastewater\\_formulas.htm](http://water.me.vccs.edu/exam_prep/wastewater_formulas.htm)
- Virginia Administrative Code Title 18, Agency 160, Chapter 40. Onsite Sewage System Professionals Licensing Regulations <https://law.lis.virginia.gov/admincode/title18/agency160/chapter40/>
- National Resources Conservation Service Field Book for Describing and Sampling Soils, version 3.0, 2012 [https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2\\_054184](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_054184)

---

## MASTER ALTERNATIVE ONSITE SEWAGE SYSTEM INSTALLER EXAMINATION (EFFECTIVE THROUGH 7/24/2018)

### Sewage System Installation (17 Items)

Characteristics of wastewater  
Chemical storage  
Conveyance  
Dispersal  
Distribution  
Water distribution of sewage water

### Monitor, Evaluate, and Adjust Treatment Processes (2 Items)

Aeration  
Cartridge filters  
Flow measurement  
Gravity/rapid sand filtration  
Leak detection  
Pretreatment  
System flushing  
Up-flow aerobic treatment unit

### Operating and Maintaining Equipment (3 Items)

Backflow prevention devices  
Blowers, compressors, pneumatics  
Check and evaluate capacity of equipment  
Drains  
Electronic testing equipment  
Facility operation and maintenance  
Finding startup/shutdown procedures  
Fittings  
Flow distribution devices (valves, etc.)  
Functions of tools  
Generators  
Heavy vehicles  
Hydraulics  
Inspect equipment for abnormal conditions  
Lifting equipment  
Measure and evaluate head loss  
Pipes  
Pumps, controls, electrical

Read and evaluate chart and meter results, gauges  
Read charts  
Tanks and infrastructure

### Security & Safety Procedures (6 Items)

Chemical handling  
Confined space entry  
Emergency plans  
Fire safety  
Lock-out/tag-out  
Material Safety Data Sheets (MSDS)  
Pathogens  
Personal protective equipment  
Source contamination  
Bloodborne pathogens  
Natural and manmade disasters  
Transportation

### General Science and Mathematical Principles (9 Items)

Chemistry  
Mathematics  
- Basic arithmetic  
- Unit conversions  
- Usage of formulas  
Measurement principles  
Mechanical principles  
Principles of electricity

### Administrative Knowledge and Procedures (6 Items)

Monitoring/reporting requirements  
Recordkeeping  
Operation and maintenance plan  
Record and evaluate data

### Laws and Regulations (17 Items)

Local permits, codes, and ordinances  
Standard Practices for Quality  
State laws relating to licensure

### Reference Materials

- Onsite Wastewater Treatment Systems Manual - EPA/625/R-00/008, EPA: Onsite Wastewater Treatment System Manual, <https://nepis.epa.gov/onsitewastewatermanual>
- Residential Onsite Wastewater Treatment Systems: An Operation and Maintenance Service Provider Program; Consortium of Institutes for Decentralized Wastewater Treatment (2008), <https://www-mwps.sws.iastate.edu/catalog/soil-air-water/residential-onsite-wastewater-treatment-systems>
- Virginia Wastewater Treatment Examination Formula Sheet, [http://water.me.vccs.edu/exam\\_prep/wastewater\\_formulas.htm](http://water.me.vccs.edu/exam_prep/wastewater_formulas.htm)

---

## MASTER ALTERNATIVE ONSITE SEWAGE SYSTEM INSTALLER EXAMINATION (EFFECTIVE STARTING 7/25/2018)

### Sewage System Installation (17 Items)

Conveyance  
Dispersal  
Distribution  
Watershed protection  
Pipes & fittings  
Tank installation  
Characteristics of wastewater  
Cartridge filters  
Treatment  
System flushing

### Operating and Maintaining Equipment (5 Items)

Electronic testing equipment  
Flow distribution devices (valves, etc.)  
Lifting equipment  
Tanks and infrastructure  
Pumps, controls, electrical  
Blowers & compressors  
Check and evaluate capacity of equipment  
Inspect equipment for abnormal conditions  
Measure and evaluate head loss  
Read and evaluate chart and meter results, gauges  
Disinfection  
Leak detection

### Security & Safety Procedures (6 Items)

Pathogens

### Personal protective equipment

Transportation  
Trench safety  
Confined space entry  
Lock-out/tag-out  
Emergency plans  
Fire safety  
Source contamination  
Chemical handling  
Material Safety Data Sheets (MSDS) get item from operator

### General Science and Mathematical Principles (9 Items)

Mathematics  
- Basic arithmetic  
- Unit conversions  
- Usage of formulas  
Measurement principles  
Mechanical principles  
Principles of electricity

### Administrative Knowledge and Procedures (6 Items)

Recordkeeping  
Monitoring/reporting requirements  
Operation and maintenance plan  
Record and evaluate data

### Laws and Regulations (17 Items)

Standard Practices for Quality  
State laws relating to licensure  
Health department regulations

### Reference Materials

- OSHA Construction Industry Regulations, PART 1926, Code of Federal Regulations - 29  
[https://www.osha.gov/pls/oshaweb/owasrch.search\\_form?p\\_doc\\_type=STANDARDS&p\\_toc\\_level=0](https://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=STANDARDS&p_toc_level=0)
- Onsite Wastewater Treatment Systems Manual - EPA/625/R-00/008, EPA: Onsite Wastewater Treatment System Manual  
[https://www.epa.gov/sites/production/files/2015-06/documents/2004\\_07\\_07\\_septics\\_septic\\_2002\\_osdm\\_all.pdf](https://www.epa.gov/sites/production/files/2015-06/documents/2004_07_07_septics_septic_2002_osdm_all.pdf)
- Residential Onsite Wastewater Treatment Systems: An Operation and Maintenance Service Provider Program; Consortium of Institutes for Decentralized Wastewater Treatment, 2008  
<https://www-mwps.sws.iastate.edu/catalog/water-septic-systems/residential-onsite-wastewater-treatment-systems>
- Virginia Wastewater Treatment Examination Formula Sheet,  
[http://water.me.vccs.edu/exam\\_prep/wastewater\\_formulas.htm](http://water.me.vccs.edu/exam_prep/wastewater_formulas.htm)
- VOWRA Onsite Systems A-Z Manual, Requires membership with Virginia Onsite Wastewater Recycling Association  
<http://www.vowra.org/index.asp>
- Virginia Administrative Code Title 18, Agency 160, Chapter 40. Onsite Sewage System Professionals Licensing Regulations  
<https://law.lis.virginia.gov/admincode/title18/agency160/chapter40/>
- Virginia Administrative Code Title 12, Agency 5, Chapter 613. Regulations for Alternative Onsite Sewage Systems  
<https://law.lis.virginia.gov/admincode/title12/agency5/chapter613/>
- Code of Virginia, Title 32.1  
<https://law.lis.virginia.gov/vacode/title32.1/>
- Virginia Sewage Handling and Disposal Regulations - 12 VAC 5-610, Commonwealth of Virginia Sewage Handling and Disposal Regulations, Virginia Department of Health  
<https://law.lis.virginia.gov/admincode/title12/agency5/chapter610/>
- Code of Virginia, Title 54.1, Chapter 4, section 54.1-402  
<https://law.lis.virginia.gov/vacode/title54.1/chapter4/section54.1-4>

---

## MASTER CONVENTIONAL ONSITE SEWAGE SYSTEM INSTALLER EXAMINATION (EFFECTIVE THROUGH 7/24/2018)

### Sewage System Installation (21 Items)

- Conveyance
- Dispersal
- Distribution
- Water distribution of sewage water
- Watershed protection

### Operating and Maintaining Equipment (6 Items)

- Backflow prevention devices
- Drains
- Electronic testing equipment
- Fittings
- Flow distribution devices (valves, etc.)
- Functions of tools
- Heavy vehicles
- Hydraulics
- Lifting equipment
- Lubricant characteristics
- Pipes
- Tanks and infrastructure
- Pumps, controls, electrical

### Security & Safety Procedures (9 Items)

- Pathogens
- Personal protective equipment
- Transportation

### General Science and Mathematical Principles (7 Items)

- Mathematics
  - Basic arithmetic
- Measurement principles
- Mechanical principles
- Principles of electricity

### Administrative Knowledge and Procedures (11 Items)

- Recordkeeping
- Monitoring/reporting requirements

### Laws and Regulations (21 Items)

- Local permits, codes, and ordinances
- Standard Practices for Quality
- State laws relating to licensure

### Reference Materials

- Field Book for Describing and Sampling Soils, National Resources Conservation Services: United States Department of Agriculture, [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2\\_054184](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_054184)
- OSHA PART 1926, Code of Federal Regulations - 29, Parts 1900 to 1910.999 - Revised as of July 1, 2004, [https://www.osha.gov/pls/oshaweb/owasrch.search\\_form?p\\_doc\\_type=STANDARDS&p\\_toc\\_level=0](https://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=STANDARDS&p_toc_level=0)
- Onsite Wastewater Treatment Systems Manual - EPA/625/R-00/008, EPA: Onsite Wastewater Treatment System Manual, <https://nepis.epa.gov/onsitewastewatermanual>
- Residential Onsite Wastewater Treatment Systems: An Operation and Maintenance Service Provider Program; Consortium of Institutes for Decentralized Wastewater Treatment (2008), <https://www-mwps.sws.iastate.edu/catalog/soil-air-water/residential-onsite-wastewater-treatment-systems>
- Virginia Wastewater Treatment Examination Formula Sheet, [http://water.me.vccs.edu/exam\\_prep/wastewater\\_formulas.htm](http://water.me.vccs.edu/exam_prep/wastewater_formulas.htm)
- Virginia Occupational Safety and Health Program, 16 VAC 25, Chapters 60, 140, 150, 160, and 170., Virginia Occupational Safety & Health Standards (VOSH), Chapter 140, Virginia Confined Space Standard for the Construction Industry, Effective July 1, 1987; amended, eff. September 1, 1993. [http://www.doli.virginia.gov/vosh\\_enforcement/vaunique\\_standards.html](http://www.doli.virginia.gov/vosh_enforcement/vaunique_standards.html)



---

## MASTER CONVENTIONAL ONSITE SEWAGE SYSTEM INSTALLER EXAMINATION (EFFECTIVE STARTING 7/25/2018)

### Sewage System Installation (21 Items)

Conveyance  
Dispersal  
Distribution  
Watershed protection  
Pipes & fittings  
Tank installation

### Operating and Maintaining Equipment (8 Items)

Electronic testing equipment  
Flow distribution devices (valves, etc.)  
Lifting equipment  
Tanks and infrastructure  
Pumps, controls, electrical

### Security & Safety Procedures (9 Items)

Pathogens  
Personal protective equipment  
Transportation  
Trench Safety  
Confined space entry  
Lock-out/tag-out  
Emergency plans

### General Science and Mathematical Principles (7 Items)

Mathematics  
- Basic arithmetic  
- Unit conversion  
- Use of formulas  
Measurement principles  
Mechanical principles  
Principles of electricity

### Administrative Knowledge and Procedures (8 Items)

Recordkeeping  
Monitoring/reporting requirements

### Laws and Regulations (22 Items)

Standard practices for quality  
State laws relating to licensure  
Health department regulations

### Reference Materials

- OSHA Construction Industry Regulations, PART 1926, Code of Federal Regulations - 29  
[https://www.osha.gov/pls/oshaweb/owasrch.search\\_form?p\\_doc\\_type=STANDARDS&p\\_toc\\_level=0](https://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=STANDARDS&p_toc_level=0)
- Onsite Wastewater Treatment Systems Manual - EPA/625/R-00/008, EPA: Onsite Wastewater Treatment System Manual  
[https://www.epa.gov/sites/production/files/2015-06/documents/2004\\_07\\_07\\_septics\\_septic\\_2002\\_osdm\\_all.pdf](https://www.epa.gov/sites/production/files/2015-06/documents/2004_07_07_septics_septic_2002_osdm_all.pdf)
- Residential Onsite Wastewater Treatment Systems: An Operation and Maintenance Service Provider Program; Consortium of Institutes for Decentralized Wastewater Treatment, 2008  
<https://www-mwps.sws.iastate.edu/catalog/water-septic-systems/residential-onsite-wastewater-treatment-systems>
- Virginia Wastewater Treatment Examination Formula Sheet, [http://water.me.vccs.edu/exam\\_prep/wastewater\\_formulas.htm](http://water.me.vccs.edu/exam_prep/wastewater_formulas.htm)
- Virginia Administrative Code Title 18, Agency 160, Chapter 40. Onsite Sewage System Professionals Licensing Regulations  
<https://law.lis.virginia.gov/admincode/title18/agency160/chapter40/>
- Virginia Sewage Handling and Disposal Regulations - 12 VAC 5-610, Commonwealth of Virginia Sewage Handling and Disposal Regulations, Virginia Department of Health  
<https://law.lis.virginia.gov/admincode/title12/agency5/chapter610/>
- VOWRA Onsite Systems A-Z Manual, Requires membership with Virginia Onsite Wastewater Recycling Association  
<http://www.vowra.org/index.asp>
- Code of Virginia, Title 32.1  
<https://law.lis.virginia.gov/vacode/title32.1/>
- Code of Virginia, Title 54.1, Chapter 4, section 54.1-402  
<https://law.lis.virginia.gov/vacode/title54.1/chapter4/section54.1-402/>

---

## MASTER ALTERNATIVE ONSITE SEWAGE SYSTEM OPERATOR EXAMINATION (EFFECTIVE THROUGH 7/24/2018)

### Onsite System Operations (3 Items)

- Basic laboratory chain of custody
- Characteristics of wastewater
- Dispersal
- Conveyance
- Distribution
- Evaluate incoming wastestream/sidestream characteristics
  - Biological/chemical
  - Solids concentration
  - Volume
- Disinfection
- Sample collection and analysis
  - Bioassay
  - Biochemical oxygen demand
  - Chemical oxygen demand
  - Chlorine residual
  - Coliform
  - Dissolved oxygen
  - Dissolved solids
  - Nitrogen (Ammonia, Nitrate, Nitrite, total Kjeldahl)
  - pH
  - Phosphorus
  - Settleability testing
  - Temperature

### Monitor, Evaluate, and Adjust Treatment Processes (8 Items)

- Flow equalization
- Clarifiers
- Odor control
- Fixed-film reactors (trickling filters, RBC's)
- Nitrification by designed extended aeration only
- Media filtration
- Chlorination
- Effluent discharge and reuse
- Up-flow aerobic treatment unit
- Flow measurement
- System flushing
- Activated sludge
- Chemical/physical advanced waste treatment without secondary
- Chemical/physical advanced waste treatment following secondary
- Reverse osmosis, electro-dialysis, and other membrane filtration
- Dechlorination
- Ultraviolet irradiation
- Pretreatment
- Chlorine disinfection
- pH adjustment
- Aeration
- Leak detection

### Operating and Maintaining Equipment (11 Items)

- Check and evaluate capacity of equipment
- Inspect equipment for abnormal conditions
- Measure and evaluate head loss
- Hydraulics
- Facility operation and maintenance
- Material Safety Data Sheets (MSDS)
- Flow distribution devices (valves, etc.)
- Computers
- Drains
- Reading meters
- Fittings
- Blowers & compressors
- Chemical feeders
- Tanks and infrastructure
- Odor control equipment
- Laboratory equipment
- Pumps, controls, electrical equipment
- Finding startup/shutdown procedures
- Water meters
- Prime movers/drives (engines & motors)
- Reading charts
- Reading pressure gauges
- Pipes

### Security & Safety Procedures (9 Items)

- Transportation
- Personal protective equipment
- Lock-out/tag-out
- Source contamination
- Chemical handling
- Confined space entry
- Pathogens

### General Science and Mathematical Principles (8 Items)

- General microbiology
- Sampling procedures
- Mechanical principles
- Chemistry
  - pH and the pH scale
- Principles of electricity
- Measurement principles
- Mathematics
  - Basic arithmetic
  - Unit conversions
  - Usage of formulas

### Administrative Procedures & Knowledge (9 Items)

- Record and evaluate data
- Recordkeeping
- Monitoring/reporting requirements

### Laws and Regulations (12 Items)

- State laws relating to licensure
- Standard practices for quality
- Local permits, codes, and ordinances



## Reference Materials

- Operation of Wastewater Treatment Plants: A Field Study Training Program, Volume 1, 2004, California State University, Sacramento Foundation, <http://www.amazon.com/Operation-Wastewater-Treatment-Plants-Volume/dp/1593710054>
- Onsite Wastewater Treatment Systems Manual - EPA/625/R-00/008, EPA: Onsite Wastewater Treatment System Manual, <https://nepis.epa.gov/onsitewastewatermanual>
- Residential Onsite Wastewater Treatment Systems: An Operation and Maintenance Service Provider Program; Consortium of Institutes for Decentralized Wastewater Treatment (2008), <https://www-mwps.sws.iastate.edu/catalog/soil-air-water/residential-onsite-wastewater-treatment-systems>
- Virginia Wastewater Treatment Examination Formula Sheet, [http://water.me.vccs.edu/exam\\_prep/wastewater\\_formulas.htm](http://water.me.vccs.edu/exam_prep/wastewater_formulas.htm)
- Virginia Sewage Handling and Disposal Regulations - 12 VAC 5-610, Commonwealth of Virginia Sewage Handling and Disposal Regulations, Virginia Department of Health, <https://law.lis.virginia.gov/admincode/title12/agency5/chapter610/>

---

## MASTER ALTERNATIVE ONSITE SEWAGE SYSTEM OPERATOR EXAMINATION (EFFECTIVE STARTING 7/25/2018)

### Onsite System Operations (10 Items)

- Characteristics of wastewater
- Dispersal
- Conveyance
- Distribution
- Evaluating incoming wastestream/sidestream characteristics
  - Volume
  - Solids concentration
  - Biological/chemical
- Sample collection and analysis
- Basic laboratory chain of custody

### Monitor, Evaluate, and Adjust Treatment Processes (10 Items)

- Leak detection
- Pretreatment
- Flow equalization
- Chemical/physical advanced waste treatment without secondary
- Chemical/physical advanced waste treatment following secondary
- Clarifiers
- Odor control
- Fixed-film reactors (trickling filters, RBC's)
- Nitrogen treatment
- Disinfection
- Effluent discharge and reuse
- Up-flow aerobic treatment unit
- Flow measurement
- System flushing
- Activated sludge
- Reverse osmosis, electro-dialysis, and other membrane filtration
- pH adjustment
- Aeration

### Operating and Maintaining Equipment (11 Items)

- Pipes & fittings
- Reading meters
- Reading charts
- Pumps, controls, electrical equipment
- Tanks and infrastructure
- Finding startup/shutdown procedures
- Prime movers/drives (engines & motors)
- Inspecting equipment for abnormal conditions

- Computers
- Flow distribution devices (valves, etc.)
- Material Safety Dates Sheets (MSDS)
- Hydraulics
- Measure and evaluate head loss
- Check and evaluate capacity of equipment
- Finding startup/shutdown procedures
- Facility operation and maintenance
- Blowers & compressors
- Chemical feeders
- Laboratory equipment
- Water meters
- Reading pressure gauges

### Security & Safety Procedures (7 Items)

- Source contamination
- Pathogens
- Lock-out/tag-out
- Confined space entry
- Transportation
- Chemical handling
- Personal protective equipment

### General Science and Mathematical Principles (8 Items)

- Mechanical principles
- Mathematics
  - Usage of formulas
  - Unit conversions
  - Basic arithmetic
- Measurement principles
- Principles of electricity
- General microbiology
- Chemistry
  - pH and the pH scale

### Administrative Procedures & Knowledge (2 Items)

- Monitoring/reporting requirements
- Recordkeeping
- Record and evaluate data

### Laws and Regulations (12 Items)

- Regulations relating to licensure
- Standard practices for quality
- Health department regulations

## Reference Materials

- Operation of Wastewater Treatment Plants: A Field Study Training Program, Volume 1, 2008  
<https://www.awwa.org/store/productdetail.aspx?productid=21664>
- Onsite Wastewater Treatment Systems Manual - EPA/625/R-00/008, EPA: Onsite Wastewater Treatment System Manual  
[https://www.epa.gov/sites/production/files/2015-06/documents/2004\\_07\\_07\\_septics\\_septic\\_2002\\_osdm\\_all.pdf](https://www.epa.gov/sites/production/files/2015-06/documents/2004_07_07_septics_septic_2002_osdm_all.pdf)
- Residential Onsite Wastewater Treatment Systems: An Operation and Maintenance Service Provider Program; Consortium of Institutes for Decentralized Wastewater Treatment, 2008  
<https://www-mwps.sws.iastate.edu/catalog/water-septic-systems/residential-onsite-wastewater-treatment-systems>
- Virginia Wastewater Treatment Examination Formula Sheet, [http://water.me.vccs.edu/exam\\_prep/wastewater\\_formulas.htm](http://water.me.vccs.edu/exam_prep/wastewater_formulas.htm)
- Virginia Sewage Handling and Disposal Regulations - 12 VAC 5-610, Commonwealth of Virginia Sewage Handling and Disposal Regulations, Virginia Department of Health  
<https://law.lis.virginia.gov/admincode/title12/agency5/chapter610/>
- VOWRA Onsite Systems A-Z Manual, Requires membership with Virginia Onsite Wastewater Recycling Association  
<http://www.vowra.org/index.asp>
- Code of Virginia, Title 54.1, Chapter 4, section 54.1-402  
<https://law.lis.virginia.gov/vacode/title54.1/chapter4/section54.1-402/>
- Virginia Administrative Code Title 12, Agency 5, Chapter 613. Regulations for Alternative Onsite Sewage Systems  
<https://law.lis.virginia.gov/admincode/title12/agency5/chapter613/>
- Code of Virginia, Title 32.1  
<https://law.lis.virginia.gov/vacode/title32.1/>
- Virginia Administrative Code Title 18, Agency 160, Chapter 40. Onsite Sewage System Professionals Licensing Regulations  
<https://law.lis.virginia.gov/admincode/title18/agency160/chapter40/>

---

## MASTER CONVENTIONAL ONSITE SEWAGE SYSTEM OPERATOR EXAMINATION (EFFECTIVE THROUGH 7/24/2018)

### Onsite System Operations (2 items)

Characteristics of wastewater  
Dispersal  
Conveyance  
Distribution  
Evaluate incoming wastestream/sidestream characteristics  
- Volume

### Monitor, Evaluate, and Adjust Treatment Processes (8 Items)

Leak detection  
Pretreatment  
Chemical/physical advanced waste treatment without secondary  
Flow equalization

### Operating and Maintaining Equipment (14 Items)

Pipes  
Fittings  
Reading meters  
Reading charts  
Pumps, controls, electrical equipment  
System operation and maintenance  
Tanks and infrastructure  
Backflow prevention devices  
Inspecting equipment for abnormal conditions  
Drains  
Computers  
Flow distribution devices (valves, etc.)  
Material Safety Data Sheets (MSDS)  
Hydraulics  
Measuring and evaluation head loss  
Checking and evaluating capacity of equipment

### Security & Safety Procedures (15 Items)

Source contamination  
Pathogens  
Lock-out/tag-out  
Confined space entry  
Transportation  
Chemical handling  
Personal protective equipment  
Facility upset  
Fire safety

### General Science and Mathematical Principles (10 Items)

Mechanical principles  
Mathematics  
- Usage of formulas  
- Unit conversions  
- Basic arithmetic

Measurement principles  
Principles of electricity

### Administrative Knowledge (10 Items)

Monitoring/reporting requirements  
Recordkeeping

### Laws and Regulations (16 Items)

State laws relating to licensure  
Local permits, codes, and ordinances  
Standard practices for quality

### Reference Materials

- Operation of Wastewater Treatment Plants: A Field Study Training Program, Volume 1, 2004, California State University, Sacramento Foundation, <http://www.amazon.com/Operation-Wastewater-Treatment-Plants-Volume/dp/1593710054>
- Onsite Wastewater Treatment Systems Manual - EPA/625/R-00/008, EPA: Onsite Wastewater Treatment System Manual, <https://nepis.epa.gov/onsitewastewatermanual>
- Residential Onsite Wastewater Treatment Systems: An Operation and Maintenance Service Provider Program; Consortium of Institutes for Decentralized Wastewater Treatment (2008), <https://www-mwps.sws.iastate.edu/catalog/soil-air-water/residential-onsite-wastewater-treatment-systems>
- Virginia Wastewater Treatment Examination Formula Sheet, [http://water.me.vccs.edu/exam\\_prep/wastewater\\_formulas.htm](http://water.me.vccs.edu/exam_prep/wastewater_formulas.htm)
- Virginia Sewage Handling and Disposal Regulations - 12 VAC 5-610, Commonwealth of Virginia Sewage Handling and Disposal Regulations, Virginia Department of Health, <https://law.lis.virginia.gov/admincode/title12/agency5/chapter610/>
- Standard Methods for Exam of Water and Wastewater 20<sup>th</sup> Edition, American Water Works Association, (800) 926-7335, <http://www.amazon.com/Standard-Methods-Examination-Water-Wastewater/dp/0875532357>
- Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act, U. S. Environmental Protection Agency (EPA), <http://water.epa.gov/scitech/methods/cwa/mur-fs200610.cfm>

---

## MASTER CONVENTIONAL ONSITE SEWAGE SYSTEM OPERATOR EXAMINATION (EFFECTIVE STARTING 7/25/2018)

### Onsite System Operations (10 items)

Characteristics of wastewater  
Dispersal  
Conveyance  
Distribution  
Evaluate incoming wastestream/sidestream characteristics  
- Volume

### Monitor, Evaluate, and Adjust Treatment Processes (8 Items)

Leak detection  
Pretreatment  
Flow equalization  
Chemical/physical advanced waste treatment without secondary

### Operating and Maintaining Equipment (18 Items)

Pipes & fittings  
Reading meters  
Reading charts  
Pumps, controls, electrical equipment  
Tanks and infrastructure  
Inspecting equipment for abnormal conditions  
Computers  
Flow distribution devices (valves, etc.)  
Material Safety Data Sheets (MSDS)  
Hydraulics  
Measuring and evaluation head loss  
Checking and evaluating capacity of equipment  
System operation and maintenance  
Backflow prevention devices

### Security & Safety Procedures (7 Items)

Source contamination  
Pathogens  
Lock-out/tag-out  
Confined space entry  
Transportation  
Chemical handling  
Personal protective equipment  
Facility upset  
Fire safety

### General Science and Mathematical Principles (14 Items)

Mechanical principles  
Mathematics  
- Usage of formulas  
- Unit conversions  
- Basic arithmetic  
Measurement principles  
Principles of electricity

### Administrative Knowledge (2 Items)

Monitoring/reporting requirements  
Recordkeeping

### Laws and Regulations (16 Items)

Regulations relating to licensure  
Standard practices for quality  
Health department regulations

### Reference Materials

- Operation of Wastewater Treatment Plants: A Field Study Training Program, Volume 1, 2008  
<https://www.awwa.org/store/productdetail.aspx?productid=21664>
- Onsite Wastewater Treatment Systems Manual - EPA/625/R-00/008, EPA: Onsite Wastewater Treatment System Manual  
[https://www.epa.gov/sites/production/files/2015-06/documents/2004\\_07\\_07\\_septics\\_septic\\_2002\\_osdm\\_all.pdf](https://www.epa.gov/sites/production/files/2015-06/documents/2004_07_07_septics_septic_2002_osdm_all.pdf)
- Residential Onsite Wastewater Treatment Systems: An Operation and Maintenance Service Provider Program; Consortium of Institutes for Decentralized Wastewater Treatment, 2008  
<https://www-mwps.sws.iastate.edu/catalog/water-septic-systems/residential-onsite-wastewater-treatment-systems>
- Virginia Wastewater Treatment Examination Formula Sheet  
[http://water.me.vccs.edu/exam\\_prep/wastewater\\_formulas.htm](http://water.me.vccs.edu/exam_prep/wastewater_formulas.htm)
- Virginia Sewage Handling and Disposal Regulations - 12 VAC 5-610, Commonwealth of Virginia Sewage Handling and Disposal Regulations, Virginia Department of Health  
<https://law.lis.virginia.gov/admincode/title12/agency5/chapter610/>
- Code of Virginia, Title 54.1, Chapter 4, section 54.1-402  
<https://law.lis.virginia.gov/vacode/title54.1/chapter4/section54.1-402/>
- Code of Virginia, Title 32.1  
<https://law.lis.virginia.gov/vacode/title32.1/>
- VOWRA Onsite Systems A-Z Manual, Requires membership with Virginia Onsite Wastewater Recycling Association  
<http://www.vowra.org/index.asp>
- Virginia Administrative Code Title 18, Agency 160, Chapter 40. Onsite Sewage System Professionals Licensing Regulations  
<https://law.lis.virginia.gov/admincode/title18/agency160/chapter40/>

## LICENSE INSTRUCTIONS

After completing the examination, PSI will transmit scores automatically to the Board at DPOR. Applicants who successfully pass the examination will receive their license in the mail from DPOR, with no additional action typically required on the part of the applicant. Applicants who fail to pass the exam may choose to re-take the exam by re-scheduling with PSI.

Questions regarding applications for licensure or how to obtain a license from the Board should be directed to the:

Department of Professional and  
Occupational Regulation  
Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals  
PO Box 26792  
Richmond, VA 23261  
(804) 367-8595

[www.dpor.virg](http://www.dpor.virg) Virginia Wastewater Treatment Examination Formula Sheet,  
[http://water.me.vccs.edu/exam\\_prep/wastewater\\_formulas.htm](http://water.me.vccs.edu/exam_prep/wastewater_formulas.htm)



All examination centers are equipped to provide access in accordance with the Americans with Disabilities Act (ADA) of 1990. Applicants with disabilities or those who would otherwise have difficulty taking the examination may request exam accommodations.

Candidates who wish to request exam accommodations because of a disability should fax this form and supporting documentation to PSI at (702) 932-2666.

Requirements for exam accommodation requests:

You are required to submit documentation from the medical authority or learning institution that rendered a diagnosis. Verification must be submitted to PSI on the letterhead stationery of the authority or specialist and include the following:

- Description of the disability and limitations related to testing
- Recommended accommodation/modification
- Name, title and telephone number of the medical authority or specialist
- Original signature of the medical authority or specialist

Date: \_\_\_\_\_ Social Security #: \_\_\_\_\_

Legal Name: \_\_\_\_\_

Last Name

First Name

Address: \_\_\_\_\_

Street

City, State, Zip Code

Telephone: (\_\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_ (\_\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

Home

Work

Email Address: \_\_\_\_\_

Check any exam accommodations you require (requests must concur with documentation submitted):

- |  |   |
|--|---|
| <input type="checkbox"/> Reader (as accommodation for visual impairment or learning disability)                  | <input type="checkbox"/> Extended time (Additional time requested: _____)   |
| <input type="checkbox"/> Large-print written examination   | <input type="checkbox"/> Service Animals (other than those required for guidance or mobility assistance due to physical disability):<br>_____ |
| <input type="checkbox"/> *Out-of-State Testing Request (this request does not required additional documentation) | <input type="checkbox"/> Other _____<br>_____   |

Site requested: \_\_\_\_\_

\*You may email your out-of-state request to [OutofStateRequest@psionline.com](mailto:OutofStateRequest@psionline.com)

- Complete and fax this form, along with supporting documentation, to (702) 932-2666 or email it to [examaccommodations@psionline.com](mailto:examaccommodations@psionline.com).
- After 4 days, PSI Exam Accommodations will email you confirmation of approval with instructions for the next step.

DO NOT SCHEDULE YOUR EXAMINATION UNTIL THIS DOCUMENTATION HAS BEEN RECEIVED AND PROCESSED BY PSI EXAM ACCOMMODATIONS.



PSI  
3210 E Tropicana  
Las Vegas, NV 89121