New Mexico Environment Department
Utility Operator Certification Program

WATER SUPPLY – LEVEL 4 (WS4)

Operator Guidebook with Need to Know Criteria

March 2026[1]

The New Mexico Environment Department (NMED) administers the Utility Operator Certification Program to implement and enforce the rules of 20.7.4 NMAC (New Mexico Administrative Code) pursuant to the Utility Operators Certification Act [Chapter 61, Article 33 NMSA 1978].

Water Supply – Level 4 (WS4)
According to Subsection A of 20.7.4.12 NMAC, the Water Supply – Level 4 (WS4) certification is required to operate the various types of treatment processes at public water supply systems as listed below.

Type of Treatment Process	Population Served				
	25 to 500	501 to 5,000	5,001 to 10,000	10,001 to 20,000	20,000+
Filtration (sand, gravity)	←	←	←	←	**WS4**
Coagulation, sedimentation, filtration	←	←	←	**WS4**	**WS4**
Chemical precipitation (Mn, Fe, softening)	←	←	←	**WS4**	**WS4**
Aeration	←	←	←	←	**WS4**
Odor and taste control (activated carbon)	←	←	←	←	**WS4**
Chemical addition (stabilization)	←	←	←	←	**WS4**
Pressure filtration	←	←	←	←	**WS4**
Ion exchange (softening, defluoridation)	←	←	←	←	**WS4**
Chlorination	←	←	←	←	**WS4**
Fluoridation	←	←	←	←	**WS4**
Arsenic removal	←	←	←	←	**WS4**
Radionuclide removal	←	←	←	←	**WS4**
Special, such as desalinization	←	**WS4**	**WS4**	**WS4**	**WS4**
Production, ground water only	←	←	←	←	**WS4**

("←" *signifies WS4 also covers lower categories*)

According to Subsection F of 20.7.4.14 NMAC, an operator holding a Water Supply – Level 4 certification is also certified to perform any activity or function or make any process control or system integrity decision which requires:

- ✓ Small Water (SW) certification,
- ✓ Small Water Advanced certification,

[1] This Guidebook was reviewed by the New Mexico Utility Operators Certification Advisory Board in January and February 2026.

- ✓ Water Supply – Level 1 certification,
- ✓ Water Supply – Level 2 certification,
- ✓ Water Supply – Level 3 certification,
- ✓ Water Sample Technician – Level 1 certification,
- ✓ Water Sample Technician – Level 2 certification,
- ✓ Water Distribution – Level 1 certification,
- ✓ Water Distribution – Level 2 certification, and
- ✓ Water Distribution – Level 3 certification.

Certification Eligibility

To be eligible to take the Water Supply – Level 4 exam, an applicant must meet the following criteria. [References: 20.7.4.21 NMAC, and 20.7.4.22 NMAC]

- Submit a complete application through the NMED Utility Operator Certification Program online platform and pay the nonrefundable examination application fee.
- Be at least 18 years of age.
- Have a High School diploma or general equivalency diploma.
- Have a minimum of one year's experience* as a WS3 certification holder.
- Complete a minimum of eighty (80) training credits covering the topics listed in the need-to-know criteria of this document.

WS4 Eligibility Criteria		**Allowable Substitutions** as set forth in Subsection B of 20.7.4.22 NMAC
Application	Completed application	No substitutions
Fee	Payment of examination application fee	No substitutions
Age	Evidence of Age of Majority (18 years of age)	No substitutions
Education	High School or general equivalency diploma	No substitutions
Experience*	One (1) year experience as a WS3 certificate holder	No substitutions
Training	Eighty (80) hours of approved training credits	No substitutions
Exam	Pass the WS4 exam	No substitutions

*"**Experience**" means actual work experience, full or part-time, as an operator in the fields of public water supply or public wastewater treatment. [Reference: Subsection K of 20.7.4.7 NMAC]

Renewal Training Credits

WS4 operator certification must be renewed at three-year intervals. Certification renewal requires the holder obtain thirty (30) training credits for approved training during the three-year period preceding the date on which the renewal application is due. The thirty training credits must be in support of the WS4 operator's job and must include at least ten (10) training credits for approved training specifically in the operations and maintenance of public water supply systems. NMED Utility Operator Certification Program approval of training credits will be based on alignment with the topics listed in the need-to-know criteria of this document.

Exam Content

NMED and a panel of subject-matter experts developed the **Water Supply – Level 4 (WS4)** operator certification exam. The WS4 certification exam consists of 130 multiple-choice questions that cover the 21 main content areas listed below. This need-to-know criteria document provides a breakdown of the topics and subtopics within each main content area. A list of suggested study references is provided at the end of this document. The minimum passing score on the WS4 exam is 70% (91/130).

	Main Content Areas	Number of Exam Questions
1	Administration	5
2	Chemical Stabilization	5
3	Coagulation & Flocculation	5
4	Cross-Connection Control	5
5	Disinfection	11
6	Distribution	10
7	Filtration	5
8	Fluoridation	6
9	General	5
10	Ion Exchange Softening	4
11	Laboratory Procedures	5
12	Mechanical Systems	5
13	Regulations	5
14	Reservoirs	5
15	Safety	5
16	Sampling & Reporting	10
17	Sedimentation	5
18	Storage	5
19	Taste and Odor	5
20	Water Characteristic	10
21	Wells	9
	Total:	130 questions on exam

NEED-TO-KNOW CRITERIA FOR WATER SUPPLY – LEVEL 4 (WS4)

Content Area and Topics	Number of Exam Questions
1. Administration	**5**
Finance Personnel Supervision Records	

Content Area and Topics	Number of Exam Questions
2. Chemical Stabilization	**5**
Corrosion Control Chemistry of corrosion Provisions Lead & Copper Rule Tests for corrosion Treatment Iron & Manganese control Calculations Treatment pH adjustment	

Content Area and Topics	Number of Exam Questions
3. Coagulation & Flocculation	**5**
Operation & maintenance Normal & abnormal conditions Problems & corrections Troubleshooting Process control Jar test Process description Chemicals used Components Purpose	

Content Area and Topics	Number of Exam Questions
4. Cross-Connection Control	**5**
Applications General Maintenance Programs Types of devices	

Content Area and Topics	Number of Exam Questions
5. Disinfection	**11**
Gas chlorination Changing cylinders Components Equipment used Leaks Maintenance Operation Safety Storage & handling Troubleshooting Process description Dosage Factors affecting disinfection Purpose Reactions of chlorine Typical pathogens Residual Ozone Disinfection	

Content Area and Topics	Number of Exam Questions
6. <u>Distribution</u>	**10**
Customer service Hydrants Components Flow testing Installation Maintenance & flushing Purpose Hydraulics System pressure Maps Meters Accountability Maintenance Types Piping & joints Hydraulics Installation Materials Operations & maintenance Thrust Valves Operation & maintenance Purpose Types Water quality	

Content Area and Topics	Number of Exam Questions
7. Filtration	**5**

- Gravity Filtration
  - Operation & maintenance
    - Backwash
    - Maintenance
    - Normal & abnormal conditions
    - Problems & corrections
    - Troubleshooting
  - Process control
  - Process description
    - Components
    - Purpose
    - Slow sand filtration
    - Types
- Membrane Filtration
  - Difference between microfiltration and ultrafiltration
  - Membrane fiber geometry
  - Membrane unit operations
  - Pressurized membrane filtration process
  - Submerged membrane filtration process
  - Backwashing of membranes (aka reverse filtration)
  - Membrane water flux
  - Trans membrane pressure
  - Membrane fouling
  - Membrane cleaning
  - Troubleshooting
    - RO/NF process monitoring
    - MF/UF data normalization
    - RO/NF data normalization
- Ozonation & Biologically Active Filtration (BAC) Process
  - Desalination
  - Advanced Water Treatment Facility Considerations
  - Process monitoring & reporting
  - Membrane integrity for MF/UF

Content Area and Topics	Number of Exam Questions
8. Fluoridation	**6**

- Chemical compounds used
- Process control
  - Laboratory procedure
- Process description
  - Chemical storage & handling
  - Components
  - Dosage
  - Purpose

Content Area and Topics	Number of Exam Questions
9. General	**5**
Calculation (generally under specific topics) Dosage Efficiency Flow Hydraulics Power Pressure Temperature Volume Hydrologic cycle Groundwater Surface water Measurement Units Purpose Terms	

Content Area and Topics	Number of Exam Questions
10. Ion Exchange Softening	**4**
Operation & maintenance Maintenance Normal & abnormal conditions Problems & corrections Troubleshooting Process control Process description Components Chemistry of softening Purpose	

Content Area and Topics	Number of Exam Questions
11. Laboratory Procedures	**5**
Laboratory safety Tests Dissolved oxygen Hardness pH Turbidity	

Content Area and Topics	Number of Exam Questions
12. Mechanical Systems	**5**
Chemical feeders Calibration Operation & maintenance Types Instrumentation Measured variables & equipment Measurement & control systems Operation & maintenance Pumps Power (efficiency)	

Content Area and Topics	Number of Exam Questions
13. Regulations	**5**
EPA SDWA regs NM Utility Operator Certification Regs NM drinking water regs NPDES permit requirements	

Content Area and Topics	Number of Exam Questions
14. Reservoirs	**5**
Reservoir management Algae control Water quality problems	

Content Area and Topics	Number of Exam Questions
15. Safety	**5**
Chemical handling Confined space entry Electrical Emergency Action Plan Excavation & shoring Facility Security Fire First aid Hazardous gases Job Safety Hazard Analysis Ozone Safety Personal Programs Rotating machinery Safety Data Sheets Working in streets	

Content Area and Topics	Number of Exam Questions
16. Sampling & Reporting	**10**
Records Reporting requirements SDWA compliance sampling Asbestos Chemical contaminants Disinfection byproducts group Lead and Copper group Microbiological contaminants Physical contaminants Public notification requirements Sampling procedure Preservation Representative sampling Testing Process description Components Purpose Types	

Content Area and Topics	Number of Exam Questions
17. Sedimentation	**5**
Loading rates & efficiency Hydraulic Removal efficiency Solids Operating characteristics Operation & maintenance Factors affecting setting Maintenance Normal & abnormal conditions Problems & corrections Troubleshooting Process control Detention time Process description Components Purpose	

Content Area and Topics	Number of Exam Questions
18. Storage	**5**
Operations & maintenance Corrosion control Disinfection Inspection Process description Components Purpose Types	

Content Area and Topics	Number of Exam Questions
19. Taste & Odor Control	**5**
Causes & Prevention Operation & maintenance Normal & abnormal conditions Problems & corrections Troubleshooting Process control Process description Activated carbon Aeration Purpose Types	

Content Area and Topics	Number of Exam Questions
20. Water Characteristics	**10**
Chemical Microbiological Physical Terms	

Content Area and Topics	Number of Exam Questions
21. Wells	**9**
Components Construction Maintenance Disinfection Inspection Operation Troubleshooting Water level measurement Process description Sanitary characteristics Well Pumps	

SUGGESTED STUDY RESOURCES

The following is a non-inclusive, non-endorsement listing of reference sources that can be reviewed to help prepare for the New Mexico **Water Supply – Level 4 (WS4)** operator certification exam.

Drinking Water Treatment

- American Water Works Association (AWWA), Water System Operations (WSO), *Water Treatment, Grade 3 & 4* (latest edition)
- California State University, Sacramento (CSUS) Foundation, Office of Water Programs, *Water Treatment Plant Operation, Volume 1* and *Volume 2*, (latest edition)

Drinking Water Distribution

- American Water Works Association (AWWA), Water System Operations (WSO), *Water Distribution, Grades 3 & 4* (latest edition)
- American Water Works Association (AWWA), *Water Distribution Operator Training Handbook*, (latest edition)
- California State University, Sacramento (CSUS) Foundation, Office of Water Programs, *Water Distribution System Operation and Maintenance*, (latest edition)

Utility Management

- American Water Works Association (AWWA), *Utility Management for Water and Wastewater Operations*
- California State University, Sacramento (CSUS) Foundation, Office of Water Programs, *Utility Management*, (latest edition)
- California State University, Sacramento (CSUS) Foundation, Office of Water Programs, *Manage for Success: Effective Utility Leadership Practices*, (latest edition)

Mathematics

- American Water Works Association (AWWA), *Math for Water Treatment Operators: Practice Problems to Prepare for Water Treatment Operator Certification Exams*
- American Water Works Association (AWWA), *Math for Distribution System Operators: Practice Problems to Prepare for Distribution System Operator Certification Exams*
- *Applied Math for Water Plant Operators*, by Joann Kirkpatrick Price, (latest edition)

Regulations

- Safe Drinking Water Act, https://www.epa.gov/sdwa, and U.S. Code of Federal Regulations, Title 40, Part 141
- U.S. Environmental Protection Agency, Drinking Water Rule Quick Reference Guides, https://www.epa.gov/dwreginfo/drinking-water-rule-quick-reference-guides
- U.S. Environmental Protection Agency, *Quick Guide to Drinking Water Sample Collection* (latest edition)
- New Mexico Administrative Code, Title 20, Chapter 7, Part 10, Drinking Water (20.7.10 NMAC)
- New Mexico Administrative Code, Title 20, Chapter 7, Part 4, Utility Operator Certification (20.7.4 NMAC)

Water Sampling

- American Water Works Association, American Public Health Association, and Water Environment Federation, *Standard Methods for the Examination of Water and Wastewater* (latest edition)
- U.S. Environmental Protection Agency, *Quick Guide to Drinking Water Sample Collection* (latest edition)
- U.S. Environmental Protection Agency, The Standardized Monitoring Framework: A Quick Reference Guide

Worker Safety

- American Water Works Association (AWWA), *Let's Talk Safety: 52 Talks on Common Utility Safety Practices for Water Professionals*, (latest edition)
- American Water Works Association (AWWA), *Chlorine Safety Pocket Guide*, (latest edition)

Additional Study Aids

- American Water Works Association (AWWA), *Water Operator Certification Exam Prep*
- American Water Works Association (AWWA), *Water Operator Certification Exam Prep App*