

# CAREER PATHWAYS AND COMPETENCY MAPS



WATER SECTOR  
INDUSTRY



## REPORT OVERVIEW

In 2023, MMSD partnered with The Council for Adult and Experiential Learning (CAEL). This joint initiative aimed to identify key occupations and construct occupational competency maps and career pathways delineating existing and emerging opportunities to identify career competencies and pathway development within the Water Sector and more specifically, MMSD and Veolia Water. Veolia Water is MMSD's contracted partner to operate and maintain the District's reclamation facilities and conveyance system.

The overarching objective of this endeavor was to identify a set of validated competencies tailored to critical occupations, alongside pathways that seamlessly integrate with the in-demand roles. The project sought to provide a comprehensive resource benefiting hiring managers while laying the groundwork for enhanced alignment efforts, facilitating smoother career transitions, and establishing more accessible and efficient pathways for channeling talent into these opportunities.

The competency maps and career pathways developed through this collaboration will serve as invaluable tools for MMSD and Veolia Water, aiding in the support and guidance of job seekers seeking entry into, and progression within the Water Sector Industry.

These articulated resources will spotlight essential competencies, educational requisites, projected wage ranges, and standard entry and transition points, providing guidance for individuals navigating the Water Sector Industry. This report was validated through feedback provided by MMSD and Veolia Water personnel.

This document remains a dynamic resource, positioned for continuous updates and modifications to reflect ongoing labor market shifts and evolving industry dynamics.

## PURPOSE

As automation and shifting economic landscapes continue to influence American workers across traditionally stable sectors, it becomes increasingly imperative for employers to gain a deeper understanding of these dynamics and proactively plan for their implications. The flux of both declining and emerging industries and occupations has profound effects on both employees and employers alike. To effectively mitigate any adverse economic repercussions stemming from industry and occupational volatility, and to prepare for the emergence of roles yet to exist, it is essential to devise comprehensive strategies that facilitate the transfer of competencies and knowledge to high-growth sectors.

Recognizing the significance of such strategic planning, MMSD has engaged CAEL to develop a practical resource to inform the design and implementation of processes to identify optimal job opportunities within the Water Sector. This initiative involves identifying in-demand and growth-oriented Water Sector occupations within MMSD and Veolia Water, while also mapping out how acquired competencies translate to entry-level and high-growth roles.

By fostering awareness among job-seekers and businesses and providing clear insights into aligning specific competencies with critical roles within the community, this endeavor seeks to empower individuals and organizations to make informed decisions regarding career paths and workforce development.



## DEVELOPMENT PROCESS

CAEL started gathering data in August 2023 and reviewed various resources provided by MMSD, such as the UWM water needs assessment report. Additionally, they conducted research on platforms like Lightcast, BLS (Bureau of Labor Statistics), and O\*NET to update the information and ensure its relevance.

CAEL facilitated in-person discovery and validation sessions with staff members from MMSD and Veolia Water. These pathways relate to identified skills, competencies, and career progressions. The finalization of these pathways in May 2024 indicates that the project has reached a significant milestone.

This collaborative effort addresses and contributes to developing effective and accessible career pathways within MMSD and Veolia Water.

# INDUSTRY-WIDE FOUNDATIONAL COMPETENCIES

The following is a compilation of key foundational competencies essential for success in the Water Sector Industry. Foundational competencies serve as fundamental skills necessary for both academic achievement and professional performance. Employers nationwide recognize the importance of these competencies, considering them prerequisites for mastering industry-specific skills. Foundational competencies are categorized into three distinct areas as outlined below:



## PERSONAL EFFECTIVENESS COMPETENCIES

These competencies are essential for all life roles such as being a member of a family, a community, and a larger society. These “soft skills” are increasingly valued in the labor market.

- ⊗ **Adaptability and Flexibility**
- ⊗ **Dependability and Reliability**
- ⊗ **Initiative**
- ⊗ **Integrity**
- ⊗ **Interpersonal Skills**
- ⊗ **Lifelong Learning**
- ⊗ **Professionalism**

## EDUCATION COMPETENCIES

These are critical competencies primarily learned in an academic setting, as well as cognitive functions and thinking styles. These competencies are likely to apply to all organizations in a single industry or be represented by an industry association.

- ⊗ **Communication**
- ⊗ **Computer Skills**
- ⊗ **Critical and Analytical Thinking**
- ⊗ **Mathematics**
- ⊗ **Reading**
- ⊗ **Science and Technology**
- ⊗ **Writing**

## WORKPLACE COMPETENCIES

These competencies represent those competencies and abilities that allow individuals to function in an organizational setting.

- ⊗ **Business Fundamentals**
- ⊗ **Checking, Examining, and Recording**
- ⊗ **Creative Thinking**
- ⊗ **Customer Focus**
- ⊗ **Planning and Organizing**
- ⊗ **Problem Solving and Decision Making**
- ⊗ **Scheduling and Coordinating**
- ⊗ **Teamwork**
- ⊗ **Working Tools and Technology**





# LABORATORY TECHNICIAN

## JOB DESCRIPTION

The Laboratory Technician conducts chemical, physical, and bacteriological analyses on diverse samples, adhering to standard procedures and maintaining quality control. They operate analytical instruments, document results, uphold lab facility conditions, provide training, and manage special projects. Essential responsibilities include performing routine quantitative and qualitative tests, documenting procedures, verifying quality assurance, troubleshooting analyses, maintaining instrumentation, ordering supplies, and complying with regulatory requirement.

## KEY FOUNDATIONAL COMPETENCIES

- Ⓢ Technical writing
- Ⓢ Knowledge analytical chemistry and use of chemical analysis equipment (e.g. gravimetric, titrator, spectrophotometer)
- Ⓢ Environmental sampling and analysis
- Ⓢ Maintaining accurate records
- Ⓢ Operation of computer and standard business machines
- Ⓢ Regard for regulations and established analytical procedures
- Ⓢ Quality control analysis
- Ⓢ use of MS office suite

## COMMON SKILLS

- Ⓢ Attention to detail
- Ⓢ Integrity
- Ⓢ Organization
- Ⓢ Active listening
- Ⓢ Critical thinking
- Ⓢ Reading comprehension
- Ⓢ Complex problem solving

## MEDIAN SALARY

\$30.50 - \$34.50 per hour; \$61,838.40-\$71,115.20 per year

## EDUCATION AND TRAINING

**Required:** Associate degree in chemistry or related field, with one semester of quantitative analysis.  
**Preferred:** Bachelor's degree with major in biology or chemistry.

## WORK EXPERIENCE

Associate degree + 2 years related experience —or— Bachelor's degree + 0 years related experience

## REQUIRED TECHNOLOGIES

Word processing software; spreadsheet software.

## SPECIAL SKILLS, COMPETENCIES AND LICENSES

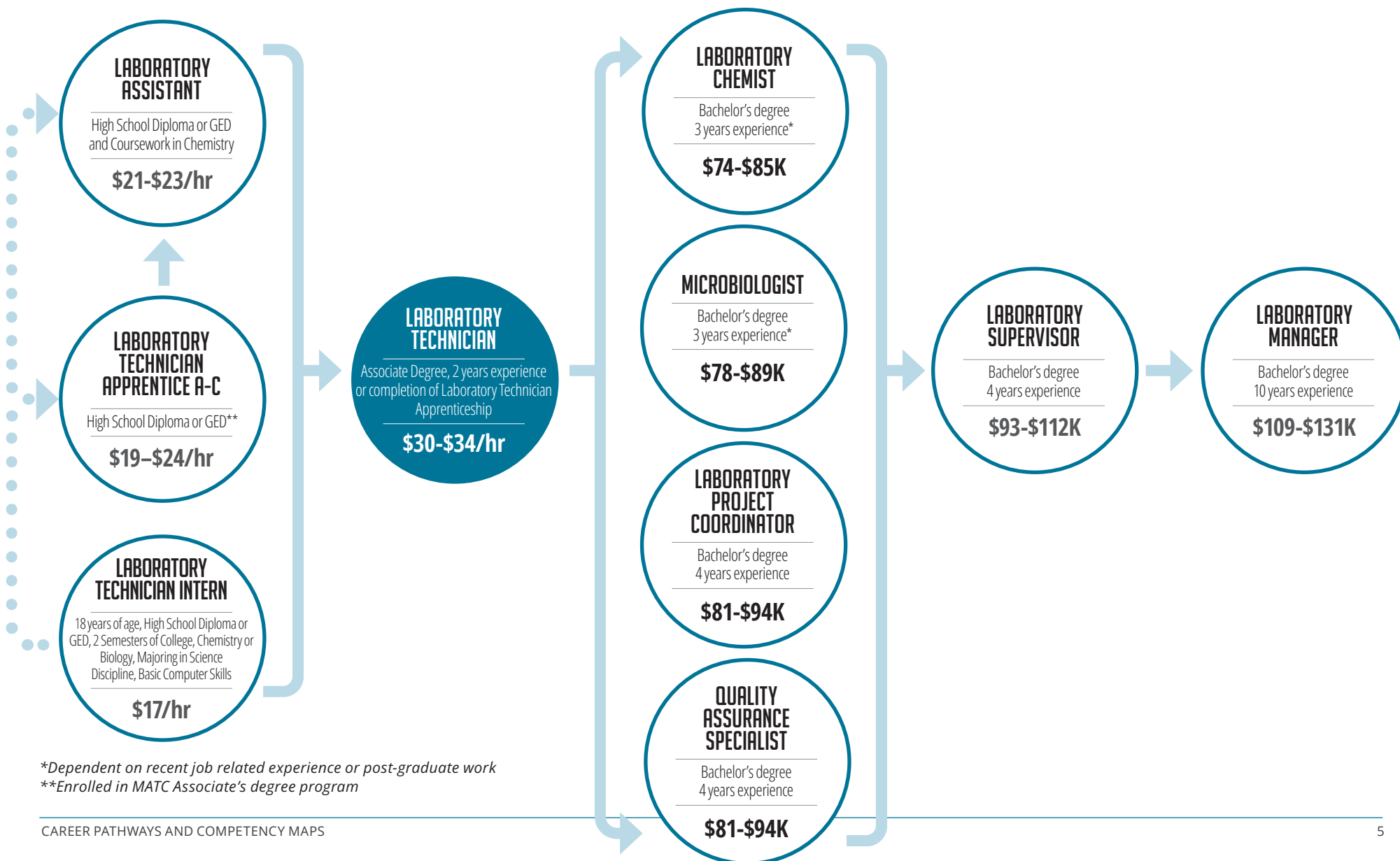
- Ⓢ Knowledge and understanding of NR149 and NR219 and other regulatory requirements.
- Ⓢ WDNR Wastewater Operators License preferred.



# LABORATORY TECHNICIAN

## LABORATORY TECHNICIAN PATHWAY

The pathway below represents a typical career pathway in the ever-changing water sector industry. The highlighted circle represents the occupation in the pathway.



\*Dependent on recent job related experience or post-graduate work

\*\*Enrolled in MATC Associate's degree program



## MONITORING TECHNICIAN

### JOB DESCRIPTION

The Monitoring Technician position is responsible for collecting samples, field data, and other information to support District programs and initiatives. The position also installs, calibrates, and maintains permanent and portable sampling, flow monitoring, and water quality monitoring equipment. Additionally, the position responds to citizen inquiries and complaints concerning water quality and other items of environmental concern.

### KEY FOUNDATIONAL COMPETENCIES

- ⌚ Proficient use of hand and power tools and other field monitoring equipment
- ⌚ Sample and measurement collection
- ⌚ Maintenance and troubleshooting of facilities and equipment
- ⌚ Use of permits
- ⌚ Plans and schematics
- ⌚ Confined space entry
- ⌚ Quality control analysis
- ⌚ Operations monitoring
- ⌚ Systems analysis
- ⌚ Use of GIS software
- ⌚ Use of MIS and ISS systems

### COMMON SKILLS

- ⌚ Teamwork
- ⌚ Flexibility
- ⌚ Communication
- ⌚ Critical thinking
- ⌚ Complex problem solving
- ⌚ Time management
- ⌚ Reading comprehension
- ⌚ Written communication

### MEDIAN SALARY

\$32-\$36 per hour; \$65,540.80-\$75,379.20 per year

### EDUCATION AND TRAINING

**Required:** Associate degree in Water Quality Technology or related program.

**Preferred:** Bachelor of Science degree in Environmental Science or related program.

### WORK EXPERIENCE

2 years job-related experience in environmental monitoring.

### REQUIRED TECHNOLOGIES

Geographic Information Systems software, Microsoft Suite

### SPECIAL SKILLS, COMPETENCIES AND LICENSES

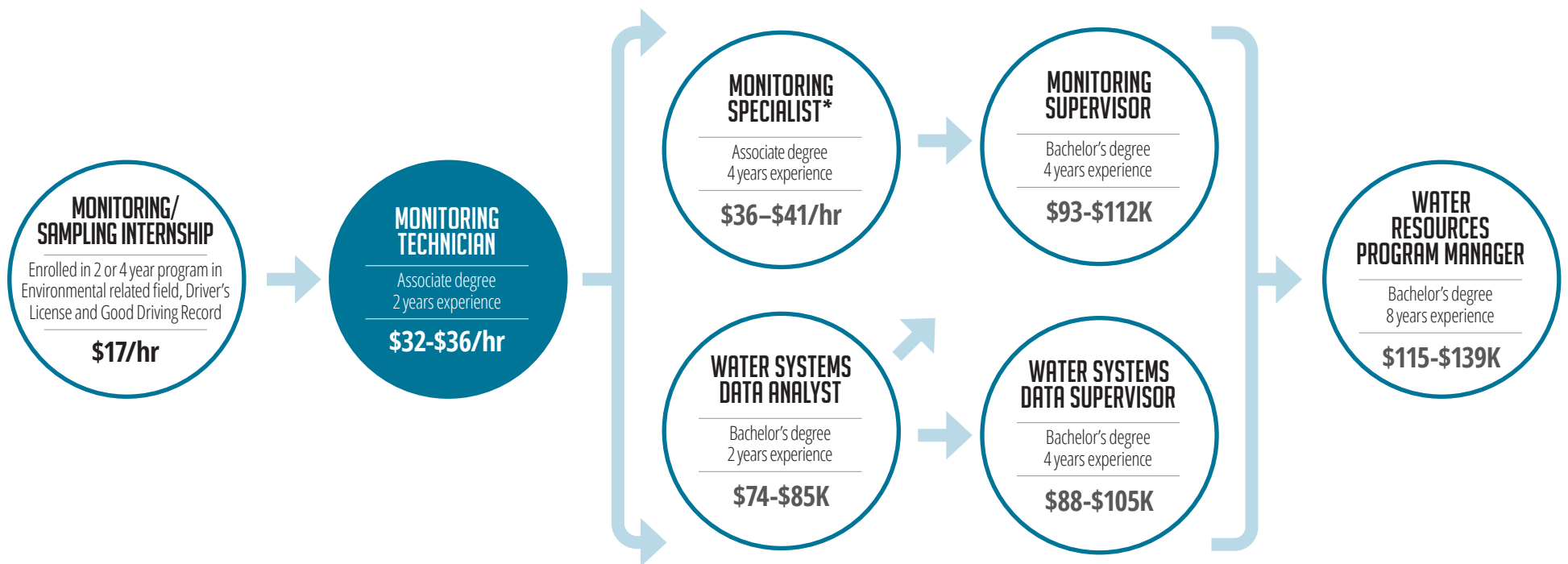
- ⌚ Ability to apply knowledge of OSHA confined entry procedures to safe completion of job duties.
- ⌚ Valid driver's license.
- ⌚ DNR License preferred.



## MONITORING TECHNICIAN

### MONITORING TECHNICIAN PATHWAY

The pathway below represents a typical career pathway in the ever-changing water sector industry. The highlighted circle represents the occupation in the pathway.



\*The only access to Monitoring Specialist is through Monitoring Technician



## FRESHWATER RESOURCES TECHNICIAN

### JOB DESCRIPTION

The Freshwater Resources Technician position is responsible for collecting samples, performing field measurements, and maintaining instrumentation to ensure compliance with Wisconsin Pollutant Discharge Elimination System (WPDES) requirements. The position also collects data from area surface waters, conducts instrument maintenance and troubleshooting, and organizes and reports data in accordance with MMSD policies and procedures.

### KEY FOUNDATIONAL COMPETENCIES

- ② Ability to collect samples and perform field measurements
- ② Use of scientific instrumentation
- ② Calibration and maintenance of scientific instrumentation
- ② Quality control analysis
- ② Systems analysis
- ② Record keeping and use of record keeping software including spreadsheet software
- ② Ability to drive monitoring vans and conduct minor maintenance on vehicles
- ② Stocking inventory of supplies
- ② Compliance with safety standards

### COMMON SKILLS

- ② Active listening
- ② Critical thinking
- ② Reading comprehension
- ② Judgment and decision making
- ② Complex problem solving
- ② Time management
- ② Writing

### MEDIAN SALARY

\$32-\$36 per hour; \$65,540.80-\$75,379.20 per year

### EDUCATION AND TRAINING

**Required:** Associate degree in related field with coursework in water resources, water chemistry, aquatic biology, surface water hydrology or statistics desirable.

### WORK EXPERIENCE

2 years job-related experience in environmental monitoring.

### REQUIRED TECHNOLOGIES

Record keeping software; Microsoft Excel.

### SPECIAL SKILLS, COMPETENCIES AND LICENSES

Valid driver's license.

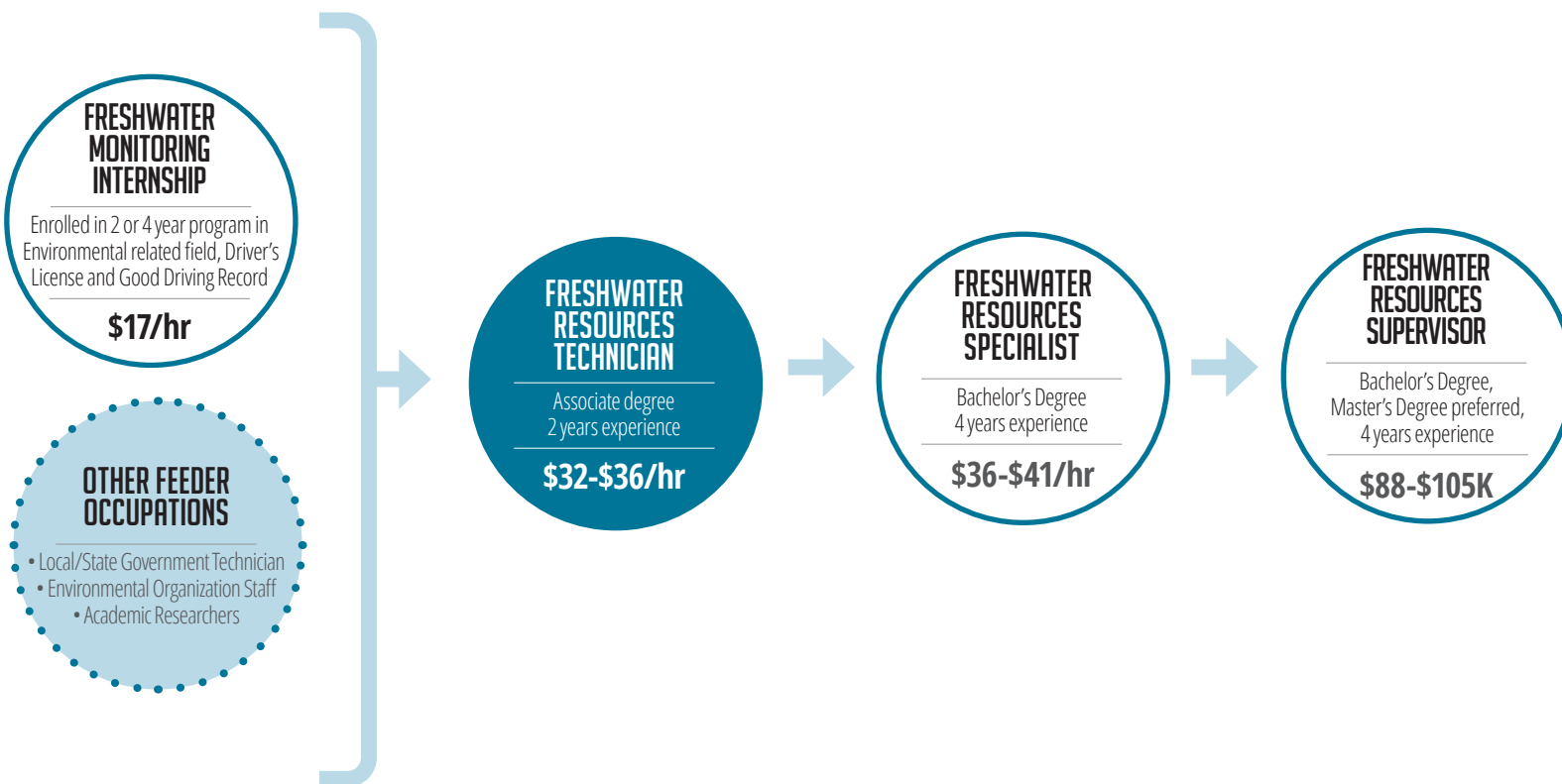




## FRESHWATER RESOURCES TECHNICIAN

### FRESHWATER RESOURCES TECHNICIAN PATHWAY

The pathway below represents a typical career pathway in the ever-changing water sector industry. The highlighted circle represents the occupation in the pathway.





# SURVEY TECHNICIAN

## JOB DESCRIPTION

Assist the Project Surveyor in providing, verifying, monitoring, recording and otherwise compiling engineering field data to plans; assist in location/protection of District facilities and the record-drawing data acquisition thereof; assist in boundary survey activities; all services to be conducted in accordance with District policies and procedures.

## KEY FOUNDATIONAL COMPETENCIES

- ⓧ Knowledge of and ability to apply survey skills
- ⓧ Apply OSHA confined entry procedures
- ⓧ Operate survey equipment

## COMMON SKILLS

- ⓧ Communication; written and oral
- ⓧ Read and interpret
- ⓧ Establish and maintain effective public and working relations
- ⓧ Record drawings, specifications, and plans

## WORK ENVIROMENT

- ⓧ Stand and walk for long period of time
- ⓧ Use hands and fingers to handle or feel objects
- ⓧ Required to sit and climb or balance
- ⓧ Ability to reach with hands and arms
- ⓧ Ability to stoop, kneel, crouch, or crawl
- ⓧ Ability to travel to construction sites as assigned
- ⓧ Lift and/or move up to 30 pounds regularly and lift and/or move up to 45 pounds frequently
- ⓧ Walk across uneven terrain
- ⓧ Specific Vision Abilities - close, distance, color, peripheral, depth and ability to adjust focus
- ⓧ Outside weather exposure
- ⓧ Subject to USDOT Drug and Alcohol Tests

## MEDIAN SALARY

\$30-\$34 per hour; \$61,838.40-\$71,115.20 per year

## EDUCATION AND TRAINING

**Required:** Associate degree in civil engineering or related program

## WORK EXPERIENCE

Minimum of 3 months of related experience

## REQUIRED TECHNOLOGIES

Computers and related software, Calculator, Telephone, Photocopier, Scanner, Microsoft Excel, Email, Word Processing

## SPECIAL SKILLS, COMPETENCIES AND LICENSES

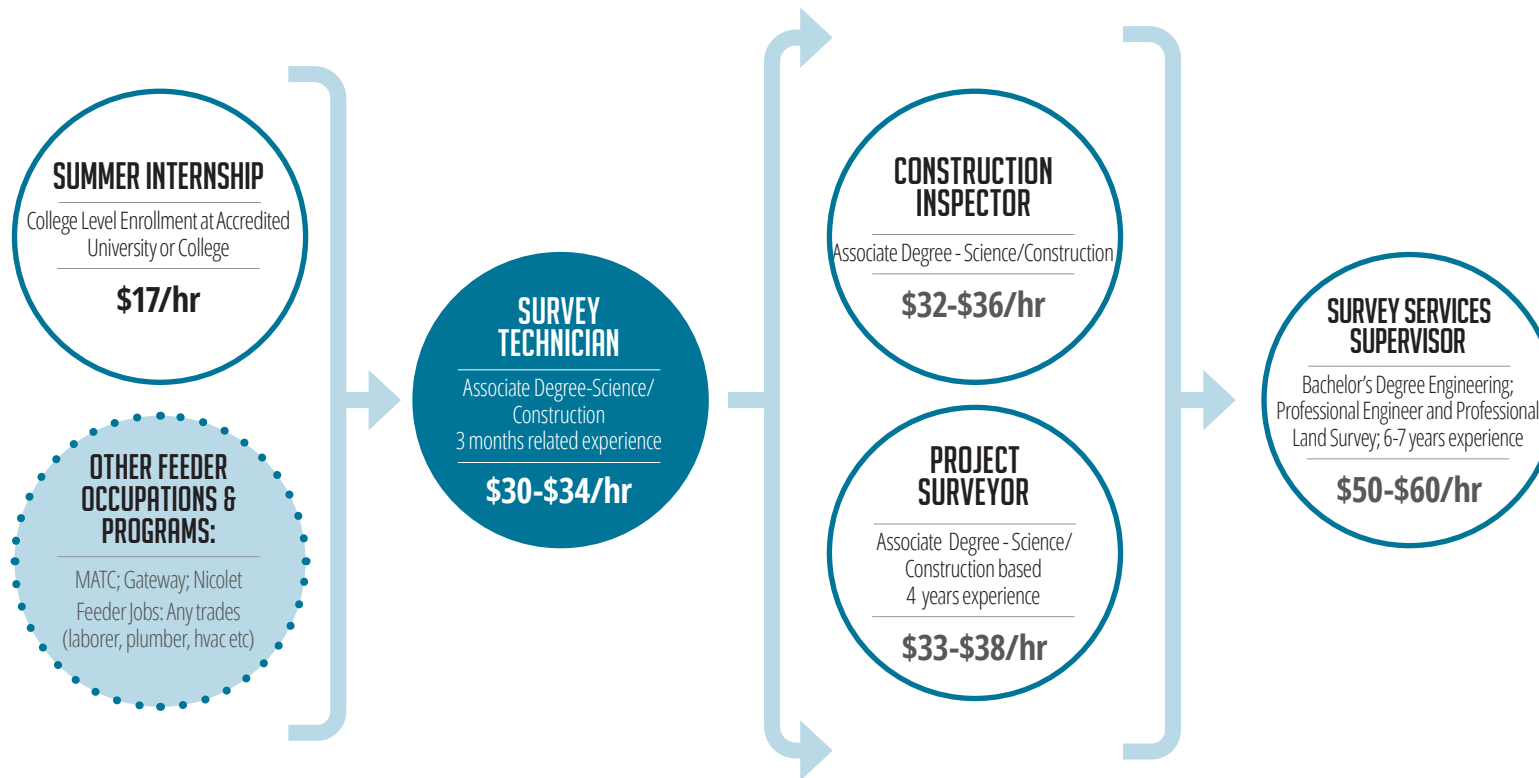
- ⓧ Valid Drivers License
- ⓧ Ability to apply knowledge of OSHA confined entry procedures to safe completion of job duties.



# SURVEY TECHNICIAN

## SURVEY TECHNICIAN PATHWAY

The pathway below represents a typical career pathway in the ever-changing water sector industry. The highlighted circle represents the occupation in the pathway.



\*Survey Technician Apprenticeship Being Developed



# CONSTRUCTION INSPECTOR

## JOB DESCRIPTION

Responsible for on-site oversight and monitoring of capital/O&M construction contracts to ensure compliance with contract documents and required quality levels. Keep and maintain accurate records of construction progress and report activities to others in accordance with District policies and procedures.

## KEY FOUNDATIONAL COMPETENCIES

- ⓧ Construction inspection
- ⓧ Record keeping
- ⓧ Detail oriented
- ⓧ Surveying
- ⓧ Field testing
- ⓧ Compliance with safety standards
- ⓧ Civil engineering fundamentals including construction codes
- ⓧ Use of blueprints
- ⓧ Technical writing
- ⓧ Apply OSHA confined entry procedures
- ⓧ Operate survey equipment

## COMMON SKILLS

- ⓧ Communication; written and oral
- ⓧ Read and interpret
- ⓧ Establish and maintain effective public and working relations
- ⓧ Record drawings, specifications, and plans

## WORK ENVIROMENT

- ⓧ Stand and walk for long period of time
- ⓧ Sit for a long period of time
- ⓧ Use hands and fingers to handle or feel objects
- ⓧ Reach with hands and arms
- ⓧ Stoop, kneel, crouch, or crawl
- ⓧ Ability to travel to construction sites as assigned
- ⓧ Lift and/or move up to 25 pounds regularly and lift and/or move up to 50 pounds occasionally
- ⓧ Walk across uneven terrain
- ⓧ Specific Vision Abilities - close, distance, color, peripheral, depth and ability to adjust focus
- ⓧ Outside weather exposure

## MEDIAN SALARY

\$31-\$36 per hour; \$65,650.80-\$75,379.20 per year

## EDUCATION AND TRAINING

**Required:** Associate degree in civil engineering or related program

## WORK EXPERIENCE

2-4 years of job-related experience

## REQUIRED TECHNOLOGIES

Field testing equipment; survey tools; computer and related software, calculator, telephone, Microsoft Suite

## SPECIAL SKILLS, COMPETENCIES AND LICENSES

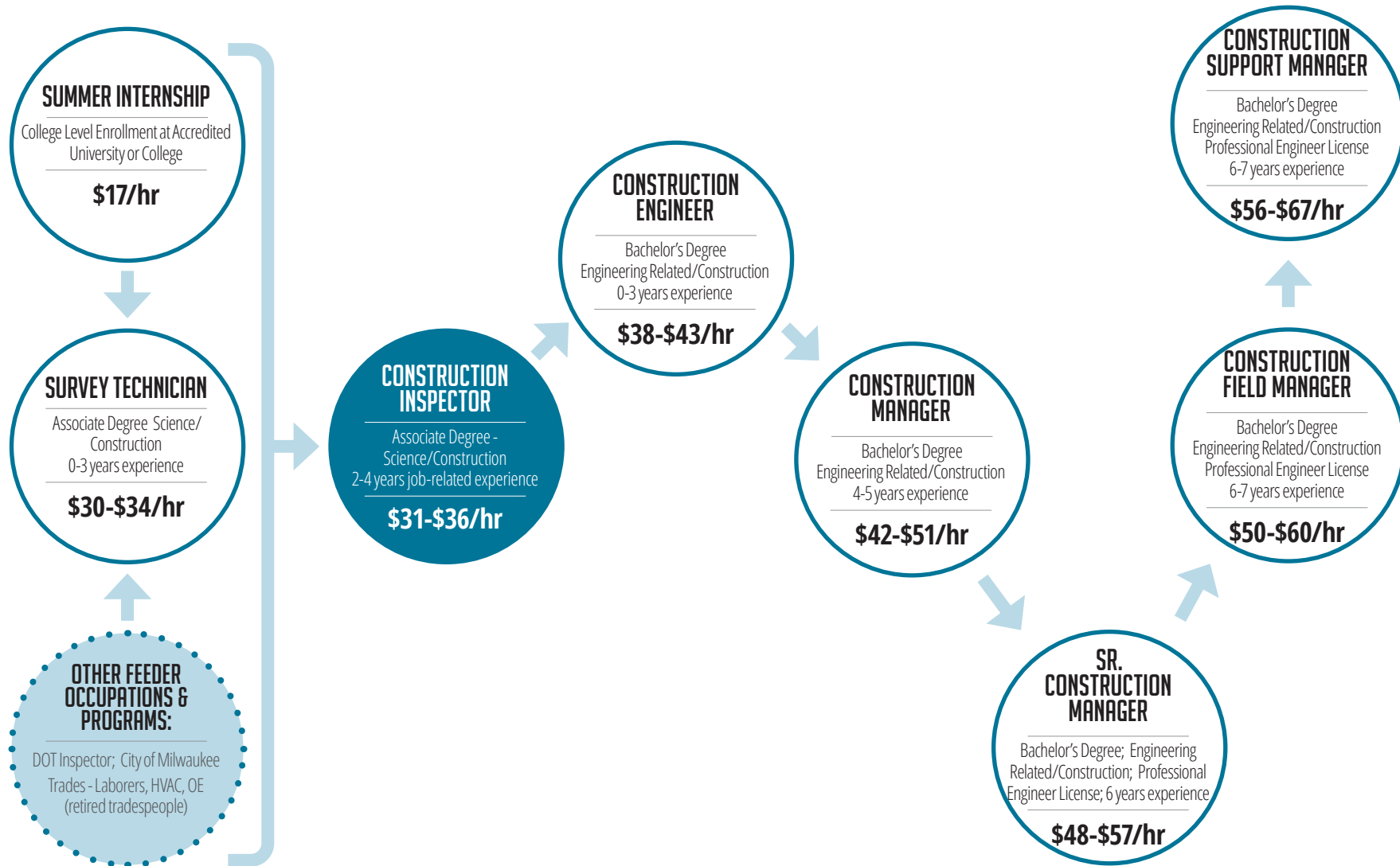
- ⓧ Valid Driver's License.
- ⓧ Pass writing intake assessment test - watch a video and write a report on what was observed.
- ⓧ Ability to apply knowledge of OSHA confined entry procedures to safe completion of job duties.



# CONSTRUCTION INSPECTOR

## CONSTRUCTION INSPECTOR PATHWAY

The pathway below represents a typical career pathway in the ever-changing water sector industry. The highlighted circle represents the occupation in the pathway.







# WASTEWATER OPERATOR

## JOB DESCRIPTION

The Wastewater Operator will operate and maintain the wastewater treatment plant in compliance with the site indirect discharge permit, including lab analysis of process samples, minor and preventive maintenance of equipment, and complete other tasks as assigned by the Lead Wastewater Operator, Account Manager, or other Veolia Leadership personnel.

## KEY FOUNDATIONAL COMPETENCIES

- Wastewater
- Valves (Piping)
- Sewage Treatments
- Water Treatments
- Safety Training
- Basic Computer Skills

## WORKPLACE COMPETENCIES

- Knowledge of operating equipment used in wastewater treatment
- Knowledge of the operation and adjustment of valves, mechanical pumps, motors, and semi-automatic controls
- Ability to read and understand a variety of dials, meters, and gauges
- Ability to prepare a log of routine activity
- Ability to enter data

## COMMON SKILLS

- Communications
- Social Skills
- Operations
- Troubleshooting
- Mentorship
- Detail Oriented
- Management
- Coaching
- Teamwork
- Writing

## WORK ENVIROMENT

While performing the duties of this job the employee is regularly required to talk and hear. The employee is frequently required to stand; walk; sit; use hands to finger, handle or feel; reach with hands and arms; climb or balance; stoop, kneel, crouch, or crawl, and taste or smell. The employee must frequently lift and/or move up to 50 pounds. Specific vision abilities required on this job include close vision and distance vision.

Generally works rotating 12- hour shifts and is subject to overtime, recall, and call-in.

## MEDIAN SALARY

\$39 per hour

## EDUCATION AND TRAINING

High School Diploma or GED Equivalent; Environmental Associate Degree or higher, and/or Wastewater Operator; Certification is a must.

Operator should be knowledgeable of many different types of wastewater systems; metal precipitation/clarification, biological (aerobic and anaerobic), filtration, and membrane technologies.

## WORK EXPERIENCE

1-3 years experience

## REQUIRED TECHNOLOGIES

Data base user interface and query software; Geographic Information Systems; Industrial control software; Spreadsheet software; Microsoft Office; Microsoft Word; Microsoft Excel; Database software; C (Programming Language); Data entry; basic computer skills

## SPECIAL SKILLS, COMPETENCIES AND LICENSES

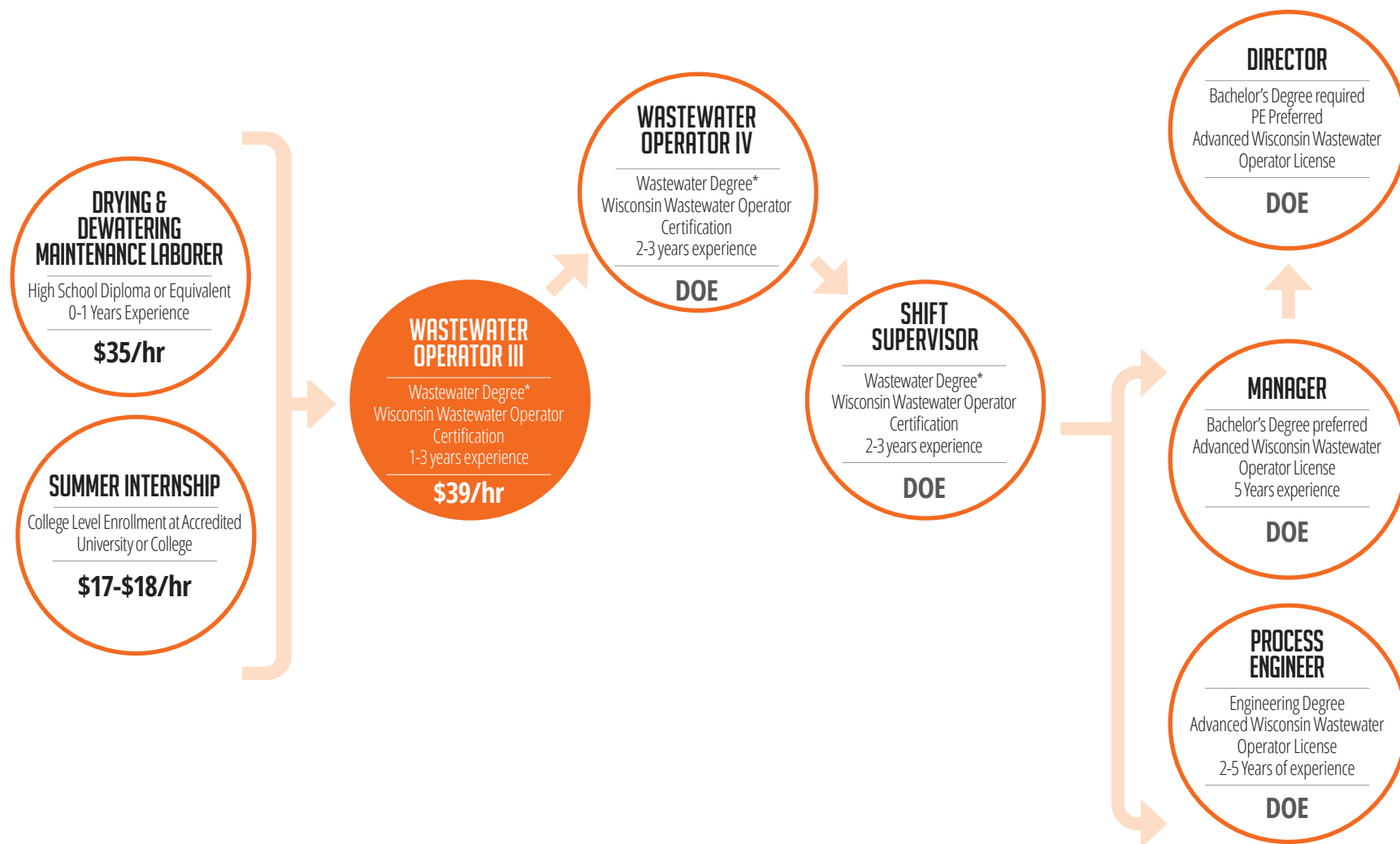
Valid Driver's License, wastewater operator license



# WASTEWATER OPERATOR

## WASTEWATER OPERATOR PATHWAY

The pathway below represents a typical career pathway in the ever-changing water sector industry. The highlighted circle represents the occupation in the pathway.



DOE = Dependent on Experience

\* School of Freshwater Science and MATC are developing a program



## PLANT LABORER MAINTENANCE

<b>JOB DESCRIPTION</b>	Under Supervision, inspects and performs various manual laboring duties including the operation of laboring equipment related to sewer and concrete repairs, sewer cleaning, or the cleaning and maintenance of buildings, grounds, watercourses, deep tunnels, or equipment			
<b>KEY FOUNDATIONAL COMPETENCIES</b>	⌚ Problem Solving ⌚ Communication	⌚ Sewer Maintenance and Cleaning	⌚ Groundskeeping	
<b>WORKPLACE COMPETENCIES</b>	⌚ Operate laboring equipment	⌚ Sewer Cleaning	⌚ Sewer and Concrete Repair	
<b>COMMON SKILLS</b>	⌚ Communications ⌚ Social Skills ⌚ Operations	⌚ Troubleshooting ⌚ Mentorship ⌚ Detail Oriented	⌚ Management ⌚ Coaching ⌚ Teamwork	⌚ Writing
<b>WORK ENVIROMENT</b>	Work involves exposure to dirt, dust, extremes in temperature and humidity, odors, heights, confined spaces, gases, raw sewage, hazardous materials			
<b>MEDIAN SALARY</b>	\$33-\$34 per hour			
<b>EDUCATION AND TRAINING</b>	High School Diploma or Equivalent			
<b>WORK EXPERIENCE</b>	1-3 years experience. General laborer experience and industrial cleaning experience.			
<b>SPECIAL SKILLS, COMPETENCIES AND LICENSES</b>	Valid Driver's License - Class B, C, D with tanker endorsement requirement			



# PLANT LABORER MAINTENANCE

## PLANT LABORER MAINTENANCE PATHWAY

The pathway below represents a typical career pathway in the ever-changing water sector industry. The highlighted circle represents the occupation in the pathway.



DOE = Dependent on Experience

\* School of Freshwater Science and MATC are developing a program



## INSTRUMENT TECHNICIAN

### JOB DESCRIPTION

Under general supervision, installs, maintains, calibrates, troubleshoots, repairs, modifies, and overhauls instrumentation; assist with the maintenance of the computer and microprocessor systems associated with the treatment plants processing of raw sewerage.

Installs, maintains, calibrates, troubleshoots, repairs, and overhauls non-process equipment such as, but not limited to, safety, surveillance and security, and analytical instrumentation.

### KEY FOUNDATIONAL COMPETENCIES

- ⌚ Problem solving
- ⌚ Computer microprocessing systems
- ⌚ Sewage Treatments

### WORKPLACE COMPETENCIES

- ⌚ Ability in soldering and desoldering without damaging materials
- ⌚ Knowledge and skills in the principles, practices, concepts and techniques used in advanced digital and analog electronics

### COMMON SKILLS

- ⌚ Communications
- ⌚ Social Skills
- ⌚ Operations
- ⌚ Troubleshooting
- ⌚ Mentorship
- ⌚ Detail Oriented
- ⌚ Management
- ⌚ Coaching
- ⌚ Teamwork
- ⌚ Writing

### WORK ENVIROMENT

Work involves exposure to confined entry areas, hazardous gases, heights, weather, noise, dirt, dust, organic waste, and explosive environments.

### MEDIAN SALARY

\$39 per hour

### EDUCATION AND TRAINING

2-year degree in electronics

### WORK EXPERIENCE

2-5 years experience

### REQUIRED TECHNOLOGIES

Microsoft Office; Microsoft Word; Microsoft Excel; Geographic Information Systems; Database software; C (Programming Language); Data entry; basic computer skills;

### SPECIAL SKILLS, COMPETENCIES AND LICENSES

Valid Driver's License

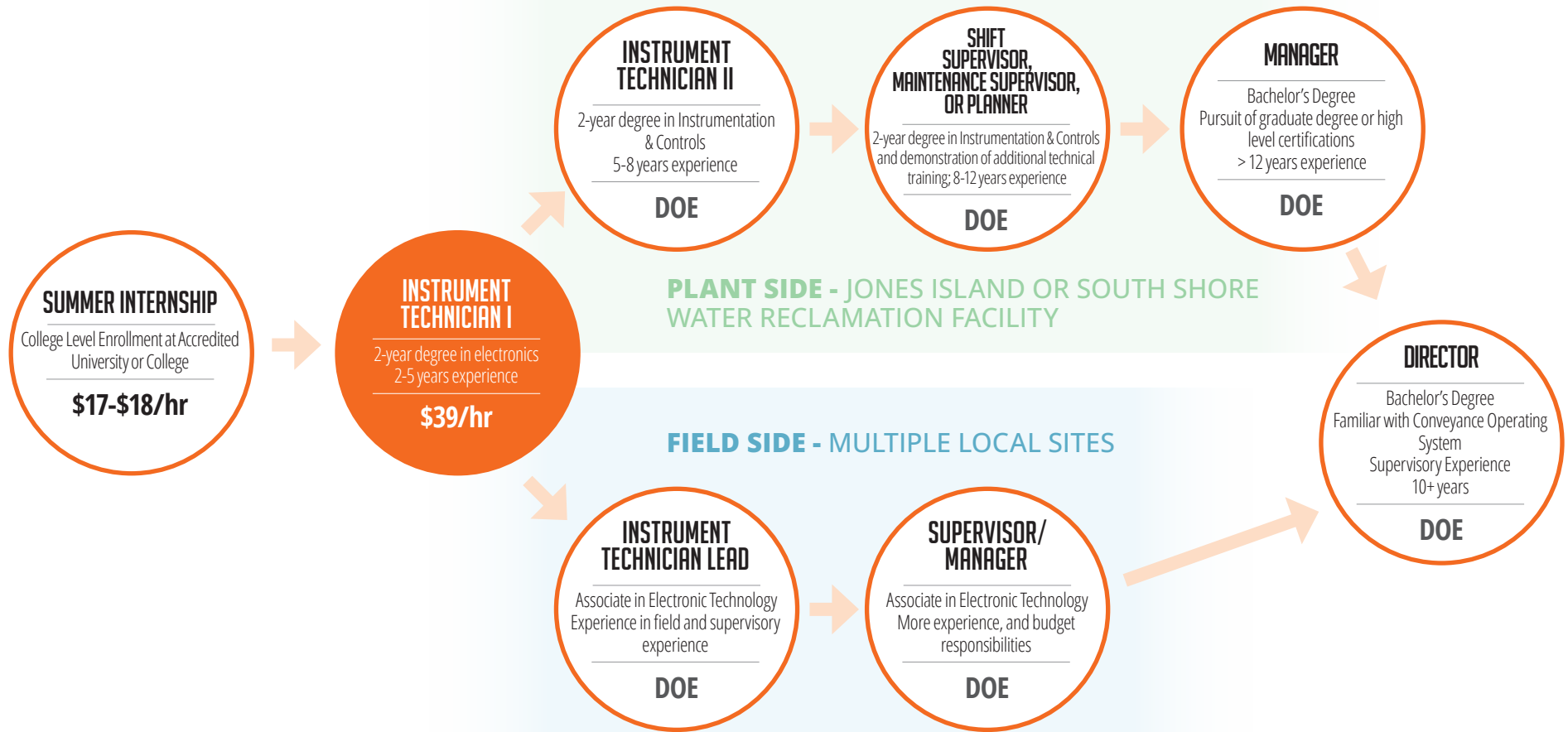




# INSTRUMENT TECHNICIAN

## INSTRUMENT TECHNICIAN PATHWAY

The pathway below represents a typical career pathway in the ever-changing water sector industry. The highlighted circle represents the occupation in the pathway.



DOE = Dependent on Experience

\*Stevens Point, Freshwater Science Master's Degree, MATC

## ABOUT MMSD

The Milwaukee Metropolitan Sewerage District (MMSD) is a regional government agency that provides water reclamation and flood management services for about 1.1 million people in 29 communities in the Greater Milwaukee Area.

Protecting public health and the drinking water supply for millions of people takes the expertise of hundreds of specially skilled and dedicated employees.

MMSD is a national leader in [wastewater treatment](#), [flood management](#), and [green infrastructure](#).

A recipient of the U.S. Water Prize and many other awards, they are most proud of their record of [98.6%](#) since 1994 for capturing and cleaning wastewater from 29 communities in a 423-square-mile area. Many metropolitan areas struggle to



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## ABOUT THE COUNCIL FOR ADULT AND EXPERIENTIAL LEARNING

Recognizing that adult learners are the backbone of the U.S. economy, CAEL helps forge a clear, viable connection between education and career success, providing solutions that promote sustainable and equitable economic growth. CAEL opens doors to opportunity in collaboration with workforce and economic developers; postsecondary educators; employers and industry groups; foundations and other mission-aligned organizations. By engaging with these stakeholders, we foster a culture of innovative, lifelong learning that helps individuals and their communities thrive. A membership organization established in 1974, CAEL is a part of Strada Collaborative, a mission-driven nonprofit. Learn more at [cael.org](#) and [stradacollaborative.org](#).





**MMSD**  
PARTNERS FOR A CLEANER ENVIRONMENT