**Water/Wastewater Technology Occupations**

**Labor Market Information Report**

**Evergreen Valley College**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

March 2020

# Recommendation

Based on all available data, there appears to be an undersupply of Water/Wastewater Technology workers compared to the demand for this cluster of occupations in the Bay region and in the Silicon Valley sub-region (Santa Clara County). There is a projected annual gap of about 1,452 students in the Bay region and 335 students in the Silicon Valley Sub-Region.

This report also provides student outcomes data on employment and earnings for programs on TOP 0958.00 - Water and Wastewater Technology in the state and region. It is recommended that these data be reviewed to better understand how outcomes for students taking courses on this TOP code compare to potentially similar programs at colleges in the state and region, as well as to outcomes across all CTE programs at Evergreen Valley College and in the region.

# Introduction

This report profiles Water/Wastewater Technology Occupations in the 12 county Bay region and in the Silicon Valley sub-region for a proposed new program at Evergreen Valley College.

|  |
| --- |
| * **Water and Wastewater Treatment Plant and System Operators (SOC 51-8031):** Operate or control an entire process or system of machines, often through the use of control boards, to transfer or treat water or wastewater.
 |
| Entry-Level Educational Requirement: High school *diploma or equivalent* |
| Training Requirement: Long-term *on-the-job training* |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 43% |
|  |
| * **Environmental Engineers (SOC 17-2081**): Research, design, plan, or perform engineering duties in the prevention, control, and remediation of environmental hazards using various engineering disciplines. Work may include waste treatment, site remediation, or pollution control technology.
 |
| Entry-Level Educational Requirement: Bachelor's *degree* |
| Training Requirement: None |
| Percentage of Community College Award Holders *or Some Postsecondary Coursework: 8%* |
|  |
| * **Pump Operators, Except Wellhead Pumpers (SOC 53-7072):** Tend, control, or operate power-driven, stationary, or portable pumps and manifold systems to transfer gases, oil, other liquids, slurries, or powdered materials to and from various vessels and processes.
 |
| Entry-Level *Educational Requirement: High school diploma or equivalent* |
| Training Requirement: Moderate-term *on-the-job training* |
| Percentage of Community College Award Holders or Some *Postsecondary Coursework: 34%* |
|  |
| * **Compliance Officers (SOC 13-1041)**: Examine, evaluate, and investigate eligibility for or conformity with laws and regulations governing contract compliance of licenses and permits, and perform other compliance and enforcement inspection and analysis activities not classified elsewhere. Excludes "Financial Examiners" (13-2061), “Tax Examiners and Collectors, and Revenue Agents" (13-2081), “Occupational Health and Safety Specialists” (29-9011), “Occupational Health and Safety Technicians” (29-9012), "Transportation Security Screeners" (33-9093), “Agricultural Inspectors” (45-2011), “Construction and Building Inspectors” (47-4011), and “Transportation Inspectors” (53-6051).
 |
| Entry-Level Educational Requirement: Bachelor's *degree* |
| Training *Requirement: Moderate-term on-the-job training* |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 26*%* |

# Occupational Demand

**Table 1. Employment Outlook for Water/Wastewater Technology Occupations in Bay Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation  | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 25% Hourly Wage | Median Hourly Wage |
| Water and Wastewater Treatment Plant and System Operators |  2,321  |  2,400  | 79 | 3% |  1,160  |  232  | $31.27 | $41.26 |
| Environmental Engineers |  2,351  |  2,438  | 87 | 4% |  1,014  |  203  | $39.01 | $49.10 |
| Pump Operators, Except Wellhead Pumpers |  214  |  216  | 2 | 1% |  133  |  27  | $17.21 | $19.83 |
| Compliance Officers |  10,027  |  10,721  | 694 | 7% |  5,236  |  1,047  | $32.50 | $41.86 |
| **TOTAL** |  **14,913**  |  **15,775**  | **863** | **6%** |  **7,542**  |  **1,509**  | **$33.11** | **$42.59** |

*Source: EMSI 2019.4*

**Bay Region** includes Alameda, Contra Costa, Marin, Monterey, Napa, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano and Sonoma Counties

**Table 2. Employment Outlook for Water/Wastewater Technology Occupations in Silicon Valley Sub-Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation  | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 25% Hourly Wage | Median Hourly Wage |
| Compliance Officers |  2,092  |  2,267  |  175  | 8% |  1,129  |  226  | $34.88 | $43.77 |
| Environmental Engineers |  566  |  588  |  22  | 4% |  243  |  49  | $38.86 | $45.85 |
| Water and Wastewater Treatment Plant and System Operators |  388  |  400  |  12  | 3% |  191  |  38  | $27.12 | $40.33 |
| Pump Operators, Except Wellhead Pumpers |  14  |  15  |  1  | 7% |  10  |  2  | $20.25 | $27.61 |
| **TOTAL** |  **3,674**  |  **3,933**  | **259** | **7%** |  **1,674**  |  **335**  | **$27.53** | **$18.56** |

*Source: EMSI 2019.4*

Silicon Valley Sub-Regionincludes Santa Clara County

### Job Postings in Bay Region and Silicon Valley Sub-Region

**Table 3. Number of Job Postings by Occupation for latest 12 months (March 2019 - February 2020)**

| Occupation | Bay Region | Silicon Valley |
| --- | --- | --- |
|  Environmental Engineers | 497 | 114 |
|  Water/Wastewater Engineers | 211 | 33 |
|  Water and Wastewater Treatment Plant and System Operators | 192 | 57 |
|  Environmental Compliance Inspectors | 142 | 29 |
|  Pump Operators, Except Wellhead Pumpers | 43 | 6 |
|  **TOTAL** | **1,085** | **239** |

*Source: Burning Glass*

**Table 4a. Top Job Titles for Water/Wastewater Technology Occupations for latest 12 months (March 2019 - February 2020) Bay Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Bay | Common Title | Bay |
| Environmental Engineer | 191 | Wastewater Project Manager/Engineer | 12 |
| Water Resources Engineer | 97 | Civil Project Manager | 12 |
| Environmental Project Manager | 37 | Project Environmental Engineer | 11 |
| Wastewater Operator | 24 | Environmental Staff Assessor | 11 |
| Water Treatment Operator | 22 | Water Treatment Technician | 9 |
| Water Treatment Specialist | 21 | Specialist | 9 |
| Staff Environmental Engineer | 21 | Water Treatment Plant Operator | 7 |
| Environmental Specialist | 21 | Wastewater Project Manager | 7 |
| Technician | 18 | Wastewater Operator, Systems | 7 |
| Environmental Scientist | 18 | Engineer | 7 |
| Remediation Project Engineer | 17 | Water Technician | 6 |
| Environmental Compliance Inspector | 17 | Waste Treatment Operator | 6 |
| Wastewater Engineer | 14 | Waste Management | 6 |
| Senior Wastewater Project Manager/Engineer | 14 | Registration Specialist | 6 |

**Table 4b. Top Job Titles for Water/Wastewater Technology Occupations for latest 12 months (March 2019 - February 2020) Silicon Valley Sub-Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Silicon Valley | Common Title | Silicon Valley |
| Environmental Engineer | 44 | Associate Environmental Engineer | 4 |
| Water Treatment Operator | 16 | Technician | 3 |
| Water Resources Engineer | 16 | Raging - Cash Control I | 3 |
| Environmental Project Manager | 11 | Permit Specialist | 3 |
| Environmental Specialist | 7 | Industrial Engineer | 3 |
| Waste Treatment Operator | 6 | Water Treatment Specialist | 2 |
| Water Treatment Technician | 5 | Water Operator | 2 |
| Vmware Operations Engineer, Enterprise, Environment | 5 | Wastewater Project Manager | 2 |
| Wastewater Operator | 4 | Wastewater Engineer | 2 |
| Staff Environmental Engineer | 4 | Waste Management | 2 |
| Materials Station Coordinator | 4 | Technician/Operator | 2 |
| Field Examiner | 4 | Technician, Chemical, Plumbing | 2 |
| Environmental Scientist | 4 | Systems Operator, Water Treatment | 2 |
| Civil Project Manager | 4 | Staff Environmental Compliance Consultant, Entry | 2 |

*Source: Burning Glass*

# Industry Concentration

**Table 5. Industries hiring Water/Wastewater Technology Workers in Bay Region**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Industry – 6 Digit NAICS (No. American Industry Classification) Codes | Jobs in Industry (2018) | Jobs in Industry (2022) | % Change (2018-22) | % in Industry (2018) |
| Local Government, Excluding Education and Hospitals (903999) | 3,076 | 3,152 | 2% | 20% |
| Federal Government, Civilian, Excluding Postal Service (901199) | 1,020 | 990 | -3% | 7% |
| State Government, Excluding Education and Hospitals (902999) | 919 | 971 | 6% | 6% |
| Engineering Services (541330) | 702 | 727 | 4% | 5% |
| Corporate, Subsidiary, and Regional Managing Offices (551114) | 698 | 718 | 3% | 5% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715) | 501 | 546 | 9% | 4% |
| Administrative Management and General Management Consulting Services (541611) | 347 | 419 | 21% | 2% |
| Research and Development in Biotechnology (except Nanobiotechnology) (541714) | 311 | 420 | 35% | 2% |
| Software Publishers (511210) | 292 | 389 | 33% | 2% |
| Water Supply and Irrigation Systems (221310) | 311 | 369 | 19% | 2% |
| Pharmaceutical Preparation Manufacturing (325412) | 267 | 247 | -7% | 2% |
| Other Scientific and Technical Consulting Services (541690) | 262 | 226 | -14% | 2% |
| Custom Computer Programming Services (541511) | 224 | 271 | 21% | 2% |
| Natural Gas Distribution (221210) | 213 | 190 | -11% | 1% |
| Marketing Consulting Services (541613) | 154 | 178 | 16% | 1% |
| Commercial Banking (522110) | 136 | 146 | 7% | 1% |

*Source: EMSI 2019.4*

**Table 6. Top Employers Posting Water/Wastewater Technology Occupations in Bay Region and Silicon Valley Sub-Region (March 2019 - February 2020)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Employer | Bay | Employer | Bay | Employer | Silicon Valley |
| Tjg Civil Engineers And Land Planners | 43 | John Wood Group Plc | 7 | Tjg Civil Engineers And Land Planners | 9 |
| Jacobs Engineering Group Inc | 17 | Ghd Incorporated | 7 | TTM Technologies | 6 |
| Hire Resolve | 17 | Geosyntec Consultants | 7 | Cogent Infotech Corp | 6 |
| AECOM Technology Corp | 15 | Fieldcore | 7 | City Sunnyvale | 6 |
| Kennedy Jenks Consultants | 13 | Facebook | 7 | ABM Industries | 6 |
| Carollo Engineers | 12 | Aptim | 7 | Locus Technologies | 5 |
| Wood | 11 | TTM Technologies | 6 | Clean Harbors | 5 |
| Six Flags Incorporated | 10 | Stantec, Inc. | 6 | Kennedy Jenks Consultants | 4 |
| Veolia North America, Llc | 9 | Partner Esi | 6 | Fieldcore | 4 |
| Veolia North America | 8 | Partner Engineering And Science, Inc | 6 | City Of San Jose City Hall | 4 |
| US Government | 8 | Langan Engineering & Environmental Services, Inc | 6 | Six Flags Incorporated | 3 |
| US Army | 8 | Financial Waste Consulting, Inc | 6 | Palace Entertainment | 3 |
| Tetra Tech | 8 | Cogent Infotech Corporation | 6 | Jacobs Engineering Group Incorporated | 3 |
| Webuild Services Llc | 7 | Clean Harbors | 6 | Arete Technologies Nc | 3 |
| Sfmta | 7 | City Sunnyvale | 6 | Arete Technologies Inc | 3 |
| Partner Engineering And Science | 7 | Brown Caldwell | 6 | Apple Inc. | 3 |
| Pacific Gas and Electric Company | 7 | Army National Guard | 6 | Aei Consultants | 3 |

*Source: Burning Glass*

# Educational Supply

There are three (3) community colleges in the Bay Region issuing 57 awards on average annually (last 3 years) on TOP 0958.00 - Water and Wastewater Technology. There are no colleges in the Silicon Valley Sub-Region issuing awards on average annually (last 3 years) on this TOP code.

**Table 7. Awards on TOP 0958.00 - Water and Wastewater Technology in Bay Region**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| College | Sub-Region | Associates | Certificate 18+ Units | Certificate Low Unit | Total |
| Gavilan College  | Santa Cruz-Monterey |  7  |  6  |  |  13  |
| Santa Rosa Junior College  | North Bay |  5  |  13  |  3  |  21  |
| Solano College  | North Bay |  12  |  11  |  |  23  |
| **Total Bay Region** |  **24**  |  **30**  |  **3**  |  **57**  |
| **Total Silicon Valley Sub-Region** | **0** | **0** | **0** | **0** |

# *Source: Data Mart*

Note: The annual average for awards is 2015-16 to 2017-18.

# Gap Analysis

Based on the data included in this report, there is a labor market gap in the Bay region with 1,509 annual openings for the Water/Wastewater Technology occupational cluster and 57 annual (3-year average) awards for an annual undersupply of 1,452 students. In the Silicon Valley Sub-Region, there is also a gap with 335 annual openings and no annual (3-year average) awards for an annual undersupply of 335 students.

# Student Outcomes

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0958.00 - Water and Wastewater Technology**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2015-16 | Bay (All CTE Programs) | Evergreen Valley College (All CTE Programs) | State (0958.00) | Bay (0958.00) | Silicon Valley (0958.00) | Evergreen Valley College (0958.00) |
| % Employed Four Quarters After Exit | 74% | 76% | 81% | 89% | 94% | n/a |
| Median Quarterly Earnings Two Quarters After Exit | $10,550 | $8,549 | $13,111 | $15,363 | $12,254 | n/a |
| Median % Change in Earnings | 46% | 75% | 31% | 40% | 50% | n/a |
| % of Students Earning a Living Wage | 63% | 53% | 78% | 78% | 68% | n/a |

*Source: Launchboard Pipeline (version available on 3/12/20)*

# Skills, Certifications and Education

**Table 9. Top Skills for Water/Wastewater Technology Occupations in Bay Region (March 2019 - February 2020)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Skill | Postings | Skill | Postings | Skill | Postings |
| Environmental Engineering | 322 | Professional Engineer | 121 | Hydrology | 84 |
| Project Management | 302 | Environmental Consulting | 119 | Project Design | 78 |
| Budgeting | 253 | Chemistry | 117 | Legal Compliance | 75 |
| Civil Engineering | 177 | Water Quality | 113 | Environmental Remediation | 70 |
| Environmental Science | 177 | Technical Writing / Editing | 108 | Site Assessments | 70 |
| Scheduling | 162 | AutoCAD | 107 | Pollution Prevention | 67 |
| Wastewater Treatment | 151 | Preparing Proposals | 107 | Staff Management | 67 |
| Calculation | 142 | Environmental Laws and Regulations | 103 | Quality Management | 66 |
| Repair | 141 | Hazardous Waste | 97 | Chemical Engineering | 64 |
| Water Treatment | 137 | Hydraulics | 96 | Geology | 64 |
| Cost Estimation | 136 | Environmental Regulations | 95 | Proposal Writing | 63 |
| Environmental Compliance | 134 | Engineering Design and Installation | 92 | Wastewater Engineering | 63 |
| Quality Assurance and Control | 133 | Engineering Design | 87 | Contract Preparation | 62 |
| Occupational Health and Safety | 129 | Customer Contact | 84 | Site Investigations | 62 |
| Business Development | 121 | Customer Service | 84 | Biology | 61 |

*Source: Burning Glass*

**Table 10. Certifications for Water/Wastewater Technology Occupations in Bay Region (March 2019 - February 2020)**

Note: 56% of records have been excluded because they do not include a certification. As a result, the chart below may not be representative of the full sample.

|  |  |  |  |
| --- | --- | --- | --- |
| Certification | Postings | Certification | Postings |
| Driver's License | 227 | Project Management Professional (PMP) | 9 |
| Licensed Professional Engineer | 123 | Contractors License | 8 |
| Hazwoper | 56 | Certified Industrial Hygienist | 6 |
| Wastewater Treatment Plant Operator | 51 | Asbestos Inspector | 6 |
| Engineer in Training Certification | 46 | Security Clearance | 5 |
| Project Management Certification | 44 | Painting Certification | 5 |
| Occupational Safety and Health Administration Certification | 23 | Epa 608 | 5 |
| American Board for Engineering and Technology (ABET) Accredited | 21 | Environmental Protection Agency Certification | 5 |
| CDL Class C | 15 | Certified Safety Professional | 5 |
| Wastewater Treatment Certification | 13 | Certified Mold Inspector | 5 |
| Civil Engineering Certificate | 12 | CDL Class B | 4 |
| Certified Hazardous Materials Manager | 10 | Cash Handling Certification | 4 |

*Source: Burning Glass*

**Table 11. Education Requirements for Water/Wastewater Technology Occupations in Bay Region**

Note: 24% of records have been excluded because they do not include a degree level. As a result, the chart below may not be representative of the full sample.

|  |  |  |
| --- | --- | --- |
| Education (minimum advertised) | Latest 12 Mos. Postings | Percent 12 Mos. Postings |
| High school or vocational training | 144 | 17% |
| Associate Degree | 5 | 1% |
| Bachelor’s Degree or Higher | 661 | 82% |

*Source: Burning Glass*

# Methodology

Occupations for this report were identified by use of skills listed in O\*Net descriptions and job descriptions in Burning Glass. Labor demand data is sourced from Economic Modeling Specialists International (EMSI) occupation data and Burning Glass job postings data. Educational supply and student outcomes data is retrieved from multiple sources, including CTE Launchboard and CCCCO Data Mart.

# Sources

O\*Net Online

Labor Insight/Jobs (Burning Glass)

Economic Modeling Specialists International (EMSI)

CTE LaunchBoard [www.calpassplus.org/Launchboard/](http://www.calpassplus.org/Launchboard/)

Statewide CTE Outcomes Survey

Employment Development Department Unemployment Insurance Dataset

Living Insight Center for Community Economic Development

Chancellor’s Office MIS system

# Contacts

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