

# CAREER EDUCATION PROGRAM TWO-YEAR REVIEW

Date: April 8, 2014

College: San Bernardino Valley College

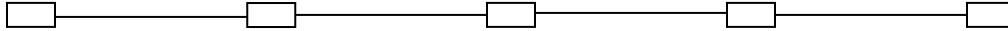
Program: Water Supply Technology

## 1. Purpose of this Program

Significantly Changed Purpose  
in the Last Two Years

Minor Changes in Purpose  
in the Last Two Years

No Changes in Purpose  
in the Last Two Years



(Use this space to include description, mission, target population, etc.)

The Water Supply Technology Program is designed to serve students who are employed or interested in employment in water treatment, water distribution, wastewater collection, wastewater treatment, backflow prevention, cross connection control, and water conservation. The course offerings include preparation for certification training, an established and formal apprenticeship program and incumbent worker training. To move up a career ladder, employees in these occupations would normally need to show certain work experience and/or obtain additional higher level certification in their specialty. Effort and planning was done since the last Water Supply Technology Program Review to continue to upgrade and modernize the curriculum to reflect recent changes in the water industry and the demands of employers on students to demonstrate up-to-date, marketable skills.

One such change was the identification of Water Quality Analyst and Water Conservations Specialist as two emerging occupations in water and wastewater industries. These occupations are not part of the Standard Occupational (TOP Code 0958.00). Throughout the nation the issue of water conservation is growing in importance. Due to drought conditions and water supply reliability concerns in the California, the need for the training and certification of water conservation personnel is crucial to the water industry. Retirements has also disrupted employment within water and wastewater industries. Furthermore, water and wastewater occupations typically follow a career pathway from apprentice to journeyman to manager/supervisor. To remain proactive in meeting the needs of regional employers, the program was revised to offer coursework in water supply reliability and the changing regulatory structure.

Subsequently, three new courses were added to the program: Water Use Efficiency II, Introduction to Water Resource Management, and Introduction to Water Utility Management and will be offered on a rotating basis every second or third semester. Historically, Water Supply Technology classes are carefully rotated to provide access to certificates and degree classes to students in a timely manner. Core classes required to complete certificates are offered at least two times per year. This rotation also takes into account the specialized nature of the program, the number of course offerings, and the college's target population.

Although plentiful, jobs in water and wastewater are more often than not perceived as less prestigious than other occupations (i.e. doctors, lawyers, electricians, information technology specialists, etc.) and therefore, less appealing to younger workers and recent graduates from college and trade programs. Similarly, there is a severe gender imbalance in the occupation, which presents recruiting challenges of replacing an ageing workforce. In addition, the program's student population is also reflective of the imbalance, whereas men disproportionately outnumber women. To close this identified gap, a concerted effort is being made by the program to attract more women, veterans and underrepresented minorities. Outreach has also been expanded to include middle college and high school students.

## 2. Demand for this Program

High Demand

Adequate Demand  
for our students

Low Demand



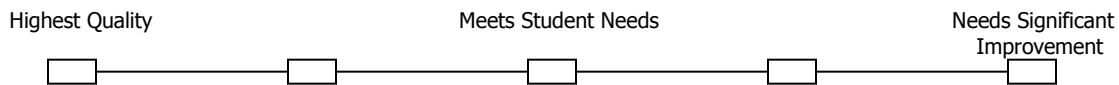
(Use this space to include labor market data, advisory input, etc.)

A well-trained and knowledgeable workforce is vital to protecting public health and the environment and ensuring the long-term sustainability of water and wastewater systems. One of the major workforce challenges faced by water and wastewater agencies is finding an adequate pool of applicants and retaining qualified workers. Managing a water utility today requires people with higher qualifications—that is, more

technical and administrative knowledge. The report, "State of the Water Industry" (2014), published by American Water Works Association (AWWA) and the AWWA Research Foundation states "Utilities continually face difficulty in recruiting, training, and retaining skilled employees. Likewise, a large number of water industry employees are eligible for retirement; these employees represent a significant amount of institutional knowledge that could be lost without proper succession planning and process documentation." In addition the Department of Labor estimates that the need for the water and wastewater operators to increase by 20% from 2008-2018.

Consequently, predicted losses to the water and wastewater workforce due to baby boomer retirements raise concern. Combined with an increasing sophistication of technologies involved in operations, facing a huge shortage of professionals will only compound the problem. An employer survey conducted by the Center of Excellence (COE) confirms as these operators begin to exit the workforce, they will take the knowledge they have acquired during their careers with them—creating an ever-growing need for qualified applicants to fill these positions (November 2011). With the loss of federal funding to the states and organizations that recruit, train and assist operators in the operation and maintenance of public water systems, the need for skilled labor is becoming greater than ever. Utilities will be required to actively recruit operators from traditional sources, such as high schools and community colleges. More importantly, a post-secondary institution such as San Bernardino Valley College is in the prime position to fill future vacancies in the water industry with applicants from various labor pools. To illustrate, the Employment Development Department Labor Market Information Report dated March 7, 2014 indicates between January 2013 and January 2014, the unemployment rate was 9.4 percent in San Bernardino County.

### 3. Quality of this Program



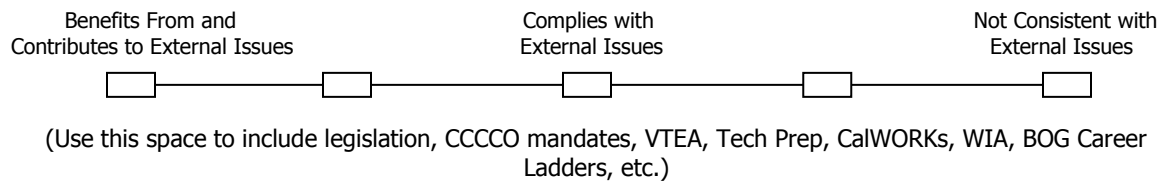
(Use this space to include core indicators, student outcomes, partnerships, certificates, degrees, articulation, faculty qualifications, diversity, grants, equipment, etc.)

The Water Supply Technology program is approved by the Department of Health Services as a provider of specialized training for operator certification requirements. Coursework, degree and certificate requirements are kept current and aligned with industry standards through regular review by the Water Supply Technology Advisory Board. In today's competitive job market, some Water Supply Technology students are deciding to continue their education beyond the two-year program offered at San Bernardino Valley College. Articulation agreements between community colleges and four-year colleges provide a smooth transition for transfer students from community college graduates into four-year colleges.

Water Supply Technology students could thereby benefit by having a simplified pathway for transfer from one college or university to another. One of the most important parts of the transfer process would be reviewing specific courses of the Water Supply Technology Program to determine which are comparable and eligible for transfer. Typically the agreement would either guarantee that the Associate of Science Degree in Water Supply Technology will satisfy all freshman and sophomore general education requirements at the four-year university or specify a list of courses that could be treated as equivalent. For example, questions brought forward from Water Supply Technology Advisory Committee members: 1) What percentage of students earn certificates versus earning a degree? 2) Does the completion of a program certificate and gaining employment create a disincentive for students to continue on to higher education? And, 3) Once students leave school for employment, it is on rare occasions that they return. Could the program structure be changed to grant the Associate Degree option with certificates embedded? Therefore to ensure program sustainability in the future, a formalized plan acknowledging eligible coursework for transfer to University of California (UC) or California State University (CSU) partner institutions is crucial.

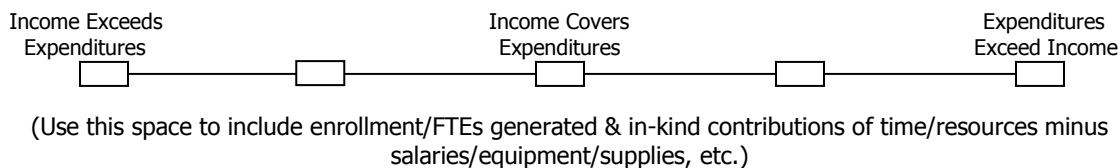
Due to budget constraints, the program employs eight adjunct professors to meet the total workload of course offerings. These instructors are water professionals, working in the field, bringing currency to the classroom every week. Full-time faculty must be given courses first to fulfill contractual obligations. With the recent addition of a second faculty member, the teaching workload is equally distributed between full-time faculty members, first; then assigned to the remaining adjunct industry professionals. The recent hire of a Student Services Intern will also benefit the Water Supply Program by providing an administrative support means to work more closely with K-12 to create articulated agreements that create a water/wastewater career pathway. Partnerships with K-12 system also helps raise awareness of the high school students about water and wastewater career options, which seems to be a challenge (according to various studies).

#### 4. External Issues



Water treatment and pollution removal are essential public services, and there are more than 2,200 water and wastewater establishments the Inland Empire. The number of water and wastewater industry employees leaving due to retirements will create an expertise and human resources gap that will be difficult to recapture. In San Bernardino County alone, there are more than ten water districts. The Employment Development Department Labor Market Information Report dated March 7, 2014 indicates between January 2013 and January 2014, trade, transportation, and utilities led all industries in growth, adding 9,600 more jobs. San Bernardino Valley College (SBVC) plays a critical role in preparing candidates for jobs in the water industry. The college is located in a metropolitan area with a population of nearly 200,000 that for years has grappled with high rates of crime and poverty. Only 2.2% of residents in the immediate surrounding area have a bachelor's degree, and 77% have a high school diploma or less. This low level of academic preparation translates generally into a shortage of technologically prepared people, which affects the overall economy in the city by not providing enough trained employees and condemns many of the local residents to working in low-paying jobs. In the zip code surrounding the college, the unemployment rate is as high as 15%. In light of the high unemployment rate in the county and the city of San Bernardino, the community needs a trained and educated workforce that can enter the job market and adapt to emerging technologies. It should be noted that the majority of students who seek education through the college are low income. More than 70% of SBVC students are eligible for financial aid, BOG Fee waivers. San Bernardino County is unique and has its own diverse populations and challenges. Additionally, every student has his or her own unique financial circumstances.

#### 5. Cost of this Program



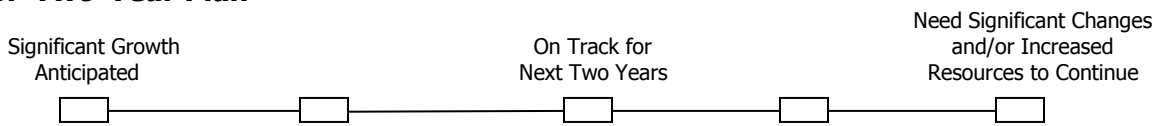
Technological advances and more stringent regulatory requirements demands a highly trained workforce to protect our water sources. These changes have resulted in increased enrollments and certificates. The Water Supply Technology Program currently has two full-time faculty members and eight part-time faculty. Annual revenue based on full-time equivalent students for the Water Supply Technology Program has risen in the past two years. Echoing cross-campus, full-time equivalent student enrollment and full-time equivalent faculty has increased. To illustrate, the previous 2013 EMP indicates that the program full-time equivalent student has gone from 84.69 in 2011-12 to 95.67 in 2012-2013. Student enrollment numbers (duplicate) have increased from 852 to 952. Student success and retention are on the rise also from 90% in 2011-2012 to 95% 2012 to 2013. The number of certificates and degrees awarded to students in 2011-2012 were four and eight with an increase in the number during the 2012 -2013 school year, eight and twelve, respectively. However, the accuracy of the information with respect to the successful awarding of certificates and degrees is questionable, primarily due to the lack of an internal tracking mechanism.

The pressing concern with required program expenditures is the lack of a program yearly budget, making it difficult to complete strategic planning or implement long-term improvements. All resources for the Water Supply Program have been provided by grants since its inception. Heavy reliance remains on grants as the chosen method to close the funding gap. Without a budget, it is difficult for the department to sustain the growth and the quality of the program simultaneously. For example, the Water Supply Technology Program does not have all the equipment needed to run its water/wastewater analysis laboratory class. Also the Backflow Testing laboratory located in the Technical Division needs to be expanded. Currently six testing

stations serve over twenty-five students. At minimum, two more stations are requested to provide students with hands-on opportunities to practice both manipulation and repair of backflow valves. More importantly, to become a licensed professional in backflow prevention, state testing has both a written and hands-on component. Additional funding is required to install the two new stations. To provide students access to know-how and technologies used in the industry despite a materials shortfall, department faculty are currently investigating used and donated equipment in the interim as a procurement option. As an example, the college can obtain the eight valves needed for the backflow testing stations as donated items from manufacturers who specialize in fabricating the type of equipment used in the water industry.

The Water Technology Program would also benefit from consistent and adequate classroom laboratory space with the recent relocation from the Science Division to the Technical Division. Until building upgrades are completed the establishment of more satellite centers/additional locations and off-campus locations will make the traditional college education accessible. Currently, the Science Division allows the program the use of its laboratory facilities and through an industry partnership, classes are conducted at a wastewater analysis site in Redlands. To facilitate the award of contact hours for California Department of Health administered exams, contract education or seminar style workshops at host water agency locations, is an option under review, as well as the offering courses in the virtual classroom setting. Lastly, faculty of the program will need a stable, permanent budget to attend workshops and keep learning in order to stay abreast of the rapid changes and evolving technologies in the water/wastewater fields. As stated above (and in previous program review), the greatest need is an on-going budget to expand the types of training and education that is offered.

## 6. Two-Year Plan



(Use this space to include recommendations, project future trends, personnel and equipment needs, etc.)

To successfully address the needs of industry, water and wastewater workers need to possess both experiential knowledge of the water and wastewater industries and comfort with technology. In meeting the demands of changing skill needs of employees, the challenges within the water utility sector demonstrates the need to establish industry specific certificate and degree programs and invest in workers through apprenticeships. More importantly, keeping the curriculum current with new technologies and formally addressing the funding needs (i.e., additional full-time faculty, equipment, facilities for hands-on instruction) will ensure the Water Supply Program can provide water utilities with the proper training vehicle necessary to fill vacancies with students knowledgeable in the operation and maintenance of water systems. The focus of the course offerings in Water Supply Technology is two-fold: 1) Career Technical Education and 2) Transferability. One of the main benefits of an articulation agreement is that students of the program could take more credits that will count toward a four-year degree at the community college level.

The Water Supply Technology Program will continue to work collaboratively with its Advisory Board, California Department of Public Health, State Water Resources Control Board, California Water Environment, Association American Water Works Association, and other certifying entities in response to changes to existing regulations and industry standards that impact licensure. Technical skill attainment, program completion (certificates, degrees, transfer-ready), employment placement, and equity (under represented identity groups in industry) are of great interest to the Water Supply Technology Program. San Bernardino Valley College is now in possession of excel-generated spreadsheets released by the state agencies detailing test examinees performance data on the state administered tests. A database will be created by cross-referencing the names of students who have successfully completed courses in the Water Supply Program with those held in state repositories. Anecdotally, the department faculty is comprised mostly of industry experts who will be seeking assistance from the various industry associations, union and organizations to further expand and strengthen employer-college partnerships.

It is also recommended that alternate delivery modes be explored to meet industry needs such as innovative distance education opportunities: offer some courses through the following modes of instruction: televised, on-line, and multi-mode. An online education provides the opportunity to study more subjects and will allow students an opportunity to have access to water principle course that are not available in the immediate area. The Water Supply Technology Program is not large enough to offer a full schedule of courses both in the morning and in the evening only format. The schedules for distance learning are more open and allow for students, parents and professionals to take the classes whenever it fits into their schedule. This is beneficial over classroom education that requires students to schedule work and childcare around the class time. Lastly, there are less space limitations and materials required for each student and the savings are passed on from the educational institution to each student. Also, there is no need to travel to and from class every single day reducing the cost for the economically disadvantaged student population the college serves.

**Signatures:**

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Administrator

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Date

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Faculty

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Date

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Advisory Committee

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Date

To Board of Trustees on \_\_\_\_\_  
Date