On-Site Courses Approved for Training Units for 2013

Title: Basic Math for Wastewater Operators					Length: 120 min	
Description: This wastewater operator focussed math course covers math basics including the Order of Operations, basic algebra and rearranging equations, dimensional analysis (unit conversions), tank geometries including areas, volumes, and perimeters, hydraulic retention time, velocities in pipes and open channels, pressure head, pump horsepower, and chemical dosing. Attendees work a variety of problems with the guidance of the instructor.						
Instructor: Sidney	TU's	W: 0.2	WW: 0.2	I: 0.2	C: 0.2	D: 0.2
Title: Basic Math for Water Operators					Length: 120 min	
Description: This water operator focussed math refresher course covers unit conversions and Coagulation, Flocculation, and Sedimentation calculations, including volume calculations, mixing energy, settling rates, and weir overflow rates.						
Instructor: Sidney	TU's	W: 0.2	WW: 0.2	I: 0.2	C: 0.2	D: 0.2
Title: Basic Math for Water Distribution Operators					Length: 120 min	
Description: This water distribution operator focussed math course covers math basics including the Order of Operations, basic algebra and rearranging equations, dimensional analysis (unit conversions), tank geometries including areas, volumes, and perimeters, hydraulic retention time, velocities in pipes and open channels, pressure head, pump horsepower, and chemical dosing. Attendees work a variety of problems with the guidance of the instructor.						
Instructor: Sidney	TU's	W: 0.2	WW: 0.2	I: 0.2	C: 0.2	D: 0.2
Title: Basic Math for Collection System Operators					Length: 120 min	
Description: This collections operator focussed math course covers math basics including the Order of Operations, basic algebra and rearranging equations, dimensional analysis (unit conversions), equivalent diameters, force main velocities, tank geometries including areas, volumes, and perimeters, hydraulic retention time, velocities in pipes and open channels, pressure head, pump horsepower, and chemical dosing. Attendees work a variety of problems with the guidance of the instructor.						
Instructor: Sidney	TU's	W: 0.2	WW: 0.2	I: 0.2	C: 0.2	D: 0.2
Title: Intermediate Math for Wastewater Operators					Length: 120 min	
Description: This wastewater operator focussed math course steps things up a notch and introduces process calculations such as surface overflow rate, solids loading rate, basic mass balances, food to microorganism ratio, chemical feed rate adjustments, basic SRT and MCRT calculations, percent volatile solids reduction through a digester, and more. Problems are worked forwards to enforce concepts. More difficult problems are added in the advanced class, for example: MCRT is worked backwards to find wasting rate.						
Instructor: Sidney	TU's	W: 0.2	WW: 0.2	I: 0.2	C: 0.2	D: 0.2

On-Site Courses Approved for Training Units for 2013

Title: Intermediate Math for Water Operators						Length: 120 min
Description: This water operator focussed math course steps things up a notch by adding more difficult problems and introducing additional process calculations like blending water sources, chemical feed rates, fluoride saturator calculations, jar testing calculations and dewatering. Math problems are worked forward to reinforce concepts without the need to rearrange equations. In the advanced water course, more difficult problems are worked backwards to find pumping rates, in-stream chemical concentrations from feed rate, and more.						
Instructor: Sidney	TU's	W: 0.2	WW: 0.2	I: 0.2	C: 0.2	D: 0.2
Title: Intermediate Math for Distribution Operators						Length: 120 min
Description: This distribution operator focussed math course steps things up a notch by adding more advanced math problems and introducing concepts such as hydraulics, system pressures, unconventional storage tank geometries, and more.						
Instructor: Sidney	TU's	W: 0.2	WW: 0.2	I: 0.2	C: 0.2	D: 0.2
Title: Intermediate Math for Collection System Operators						Length: 120 min
Description: This collections operator math course steps things up a notch by adding more difficult problems and introducing pump run time calculations, chemical dosing, chemical feed rates, cost to run a pump, calculating pipe slope, finding tap setback to maintain pipe slope, equivalent diameter, optimizing pump cycle times for a given influent and effluent flow rate from a pump station, and more.						
Instructor: Sidney	TU's	W: 0.2	WW: 0.2	I: 0.2	C: 0.2	D: 0.2
Title: Advanced Math Topics for Wastewater Operators						Length: 120 min
Description: The advanced wastewater course covers more advanced math problems including dilutions, activated sludge (F:M, MCRT, space loading, SOR), solids handling (percent VSS reduction, land application rates), and velocities in partially full pipes given flow rate and slope. The advanced math topics course is tailored for each group of students to accentuate topics of interest. The big difference between the advanced course and the intermediate course is the complexity of problems tackled and the need for more advanced algebra to isolate any variable in a particular equation.						
Instructor: Sidney	TU's	W: 0.2	WW: 0.2	I: 0.2	C: 0.2	D: 0.2
Title: Advanced Math Topics for Water Operators						Length: 120 min
Description: The advanced water math course covers more advanced math problems and forces students to apply more advanced algebra to rearrange equations to find any variable. Scaling up of bench scale testing results to full scale operation, dilutions, blending water from multiple sources, and more.						
Instructor: Sidney	TU's	W: 0.2	WW: 0.2	I: 0.2	C: 0.2	D: 0.2
Title: Fundamental Concepts in Math						Length: 60 min
Description: The Fundamental Concepts in Math course goes back to basics to explain fractions, percents, the number line, properties of addition, subtraction, multiplication, and division, the distributive property, and more. It is meant for attendees who struggle with basic concepts.						
Instructor: Sidney	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1

On-Site Courses Approved for Training Units for 2013

Title: Percents , Percent Removal, and Efficiency						Length: 30 min
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Unit Conversions						Length: 30 min
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Geometry 1						Length: 30 min
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Geometry 2						Length: 30 min
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Hydraulic Detention Time						Length: 30 min
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Velocity in Pipes and Open Channels						Length: 30 min
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Finding Slopes and Lengths						Length: 30 min
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Wells -- specific yield, drawdown, zone of influence						Length: 30 min
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Force -- pressure in pipes, buoyancy, hydraulic tools						Length: 30 min
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05

On-Site Courses Approved for Training Units for 2013

Title: Pumps -- horsepower, cost to operate, head loss, cycle times					Length: 30 min	
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Chemical Dosing					Length: 30 min	
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Filters -- backwash rate, hydraulic loading rate, bed expansion					Length: 30 min	
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Calculating dilutions for chemical addition					Length: 30 min	
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Organic Loading Rate					Length: 30 min	
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Sludge Volume Index					Length: 30 min	
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Mean Cell Residence Time and Solids Residence Time					Length: 30 min	
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Food to Microorganism Ratio					Length: 30 min	
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Math for Secondary Clarifiers -- SOR, Weir Loading Rate, Solids Flux					Length: 30 min	
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05

On-Site Courses Approved for Training Units for 2013

Title: Percent Volatile Solids Reduction in Digesters					Length: 30 min	
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Sludge Dewatering Calculations					Length: 30 min	
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Electrical Systems Calculations					Length: 30 min	
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Laboratory Math -- Calculations for Sampling and Lab Tests					Length: 30 min	
Description: Each of these 30 minute math modules focusses specifically on the type of problem in the title.						
Instructor: Sidney	TU's	W: 0.05	WW: 0.05	I: 0.05	C: 0.05	D: 0.05
Title: Centrifugal Pumps					Length: 90 min	
Description: This course includes a detailed look at how centrifugal pumps are put together, the function of each component, the impact of influent and discharge conditions on pump output, causes of cavitation, the pump affinity laws, and how to read pump curves.						
Instructor: Sidney	TU's	W: 0.15	WW: 0.15	I: 0.15	C: 0.15	D: 0.15
Title: Pumps for Water and Wastewater					Length: 90 min	
Description: This course discusses the different kinds of pumps used in water and wastewater treatment including centrifugal, positive displacement, peristaltic, and more. Components of each pump and mechanism of action are discussed as well as typical uses. Other topics include: cavitation, pump curves, the pump affinity laws, and total dynamic head. This presentation is supplemented with many wonderful pump animations provided by various pump manufacturers that are linked to through youtube.						
Instructor: Sidney	TU's	W: 0.15	WW: 0.15	I: 0.15	C: 0.15	D: 0.15
Title: Pumps for Water Distribution Systems					Length: 90 min	
Description: This course focussed on pumps used in wells and booster pump stations including turbine pumps, can pumps, single stage centrifugal pumps, and more. The pieces and parts of each pump and their function are discussed. Attendees are introduced to the pump affinity laws.						
Instructor: Josh	TU's	W: 0.15	WW: 0.15	I: 0.15	C: 0.15	D: 0.15

On-Site Courses Approved for Training Units for 2013

Title: Hydraulics Basics						Length: 90 min
Description: This 90?minute course discusses basic properties of water including weight, density, pressure, and specific gravity. Conversion of pressure to feet of head in various units is demonstrated. Multiple examples of why pressure is so important in water and wastewater systems are presented including: determining pressures due to elevation changes in distribution systems, high groundwater and floating tanks, surcharging of sewers, and using pressure to do work with hydraulic jacks. The concepts of velocity and water hammer are introduced. The presentation closes with a description and demonstration of a ram pump whose operation is based on pressure, velocity, and water hammer.						
Instructor: Sidney	TU's	W: 0.15	WW: 0.15	I: 0.15	C: 0.15	D: 0.15

Title: Hydraulics of Pumped Systems						Length: 150 min
Description: This 150?minute (2.5 hour) presentation discusses hydraulic principles as they relate to pump operation. The presentation begins with a thorough discussion of total dynamic head and each of its components, the difference between suction lift and suction head, and how to calculate major and minor losses in a system. The second portion of the talk discusses work, power, and energy, how each is calculated, and the cost of running a piece of equipment. The presentation continues with a discussion of discharge velocity from a centrifugal pump, calculating impeller diameter, and the pump affinity laws. Attendees will learn to predict pump discharge, brake horsepower, amp draw, and discharge head from changes to either the pump speed or impeller diameter. The presentation ends with a discussion of cavitation, net positive suction head, and how to read both system curves and pump curves.						
Instructor: Sidney	TU's	W: 0.25	WW: 0.25	I: 0.25	C: 0.25	D: 0.25

Title: Lift Stations - Collections and Wastewater						Length: 90 min
Description: This 60?minute presentation discusses dry pit and wet pit lift stations, pump arrangement, level indicator equipment, and basic lift station operation and maintenance. It includes a brief discussion of confined space entry and the safety hazards that may be present in lift stations. Types and causes of different types of corrosion are discussed as well as mitigation techniques including coatings, wrapping, and cathodic protection.						
Instructor: Sidney	TU's	W:	WW:	I:	C: 0.15	D:

Title: Booster Pump Stations						Length: 90 min
Description: The booster pump station course is based on material presented in ACRP's "Operation of Water Distribution Systems" course book. Topics include types of booster stations, typical equipment numbering system for booster station equipment, booster station building components, common mechanical components, common electrical components, typical booster pump station electrical control diagrams and control sequence, safety considerations, and typical start-up and shut-down sequences.						
Instructor: Josh	TU's	W: 0.15	WW:	I:	C:	D: 0.15

Title: Valves - Types and Uses						Length: 60 min
Description: This presentation discusses the various types of valves used in water and wastewater systems, components, construction and function of each, and typical applications.						
Instructor: Sidney	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1

On-Site Courses Approved for Training Units for 2013

Title: Chlorine Disinfection - Wastewater Focus					Length: 90 min	
Description: This wastewater focussed presentation walks the participant through chlorine chemistry, the different forms of chlorine available for disinfection, and chlorine safety. This class devotes time to the safe handling of gaseous and liquid chlorine and reporting requirements under SARA Title III. The class covers recommended doses and contact times for various applications as well as the impact of water chemistry and temperature on disinfection.						
Instructor: Sidney	TU's	W: 0.15	WW: 0.15	I: 0.15	C: 0.15	D: 0.15
Title: Chlorine Disinfection - Water Focus					Length: 90 min	
Description: This water treatment focussed course will discuss the purpose of disinfection, and effect of pH, Temperature, and organic matter on disinfection. Topics will include breakpoint chlorination curve, free and total chlorine, demand calculations, hypochlorite, and chlorine dioxide. Points of application, and operation and maintenance of chlorination equipment will also be covered.						
Instructor: Sidney	TU's	W: 0.15	WW: 0.15	I: 0.15	C: 0.15	D: 0.15
Title: Corrosion Control Basics					Length: 60 min	
Description: This class discusses the different types of corrosion that can occur in water and wastewater treatment systems. The concept of the galvanic cell is introduced as well as the chemical theory behind different types of localized corrosion.						
Instructor: Sidney	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1
Title: Intermediate Corrosion Control					Length: 120 min	
Description: Each of the following methods for controlling corrosion is discussed at length: materials selection, coatings, passive and active galvanic protection, reducing hydrogen sulfide formation through various methods (chemical precipitation, pH control, oxygen addition), are discussed as well as minimizing dead spots. Crown corrosion of manholes and concrete pipe is discussed as well as corrosion issues associated with pump stations.						
Instructor: Sidney	TU's	W: 0.2	WW: 0.2	I: 0.2	C: 0.2	D: 0.2
Title: Controlling Corrosion in Distribution Systems					Length: 120 min	
Description: This class discusses the different corrosion control in distribution systems. The concept of the galvanic cell is introduced as well as the chemical theory behind different types of localized corrosion. Each of the following methods for controlling corrosion is discussed at length: selection of pipe materials, addition of sequestering agents such as polyphosphate, adjustment of water chemistry to form passivating films, addition of film forming agents such as silicates and phosphates, and galvanic protection.						
Instructor: Sidney	TU's	W: 0.2	WW:	I:	C:	D: 0.2
Title: Electrical Basics					Length: 60 min	
Description: Electrical Basics is based on a chapter from ACRP's book "Introduction to Small Water Systems". Topics include: atomic theory, measurements of electricity (volts, amperage, and resistance), types of circuits, direct versus alternating current, single and three-phase power, electromagnetism, and components in electrical systems (transformers, contacts, switches, float switches, pressure switches, and probes).						
Instructor: Sidney	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1

On-Site Courses Approved for Training Units for 2013

Title: Chemistry					Length: 90 min	
Description: Chemistry is based on a chapter from ACRP's book "Introduction to Small Water Systems". Topics include: characteristics of water, structure of an atom, chemical bonding, elements versus compounds, definitions of different types of solids present in water, definition of turbidity and discussion of measurement technique, definitions of pH, alkalinity, and hardness, and introduction to relationships between constituents.						
Instructor: Sidney	TU's	W: 0.15	WW: 0.15	I: 0.15	C: 0.15	D: 0.15
Title: Trenching and Shoring					Length: 120 min	
Description: Two hour class domonstrates the need for a competent site supervisor to evaluate and take necessary steps to maintain a safe work site. Uses OSHA standards as a reference for shoring, benching, and safe operatoin whithin a construction trench.						
Instructor: Josh	TU's	W: 0.2	WW: 0.2	I: 0.2	C: 0.2	D: 0.2
Title: GIS and Asset Management					Length: 60 min	
Description: Utilizing mapping and maintenance management software to reduce maintenance costs and prolong life cycles of equipment.						
Instructor: Josh	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1
Title: Distribution System Valves					Length: 60 min	
Description: Distribution system system valve types and design, repair considerations, and typical uses.						
Instructor: Josh	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1
Title: Math for the Utility Manager					Length: 90 min	
Description: Staffing considerations, budgeting for maintenance, and prioritizing projects will be convered.						
Instructor: Josh	TU's	W: 0.15	WW: 0.15	I: 0.15	C: 0.15	D: 0.15
Title: Communication and Public Relations					Length: 60 min	
Description: Proper communication strategies. Public notification, CCR data and compliance.						
Instructor: Josh	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1
Title: Confined Space Entry					Length: 90 min	
Description: Safety programs, confined space entry requirements and proceedures.						
Instructor: Josh	TU's	W: 0.15	WW: 0.15	I: 0.15	C: 0.15	D: 0.15
Title: Instrumentation and Control					Length: 60 min	
Description: SCADA and WQ instrumentation overview, theory, and concepts						
Instructor: Josh	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1
Title: Using Data to Optimize the Process					Length: 90 min	
Description: Utilizing data to assist in plant optimization. Recognizing "direction" and "speed" with respect to analyzing trainding. Representative sample, correlation strategies.						
Instructor: Josh	TU's	W: 0.15	WW: 0.15	I:	C:	D:

On-Site Courses Approved for Training Units for 2013

Title: Project Management and CIP's					Length: 60 min	
Description: Utilizing Asset management / Data Analysis to determine capital planning						
Instructor: Josh	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1
Title: Management Considerations					Length: 90 min	
Description: 90 minute course covers the management of resources, from financial, manpower, and water supplies. Prioritization techniques, overlapping rate studies, budgets, and Capital Improvement Programs are discussed.						
Instructor: Sidney	TU's	W: 0.15	WW: 0.15	I: 0.15	C: 0.15	D: 0.15
Title: Representative Sampling					Length: 120 min	
Description: This two hour class explains what it means to take a representative sample. We'll look at the language of sampling (populations, standard deviations, variance), the unspoken assumptions, and evaluate various sampling locations. The concept of Data Quality Objectives (DQO's) is introduced as a way to help attendees make informed decisions about where to take samples, whether grabs or composites are appropriate, the level of QA/QC required, sampling containers, and preservation methods. Improve your process control by improving data quality.						
Instructor: Sidney	TU's	W: 0.2	WW: 0.2	I: 0.2	C: 0.2	D: 0.2
Title: Various laboratory procedures, each					Length: 60 min	
Description: These one hour talks cover a variety of laboratory testing procedures used in water and wastewater labs. Each method has its own one hour powerpoint presentation with lots of photographs walking analysts through procedures step by step. Appropriate QA/QC samples for each method are discussed as well as what to do when QA samples are out of limits. Each presentation references back to EPA 200 series methods and Standard Methods.						
Instructor: Sidney	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0	D: 0
Title: BOD, TSS, Alkalinity and Hardness, others					Length: min	
Description:						
Instructor: Sidney	TU's	W:	WW:	I:	C:	D:

On-Site Courses Approved for Training Units for 2013

Title: One Full Day Sampling and Analysis Evaluation						Length: 480 min
Description: This eight?hour on site training course will provide site?specific training on wastewater sampling and laboratory procedures. The intent of this training is to improve sampling and testing procedures at individual facilities by observing and correcting standard operating procedures. Training will include a discussion of representative sampling and a review of clean sampling procedures. Each existing sampling location at the WWTP will be physically visited. The attendees will collect samples according to their standard operating procedures while the instructor observes. After sample collection is complete, the instructor will provide feedback (if needed) on how to improve sampling at that particular location. The instructor will also demonstrate good sampling procedure for various unit processes. Appropriate sampling containers and methods of preservation will also be discussed. Approximately 2 hours will be needed to cover this material. Training will also include an evaluation of on?site laboratory procedures. Attendees will analyze the collected samplesfor various parameters including: BOD, ammonia, fecal coliforms, total suspended solids, total solids, pH, and alkalinity. The instructor will observe each procedure as it is performed and provide feedback (if needed) on how to improve analytical technique. After making any recommendations, the instructor will demonstrate each procedure while explaining each step. Laboratory instruction is expected to take 5 hours. A one hour PowerPoint presentation will be given on quality assurance and quality control samples as recommended by Standard Methods and the Handbook of Good Laboratory Practices.						
Instructor: Sidney	TU's	W: 0.4	WW: 0.8	I: 0.8	C: 0	D: 0
Title: Lab Cram						Length: 420 min
Description: The lab cram walks participants though the most common laboratory tests used for water and wastewater. We highlight the reason for running the test, theory and chemical reactions behind each test, and the basic procedure for each. This presentation is loaded with full color photographs of each step. Ideal for folks who don't run their own lab tests, but need a solid understanding of basic lab procedures.						
Instructor: Sidney	TU's	W: 0.7	WW: 0.7	I: 0.7	C: 0.7	D: 0.7
Title: Federal Pretreatment Program and Pollution Prevention						Length: 150 min
Description: This course discusses the industrial pretreatment and pollution prevention programs. It focuses on how effluent limits for indirect dischargers are determined. The impact of various types of discharges on the collection system, especially FOG, will be discussed. Topics to be covered include: legal authority and the sewer ordinance, setting local limits, categorical limits, types of users connecting to the collection system, and pollution prevention at the source. The pollution prevention portion of the course focusses on how industrial users can decrease water usage and wastewater strength by implementing simple changes on the factory floor. The use of screens, water audits, and other methods is discussed.						
Instructor: Sidney	TU's	W: 0	WW: 0.25	I: 0.25	C: 0.25	D: 0
Title: Completing the Discharge Monitoring Report						Length: 60 min
Description: This presentation discusses the Discharge Monitoring Report and common mistakes and misconceptions. We'll walk through examples of loading calculations, discuss the various types of samples collected included grab, composite, and flow?proporational composites, how to read laboratory data sheets, and more. Participants will receive a hard copy of the State of Colorado's new DMR guidance document for reference.						
Instructor: Sidney	TU's	W: 0	WW: 0.1	I: 0.1	C: 0	D: 0

On-Site Courses Approved for Training Units for 2013

Title: Sources of Discharge Permit Limits					Length: 60 min	
Description: This course shows participants how discharge permit limits are determined. Topics include: water quality based effluent limits (WQBELs), nutrient criteria, low flow analysis, CAM and AMMTOX, anti-degredation, and TMDLs.						
Instructor: Sidney	TU's	W: 0	WW: 0.1	I: 0.1	C: 0	D: 0
Title: Characteristics and Composition of Domestic Wastewater					Length: 90 min	
Description: Domestic wastewater is fairly consistent in composition from treatment plant to treatment plant. Unless there are large industrial contributions, domestic wastewater can be expected to adhere to some basic principals. For example, influent BOD should be between 80 and 120% of the influent TSS. Influent TKN should be around 10 or 20 percent of the influent BOD. We'll look at why these ratios hold true and how they can be used to determine if laboratory data is internally consistent. Knowing typical wastewater characteristics can be extraordinarily helpful in determining whether sample results are representative. Look at your lab data in a whole new light!						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0.15	D: 0
Title: Calculations for Estimating Future Flows and Loads					Length: 90 min	
Description: We'll look at typical wastewater generation rates and water usage rates, population projections, and peaking factors (peak hour, peak day, and max month) and how to use that information to plan for future needs.						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0	D: 0
Title: Lagoons and Natural Systems					Length: 90 min	
Description: This 90?minute section presents the method of operation for lagoons and various fixed film processes including trickling filters, rotating biological contactors, biological aerated filters, and others. Basic design principals are discussed for lagoons as well as biological processes taking place in aerobic, facultative, and anaerobic ponds. Differences between fixed film systems and suspended growth / hybrid systems are discussed as well as typical operating ranges for each system type including hydraulic and organic loading rates. This course is supplemented with many photographs showing different techologies with descriptions of the functions of various pieces such as the plenum, underdrain, and distributors.						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0	D: 0
Title: Fixed Film Treatment Processes					Length: 120 min	
Description: This 90?minute section presents the method of operation for lagoons and various fixed film processes including trickling filters, rotating biological contactors, biological aerated filters, and others. Basic design principals are discussed for lagoons as well as biological processes taking place in aerobic, facultative, and anaerobic ponds. Differences between fixed film systems and suspended growth / hybrid systems are discussed as well as typical operating ranges for each system type including hydraulic and organic loading rates. This course is supplemented with many photographs showing different techologies with descriptions of the functions of various pieces such as the plenum, underdrain, and distributors.						
Instructor: Sidney	TU's	W: 0	WW: 0.2	I: 0.2	C: 0	D: 0

On-Site Courses Approved for Training Units for 2013

Title: Activated Sludge Basics					Length: 60 min	
Description: This course introduces participants to the basics of activated sludge. It presents fundamental concepts such as space loading, F:M ratio, MCRT, SRT, solids loading and flux to the secondary clarifier, and surface overflow rate. We focus on how each of these variables is interrelated and how changing one necessarily changes the others. Typical ranges for conventional and extended aeration activated sludge plants are compared.						
Instructor: Sidney	TU's	W: 0	WW: 0.1	I: 0.1	C: 0	D: 0
Title: Types of Activated Sludge Systems					Length: 90 min	
Description: Different types of activated sludge systems are discussed with a focus on flow patterns (complete mix, plug flow, batch) versus operational method (pureox, conventional, extended aeration, step feed, high rate, etc.). Simple process diagrams and photographs of each process type are included. Pros and cons of each type of system and their associated treatment objectives are also discussed.						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0	D: 0
Title: Activated Sludge Process Control Methodologies					Length: 90 min	
Description: This activated sludge course focuses on process control technologies and can be tailored to a specific treatment plant. The general agenda discusses process control by MCRT and SRT, constant MLSS mass, and food to microorganism ratio. Additional strategies such as DO control, ORP control, selective wasting, use of anoxic and anaerobic selectors, and impact of sidestreams may also be discussed depending on the particular plant where the training takes place.						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0	D: 0
Title: Activated Sludge Microbiology					Length: 60 min	
Description: Activated sludge microbiology gives a broad overview of the role of different microorganisms present in activated sludge and how the dominance of one species over another, especially filaments, can be an indicator to direct plant troubleshooting. The conditions that promote the growth of common activated sludge filaments are discussed along with methods for their control.						
Instructor: Sidney	TU's	W: 0	WW: 0.1	I: 0.1	C: 0	D: 0
Title: Secondary Clarifier Operation and State Point Analysis					Length: 90 min	
Description: This course gives an in-depth discussion of secondary clarifier state point analysis which is a mathematical model used to predict secondary clarifier performance based on sludge settling characteristics, solids loading rate, surface overflow rate, and return activated sludge rate. Participants will actively utilize the model in class for hands-on exercises.						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0	D: 0
Title: Activated Sludge Process Control Tests - Part 1					Length: 90 min	
Description: Activated sludge process control tests discussed in part 1 include: Clarifier depth of blanket, Settleometer, Diluted Settleometer, Sludge Volume Index, and Centrifugal Spin versus gravimetric analysis for TSS. Interpretation of results is stressed.						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0	D: 0

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Title: Activated Sludge Process Control Tests - Part 2					Length: 90 min	
Description: Activated sludge process control tests discussed in part 2 include: Process Control Charts, Cumulative Sum Charts (CUSUM), Winkler DO, Volatile Acids, Oxygen Uptake Rate, and Specific Oxygen Uptake Rate						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0	D: 0
Title: Activated Sludge Troubleshooting					Length: 150 min	
Description: This lengthy troubleshooting course walks participants through basic troubleshooting rules (change one thing at a time, wait at least 2 sludge ages before making another, make little changes not big ones, etc.), interpretation of microbiological examinations, interpretation of activated sludge foaming based on appearance and other characteristics, and how to perform a simple mass balance. Participants are walked through numerous case studies where they are reminded again and again to go back to the basics of what they know about the process and find the one thing that is out of place.						
Instructor: Sidney	TU's	W: 0	WW: 0.25	I: 0.25	C: 0	D: 0
Title: Secondary Clarifier Troubleshooting					Length: 90 min	
Description: Secondary clarifier troubleshooting walks attendees through basic calculations for clarifier process control including solids flux and a basic mass balance. Attendees will learn to recognize the signs of denitrification in the sludge blanket, pin floc, straggler floc, the rolling pattern associated with hydraulic surge, and other common problems encountered in secondary clarifiers.						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0	D: 0
Title: Colorado Nutrient Criteria Review					Length: 60 min	
Description: This course gives an overview of the new Regulation 85 for control of Nutrients and the stream standards for nutrients that were adopted into Regulation 31.						
Instructor: Sidney	TU's	W: 0	WW: 0.1	I: 0.1	C: 0	D: 0
Title: Nitrogen Removal Basics					Length: 60 min	
Description: This presentation covers the basics of biological nitrification and denitrification. It is meant as an introduction to the topic for D and C level operators. The course focuses on the organisms responsible for nitrification and denitrification and their growth requirements as well as a basic explanation of the chemical changes that take place.						
Instructor: Sidney	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0	D: 0.1
Title: Nitrification and Denitrification - Intermediate Level					Length: 120 min	
Description: This presentation covers ammonia removal by non?biological methods, biological nitrification, and denitrification. Topics that are covered include: the organisms responsible for nitrification and denitrification, stoichiometry, variables that impact performance, the different types of unit processes (fixed films and activated sludge) that can be used for nitrogen removal, ion exchange, and breakpoint chlorination.						
Instructor: Sidney	TU's	W: 0	WW: 0.2	I: 0.2	C: 0	D: 0

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Title: Nitrification and Denitrification - Advanced Level					Length: 120 min	
Description: Advanced nitrification and denitrification goes even further and introduces more advanced topics including: sources of nitrogen in wastewater, how influent characteristics impact nitrification and denitrification success, using mass balances to inform process control decisions, and BNR troubleshooting.						
Instructor: Sidney	TU's	W: 0	WW: 0.2	I: 0.2	C: 0	D: 0
Title: Phosphorus Removal Basics - Biological and Chemical					Length: 60 min	
Description: Phosphorus removal basics is an introduction to biological and chemical phosphorus removal. Attendees will learn about the organisms responsible for biological phosphorus removal, the importance of cycling between anaerobic and anoxic/aerobic conditions, the benefits of biological phosphorus removal, and a brief introduction to chemical removal methods.						
Instructor: Sidney	TU's	W: 0	WW: 0.1	I: 0.1	C: 0	D: 0
Title: Biological Phosphorus Removal - Intermediate Level					Length: 60 min	
Description: This 60?minute presentation covers the basics of biological phosphorus removal. Topics include: regulatory drivers, Phosphate Accumulating Organisms (PAOs), luxury uptake of phosphorus, the effect of various operational variables on phosphorus uptake, and the need for tertiary filtration.						
Instructor: Sidney	TU's	W: 0	WW: 0.1	I: 0.1	C: 0	D: 0
Title: Biological Phosphorus Removal - Advanced Level					Length: 90 min	
Description: Advanced biological phosphorus introduces additional topics such as the importance of influent wastewater characteristics, predicting Bio-P success, the influence of side-streams, and troubleshooting.						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0	D: 0
Title: Chemical Phosphorus Removal					Length: 30 min	
Description: Chemical phosphorus removal includes discussion of the metal equivalent to P ratio, impact on overall sludge production depending on where coagulant is added, type of coagulant selected, and treatment goals, the importance of tertiary filtration, and the impact on other treatment processes of adding inert coagulants such as metal salts to the activated sludge process.						
Instructor: Sidney	TU's	W: 0	WW: 0.05	I: 0.05	C: 0	D: 0
Title: Troubleshooting BNR Systems - Basics					Length: 60 min	
Description: Basic BNR troubleshooting reminds participants to go back to the basics of what they know is true about BNR processes as a basis for troubleshooting. Attendees walk through multiple case studies looking for the piece of information that is out of place or contradictory to other information given. In the Basics course, the focus is on evaluating process control data and control charts.						
Instructor: Sidney	TU's	W: 0	WW: 0.1	I: 0.1	C: 0	D: 0
Title: Troubleshooting BNR Systems - Intermediate					Length: 90 min	
Description: Intermediate BNR troubleshooting steps things up a notch with more difficult case studies. Participants must take additional information into account such as influent characteristics, BOD:N and BOD:P ratios, and sidestreams from solids handling processes.						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0	D: 0

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Title: Troubleshooting BNR Systems - Advanced					Length: 90 min	
Description: Advanced BNR troubleshooting adds additional tools such as performing mass balances, microscopy, OUR and SOUR testing, and more to the troubleshooting toolbox.						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0	D: 0
Title: Introduction to Solids Handling					Length: 180 min	
Description: This two?hour presentation introduces participants to various solids handling processes including dissolved air floatation thickening, aerobic digestion, anaerobic digestion, gravity thickening, belt presses, centrifuges, and rotary drum thickeners. The biological mechanisms behind aerobic and anaerobic digestion are discussed with a focus on the specialized organisms responsible. Typical operating parameters for each unit process are presented along with methods for calculating them. A brief overview of the 503 regulations and the need for biosolids processing kicks off this informative presentation.						
Instructor: Sidney	TU's	W: 0	WW: 0.3	I: 0.3	C: 0	D: 0
Title: Aerobic Digestion					Length: 60 min	
Description: This course focusses specifically on aerobic digestion including: typical design and operating parameters, using on/off aeration to maintain near neutral pH, controlling foaming, importance of regular decanting, odor potential, and process control calculations specific to aerobic digestion.						
Instructor: Sidney	TU's	W: 0	WW: 0.1	I: 0.1	C: 0	D: 0
Title: Anaerobic Digestion					Length: 120 min	
Description: This course focusses specifically on anaerobic digestion with a focus on components (parts and purpose including lids, gas collection, mixing techniques, heat exchangers, and more), typical design and operating criteria, indications of souring, and process control calculations specific to anaerobic digestion.						
Instructor: Sidney	TU's	W: 0	WW: 0.2	I: 0.2	C: 0	D: 0
Title: Troubleshooting Anaerobic Digestion					Length: 120 min	
Description: The anaerobic digestion troubleshooting course opens with a brief discussion of typical design and operating conditions followed by a four part case study published as a training exercise by the Water Environment Federation. Attendees will review lab data for a digester that is souring in one week chunks. They must perform process control calculations, determine whether or not an upset is impending or already occuring, and decide what actions to take to correct the problem. Based on the group decisions, they will receive additional data that reflects the impact of their decision. Gradually, each group will bring their digester back on-line with a combination of lime dosing, seeding from a secondary digester, and manipulating VSS feed rate. As a final challenge, attendees must determine the source of increased loading to the digesters. A great way to reinforce concepts learned in more basic classes.						
Instructor: Sidney	TU's	W: 0	WW: 0.2	I: 0.2	C: 0	D: 0
Title: Sludge Stabilization Techniques in Addition to Digestion					Length: 90 min	
Description: This course discusses sludge stabilization techniques such as lime stabilization and composting as alternatives to traditional digestion methods.						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0	D: 0

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Title: Dewatering - Sludge Conditioning					Length: 90 min	
Description: Sludge conditioning discusses jar testing to determine the best chemical and dose to achieve the best dewatering at the lowest cost. Also discussed are the importance of chemical addition point, aging of dry polymer, feed water quality, and impact on other unit processes.						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0	D: 0

Title: Dewatering - Belt Filter Presses					Length: 90 min	
Description: This course is devoted to operation and maintenance of belt filter presses. It begins with a thorough discussion of belt filter press theory followed by a close examination of the components of the press itself. The second half of the course is devoted to process control calculations specific to belt filter presses followed by a section on troubleshooting.						
Instructor: Sidney	TU's	W: 0	WW: 0.15	I: 0.15	C: 0	D: 0

Title: Dewatering - Centrifuges					Length: 60 min	
Description: This course is devoted to operation and maintenance of centrifuges. It begins with a thorough discussion of centrifugal dewatering theory followed by a close examination of the equipment components. The second half of the course is devoted to process control calculations and adjustments specific to centrifuges followed by a section on troubleshooting.						
Instructor: Sidney	TU's	W: 0	WW: 0.1	I: 0.1	C: 0	D: 0

Title: Intro to Collection Systems					Length: 60 min	
Description: This class presents an overview of the collection system and discusses its primary components and types. Placement of interceptors along natural drainages, manhole placement, pump station function, and inflow and infiltration are discussed. Collection system architecture is compared to distribution system architecture. The following topics are also covered: minimum slopes for given pipe diameters, preferred d/D ratios, scour at peak hour flows, pipe materials, velocities in force mains, hydraulic gradeline, and causes of surcharging.						
Instructor: Sidney	TU's	W: 0	WW: 0.1	I: 0.1	C: 0.1	D: 0

Title: Collection System Inspection and Testing					Length: 180 min	
Description: This three hour course introduces participants to the purposes and methods of collection system inspection, testing, and cleaning including: closed circuit television inspections, smoke testing, dye testing, sewer balling, jetting, rodding, flushing, and bucketmachines. The importance of maintaining good system records and maps of the collection system is emphasized. Collection system modeling and GIS concepts are introduced as they relate to maintenance records. Participants will learn to identify problems in existing pipelines, locate storm sewer connections to the sanitary sewer, estimate inflow and infiltration, and identify deposits of oil and grease. Participants will view actual CCTV footage.						
Instructor: Sidney	TU's	W: 0	WW: 0	I: 0	C: 0.3	D: 0

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Title: Pretreatment and the Sewer Ordinance					Length: 180 min	
Description: Pretreatment and the Sewer Ordinance: This three hour course discusses the industrial pretreatment and pollution prevention programs. It focuses on how effluent limits for indirect dischargers are determined. The impact of various types of discharges on the collection system, especially FOG, will be discussed. Topics to be covered include: legal authority and the sewer ordinance, setting local limits, categorical limits, types of users connecting to the collection system, and pollution prevention at the source. Participants will walk through case studies to see how an industrial pretreatment or hauled waste monitoring program is put together.						
Instructor: Sidney	TU's	W: 0	WW: 0.3	I: 0.3	C: 0.3	D: 0
Title: Collection Systems Design					Length: 90 min	
Description: Overview of the collection system and discusses its primary components and types minimum slopes for given pipe diameters, preferred d/D ratios, scour at peak hour flows, pipe materials, and velocities in force mains.						
Instructor: Josh	TU's	W:	WW: 0.15	I:	C: 0.15	D:
Title: Controlling Hydrogen Sulfide Formation in the Collection System					Length: 60 min	
Description: Discussion of acceptable H2S levels in the collection system and methods to mitigate formation to prevent corrosion control and health hazards.						
Instructor: Josh	TU's	W:	WW: 0.1	I: 0.1	C: 0.1	D:
Title: Inflow and Infiltration					Length: 60 min	
Description: Detecting and controling pipe infiltration and exfiltration, sealing options, cure in place point repair, root control, and more.						
Instructor: Josh	TU's	W:	WW: 0.1	I: 0.1	C: 0.1	D:
Title: Inspection and Testing					Length: 90 min	
Description: Fats oils and grease, CCTV inspections. Capital improvement decision making						
Instructor: Josh	TU's	W:	WW: 0.15	I: 0.15	C: 0.15	D:
Title: Lift Stations					Length: 90 min	
Description: Cyclic and single stage design operation and maintenance of lift stations						
Instructor: Josh	TU's	W:	WW: 0.15	I:	C: 0.15	D:
Title: Manholes					Length: 60 min	
Description: Invert and outlet elevation requirements, manhole construction and design, drop manholes, split flow, pipe materials, velocities in force mains, hydraulic gradeline, and causes of surcharging.						
Instructor: Josh	TU's	W:	WW: 0.15	I:	C: 0.15	D:
Title: Operation and Maintenance Activities					Length: 60 min	
Description: purposes and methods of collection system inspection, testing, and cleaning including: closed circuit television inspections, smoke testing, dye testing, sewer balling, jetting, rodding, flushing, and bucket machines. CCTV footage.						
Instructor: Josh	TU's	W:	WW: 0.1	I: 0.1	C: 0.1	D:

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Title: Operations and Maintenance - Point repairs, CIP					Length: 90 min	
Description: Rehabilitation techniques including cure in place, grouting, epoxy, and line / manhole replacement						
Instructor: Josh	TU's	W:	WW: 0.15	I:	C: 0.15	D:
Title: Operations and Maintenance Odor Control					Length: 60 min	
Description: Chemical and mechanical odor control methodologies.						
Instructor: Josh	TU's	W:	WW: 0.1	I:	C: 0.1	D:
Title: Managing Sanitary Sewer Overflows (SSOs)					Length: 90 min	
Description: Safety, customer service, and environmental impacts of sanitary overflows. Prevention, remediation, and predictions.						
Instructor: Josh	TU's	W:	WW: 0.1	I:	C: 0.1	D:
Title: Effect of Water Treatment Residuals on WWTP Performance					Length: 30 min	
Description: The City of Boulder experimented with exposing biofilm samples grown in their rock media trickling filters to increasing concentrations of ferric residuals from their water treatment plant. This brief, 30 minute talk presents the results of those experiments and presents information related to the industrial pretreatment permit that the WWTP issued to the WTP for residuals control.						
Instructor: Sidney	TU's	W: 0	WW: 0.05	I: 0.05	C: 0	D: 0
Title: Effect of Alkalinity Type and Concentration on Nitrifying Biofilm Activity					Length: 30 min	
Description: Nitrifying bacteria are dependent on alkalinity to buffer pH changes and to provide an inorganic carbon source for growth. This brief, 30 minute presentation details experiments conducted at the Littleton/Englewood WWTP to discover how much alkalinity was required. Literature values cite a lower limit of 100 mg/L as calcium carbonate alkalinity, but the lower limit found here may surprise you.						
Instructor: Sidney	TU's	W: 0	WW: 0.05	I: 0.05	C: 0	D: 0
Title: Optimizing the TF/SC Process for Nitrification					Length: 30 min	
Description: This brief presentation compares field data collected at the Boulder 75th Street WWTP from their trickling filter activated sludge process to a theoretical model proposed by Glen Daigger. The model predicts nitrification in TF/SC systems which are not designed to nitrify. The effect of small changes in SRT from 1.8 to 2.3 days are discussed as well as impacts on their downstream nitrifying tricking filter.						
Instructor: Sidney	TU's	W: 0	WW: 0.05	I: 0.05	C: 0	D: 0
Title: Denitrification with Carbonaceous Trickling Filters					Length: 30 min	
Description: The Littleton/Englewood WWTP experimented with recycling fully nitrified effluent back to the head of the treatment plant to encourage denitrification in the roughing filters. Carbonaceaous biofilms can be quite thick, but only the upper 200 microns are aerobic. The remaining volume of biofilm is potentially available for denitrification. Denitrification rates were determined for biofilm samples collected at various points within the filter.						
Instructor: Sidney	TU's	W: 0	WW: 0.05	I: 0.05	C: 0	D: 0

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Title: Comparing Gravimetric with Spin Data: Accuracy of Process Control Calculations					Length: 30 min	
Description: Many operators rely on centrifugal spin data for process control calculations. This presentation compares side by side gravimetric and spin data from two different treatment plants. The conclusion: centrifugal spin data results depend on sludge settling characteristics and cannot be used to guestimate solids concentrations in the aeration basin.						
Instructor: Sidney	TU's	W: 0	WW: 0.05	I: 0.05	C: 0	D: 0
Title: Introduction to Small Water Systems					Length: 90 min	
Description: Introduction to Small Water Systems is based on a chapter from ACRP's book "Introduction to Small Water Systems". Topics include: A description of water and its properties, the distribution of water on earth, types of water systems and percentage of population using each, information specific to Colorado water system types, typical water use and demands, how the hydrologic cycle works, functions of a water system, how diseases are transported by water, historically significant facts about water systems including disinfection and fluoridation, and the various classes of public water systems and basic configurations.						
Instructor: Sidney	TU's	W: 0.15	WW:	I:	C:	D: 0.15
Title: Microbiology for Water and Distribution Operators					Length: 60 min	
Description: Microbiology is based on a chapter from ACRP's book "Introduction to Small Water Systems". Topics include: differences between viruses, bacteria, and protozoans, and algae. Discussion focusses on waterbone pathogens and the importance of sampling to protect public health.						
Instructor: Sidney	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1
Title: Hydraulics					Length: 120 min	
Description: Hydraulics is based on a chapter from ACRP's book "Introduction to Small Water Systems". Topics include: weight and density of water, force and pressure, velocity and flow, and basic concepts for pumped systems including defining head, head loss, static, dynamic, suction lift, suction head, and major and minor losses.						
Instructor: Sidney	TU's	W: 0.2	WW: 0.2	I: 0.2	C: 0.2	D: 0.2
Title: Water Sources Part 1					Length: 90 min	
Description: Water Sources Part 1 is based on a chapter from ACRP's book "Introduction to Small Water Systems". Topics include: definition of surface water, examples of surface water, surface water hydrology, surface water intake structures, the types of pumps used to collect surface water, and transmission lines.						
Instructor: Sidney	TU's	W: 0.15	WW:	I:	C:	D: 0.15
Title: Water Sources Part 2					Length: 90 min	
Description: Water Sources Part 2 is based on a chapter from ACRP's book "Introduction to Small Water Systems". Part 2 focusses on groundwater. Topics include: Definition of groundwater, advantages and disadvantages of groundwater, GWUDI's, types of aquifers, water movement through an aquifer (permeabiity and porosity), cone of depression, zone of influence, drawdown, static water level, well location criteria, well components, well pumps, and data and record keeping requirements.						
Instructor: Sidney	TU's	W: 0.15	WW:	I:	C:	D: 0.15

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Title: Water Treatment Part 1						Length: 120 min
Description: Water Treatment Part 1 is based on a chapter from ACRP's book "Introduction to Small Water Systems". Topics include: Reasons for water treatment, treatment goals, overview of conventional and direct filtration water treatment (coagulation, flocculation, sedimentation, and filtration), jar testing, and membrane treatment plants.						
Instructor: Sidney	TU's	W: 0.2	WW:	I:	C:	D: 0.2

Title: Water Treatment Part 2						Length: 120 min
Description: Water Treatment Part 2 is based on a chapter from ACRP's book "Introduction to Small Water Systems". Part 2 is focussed on disinfection. Topics include: purpose of disinfection, treatment goals, primary and secondary disinfection, forms of chlorine used in water treatment, properties of chlorine gas, chlorine gas safety, properties of sodium hypochlorite and calcium hypochlorite, overview of disinfecting with hypochlorite, alternate disinfectants (on-site generation, chlorine dioxide, and chloramines), advantages and disadvantages of each disinfectant type, disinfection byproduct formation, feeding chlorine and the breakpoint curve (dose, demand, and residual), and impact of process variables on disinfection efficiency (temperature, pH, residence time),						
Instructor: Sidney	TU's	W: 0.2	WW:	I:	C:	D: 0.2

Title: Well Systems						Length: 60 min
Description: This sixty minute class discusses types of aquifers, recharge zones, well construction, and well terminology including: zone of influence, cone of influence, static water level, pumping water level, drawdown, yield, and specific yield. Setback requirements from community sewer lines, underground storage tanks, and other potential contamination sources are presented as well as the relative merits of groundwater versus surface water sources. Participants are given an overview of the new groundwater monitoring rule which was promulgated in January 2007.						
Instructor: Sidney	TU's	W: 0.1	WW:	I:	C:	D: 0.1

Title: Intro to Distribution Systems						Length: 90 min
Description: This presents an overview of the distribution system and discusses its primary components including wells. Arterial loop versus branched type systems and placement of valves and storage tanks are discussed. The presentation discusses water age and how it relates to water quality at the customer's tap.						
Instructor: Sidney	TU's	W:	WW:	I:	C:	D: 0.15

Title: Intermediate Topics in Distribution Systems						Length: 180 min
Description: Intermediate Topics in Water Distribution Systems is based on a chapter from ACRP's book "Introduction to Small Water Systems". Topics include: Functions of a distribution system, common distribution piping materials, common methods of connecting distribution piping materials, common distribution system fittings, valves, and fire hydrants, common fire hydrants and their major components and function, common reservoirs and their major components and function, common household service equipment and function, common methods for controlling cross-connections, and basic operation and maintenance requirements of a distribution system.						
Instructor: Sidney	TU's	W:	WW:	I:	C:	D: 0.3

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Title: Water Storage						Length: 60 min
Description: This sixty minute presentation covers the basics of water storage tank design, inlet and outlet piping arrangements, using PRVs and altitude valves to maintain fill volumes and water pressure, and tank ventilation. Both stand pipes and reservoir type tanks are discussed. Maintenance procedures for ventilation screens and tank painting/cleaning are covered. Effects of storage time and condition on water quality parameters, particularly THMs and HAAs are discussed.						
Instructor: Sidney	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1
Title: Regulations Part 1						Length: 90 min
Description: Regulations and Monitoring is broken into two parts because of the extensive amount of information covered. This course provides an overview of the SDWA with specific references to the Colorado Regulations. Topics covered in part 1 include: a brief history of the development of the existing drinking water regulations, the major components of the drinking water regulations, how the regulations are applied to systems of various sizes, the difference between primary and secondary MCLs, and major groups of regulated compounds. Major rules discussed in Part 1 include: Lead and Copper Rule, Fluoride Rule, Total Coliform Rule, Arsenic Rule, Phase I/II/IIB/V Rules, and Groundwater Rule.						
Instructor: Sidney	TU's	W: 0.15	WW:	I:	C:	D: 0.15
Title: Regulations Part 2						Length: 90 min
Description: Specific regulations discussed in Part 2 include: Surface Water Treatment Rule, Filter Backwash Recycling Rule, Long-term Enhanced Surface Water Treatment Rules 1 and 2, Disinfection Byproducts Rules 1 and 2, and Radionuclides Rule.						
Instructor: Sidney	TU's	W: 0.15	WW:	I:	C:	D: 0.15
Title: Lead and Copper Rule						Length: 60 min
Description: This one hour class presents need to know information for the Lead and Copper Rule including basis of regulation, health effects of lead and copper, lead and copper MCLs, and sampling procedures for field personnel. The regulatory requirements for action when the MCL is exceeded on an acute and chronic basis are presented.						
Instructor: Sidney	TU's	W: 0.1	WW: 0	I: 0	C: 0	D: 0.1
Title: Total Coliform Rule						Length: 60 min
Description: This one hour presentation discusses the Total Coliform Rule including reasoning behind the rule, definition of an indicator organism, sampling requirements, required actions for positive samples, and public notification requirements.						
Instructor: Sidney	TU's	W: 0.1	WW: 0	I: 0	C: 0	D: 0.1
Title: LT2ESWTR and DBPR2 Rules						Length: 60 min
Description: This one hour presentation introduces the sister regulations designed to minimize microbial contaminants in the water supply while simultaneously protecting against over?chlorination and the formation of harmful disinfection byproducts. Formation of THMs and HAAs are discussed along with sampling requirements and new terminology introduced in stage two such as the LRAA.						
Instructor: Sidney	TU's	W: 0.1	WW: 0.05	I: 0.05	C: 0	D: 0.1

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Title: Water Treatment Sources						Length: 60 min
Description: This 60 minute course covers the Hydrologic cycle, a brief overview of water rights, surface water, groundwater, and reclaimed water. Physical impoundments, reservoirs, and intake structures will be discussed. Sourcewater selection and protection will include sanitary survey information, physical, biological, radiological, and chemical characteristics of potential source waters, and basic math including acre ft and demand, and residence time calculations						
Instructor: Josh	TU's	W: 0.1	WW:	I:	C:	D: 0.1
Title: Coagulation						Length: 60 min
Description: This 60 minute course covers coagulant alternatives, basic coagulant chemistry, and mixing (methods and types of mixers), coagulation basins. Attendants will learn about optimum pH and saturation conditions, floc density, and enhanced coagulation treatment techniques.						
Instructor: Josh	TU's	W: 0.1	WW:	I:	C:	D: 0.1
Title: Flocculation						Length: 90 min
Description: This 90 minute course will cover floc formation processes, baffling, paddle mixing, and basic math of flocculation, including detention times, basin volume calculations, and settling times. Course will also cover performing a Jar Test.						
Instructor: Josh	TU's	W: 0.15	WW:	I:	C:	D: 0.15
Title: Sedimentation						Length: 60 min
Description: This 60 minute course will cover sedimentation basin zones, basin types, and processes, and basic math of sedimentation, including detention times, basin volume calculations, settling times, and weir overflow rates. Floc characterization, effluent NTU's and filterability indicators and sludge handling techniques and removal systems will also be covered.						
Instructor: Josh	TU's	W: 0.1	WW:	I:	C:	D: 0.1
Title: Drinking Water Regulations						Length: 60 min
Description: This 60 minute course will cover the CDPHE Primary Drinking Water Regs, including the new Groundwater Rule, DBP Rule, and ESWTR.						
Instructor: Josh	TU's	W: 0.1	WW:	I:	C:	D: 0.1
Title: Instrumentation and Control						Length: 60 min
Description: This 60 minute course will cover basic remote monitoring and automation technologies, including SCADA, Remote IO, Radio, Telemetry, and operations control strategies. It will also dover basic instrumentation, including pressure switches, level monitoring equipment, flow measurement equipment, and basic online water quality instrumentation.						
Instructor: Josh	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1
Title: Water Plant Operations						Length: 60 min
Description: This 60 minute course will cover tools and methodologies to optimize treatment performance. Topics include using data and trends to measure performance, predicting demand and water quality changes, optimizing chemical dosages, and documentation.						
Instructor: Josh	TU's	W: 0.1	WW:	I:	C:	D: 0.1

On-Site Courses Approved for Training Units for 2013

Title: Taste and Odors						Length: 60 min
Description: This 60 minute course will focus on controlling and preventing taste and odor indicators and causes in source water, and treatment of taste and odor in the treatment process. Blue green algae prevention and treatment strategies, and other treatment strategies will be discussed. Customer service, customer notification, and responding to taste and odor events will also be discussed.						
Instructor: Josh	TU's	W: 0.1	WW:	I:	C:	D: 0.1
Title: Water Lab Procedures						Length: 90 min
Description: This 90 minute course ill cover basic water laboratory procedures, including basic metric system math, basic chemical names and formulas, and basic laboratory equipment. Titrations, dilutions, QA/AC will be discussed, and sampling techniques will also be covered. Several specific tests will be covered, including titrating for alkalinity, free and total chlorine, and using spectrophotometers.						
Instructor: Josh	TU's	W: 0.15	WW:	I:	C:	D: 0.15
Title: Advanced Water Treatment						Length: 90 min
Description: This 90 minute course will cover advanced water treatment technologies, including ion exchange, membranes, UV, AOP, and Ozone.						
Instructor: Josh	TU's	W: 0.15	WW:	I:	C:	D: 0.15
Title: Pumps and Motors						Length: 60 min
Description: This 60 minute course will cover different types of pumps and motors and will include typical uses. Basic pump curves, horsepower calculations, basic hydraulics, and pressure conversions will be discussed.						
Instructor: Josh	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1
Title: Maintenance						Length: 60 min
Description: This 60 minute course will cover predictive, preventative, and corrective maintenance strategies. It will address maintaining electrical equipment, mechanical equipment (general pump maintenance including lubrication and impellers,) compressors, valves, and basic engine maintenance.						
Instructor: Josh	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1
Title: Filtration						Length: 90 min
Description: This 90 minute course will cover types of filters, types of medias, and filter operations, including backwashing and surface washing techniques. Filtration interactions with other treatment processes, including sludge lagoons, sedimentation effluent weirs, and polishing filters will also be discussed. Particle counters and Turbidity measurements for performance indication, data documentation, and other filter surveillance strategies will also be discussed.						
Instructor: Josh	TU's	W: 0.15	WW:	I:	C:	D: 0.15
Title: Record Keeping						Length: 60 min
Description: This 60 minute course will cover record keeping requirements for compliance with CDPHE PDWR's and will also discuss data storage and operator and maintenance logs theories and best practices.						
Instructor: Josh	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1

On-Site Courses Approved for Training Units for 2013

Title: Operations Safety					Length: 90 min	
Description: This 90 minute course will cover basic operations safety, and will include emergency response, fire safety, vehicle/traffic safety, PPE, slip trip and fall hazards, and spill prevention and response.						
Instructor: Josh	TU's	W: 0.15	WW: 0.15	I: 0.15	C: 0.15	D: 0.15
Title: Alternate Treatment Technologies					Length: 90 min	
Description: Students will learn about non conventional treatment methods, including Dissolved Air Flotation and Biological Filtration. Pros and cons will be evaluated as well as other potential impacts, including residuals management						
Instructor: Josh	TU's	W: 0.15	WW: 0.15	I:	C:	D: 0.15
Title: Ion Exchange					Length: 60 min	
Description: Ion Exchange operations and maintenance, selecting resins, recharge and regeneration techniques, loading, residuals management will be covered						
Instructor: Josh	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1
Title: Membranes					Length: 90 min	
Description: Students will be expoesed to the design, operation and maintenance of all membrane types, RO, Nano, Ultra, Micro, and cleaning methodologies. Capital considerations, and residulas management will also be covered.						
Instructor: Josh	TU's	W: 0.15	WW: 0.15	I:	C:	D:
Title: Distribution System Design and Administration					Length: 90 min	
Description: Population, Fire Flow, Tank and Buffering Considerations						
Instructor: Josh	TU's	W: 0.15	WW:	I:	C:	D: 0.15
Title: Distribution System O&M Pumps					Length: 90 min	
Description: Pumping Theory, Part diagrams and identification of Positive displacement and centrifugal pumping systems						
Instructor: Josh	TU's	W: 0.15	WW: 0.15	I: 0.15	C: 0.15	D: 0.15
Title: Piping Materials and Water Mains					Length: 60 min	
Description: Distribution piping materials and characteristics for consideration in repair and replacements, new design.						
Instructor: Josh	TU's	W: 0.1	WW:	I:	C: 0.1	D: 0.1
Title: Meters and Service Lines					Length: 60 min	
Description: Service connections, metering devices, instalation and repair of service lines						
Instructor: Josh	TU's	W:	WW:	I:	C:	D: 0.15
Title: Distribution System O&M Main Breaks					Length: 90 min	
Description: Main Breaks/Leak detection						
Instructor: Josh	TU's	W:	WW:	I:	C: 0.15	D: 0.15

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Title: GIS and AMS					Length: 60 min	
Description: Mapping and Asset management theory and techniques						
Instructor: Josh	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1
Title: Fire Hydrants					Length: 60 min	
Description: Fire hydrant types and components. Operation and maintenance of hydrants.						
Instructor: Josh	TU's	W: 0.1	WW:	I:	C:	D: 0.1
Title: Water Quality/DBPs					Length: 90 min	
Description: Reducing water age, understanding the relationship between TOC and Free Chlorine, IDSE's, max residence times, controlling nitrification, removing TOC with enhanced coagulation.						
Instructor: Josh	TU's	W: 0.15	WW:	I:	C:	D: 0.15
Title: Cross Connection					Length: 60 min	
Description: Overview of a proprely implemented cross connection control program, types of devices						
Instructor: Josh	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1
Title: Distribution System Regs in Colorado					Length: 240 min	
Description: 4 hour class featuring the Lead and Copper Rule, Disinfection By Products, Total Coliform Rule, and a hands on chlorine sampling and residual measurement excersize.						
Instructor: Josh	TU's	W: 0.35	WW:	I:	C:	D: 0.35
Title: DBP's					Length: 90 min	
Description: Controlling DBP's in the Distribution system by optimizing disinfectant dosage, optimizing Operatinal strategies, and controlling source water TOC, Disinfection By products regulatory overview of best operational practices for reduction of DBP creation potential						
Instructor: Josh	TU's	W: 0.15	WW:	I:	C:	D: 0.15
Title: Distribution Storage					Length: 90 min	
Description: Balancing system storage to meet demand, detention time, water quality, and emergency conditions. Analysis of annyual and daily demand fluctuations.						
Instructor: Josh	TU's	W: 0.15	WW:	I:	C:	D: 0.15
Title: Distribution System Management and Administration					Length: 60 min	
Description: Resource allocation and budgeting activities						
Instructor: Josh	TU's	W: 0.15	WW: 0.15	I: 0.15	C: 0.15	D: 0.15
Title: Distribution System Operation and Maintenance					Length: 75 min	
Description: Scheduled Maintenance Activities Pump operation and mainteneance, troubleshooting						
Instructor: Josh	TU's	W: 0.15	WW:	I:	C:	D: 0.15
Title: Distribution System Operator Safety					Length: 60 min	
Description: Trenching, Shoring, Traffic, and Confined Space activities						
Instructor: Josh	TU's	W: 0.1	WW: 0.1	I: 0.1	C: 0.1	D: 0.1

On-Site Courses Approved for Training Units for 2013

Title: Distribution System Water Quality					Length: 60 min	
Description: Nitrification, DBP's, Taste and Odor, Dirty Water						
Instructor: Josh	TU's	W: 0.1	WW:	I:	C:	D: 0.1
Title: Flushing for Water Quality					Length: 60 min	
Description: Unidirectional and Annual system flushing techniques						
Instructor: Josh	TU's	W:	WW:	I:	C:	D: 0.1
Title: Lead and Copper Rule					Length: 60 min	
Description: Overview and compliance with Stage 2 DBP rule. Distributino system BMP's and optimization						
Instructor: Josh	TU's	W: 0.1	WW:	I:	C:	D: 0.1
Title: Total Coliform Rule					Length: 60 min	
Description: Overview and compliance with TCR. Distribution system BMP's and optimization						
Instructor: Josh	TU's	W: 0.1	WW:	I:	C:	D: 0.1