

November 1, 2024

Judy Grycko
OESAC CEU COMMITTEE
PO Box 577
Canby, OR 97013-0577

Subject: *Level 1 Wastewater Operator Course 2025 Accreditation Renewal*

Dear Judy,

Thank you for your recent correspondence with our team. We appreciate your consideration towards renewal of the 24-Module *Level 1 Wastewater Operator Course* of 2.0 accreditation CEUs and 20.0 Training Credit Hours. Jacobs will provide project and regional resources to help those who enroll for this course. Course accountability will be documented by a signed attendance sheet and the module quiz scores will be tracked.

This course is not intended to mimic other institutional correspondence courses. This course is instead tuned to emphasize the unique challenges and needs encountered by the facilities we are contracted to operate. This course defines Operator operations and maintenance field best practices and expectations while in the field. The module narrative is complimented with graphic field images, or descriptive videos so the operator can more effectively comprehend and relate to the material presented.

As the course Instructor, I have 36 years of applied wastewater experience as an operator, microbiologist, and senior wastewater technical specialist. I hold a current Grade 4 Wastewater Certification in Tennessee. My area of expertise includes wastewater process control, microbiology, and training of operators in these areas. I also provide technical support for project databases, HACH WIMS, and our companies process control systems, (CPCS).

We hope your State will renew this course with the CEU equivalency of 20 hours or 2.0 CEUs. Thank you for your review and assigning the appropriate CEUs. If you require any additional information, please feel free to reply via email or call.

Sincerely,



Dave Sanford
Jacobs Senior Technical Consultant
+1(865) 599-8575
Dave.Sanford@jacobs.com

Attachments: Online Course Renewal Fee
Level 1 Wastewater Course Syllabus
Dave Sanford, Curriculum Vitae

Pay Registration Fees

Below is the course you just entered. You must now pay the registration fee(s).

You will be able to add documents attached to the course after paying.

[Paypal](#)[Cancel Registration](#)

Course Title

Level 1 Wastewater Operator Course

Target Audience

WW Operators

Instructor

Dave Sanford

Training Location

Online/ Training Rm

Dates

To be Determined

DWP CEUs**WW CEUs**

2.00

OnsiteInstall CEUs**OnsiteOandM CEUs****MaxCEUs**

2

Fees Charged

175

SponsorID

0

CurrentContactName

Annie Smith

Business Name

Jacobs Engineering Group, Inc.

ContactAddress

2020 SW Fourth Ave., Ste. 300

ContactCity

Portland

ContactState

OR

ContactZip

97201

CurrentContactPhone

4807719300

CurrentContactFax**CurrentContactEmail**

Annie.Smith@jacobs.com

Date Course**Received**

11/1/2024

Fees Paid**CheckNumber****PrelimAprvDate****MailedReceipt****Final Approval Date**

1/1/1900

HomeStudy

no

Recurring

yes

URL**TakeOffWeb****Inactive**



Moderated



Does Course Promote a Product?

no

BetaTested

NA

In House?

yes

Comments

Please see course Syllabus

SponsorID

0

Sponsor's Business

Name

Jacobs Engineering Group, Inc.

Sponsor's Address

2020 SW Fourth Ave., Ste. 300

Sponsor's City

Portland

Sponsor's State

OR

Sponsor's Zipcode

97201

Sponsor's Phone

4807719300

Sponsor's Fax

Sponsor's Name

Annie Smith

Sponsor's Email

Annie.Smith@jacobs.com

thank you

This is your receipt for:

Level 1 Wastewater Operator Course

Course ID: 11374

Fees Charged: \$175.00

date paid: 11/01/2024

Next steps:

Your course application will be reviewed and the administrator will contact you with any concerns.

Accurate course applications will be forwarded to the CEU committee for approval.

Until moderator ok's your course you will see your course in the "Waiting for Moderator's OK"



Level 1 Wastewater Operator Course

OMFS Training Series
2024 Syllabus Course Description
Operations Group

Revision	Date	Description	Author	Checked	Reviewed	Approved

Level 1 Wastewater Course Syllabus

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Executive Summary

The OMFS Technical Services Group, in conjunction with the Operations Group, approved an initiative to gather historical and institutional training materials to reconstruct and reconfigure our Operations and Management (O&M) Training Program.

This program was intended to be convenient and practical for busy Operators. In addition to providing institutional materials, this program will create new formats and content flow, coupled with innovative approaches and coaching delivery. Our training program is meant to be accredited by all Regulatory Authorities.

Training course materials will be delivered in the format requested by each State. Participating States will assign CEU values or equivalent. Jacobs will utilize an internal framework to file training materials, enrolled participants, participant attendance signatures, and completed quiz/test scores. Course accountability will be documented by a course completion sign-off sheet and verified by the Training Program Administrator.

Our training program has been prioritized to be offered to our Operators as soon as possible and be incorporated into Jacobs eLearning platform. It is expected the Training Program will quickly evolve to reflect the needs of the Operations Group and Leadership.

1. Course Syllabus Description

The *Level 1 Wastewater Operator Course* was developed with the inexperienced Operator in mind. This course is not intended to compete with industry recognized technical training courses (i.e., Water Otter, or University of California Sacramento Ken Kerri Courses), nor is it intended to compete with group learning tools like (Jacobs Operator Bookshelf).

The *Level 1 Wastewater Operator Course* is intended to provide the individual Operator with State recognized CEU valued Modules, containing foundational wastewater information and practices that are applied and relatable to the unique Projects we serve, with active, visual examples. In this course the Operator will be introduced to:

- a) Basic Wastewater Characteristics
- b) Foundational Wastewater Treatment Schemes
- c) Effectively Address Treatment Challenges
- d) Basic Asset Management Responsibilities
- e) Proven Operator Industry Standard Field Practices
- f) Industry Standard Record Keeping and Reporting Practices
- g) Effective Habits for Training Material Field Application and Retention
- h) Compliment and Support other Jacobs Training Programs

The *Level 1 Wastewater Operator Course* consists of 24 Modules designed to on average take approximately 30-45 minutes to review and complete at the Operator's convenience with exception to three more extensive modules regarding activated sludge and anaerobic digestion. Each Module will include:

- Simple Text (designed for ease of reading and comprehension)
- Content Examples
- Content Diagrams and Videos
- Module Quiz

Each Module encourages and provides examples of technical materials that can be practiced until confidence and material is understood and retained. Course retention is critical. Technical Coaches will be provided to help Operators understand and practice/apply what they have learned. The Operator Bookshelf (containing electronic flipbooks) is a companion of this Course and can be taken by the Project Team as an entry to this *New Operator Orientation Course*.

Each Module will require the Operator's Manager to complete a Course Completion Sign-Off sheet that includes Course title, Module title, date, printed name, certification number, and signature of verification. The Project Manager (or designee) will be required to ensure Operators are utilizing the course material appropriately and successfully applying what they have learned in the field.

The Course content and brief description is provided in Appendix A.

2. Module Lesson Plan

The *Level 1 Wastewater Operator Course* is a self-paced series of *PowerPoint* presentations designed to allow the participant opportunity to read course materials and then observe or experience examples of the content. The *PowerPoint* presentations will provide pop up answers to questions and provide math exercises encouraging repetitive practice. Each Course Module will have a Module ending Quiz that will be scored and tracked.

The learning environment will be in a quiet place to help the Operator focus without distractions (headphones), furnished with a desktop or laptop computer, with the downloaded Modules. The Project Manager (or designee) will be responsible for providing the Operator with a printed copy of the Course Completion Sign-In Sheet, and Module # Quiz (Printable) and other materials (calculator, scratch paper for notes and computations) and will collect the Module Quiz upon completion.

Upon completing all 24 Modules, and achieving a passing grade of 70%, the Operator will be given a 100 question Final Exam which will be proctored by the Project Manager (or designee). The Final Exam will serve to confirm Operator retention of the Modules and may be utilized as part of the Operator Performance Program internally known as e3.

3. Program Tracking and Accountability

The Training Program Administrator will score and store the Module Quizzes. Scores will be made available to the participants, as well as to Project Manager (or designee) and Regional Leadership. An assigned Coach (local Project resource or Regionally assigned Consultant) will be available to support the Operator's demonstrative understanding of the materials. This coordinated Team approach assures the Operator's needs are addressed and that Course progress is maintained. Operators will be given the course material objectives as part of their annual performance objectives.

Appendix A. Course Module Descriptions

The following Modules are offered in the recommended progression:

Module	Description	Duration
Module 1 – Introduction to Wastewater	This Module describes Operator’s duties and responsibilities and potential impact to the community and environment. It also introduces Biochemical Oxygen Demand (BOD) BOD calculations and applied pounds loading math.	0.5 Hours
Module 2 – Preliminary Treatment	This Module describes Preliminary Treatment processes including Headworks’ infrastructure, flow monitoring, screening, and grit removal. Module math covers volumetric cubic feet and headworks residual forward planning.	0.5 Hours
Module 3 – Primary Clarification	This Module describes Primary Treatment processes including volume math for a rectangular and circular clarifier.	0.5 Hours
Module 4 – Activated Sludge (Part 1)	This first of a 2 Part Activated Sludge Series describes activated sludge biology and utilizes pounds math to calculate Food to Mass ratio.	2.0 Hours
Module 5 – Activated Sludge (Part 2)	This second of 2 Part Activated Sludge Series describes process challenges associated with bulking filamentous bacteria and foam generating bacteria. Math practice is provided including Volume, Pounds, F:M, Detention and Efficiency of Removal.	2.0 Hours
Module 6 – Biomass Community Control	This Module describes Sludge Age expressed as Sludge Retention Time (SRT) and Mean Cell Residence Time (MCRT) with applied examples targeting ideal microorganism community control.	0.5 Hours
Module 7 – Process Control	This Module describes proactive process control utilizing process monitoring tools, structured weekly process control meetings and O&M coordination.	0.5 Hours

Level 1 Wastewater Course Syllabus


Module	Description	Duration
Module 8 – Return Activated Sludge Strategy	This Module describes Return Activated Sludge (RAS) strategies based on normal and high flow scenarios emphasizing Secondary Clarifier Detention as the key long- term performance indicator.	0.5 Hours
Module 9 – Activated Sludge Design Overview	This Module describes all the major activated sludge design schemes including extended aeration designs, oxidation ditches, sequential batch reactors, fixed film media applications and advantages/disadvantages of each.	1.0 Hours
Module 10 – Biological Nutrient Removal	This Module describes biological nitrogen and phosphorus removal concepts and process strategies. This Module also provides alkalinity dosage math.	0.5 Hours
Module 11 – Tertiary Treatment	This Module describes Tertiary Treatment schemes including Sand and Disk Filtration, as well as chemical treatment applications.	0.5 Hours
Module 12 - Disinfection	This Module describes disinfection including chlorine- based oxidation, ozone oxidation and ultra-violet sterilization. Dechlorination is also described including chlorine demand math.	0.5 Hours
Module 13 – Aerobic Digestion	This Module describes Aerobic Digestion, Operator controls and Sludge Retention Time (SRT) math.	0.5 Hours
Module 14 – Digester Short School	This Module presentation describes Anaerobic Digestion biochemistry and Operator controls.	2.0 Hours
Module 15 – Selecting Process Parameters	This Module describes how to select non-permit defined sampling and process monitoring.	0.5 Hours
Module 16 - Dewatering	This Module describes the common methods of biosolids dewatering including Vacuum Filters, Plate & Frame Presses, Centrifuges, Belt Filter Press, Screw Press and Fan Press.	0.5 Hours
Module 17 – Belt Filter Press Operation	This Module focuses on Belt Filter Press (BFP) Operation and care.	0.5 Hours
Module 18 – Proactive Predictive Maintenance	This Module describes proactive asset care reflecting the needs of new and older assets.	0.5 Hours
Module 19 - Troubleshooting	This Module describes tools and the logical progression of effective troubleshooting.	0.5 Hours
Module 20 – Logbook Entry & Status Exchange	This Module describes industry standard methods for Operator logbook entry to capture and preserve facility event and process history.	0.5 Hours

Level 1 Wastewater Course Syllabus

Module	Description	Duration
Module 21 - Pumps	This Module describes centrifugal and positive displacement pumps and their applications. Pump horsepower math is included.	0.5 Hours
Module 22 – Package Plants	This Module describes the purpose and application of package plants including specific needs.	0.5 Hours
Module 23 - Housekeeping	This Module describes the Operators obligations to maintain a safe and clean work environment for the wellbeing of the team and community.	0.5 Hours
Module 24 – Operator Rounds	This Module describes the Operator field observations and duties required for field and process accountability.	0.5 Hours
Level 1 Final Exam	100 Questions	3.0 Hours
Total Hours	All Hours Listed are Estimates	20.0 Hours

Appendix B. Course Completion Sign Off Sheet

Upon completion of each Module, and achieving a passing grade of 70%, the Operator will obtain a signature from the Project Manager acknowledging module completion. Then access to the next Module will be provided. The Project Manager (or designee) is responsible for Attendee enrollment. The Attendee must commit to full participation, and application of acquired knowledge towards individual professional growth. Upon completion of all modules, the Operator will legibly print their name and provide a valid signature, State Operator License number and date to receive credit. The Training Program Administrator will file the Course Completion Sign-Off Sheet and Module Quiz answer sheets then issue the Certificate of Completion.

	Course Completion Sign-Off Sheet State: ____ Course # _____ Operator Name _____			
	Level 1 Wastewater Operator Course	Start Date	Completion Date	Hours to Complete
Module 1 – Introduction to Wastewater			0.50	
Module 2 – Preliminary Treatment			0.50	
Module 3 – Primary Clarification			0.50	
Module 4 – Activated Sludge (Part 1)			2.00	
Module 5 – Activated Sludge (Part 2)			2.00	
Module 6 – Biomass Community Control			0.50	
Module 7 – Process Control			0.50	
Module 8 – Return Activated Sludge Strategy			0.50	
Module 9 – Activated Sludge Design Overview			1.00	
Module 10 – Biological Nutrient Removal			0.50	
Module 11 – Tertiary Treatment			0.50	
Module 12 - Disinfection			0.50	
Module 13 – Aerobic Digestion			0.50	
Module 14 – Digester Short School			2.00	
Module 15 – Selecting Process Parameters			0.50	
Module 16 - Dewatering			0.50	
Module 17 – Belt Filter Press Operation			0.50	
Module 18 – Proactive Predictive Maintenance			0.50	
Module 19 - Troubleshooting			0.50	
Module 20 – Logbook Entry & Status Exchange			0.50	
Module 21 - Pumps			0.50	
Module 22 – Package Plants			0.50	
Module 23 - Housekeeping			0.50	
Module 24 – Operator Rounds			0.50	
Level 1 Final Exam			3.00	
Total Hours Awarded for CEU Credit			20.0 Hrs	2.0 CEU
I understand that it is incumbent upon me to complete all modules in this Course and that Jacobs verifies and audits the completion of training by employees. My signature indicates that I personally reviewed and completed all portions of this Course and no one has completed any portion of this course on my behalf.				
_____ Operator Signature		_____ DD/MM/20YY Date		# _____ Operator License #

Appendix C. Wastewater Certificate of Completion

Upon completion of the Course, the Training Program Administrator will fill in the Certificate of Completion and provide a copy to the Operator for their records. The Operator is responsible for submitting this Certificate to the State. The Training Program Administrator can assist, if needed. When required, this form will be customized to include State specific information.



Jacobs

CERTIFICATE OF COMPLETION

First Last Name

has successfully completed:

Level 1 – Wastewater Operator Course

Awarded _____ CEU

Course ID # _____

Operator Certification # _____

On _____ (Date)

As reviewed and approved by:

John Dunty, Course Advisor

Dave Sanford

Senior Operations Specialist

Summary/Profile

Mr. Sanford is an experienced Project Manager, Troubleshooter, and Operator in the municipal and industrial water and wastewater fields. His 36-year in-depth knowledge includes wastewater biological processes, laboratory, and facility management. Mr. Sanford also has performed technical support and consulting services to provide training for operators and managers. Work side by side in the field with operators to develop a process control strategy. Developed process control testing for the lab, data interpretation, and process changes based on lab data. Background includes wastewater microbiology, facility, and infrastructure management, as well as construction management for capital projects.

Project Experience

Senior Operations Specialist Jacobs Engineering

Duties include HACH WIMS process control database implementation, development of process control programs for various project facilities. In addition, Mr. Sanford has developed and provided in depth wastewater training to operators in wastewater fundamentals, process control, wastewater microbiology, and MBR operations. Mr. Sanford continues to support projects, and staff reviewing weekly process control data developed specifically for

the WWTPs and making process recommendations. Mr. Sanford is training and implemented additional process testing for project operations including Nitrate Nitrogen, Ammonia Nitrogen, and Reverse Staining for microbiological examination. Mr. Sanford has performed process modeling for various WWTPs. Mr. Sanford also provides Leadership training and Project Manager mentoring. Mr. Sanford has worked with client identified engineers to design a new activated sludge WWTP for the Grants NM project.

EDUCATION

- B.S. Environmental Engineering, Kennedy Western University, Agoura Hills, California
- A.A. Science, Big Bend Community College, Moses Lake, Washington
- Responding to Terrorism/ Weapons of Mass Destruction National Emergency Response and Rescue Training Center, Batavia, Ohio
- Wastewater Microbiology, Green River Community College, Yakima, Washington
- OMI University I, II, Mastery

CERTIFICATIONS

- Tennessee Grade IV Wastewater Operator
- Hazardous Waste Operations and Emergency Response
- 40-Hour Occupational Health and Safety Administration

PROFESSIONAL AFFILIATIONS

- American Water Works Association
- Water Environment Association
- Tennessee Association of Utility Districts
- Pacific Northwest Pollution Control Association

PUBLICATIONS

- Wastewater Fundamentals and Treatment Plant Troubleshooting
- EZ-Calc (Process Control Software)

Twelve Mile Creek Remediation – Central SC

Project Manager, Water Treatment Facility
Removal of PCB's From River Dredging
Super Fund Site, Discharge Compliance

Anniston Army Depot – Anniston Alabama

Process Control
Operations Plan and SOP's
Process Control Laboratory Test Procedures and Microbiology
Process Control Software

StatOilHydro – Alberta Canada

Operation of Nano Filtration Water Treatment Facility
Operation of Membrane Wastewater Treatment Facility
Operations Plan and SOPs

Carol Stream Water Reclamation Center – Chicago IL.

Process Control
Process Control Laboratory Test Procedures and Microbiology
Operator Training

CH Caribe Engineers – Puerto Rico

Facility Assessments, Wastewater Facilities

Senior Operations Specialist

***CH2M HILL OMI / Technical Services Group
Oak Ridge, Tennessee***

Mr. Sanford has successfully completed tasks as a Senior Operations Specialist including troubleshooting wastewater treatment facilities, instituting process control programs and parameters, facility reviews, operator and staff training in operations, laboratory, and microbiology. Mr. Sanford has produced documents for clients and facilities including SOP's, UPCP's, operations plans, training materials, high flow plans, and microbiology posters for laboratory use.

Project Manager/Operations Specialist

***CH2M HILL
Oak Ridge, Tennessee***

Mr. Sanford was responsible for day-to-day O&M of the East Tennessee Technology Park utility infrastructure systems. Systems included water treatment and distribution, wastewater treatment and collection, compressed air distribution. CH2M HILL also performed maintenance and management of roads, grounds, buildings, and associated facilities. Mr. Sanford supervised a staff of 50, including supervisory personnel. He served as a liaison with the U.S. Department of Energy (U.S. DOE) and the Community Redevelopment Organization of East Tennessee.

Mr. Sanford's management and leadership duties included capital projects such as the following:

- A \$6-million force main and duplex lift station
- Cut and cap project for sewer, and water

- Fire water conversion to sanitary water including new hydrant installations
- Backflow preventer installations for all buildings as well as two 8-inch preventers placed in the distribution system
- A water-meter installation project for all buildings onsite
- Design and construction of facilities for groundwater remediation and volatile organic compound removal

Mr. Sanford worked on numerous special projects including proposal development for U.S. DOE and U.S. Department of Defense utility privatization for facility condition assessments and evaluations, energy consumption and management, facility and equipment life-cycle analysis, capital improvement planning, capital upgrades, infrastructure optimization and cost-saving initiatives, and groundwater remediation at the Oak Ridge project.

Project Manager/Process Control Specialist

Earth Tech

Clermont County, Ohio

Mr. Sanford oversaw O&M of 10 wastewater treatment plants ranging in size from 0.05 – 9 million gallons per day, and operation of collection systems encompassing 99 lift stations and 500 miles of sewer line. Mr. Sanford managed the industrial pretreatment program and operation of a central wastewater laboratory. This laboratory performed required analytical testing for the County and for outside customers. He oversaw regulatory permitting, sewer cleaning and analysis, lift-station maintenance and management, sewer rehabilitation, flow monitoring, customer service, and client reporting. Mr. Sanford also performed technical support and consulting services for Earth Tech-operated facilities in the U.S., Canada, and the Caribbean.

Western Region Quality Assurance Manager

Earth Tech

Quincy, Washington

Mr. Sanford performed quality assurance audits and conducted client satisfaction surveys. He oversaw the implementation of the DataStream MP2[®] computerized maintenance management program at six project locations and performed security assessments at projects in the U.S. and Canada.

Senior Microbiologist/Process Control Specialist

Earth Tech

Quincy, Washington

As a Process Control Specialist, Mr. Sanford performed troubleshooting at facilities including investigating plant process using laboratory sample data and microscopic evaluation methods. He performed various microscopic evaluations and consulting services for clients.

Laboratory Manager

City of Quincy

Quincy, Washington

Mr. Sanford was responsible for laboratory testing required for State laboratory certification. He prepared documents including laboratory quality assurance/quality control manuals, chemical hygiene plans, and material safety data sheet manuals. He instituted the City's confined space entry program. Mr. Sanford performed analytical testing for wastewater parameters including ammonia nitrogen, total Kjeldahl nitrogen, alkalinity, biological oxygen demand, chemical oxygen demand, fecal coliform, e-coli, nitrate, phosphorus, total suspended solids, and volatile suspended solids.

He managed a water quality database for Department of Ecology, U.S. Environmental Protection Agency, and local industry reports. He monitored and tested wastewater quality for industrial parameter compliance. He also assisted in a community wetland evaluation project.

Awards

- Team award - 2012 CEO Excellence Award, Twelve Mile Creek Remediation
- 2006 Tennessee Association of Utility Districts Wastewater Operator of the Year

Publications and Presentations

- Wastewater Fundamentals & Treatment Plant Troubleshooting
- EZ-Calc (Process Control Software)
- Guest Speaker—Snail Mitigation in Wastewater Treatment Plants, Ohio Water and Wastewater Association
- Guest Speaker—Treatment Plant Troubleshooting, Evergreen Rural Water of Washington
- Guest Speaker—Wastewater Microbiology, Washington Environmental Training Center
- Guest Speaker—Basic Activated Sludge Operation, Bashaian Water, Barbados