COURSE OVERVIEW TE0005-4D
Best Practice in Sewage & Industrial Waste Water Treatment & Environmental Protection

Course Title
Best Practice in Sewage & Industrial Waste Water Treatment & Environmental Protection

Course Date/Venue
December 16-19, 2024/Fai Meeting Room, Crowne Plaza Al Khobar, KSA, Al Khobar, KSA

2.4 CEUs (24 PDHs) AWARD

Course Reference
TE0005-4D

H-STK© INCLUDED

Course Duration/Credits
Four days/2.4 CEUs/24 PDHs

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

This course is designed to provide participants with a detailed and up-to-date overview of Best Practices in Sewage & Industrial Waste Water Treatment and Environmental Protection. It covers the planning considerations, social & environmental goals of planning and environmental assessment; the need for health & safety and environmental imperatives; the waste water fundamentals chemical analysis, analytical methods and industrial waste water treatment system; and the stages in treating general effluent as well as the suspended solids, floatation & sedimentation (physicochemical purification).

During this interactive course, participants will learn the aerobic and anaerobic treatment systems covering process types and configuration, bioreactors, biotreatment, aerobic biological purification systems and activated sludge; the filtration, clarification, cell separation direct discharge and disinfection; the management of industrial wastewater system; the industrial water standards and regulations including financial and legal issues; and the design calculation for your own system and for corrugated plate interceptor (CPI) separator.

Course Objectives

Upon the successful completion of this course, each participant will be able to: -

- Apply and gain an in-depth knowledge on sewage and industrial waste water treatment and environmental protection best practices
- Carryout planning considerations, social & environmental goals of planning and environmental assessment
- Discuss the need for health & safety and environmental imperatives
- Apply waste water fundamentals chemical analysis, analytical methods and industrial waste water treatment system
- Describe the stages in treating general effluent as well as the suspended solids, floatation & sedimentation (physicochemical purification)
- Recognize aerobic and anaerobic treatment systems covering process types and configuration, bioreactors and biotreatment, aerobic biological purification systems and activated sludge
- Illustrate filtration, clarification, cell separation direct discharge and disinfection and management of industrial wastewater system
- Review the industrial water standards and regulations including financial and legal issues
- Apply design calculation for your own system and for corrugated plate interceptor (CPI) separator

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all best practices in sewage and industrial waste water treatment and environmental protection for those who are involved in making decisions about the discharge of any industrial pollutants into the environment. This includes industrial waste water compliance managers, supervisors, engineers, inspectors, plant managers and HSE staff. Further, the course is suitable for operations, inspection, maintenance and design engineers and technical staff including laboratories.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **2.4 CEUs** (Continuing Education Units) or **24 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Fee

US$ 4,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Instructor

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Saad Bedir is a **Senior Water Engineer** with over **30 years** of extensive experience in the **Power**, **Petrochemical** and **Oil & Gas** industries. He is well-versed in the areas of **Water Chemistry**, **Chemical Water Analysis**. **Water Processing**, **Biological Oxygen Demand** (BOD), **Chemical Oxygen Demand** (COD), **Dismantling & Installing Membranes**, Operation, **Membrane Unit** Operation & Troubleshooting, Industrial **Membranes** Separations, Maintenance Optimization & Troubleshooting of Flat Sheets **Membrane System**, **Membranes Desalination**, **Water Audit & Leak Detection, Water Networks Operation, Water Handling Unit Operation, Water Production & Treatment, Water Chemistry, Laboratory, Advanced Waste Water** Treatment Operation & Process**,** Health, Fire, Safety, Security & Environmental Codes of Practice, Legislations and Procedures. His expertise include the implementation of **ISO 17025:2005 Laboratory Quality Management & Quality Assurance Systems**, **OHSAS 18001**, **ISO 9001**, **ISO 14001**, **QHSE** Management Planning, Crisis & Business Continuity Management Planning, Emergency Response & Procedures, Industrial Security Risk Assessment & Management, Environmental Impact Assessment (**EIA**), Behavioural Safety, Incident & Accident Investigation, Integrated EHS Aspects, Risk Assessment & Hazard Identification, Environmental Audits, Hazardous & Non-Hazardous Waste Management, Confined Space Safety, **SHEMS** Principles, Process Safety, Basic & Advanced Construction Safety, Air Quality Management, Safety & Occupational Health Awareness, Loss Control, Marine Pollution Hazards & Control, Ground Contamination & Reclamation Processes, Waste Management & Recycling, Clean Energy & Power Saving, **HAZOP**, **HAZID**, **HSEIA**, **QRA**, Hazardous Area Classification and Radiation Protection. Presently, he is the **HSE Director** for one of the largest and renowned companies in the Middle East, wherein he takes charge of all HSE and security operations of the company.

Mr. Saad's vast professional experience in directing and managing laboratory, health, safety and the environment aspects as per **ISO 17025:2005** & **OSHA framework** and guidelines can be traced back to his stint with a few international companies like **Saudi ARAMCO**, **CONOCO**, **Kuwait Oil Co.** (**KOC**), where he worked as the **Field HSE Senior Engineer** and **Water Engineer** handling major projects and activities related to the discipline. Through these, Saad gained much experience and knowledge in the implementation and maintenance of international safety standards such as the National Fire Protection Association (**NFPA**), the American Petroleum Institute (**API**), Safety of Life at Sea (**SOLAS**) and Safety for Mobile Offshore Drilling Unit (**MODU**).

Mr. Saad has **Bachelor's** degree in **Chemical Engineering** and a **NEBOSH** certificate holder. Further, he is a **Certified Instructor/Trainer**, a **Certified Lead Auditor** for **OHSAS 18001**, **ISO 9001**, **ISO 14001** and a **member** of the **Egyptian Syndicate** & **Scientific Professions**. His passion for development and acquiring new skills and knowledge has taken him all over the Middle East to attend and share his expertise in numerous trainings and workshops.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will be always met:

Day 1: ***Monday, 16th of December 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0900	***Planning Considerations*** *Water Cycles & Treatments ● Economics of Sewage Treatment Plant*
0900 – 0930	***Social & Environmental Goals of Planning*** *Planning Permission ● Design of the Site*
0930 – 0945	*Break*
0945 – 1015	***Environmental Assessment*** *Environmental Impact Assessment (EIA) ● Impacts on Neighbours ● Sufficient Land ● Landscape Designations ● Ecological Impacts ● Visual Impact of Process Plant and Other Buildings ● Water Courses*
1015 – 1115	***Need for Health & Safety*** *Fire Protection and Prevention ● Health ● Odors*
1115 – 1230	***The Environmental Imperatives*** *Living Organisms Need Some Nutrients ● Effects of Nutrient Excess*
1230 – 1245	*Break*
1245 – 1420	***Waste Water Fundamentals Chemical Analysis*** *Contaminant Considerations ● Nitrogen and Phosphorous ● Ammonia Removal from Liquors ● Ammonia Equilibrium in Water with pH ● Presentation Forms of HC in Waste Water ● HC Purification Processes ● Biochemical Oxygen Demand (BOD) ● Chemical Oxygen Demand (COD) ● COD and BOD5 Equivalence for Hydrocarbons ● Other Method for Estimation of Organic Content*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2: **Tuesday, 17th of December 2024**

0730 – 0830	***Analytical Methods*** *Determination of Oil and Grease ● Determination of pH ● Determination of Phenols ● Determination of Sulphide ● Determination of Total Phosphorus ● Determination of Total Suspended Solids (TSS) ● Determination of Heavy Metals ● Determination of Ammonia / Ammonium ● Determination of Total Nitrogen ● Determination of Biological Oxygen Demand (BOD-5) ● Determination of Chemical Oxygen Demand (COD) ● Determination of Free Cyanide ● Determination of Fluorides ● Determination of Hexavalent Chromium ● Basic Terminology & Definitions*
0830 - 0930	***Design Considerations*** *Collection & Planning Sewer Networks (Surge Tanks, Lagoons) ● Planning Sewer Networks (Surge Tanks, Lagoons) ● Industrial Waste Water Treatment System ● Sources of Industrial Waste Water ● Composition of Industrial WW ● Wastewater Processes in Refinery ● Source of Oily WW & Treatment Method ● Design Parameters for Communal Sewage ● Industrial Waste Waters Networks ● Normally Oily Water ● Accidentally Oily Water ● Non-oily Waste Water*
0930 – 0945	*Break*
0945 – 1015	***Stages in Treating General Effluent*** *Conventional Sewage Treatment ● Process Flow Diagram for a Typical Large-scale Treatment Plant*
1015 – 1230	***Suspended Solids, Floatation & Sedimentation (Physicochemical Purification)*** *Objectives of Floatation & Sedimentation ● Preliminary Separation Processes ● Flotation ● Water and Air Up-flow Bio-filters ● Physicochemical Purification of Effluents from Primary Oil Separators ● Aims of Physicochemical Purification ● Flocculation & Coagulation ● Flocculants ● Induced Air Flotation (IAF) or Mechanical Flotation ● Normal Fat, Oils & Grease Removal ● Construction of Gravity Oil Separators ● Longitudinal API Separators ● Circular Oil Separators ● Principle ● Implementation ● Lamella Oil Separators ● Oil Skimming Device*
1230 – 1245	*Break*
1245 – 1420	***Aerobic & Anaerobic Treatment Systems*** *Fundamentals of Aerobic Biological Processes ● Bio-treatment Rationale ● Advantages vs. Chemical Oxidation ● Disadvantages ● Aerobic & Anaerobic Treatment Process Types ● Process Configuration ● Bioreactors Feeding Regime ● Biotreatment Technologies ● N –Removal (Nitrification & Denitrification) ● P-Removal (Phosphorous Reduction) ● Removing Aromatic Hydrocarbons ● Enhance Septic Tanks as Primary for Bioreactors*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3: **Wednesday, 18th of December 2024**

0730 – 0930	***Aerobic & Anaerobic Treatment Systems (cont'd)*** *Mechanical Surface Aerators ● Aerobic Biological Purification Systems ● Membrane Bio-Reactors (MBR) ● MBR Process Configurations ● Activated Sludge Theories ● Basic Biochemistry of Activated Sludge ● Powdered Activated Carbon Treatment (PACT) ● Activated Sludge Extended Aeration ● Biosolids Filter (BF) ● Rotating Aerobic Biological Purification Systems ● Trickling Filters (TF) (Fixed Film ● Mechanism of Anaerobic Fermentation ● Design of Anaerobic Digester (AD) Plant ● Guarantees ● Sludge Digester Guarantees Include*
0930 – 0945	*Break*
0945 – 1045	***Filtration, Clarification & Cell Separation*** *History Experiment Design ● Filter Bed ● Separation by Filtration ● Shallow Trench ● Leaching Bed ● Constructed Wetland*
1045 – 1230	***Direct Discharge & Disinfection*** *Hauled Wastes ● Effluents of Waste Water Objections ● Example: Discharge Limits in WW ● Sludge Disposal ● Sludge Treatment and Disposal ● Disposal of Bottom Sludge ● Disposal of Oil and Floating Matter (Hauled Waste) ● Disposal of Oil and Floating Matter ● 'Temporary' Storage of Water ● Biosolids Disposal ● Compost ● Wastewater Residual Composting ● Lime Stabilization of Sludge ● Stream Assimilative Capacity ● Mixing Zone ● Disinfection ● Continuous Chlorine Monitoring System ● How Does Disinfection Happen? ● Disinfection With Chlorine ● The Ideal Disinfectant ● Disinfectant Performance*
1230 – 1245	*Break*
1245 – 1420	***Management of Industrial WW System*** *Regular Monitoring ● Key Responsibilities ● Hazard Datasheet on Occupation ● Preventive Measures on Job ● Operational Control of Activated Sludge ● Aerobic Digester ● Recording Settleometer Data ● Choosing Bio-treatment Process ● Recent Changes in WW Treatment*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

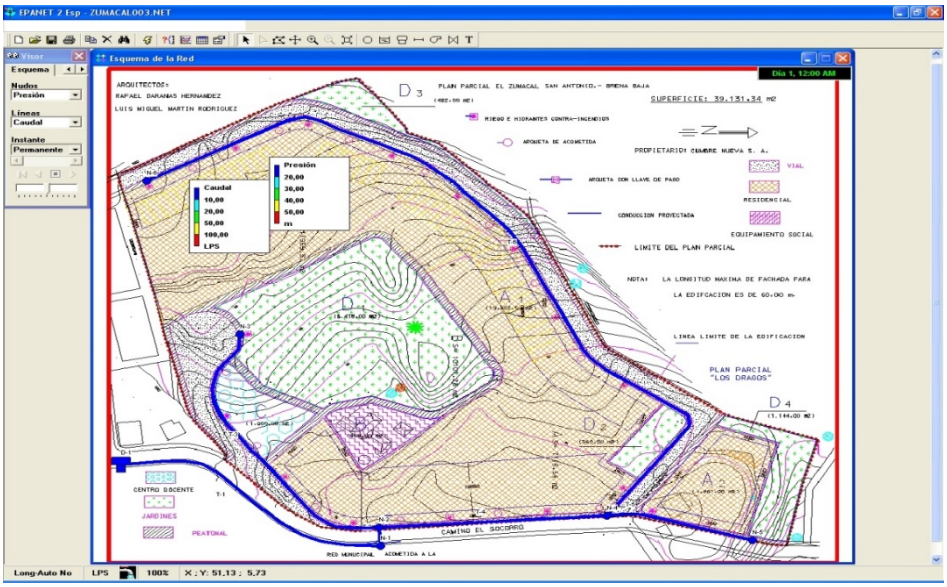
Day 4: **Thursday, 19th of December 2024**

0730 – 0930	***Industrial Water Standards & Regulations*** *W Water Quality Standards & Regulations ● Overview of The USA Clean Water Act ● Oil Spills & Environment Protection Authority ● What is an NPDES Permit? ● What is a Pollutant?*
0930 – 0945	*Break*
0945 – 1100	***Industrial Water Standards & Regulations (cont'd)*** *Spill Prevention, Control & Countermeasure (SPCC) ● Effluent Guidelines & Standards ● World Bank Effluents Guidelines & Standards ● BP's Environmental & Social Action Plan ● Overview of International Clean Water Acts*
1100 – 1200	***Financial & Legal Issues*** *Funding Sources ● Approval Process ● Regulatory Compliance ● Municipal & Owner Liability*
1200 – 1230	***Design Calculation of your Own System*** *Rising Velocity of Oil Droplets ● Longitudinal API Separators ● API Separator Feed ● Implementation of your System - Example of Design ● Retention Pond Exercise*

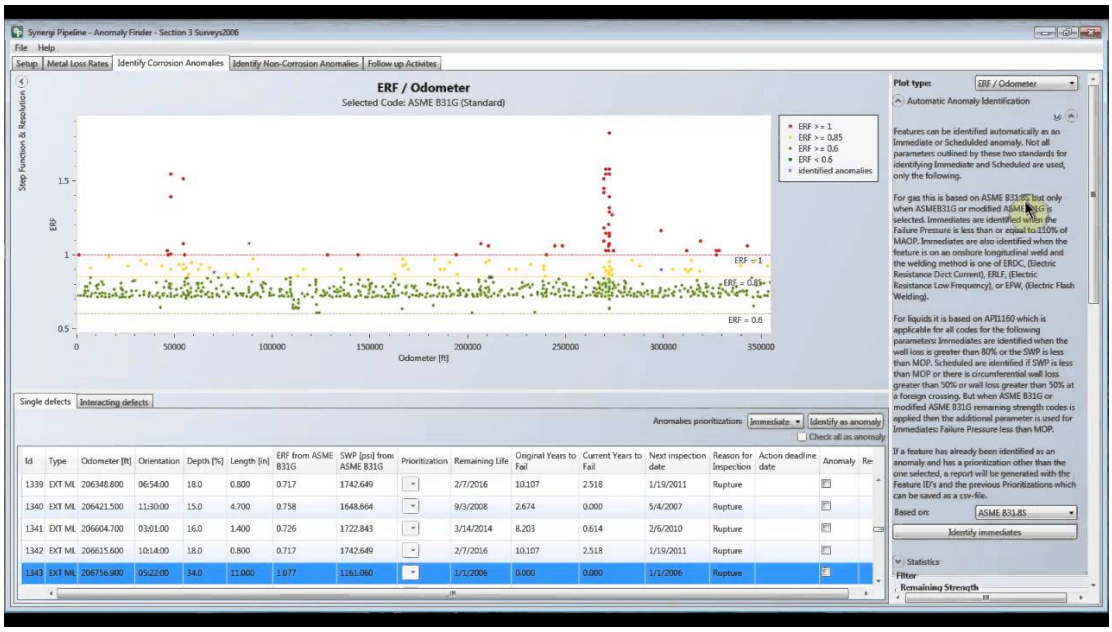
1230 – 1245	*Break*
1245 – 1345	***Design Calculation for Corrugated Plate Interceptor (CPI) Separator*** *Basis of Calculations ● Rising Velocity ● Design ● CPI Pack Design ● Calculation: at 40°C ● Calculation: at 5°C*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

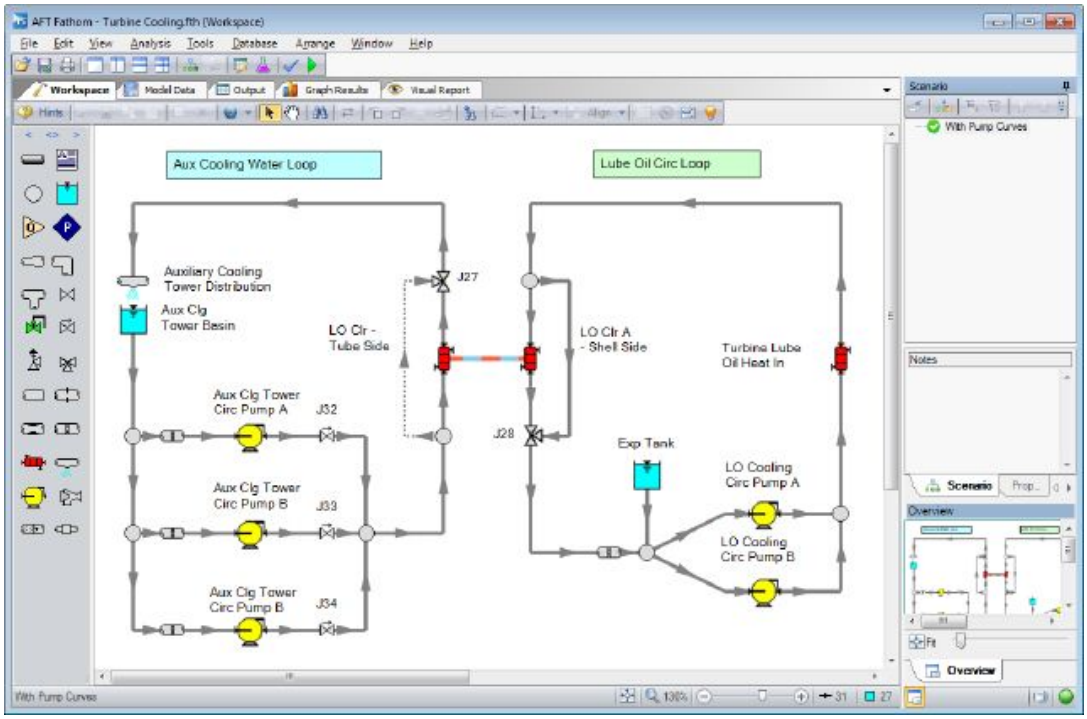
Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the latest revision of "EPANET", "Synergi Pipeline", "AFT Fathom" and "WaterGEMS" simulators.



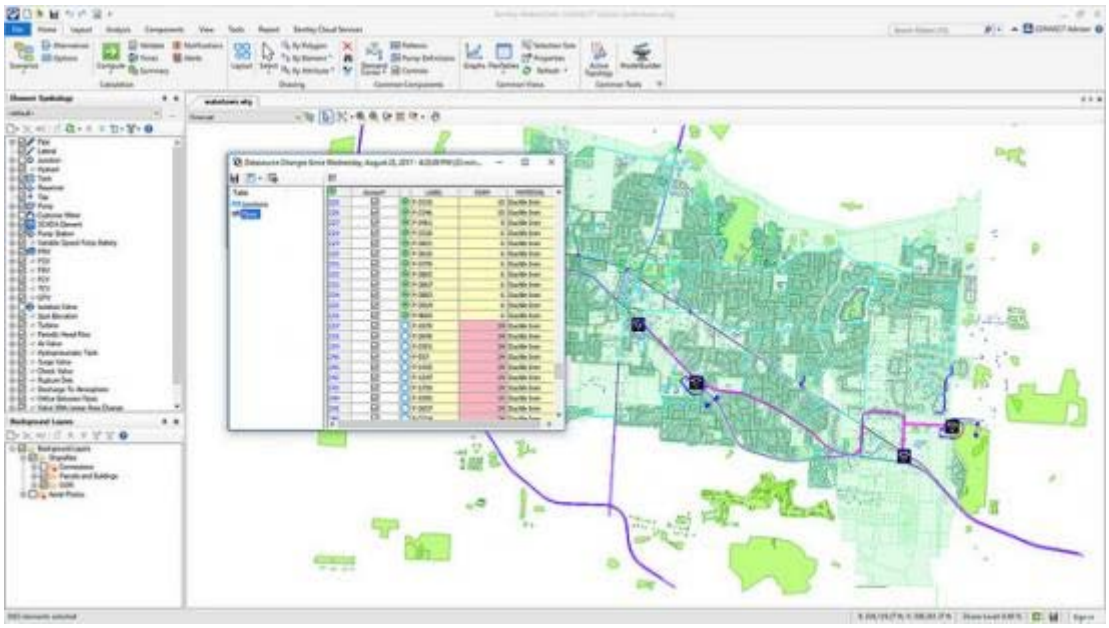
EPANET Simulator



Synergi Pipeline



AFT Fathom



WaterGEMS

Course Coordinator

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