



**BRITISH
WATER
ENGINEERING
COLLEGE**

Level 4 Diploma in Water Industry Operations and Management

Professional Diploma For Current And Aspiring Leaders In The Water Industry



www.bwec.org.uk

The Level 4 Diploma in Water Industry Operations and Management

The **Level 4 Diploma in Water Industry Operations and Management** offers a flexible, comprehensive qualification for professionals working in the sector.

The qualification is nationally recognised and is available globally. It has been approved by **Ofqual** and is accredited by the **CABWI Awarding Body**.

The programme offers flexible pathways and choices of modules for managers and team leaders who want to learn more about the discipline within which they are working.

It does not simply focus on the technical skills and knowledge needed, but also covers the practical skills required to become a successful manager.

These skill areas are finance and budgeting; project management; and leadership and development.

There is also the option to take single units to gain specific skills and knowledge as required. A full qualification will not be awarded, but credits will be certified.

- Assessment will be designed around work based assignments or projects, which cover the required Learning Outcomes and have a business benefit to the employers. Each assessment is specifically designed to provide value to both the learner and their employer.
- The qualification is made up of 10 units. Usually, each unit will be divided into two or three two day blocks of study 4–6 weeks apart. The commitment for each unit would vary depending on a learner's prior knowledge and experience. Most learners complete the course in under two years, however, accelerated programs can be arranged by request.
- The course will be delivered once a year from our training facilities at the Scottish Provident Building in Belfast (United Kingdom). However, the majority of clients prefer to study at or near their place of work. BWEC tutors travel globally to deliver the Level 4 Diploma.



Bob Windmill

Academic Director British Water Engineering College

"In the UK water industry we have a tendency to invest years into the training and development of exceptional engineers, scientists, technicians and operators.

However, when those capable front-line professionals make the move into leadership roles they need a different kind of development program.

The **CABWI Level 4 Diploma in Water Operations with Management** is designed specifically for those in or preparing to move into management positions within the industry."

Qualification pathways

The Water Level 4 Diploma offers a comprehensive range of pathways, which are matched to the industry's principal functions and roles. All pathways include four mandatory units.

- Water Industry structure and organisation (WOM401)
- Leadership and management (WOM402)
- Managing financial resources in the Water Industry (WOM403)
- Complete a Water Industry research project (WOM404)

Each of the qualification pathways are made up of a variety of different units. The units have been chosen to reflect the skillset that is needed for each of the pathways

- The first four units listed on pages 6 and 7 are mandatory for all pathways
- There are various other units that can be studied in addition to those listed on pages 6 and 7. These are detailed on page 11
- Additionally, you have the option to add additional units to the pathway that you have taken



Qualification pathways

Wastewater Treatment

The Wastewater Treatment pathway offers students a broad framework to increase their knowledge of a range of advanced Wastewater technologies.

It covers the scientific perspective of treatment principles; the environmental aspects of the discipline; and the management of waste using specific technologies, including activated sludge, dewatering and sludge disposal.

It concludes with an examination of ways the energy and carbon agenda will affect the industry, in particular biomass and anaerobic digestion.

Water Industry Operations

This pathway provides a comprehensive overview of the entire function of the Water Industry.

It is suitable for those seeking broad knowledge across the entire water cycle, in addition to other specialist pathways.

Units include:

- Water Treatment
- Water Distribution
- Waste Water Network
- Waste Water Treatment
- Other additional units needed to become a successful manager

Asset Management

Providing a water specific Asset Management (AM) route to knowledge (instead of a generic AM qualification), this pathway teaches students the principles of Asset Management.

It also allows for study of optional modules from the operational module structure, such as wastewater and water treatment, hydraulics, civils, finance and contract law.

This greatly enhances the overall learning experience in this important area of water activity and will prepare students for future industry developments, such as Building Information Modelling (BIM).

These core modules (as with the Project Management pathway) can be enhanced with key operational modules, therefore contextualising the whole qualification for the specific role of the student.

Bespoke

A bespoke pathway, catering for all roles within the Water Industry.

It is for those who would prefer a route to the Diploma that more ideally meets their specific business and individual needs.

This pathway would be made up of the four Mandatory units and any six of the other units, offering a bespoke approach to the Diploma.

Qualification pathways

Wastewater Treatment		Asset Management		Water Industry Operations		Water Treatment	
Water Industry Structure & Organisation	8	Water Industry Structure & Organisation	8	Water Industry Structure & Organisation	8	Water Industry Structure and Organisation	8
Leadership & Management	8	Leadership & Management	8	Leadership & Management	8	Leadership & Management	8
Managing Financial Resources in the Water Industry	8	Managing Financial Resources in the Water Industry	8	Managing Financial Resources in the Water Industry	8	Managing Financial Resources in the Water Industry	8
Complete a Water Industry Research Project	8	Complete a Water Industry Research Project	8	Complete a Water Industry Research Project	8	Complete a Water Industry Project	8
Renewable Energy Systems	12	Management Principles & Application for Water Industry Construction Projects	8	Water Resources	12	Water Resources	12
Understanding Water Sector Plant Identification, Engineering Maintenance & Operation	8	Civil Engineering Technology in the Water Industry	12	Water Treatment Processes	12	Understanding Water Sector Plant Identification, Engineering Maintenance & Operation	8
Management of Waste in the Water Industry	12	Understanding Water Sector Plant Identification, Engineering Maintenance & Operation	8	Water Distribution	12	Management of Waste in the Water Industry	12
Managing Operational Resources	12	Manage Operational Resources	8	Operation & Maintenance of the Wastewater Network	12	Managing Operational Resources	12
Activated Sludge & Advanced Wastewater Treatment Processes	12	Production Management for Water Industry Construction Projects	12	Wastewater Treatment Processes	12		
		Contractual Procedures & Procurement for the Water Industry	12	Activated Sludge & Advanced Wastewater Treatment Processes	12		
Credits	94	Credits	94	Credits	104	Credits	98

Delivery & assessment of the Diploma

The aims of the Water Diploma

The Diploma caters for a variety of different learner requirements and aspirations. However, whatever the academic ability of the learner, they will be fully supported to meet their goals by their tutors.

The qualification has been designed to ensure that there are opportunities to develop the skills to meet the needs of employers in the Water Industry and also to provide a platform from which learners might progress to further study.

General aims:

- Develop strategic knowledge and skills relating to the Water Industry to enable a more effective contribution to the business needs
- Develop a comprehensive set of skills to carry out the role of a leader within a variety of positions in the Water Industry
- Allow the development of academic study and research skills
- Enable progression to Higher Education and membership of Industry professional bodies, e.g. Institute of Water or CIWEM

Specific aims:

- Provide an understanding of specific key areas of the Water Industry
- Develop knowledge of water operations in terms of collection, treatment and distribution of water
- Equip candidates with an understanding of wastewater in terms of collection, treatment and disposal
- Develop knowledge of the legislative and regulatory context under which water operations are controlled
- Provide an understanding of the organisation and management of the Water Industry in the UK

Delivery & assessment

Delivery of the course

The course is predominately classroom based and can be delivered at a location arranged with your company or by joining another course.

The teaching is also classroom based, but there will be an expectation that site visits within your own company are needed to gain the practical experience.

Assessment and testing

There will be testing and assessment throughout the course.

The tests will cover at least 30% of the learning outcomes (detailed on page 11).

The majority of the assessments will be work based. You will be expected to take the classroom learning that you have acquired and use it to carry out a work based assessment.

Marking and grading

All modules will contain at least one work based assignment and one end of unit test.

In some modules, there may be more than one of each, depending on the subject matter.

All Learning Outcomes for the unit will be tested for understanding in either the work based assignment or the end test.

There is the ability to achieve Distinction, Merit and Pass grades listed below, depending on the mark achieved:

Distinction: 85%+

Merit: 70%–85%

Pass: 50%–69%

Wastewater Treatment Pathway

The Wastewater Treatment pathway offers students a broad framework to increase their knowledge of a range of advanced Wastewater technologies.

It covers the scientific perspective of treatment principles; the environmental aspects of the discipline; and the management of waste using specific technologies, including activated sludge, dewatering and sludge disposal.

It concludes with an examination of ways the energy and carbon agenda will affect the industry, in particular biomass and anaerobic digestion.

Water Industry Research Project

This unit has been developed to provide an opportunity for learners to demonstrate their understanding of outcomes achieved across a range of units.

The anticipated outcome would be one or more conclusions reached through a structured process of research, which could be used to deliver a quantifiable business benefit.

The trainer led sessions will give the learner the tools and techniques needed to carry out a successful research project.

The culmination of this activity would be the delivery of a presentation to a small panel of managers and tutors. This 'end panel presentation' will take place at a date to be arranged at the end of the Diploma.

Unit purpose and aims

This unit is designed to provide evidence that the learner can complete a research project to address a query, problem or suggest an improvement in an area that they have studied within their chosen pathway.

The project would be expected to cross over several of the modules undertaken within their chosen pathway.

This could be:

- the management of a water resource, or
- the principles of water treatment processes, or
- the basic principles and components of a water distribution network system, or
- the processes involved in the collection, treatment and disposal of wastewater

This unit is dependent on the demonstration of understanding how to carry out a research project in the Water Industry.

It will require the learner to select an area, and relevant Water Industry operational activities, to research and identify objectives for a specific project in their chosen functional area. For this reason, it is recommended that the learner should have started the course and have completed some of the operational units.

Assessment of this unit will be by:

- The completion of an agreed business-related project that covers all assessment criteria
- The production of a project report, including the justification of any conclusions reached
- A presentation of the project to a suitable assessment panel, including a question and answer session

The subject

The presentation will be on a subject that will add benefits to both you and your company. You should discuss your intentions with your line manager, mentor or course sponsor. It should be of your choice, but agreed with your course tutor.

The project will be on a subject linked to the operations of your company or the Water Industry.

As a guide, consider a problem or an issue related to your role where an improvement can be made. The improvement could be related to:

- Improving customer service
- Improving or ensuring the company's compliance with regulations
- Adding value for stakeholders
- Reduction of risks to the business

Units

UNITWOM401

Unit title: **Water Industry Structure and Organisation**

Learning outcomes:

1. Explain the legislative and regulatory framework and structures of water undertakers in the UK
 2. Explain the business of the UK Water Industry
 3. Explain the principal features of financial methods used by private and public water undertakers
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UNITWOM402

Unit title: **Leadership and Management**

Learning outcomes:

1. Apply management techniques needed to supervise an activity
 2. Propose a structure to improve organisational effectiveness for a given activity
 3. Understand the role of management in developing and promoting team working
-

UNIT WOM403

Unit title: **Management of Waste within the Water Industry**

Learning outcomes:

1. Assess the performance and financial position of a business
 2. Evaluate the financial information needs of stakeholders
 3. Recommend sources of finance for specified purposes
 4. Understand the main responsibilities and accountabilities of managing operational budgets
-

UNIT WOM404 – special project

Unit title: **Complete a Water Industry Research Project**

Learning outcomes:

1. Identify and plan a project within the Water Industry
 2. Develop and carry out the project
 3. evaluate the outcome of the project and identify lessons learned
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UNIT WOM405

Unit title: **Wastewater Treatment Processes**

Learning outcomes:

1. Understand preliminary and primary wastewater treatment processes
 2. Understand biological wastewater treatment processes
 3. Understand tertiary wastewater treatment processes
 4. Understand sludge treatment and disposal methods
-

UNITWOM406

Unit title: **Water Industry Materials and Components**

Learning outcomes:

1. Understand the properties and uses of Water Industry engineering materials
 2. Understand how materials are selected for Water Industry network installation systems
 3. Understand the function of components used within the Water Industry
 4. Understand corrosion prevention methods for the Water Industry
 5. Understand the materials and components for installation and rehabilitation of wastewater collection systems
-

UNITWOM407

Unit title: **Water Resources**

Learning outcomes:

1. Understand the concepts of hydrology
 2. Understand and calculate flow measurement
 3. Understand key design features of water abstraction methods and how legislation impacts on them
 4. Understand the factors affecting yield of water resources and factors involved in demand forecasting
 5. Understand the practical management of water resources
-

UNITWOM408

Unit title: **Water Quality Management**

Learning outcomes:

1. Understand the importance of quality control in drinking water operations
2. Understand legislation and controls relevant to the quality of drinking water
3. Understand the significance of quality indicators for drinking water operations
4. Understand quality infringements of drinking water and how they are remedied
5. Understand the practical management of water resources to avoid quality infringements

Units

UNIT WOM409

Unit title: **Water Distribution**

Learning outcomes:

1. Design a typical water distribution system and explain the operation and maintenance strategy required
2. Understand the significance of flow and pressure within a water distribution system
3. Understand how to manage leakage within a water supply zone
4. Understand pipe laying operations in a water distribution network
5. Understand the inspection of plumbing systems for compliance with the water fittings regulations
6. Understand the requirements for maintaining water quality in the network

UNITWOM410

Unit title: **Operation and Maintenance of the Wastewater Network**

Learning outcomes:

1. Understand the origins of sewage, its characteristics and risks
2. Understand the impact and control of trade effluent
3. Understand the operation and maintenance of wastewater systems and related installations
4. Understand the design and construction of waste water systems
5. Understand the contractual framework used by the Water Industry for the operation and maintenance of wastewater systems

UNITWOM411

Unit title: **Activated Sludge and Advanced Wastewater Treatment Processes**

Learning outcomes:

1. Understand scientific aspects of the activated sludge processes
2. Understand assets involved in the activated sludge processes
3. Understand activated sludge processes control
4. Understand the settlement of activated sludge and final settlement tank design
5. Understand the process variations used in advanced wastewater treatment
6. Understand the remedial processes for non-compliance

UNIT WOM412

Unit title: **Water Treatment Processes**

Learning outcomes:

1. Understand the background to and reasons for water treatment
2. Understand the processes used in the first stage screening of raw waters
3. Understand the principles of chemical handling and storage
4. Understand the principles and processes of raw water clarification
5. Understand the principles and processes of filtration
6. Understand the principles and processes involved in water disinfection
7. Understand the principles and processes of pH correction
8. Understand the principles and processes involved in other aspects of water treatment
9. Understand the principles and processes of sludge treatment at water treatment works
10. Understand new developments within water treatment

UNITWOM413

Unit title: **Management of Waste within the Water Industry**

Learning outcomes:

1. Understand the key sources of waste in the Water Industry
2. Understand the impact of waste management legislation and its influence on waste strategy
3. Understand the principles of waste management

UNITWOM414

Unit title: **Managing Operational Resources**

Learning outcomes:

1. Analyse the management of operations in relation to the business transformation process
2. Apply quality control measures and use quality improvement techniques
3. Utilise financial data in operations management

UNIT WOM415

Unit title: **Managing Legal and Environmental Issues**

Learning outcomes:

1. Understand the role of UK and European agencies as 'sources of law' and practice within the Water Industry
2. Understand relevant and current regulations within the Water Industry
3. Understand the key elements of contract law
4. Understand the key elements of employment law

Units

UNIT WOM416

Unit title: **Renewable Energy Systems**

Learning outcomes:

1. Understand the carbon cycle, biomass and climate change
2. Understand the forms and diverse nature of biomass resource in the WasteWater Industry
3. Understand the treatment and utilisation of biomass resource in the Water Industry: mesophilic anaerobic digestion (MAD)
4. Understand the treatment and utilisation of biomass resource in the Water Industry: combined heat and power (CHP)
5. Understand the treatment and utilisation of biomass resource in the Water Industry: incineration
6. Understand the treatment and utilisation of biomass resource in the Water Industry: strategy formulation
7. Understand the forms of renewable energy in the Water Industry: not related to biomass
8. Understand the key elements of the relevant legislation and their influence on the Water Industry

UNITWOM417

Unit title: **Customer Service in the Water Industry**

Learning outcomes:

1. Understand the needs and expectations of customers in a Water Industry context
2. Identify organisational actions required to promote excellent customer service
3. Evaluate the quality of customer service provision and identify actions to improve the customer service provision within the organisation
4. Make recommendations to improve customer service provision within the organisation

UNIT WOM418

Unit title: **Hydraulic principles and application in the Water Industry**

Learning outcomes:

1. Solve engineering hydrostatic problems
2. Solve engineering flow problems
3. Match pumps to the demands of a specific system
4. Undertake hydraulic experimental procedures

UNIT WOM419

Unit title: **Management Principles and Application for Water Industry Construction Projects**

Learning outcomes:

1. Understand the evolution of management principles and their application to the Water Industry
2. Understand the Water Industry in terms of organisational structures and activities
3. Understand the management techniques used in the Water Industry
4. Understand the methods of procurement and contracting used in the Water Industry

UNIT WOM420

Unit title: **Civil Engineering Technology in the Water Industry**

Learning outcomes:

1. Understand the methods and techniques used in earthwork activities
2. Understand the methods and techniques used to create substructures
3. Understand the methods and techniques used to create superstructures
4. Understand the hazards associated with civil engineering activities
5. Solve problems associated with civil engineering activities

UNITWOM421

Unit title: **Production Management for Water Industry Construction Projects**

Learning outcomes:

1. Understand the principles and application of effective site management
2. Understand the importance of effective communication in planning and resource management
3. Apply cost forecasting, control and reporting techniques
4. Create planning and programming charts for construction projects
5. Understand how quality issues and environmental considerations are addressed during the production process

UNITWOM422

Unit title: **Contractual Procedures and Procurement for the Water Industry**

Learning outcomes:

1. Understand the factors that affect the choice of procurement methods and contractual arrangements
2. Know current issues and best practice associated with the procurement of Water Industry services and projects
3. Know the roles and activities of the parties and organisations involved in the procurement of Water Industry services and projects
4. Understand construction contracts in terms of time, cost and quality
5. Understand procurement contracts in terms of supply chain management

Units

UNIT WOM423

Unit title: [Project Management for the Water Industry](#)

Learning outcomes:

1. Understand the practice of project management
2. Understand the competencies and training required of project managers
3. Understand the duties and responsibilities of project managers
4. Understand how client objectives can be achieved through project management
5. Understand how project management adds value to a project

UNITWOM424

Unit title: [Design Principles and Application for Water Industry Construction Projects](#)

Learning outcomes:

1. Understand the planning and design phases of the construction process
2. Understand the factors that affect the specification of materials and building services
3. Understand how environmental factors affect the planning and design phases of the construction process
4. Understand the roles and responsibilities of all parties involved in construction projects
5. Understand how technology affects the design and production phases of construction projects

UNITWOM425

Unit title: [Science and Materials for Water Industry Construction Projects](#)

Learning outcomes:

1. Understand the properties and use of construction materials
2. Understand the structural behaviour of construction materials
3. Apply scientific principles to the design and use of buildings
4. Solve scientific problems in construction and the built environment

UNITWOM428

Unit title: [Understanding Water Sector Plant Identification, Engineering Maintenance and Operation \(D/503/1467\)](#)

Learning outcomes:

1. Understand a range of mechanical plants in the Water Industry
2. Understand the use and characteristics of different types of pumps
3. Understand the use and maintenance of compressors and blowers
4. Understand the safe use of power supply and distribution
5. Apply mechanical engineering and electrical principles to Water Industry plants

UNIT WOM429

Unit title: [Understanding Health and Safety Legislation for Water Industry Operations \(Y/503/1466\)](#)

Learning outcomes:

1. Know health and safety legislation in the UK
2. Understand how health and safety law is acted upon in the Water Industry
3. Understand how health and safety risk is managed in the Water Industry

UNITWOM430

Unit title: [Understanding Water Sector Construction and Operational Processes related to Compliance and the Environment \(L/503/1464\)](#)

Learning outcomes:

1. Know the regulatory requirements for construction in the Water Industry
2. Understand roles and responsibilities during construction projects
3. Understand regulatory compliance in Water Industry operations

UNITWOM431

Unit title: [Understanding the Chemical and Biological Characteristics of Water and Wastewater \(J/503/1463\)](#)

Learning outcomes:

1. Understand the System International (SI) unit of measurement used in water and wastewater
2. Know and understand the chemical characteristics of water and wastewater
3. Understand the biological and microbiological characteristics of water and wastewater
4. Understand parameters used to measure quality of water, wastewater and trade effluent



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Contact us for more information on the new
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your training requirements

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