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CODE OF PRACTICE

MAINTENANCE AND SERVICING OF SMALL WASTEWATER TREATMENT SYSTEMS (PACKAGE PLANTS) UP TO 50 POPULATION EQUIVALENTS (PE) AND LARGER SYSTEMS UP TO 1000 PE.

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Code of Practice

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Maintenance and Servicing of Small Wastewater Treatment Systems (Package Plants) up to 50 population equivalent (pe) and larger systems up to 1000 pe.

1 Scope

The code of practice defines the ways in which small wastewater treatment systems (package plants) up to 50pe and larger systems up to 1000pe should be serviced and maintained. It also sets out a training and certification scheme where service technicians can obtain a recognized nationwide qualification.

Please note:

- The qualification is broad based and aimed at all service engineers of small wastewater treatment systems (package plants) up to 50pe and larger systems up to 1000pe to advance them to a recognized level.
- All participants and service companies need to pre-qualify (see Appendix A for details).
- The code of practice is recommended by the environmental regulators as the preferred methodology of servicing of small wastewater treatment systems (package plants) up to 50pe and larger systems up to 1000pe.

2 References

2.1 Regulatory

2.1.1 England and Wales, Building Regulations Section H drainage regulations. Scotland, Section M.

2.1.2 Regulator permit or consent to discharge (Environment Agency/Scottish Environment Protection Agency/ Northern Ireland Environment Agency Department of Environment)

2.2 Technical

2.2.1 Institution of Electrical Engineers - Regulations for Electrical Installations, 16th edition 1992, incorporating BS7671:2001, or latest edition

2.2.2 Health and Safety Regulations – latest Regulations

2.2.3 BS EN 12566 -3 2005 Small wastewater treatment systems up to 50 persons

2.3 CE marking

2.3.1 BS EN 12566 -3 2005 sets out the minimum requirements for small wastewater treatment systems less than 50 population equivalent. There is a transitional period for the withdrawal of conflicting standards in Europe. This has been completed in the UK and so there are no conflicting standards in the UK and consequently there are no alternative routes for compliance with the performance requirements.

3 Definitions

3.1 Cesspool

A cesspool is an underground watertight container or tank without outflow (discharge) used for collecting domestic wastewater and for storing raw sewage, which is removed and disposed of by suction tanker (approved wastewater disposal companies only). The storage capacity for a cesspool should be sufficient for a least 45 days retention with a minimum volume of 18 cubic meters (BS 6297: 2007).

Note: In Scotland the building regulations do not permit the use of cesspools.

3.2 Septic tank

Sealed sedimentation tank in which settled sludge is in immediate contact with the wastewater flowing through the tank, and the organic solids are partially decomposed by anaerobic bacterial action. The capacity of a septic tank is defined in BS 6297: 2007 and BS EN12566 Parts 1 and 4 cover the design of package and in situ built septic tanks.

3.3 Sewage or wastewater treatment system or plant

A sewage or wastewater treatment system or plant is designed to treat raw effluent to a better and less polluting quality than a septic tank. Most treatment plants will have a secondary or biological treatment zone where microbes remove the soluble polluting matter. A final section allows the solid particles to settle out as sludge.

Note: The selection and sizing of a treatment plant requires specialist advice to ensure it meets the needs of the site and application.

3.4 Soakaway or drainage field

Sub surface pit or other drainage arrangement (network of porous pipes) prepared in permeable ground into which treated wastewater is fed and from which it then soaks into the ground. The design and sizing of a soakaway is defined in BS 6297: 2007 and TR EN 12566 Part 2 covers the design of sub surface irrigation (drainage) systems.

Note: It is important that a percolation test is carried out to assess whether the ground is suitable and before the soakaway / drainage field is designed.

3.5 Direct discharge point

The direct discharge point is where the treated effluent leaves the wastewater treatment plant and is discharged into the environment into a receiving water course, i.e. ditch, stream etc.

3.6 Grease removal and management

Grease trap: structure or device for separation of grease, fat and oil or other floating material from wastewater.

Biological Dosing System: system which includes a device which doses the drain line periodically with a bacterial suspension to breakdown grease, fat and oil and so prevent a build up which would eventually lead to a blockage of the drain. It may also be used to stimulate treatment when a new sewage or wastewater treatment system has been installed.

3.7 Pumping Station

A pumping station is used to move liquid to a higher point or across a distance for treatment or to a suitable discharge point. It comprises a chamber to collect the liquid which is pumped by submersible pumps within the wet chamber or by pumps mounted in an

adjacent drywell or dry chamber that suck as well as pump. Either crude or treated wastewater can be pumped via a pumping station.

Note: Selection and sizing of the systems used requires specialist advice.

3.8 Flow balancing or equalising

A reduction in variations in flow, concentration, temperature, etc is generally achieved by incorporating a balancing tank before the treatment chamber. Flow balancing or equalization is used to reduce the peak loads and variations in other wastewater characteristics to the sewage or wastewater treatment plant, in many cases the treatment plant can then be reduced in size. However, the flows and site activities must be very carefully ascertained before sizing takes place.

Note: Application of flow balancing requires specialist advice.

3.9 Combined or storm flow

3.9.1 **Combined flow:** wastewater plus infiltration from cracked or leaking pipes which allow ground water or surface water plus storm (rain) water to enter the drain line.

3.9.2 **Storm flow:** Run off from roofs, car parks, highways or any impermeable area.

3.10 Regulator Consent

Statutory approval to discharge final effluent, trade or industrial effluent, surface water or storm water to receiving watercourse; the approval may be called a Permit or Consent to discharge.

4 Basic Product Knowledge

What service technicians and service companies should know:

4.1 The basic theory of aerobic wastewater treatment.

4.2 Practical knowledge about poor effluents, grease, bio-mass (healthy or not) and why they occur.

4.3 Inhibition of the microbial activity within the treatment plant, overloading effects and problem resolution.

4.4 Practical problem solving for all types of plant and associated component failure, for example media blockages, disc blinding, mats fouling, pipe blocking, pump failure, compressor failure, control issues, all types of fault diagnosis.

4.5 Basic effluent test principles, BOD, suspended solids (SS) and ammonia; why they are important and what affects them.

4.6 The reasons why sludge accumulates, the need to de-sludge and the correct method of de-sludging.

4.7 When a plant needs de-sludging and whether it has been done properly or not.

4.8 Basics of gravity drainage, surface water flows, balancing and pumping.

5 Final Effluent Measurement

What service technicians and service companies should know about and be aware of:

5.1 The correct method of collecting a sample and having it analysed.

5.2 Choosing between the different analyses available and which may be required according to the permit or consent to discharge and the nature of the situation:

5.2.1 If the system is failing then the appropriate elements need to be specified for the analyses to provide a picture to enable a suitable correction program to be developed and undertaken.

5.2.2 To check that the equipment satisfies the consent.

5.3 Different types of sampling equipment and their uses and application.

5.4 Turbidity tube and how to use it.

5.5 Visual inspection of final effluent and giving informative comment on it.

5.6 Recording sample condition and preferably taking a photograph.

5.7 Ammonia and COD, comparison of test kits will be useful although not essential.

6 Regulator permit or consent to discharge

The service company should check and advise the client as necessary:

6.1 If the site has permit or consent to discharge

6.2 If, in the Technician's opinion, the system onsite is capable of meeting the consent

6.3 In the situation where there is no permit or consent to discharge to inform them of their legal responsibilities and how to assess the need for and, if necessary, to obtain a permit or consent to discharge

6.4 To interpret the results of regulator's and other analyses

6.5 The reason(s) for possible differences in final effluent quality, e.g. the effect of loading, the plant's ability to treat loadings that it receives.

7 Health and Safety

There are basic health and safety needs which should be covered by the service company which should ensure that:

7.1 Technicians consult a Doctor and are vaccinated as recommended i.e. Hepatitis A, Polio, Typhoid, Tetanus, etc and carry vaccination awareness cards.

7.2 To enter a confined space technicians need to have valid confined space certificates and to practice the requirements when entering designated confined spaces

7.3 Technicians need to have basic electrical safety knowledge.

7.4 Risk assessments will need to be completed for all types of treatment plants being serviced. Changing large components may require a method statement.

7.5 Full personal protective equipment must be available and worn when appropriate.

8 Recommended Basic Equipment

8.1 Manhole lifting keys, cabinet keys, manufacturer and site specific access keys

8.2 General mechanical and electrical tools for changing components and making on site repairs

8.3 Regularly replaced components / parts: -

Floats – differential, single acting

Air filters – various types including manufacturer specific components

Fuses – range of sizes and types

Pipework – solvent weld, fittings and glues

Flexible pipe work – various sizes, hose tails, jubilee clips, wide bolt clamps

Electrical components such as MCB's, contactors, change over relays

Any manufacturer specific parts as required

8.4 Testing equipment - multimeter and insulation tester

8.5 Turbidity tube, sample bottles and sampling device

8.6 Core tube sampler

8.7 First Aid box

8.8 Pressure washer and various fittings, hose pipe and a supply of water if possible

8.9 Camera (disposable or / and digital, very useful but not essential)

8.10 Generator (useful not essential)

8.11 Manufacturer's spares plus miscellaneous parts, fuses etc.

8.12 230V Submersible pump or portable site pump

8.13 Personal sanitation device i.e. hand washing unit preferably with hot water supply (preferably a van fitted unit)

9 Servicing Schedules / Intervals

Servicing should be undertaken according to the system manufacturer's specification, see current versions available on all manufacturers' web-sites. In the absence of any recommendations the following guidelines may apply:

9.1 Domestic residences up to 50pe, servicing should be a minimum of twice per year.

9.2 Commercial applications at least four times per year, dependent on site conditions.

9.3 Levels of service to be offered should be based on the particular situation, commercial considerations and the requirements of each treatment plant manufacturer. A possible structure of service could be: -

- Gold – Fully Comprehensive
- Silver – Regular maintenance and general wear items
- Bronze – Parts and labour only

10 De-sludging / Suction Tanker visits

Follow the manufacturer's recommended desludging intervals as defined in the O & M manual. British Water has published a Code of Practice: Desludging of Sewage treatment Systems 2009. In the absence of other recommendations the following intervals are suggested:-

- Septic Tanks – annually, although could be varied according to loading
- Sewage / Wastewater Treatment Plants: Domestic – twice each year although could be varied according to loading and permit or consent requirements
- Sewage / Wastewater Treatment Plants: Commercial – quarterly although could be varied according to loading and permit or consent requirements, possibly more frequently

10.1 On inspection the service technician may change the emptying intervals if required, because of high / low loadings or seasonal variations, but only if required for the safe and correct operation of the equipment.

10.2 Responsible Waste Contractors (desludging companies) will audit their services and assure that they operate to a competent and reliable standard. They should provide feedback on the state of the system and equipment if the visit is not supervised by an Accredited Service Engineer who will have successfully completed the British Water course for Package Sewage Treatment Plant Maintenance. Currently, not all service providers are effective in supervising de-sludging to ensure correct and proper methodology is adhered to or problem identification carried out.

10.3 The responsibility for organising de-sludging should be agreed with the client or included within the service contract.

10.4 De-sludging, irrespective of plant type or manufacturer, should be the removal of the crust then the settled sludge, clearing any deleterious material throughout the system including accumulated sludges. Jet washing through out the sewage / wastewater treatment plant as required and in accordance with the manufacturer's instructions.

10.5 Moving logically through the system generally from Primary Zone, Biozone to Humus / Final Settlement zone and to include both primary and final effluent pumping stations if they are part of the system.

10.6 All service technicians should be aware of correct and proper methods of de-sludging and have a general knowledge of the governing legislation.

10.7 The treatment system should be re-primed or filled as soon as possible after emptying, especially in wet conditions where a local water table is close to tank installation depth. This is to minimize upward pressure and the potential to destabilize the system

10.8 Technicians and service providers should give advice as to the optimum distance for access for the de-sludging process. The maximum distances for a standard vacuum tanker are

> 75m horizontally and 9m vertically measured from the base of the tank to the top of the stack pipe of the suction tanker.

11 Manufacturers O & M (Operational & Maintenance) Manual

11.1 Compliance to manufacturer's instruction is essential to maintain optimum plant performance: for latest versions of the manuals consult manufacturers' web-sites.

11.2 Operational and maintenance advice should be given at the time of installation. For general advice on basic operational Do's and Don'ts, especially for a householder, see the British Water Code of Practice A Guide for Users of Sewage Treatment Systems 2009.

11.3 The consequences of grease and toxic substances entering the plant on operation and maintenance should be explained in the manuals.

12 Use of Correct Replacement Parts

12.1 It is important to appreciate that not using proprietary replacement parts will invalidate any warranty on the wastewater treatment system and may adversely affect its performance.

12.2 Manufacturers should ensure that replacement parts are readily available to service companies.

12.3 Accredited service engineers may compromise their certification if they use other than approved replacement parts, especially if the parts fitted compromise the plant's performance.

13 Quality Assurance

13.1 Service companies should meet the minimum standards ISO 9001:2000 and ISO14001. If however a service company does not have certification to these standards then they can be part of a similar system of an approved treatment plant manufacturer who has the required standards or should ensure that they maintain relevant records for servicing, replacement parts and company procedures.

13.2 All service companies must keep a competent persons register and training records.

13.3 Plant manufacturers can carry out auditing at random of associated service companies who have their type approval.

13.4 Records to be maintained regarding the operation, performance and equipment condition of the treatment plant. Details of performance and breakdowns may be reported to the manufacturer of the wastewater treatment system.

13.5 If a product complaint occurs this will instigate an investigation by the service provider and if necessary referred to the appropriate wastewater treatment system manufacturer. Records should be maintained in accordance with a quality assurance system to facilitate the investigation of all incidents, large or small.

13.6 All British Water training certificates require re-validating every 3 years.

13.7 Manufacturer's product updates should be regularly reviewed and changes introduced into service procedures if required.

14 Documentation and Record Keeping

14.1 End users, i.e. householders, should be encouraged to keep records of service visits, de-sludging visits and volumes to help with satisfying the Regulator's requirements.

14.2 Servicing companies shall keep records of service visits and all work carried out.

14.3 Service companies and technicians should retain current Waste Carrier details and all Duty of Care Waste Consignment Notes related to individual waste and de-sludging visits and contracts as required by current UK Regulations.

14.4 Service companies and technicians should keep copies of Regulator Consent Certificates where available.

15 Bibliography

15.1 Code of Practice Flows and Loads – 3 Sizing Criteria, Treatment Capacity for Sewage Treatment Systems

15.2 Code of Practice Guide to the Installation of Sewage Treatment Systems

15.3 Code of Practice Guide to the Desludging of Sewage Treatment Systems

15.4 Code of Practice A Guide for Users of Sewage Treatment Systems

15.5 Burks, B.D. and Minnis, M.M. (1994) "Onsite Wastewater Treatment Systems" (Hogarth House)

15.6 Tchobanoglons, G.; Burton, F.L.; Stensel, H.D. (2003) "Wastewater Engineering: Treatment and Re-use – Metcalf and Eddy" (McGraw Hill)

15.7 Simpson, J.R. (1972) "Wastewater Treatment for Small Communities" (Process Biochem)

Appendix A

Pre-Qualification

The Company

1 Commercial

1.1 Quality assurance to IS0 9001:2000 and ISO14001 or similar

1.2 Financial: Bank and two trade references or similar

1.3 Insurance: Public Liability (£2.0M) and Employer's liability in the event of pollution.

1.4 Geographical service area they are prepared to cover: usually at least a county

1.5 When carrying waste there is a need to be a Registered Waste Carrier Broker

1.6 At least one reference (preferably 2/3) from members of British Water

2 Systems

2.1 Plans for all routine servicing activities

2.2 Record keeping of service visits, action taken, equipment/system inventory, list of replacement parts provided and demonstration of correct disposal of components removed during service.

2.3 Training records for the service technician(s)

2.4 Health & Safety training and activity log

2.5 Equipment test certificate register

3 Technical background of employees

3.1 Either

3.2 Qualified by experience i.e. can demonstrate knowledge and familiarity with

- 3.2.1 treatment plants and pumping systems
- 3.2.2 how they operate
- 3.2.3 with equipment and tools used for servicing
- 3.2.4 techniques used to service treatment plants and pumping systems in accordance with the British Water Code of Practice.

3.3 Or

3.4 A minimum of 12 months experience working under the supervision of a qualified technician (British Water Accredited Service Engineer)

3.5 Or

3.6 Attended a training course by at least one of the members of British Water who manufacture small package treatment plants less than 50 PE.

4 Technical knowledge and competence of maintenance staff

4.1 Ideally have successfully completed the British Water Course for Package Sewage Treatment Plant Maintenance Engineers and be in possession of a valid certificate or can demonstrate understanding of this British Water Code of Practice and substantiate the knowledge which can be summarised as:-

4.1.1 Understanding of treatment plants, how they operate and an understanding of the main types of sewage and wastewater treatment plants and their maintenance requirements

4.1.2 Knowledge of fault findings process and M&E related issues and practical problem solving techniques

4.1.3 Confined space trained for use as necessary

4.1.4 An understanding of all relevant regulations

4.1.5 Adequate level of experience in the industry

4.1.6 Can demonstrate a knowledge of customer care requirements

4.2 Alternatively attended a training and development program that is overseen by the servicing company or British Water member of manufacturers

4.3 Driving licence

Appendix B

Glossary

Activated sludge	Aerated wastewater with a suspended biomass which breaks down much of the substances in sewage and wastewaters
Aerobic	Condition where oxygen is present
Ammonia	A nitrogen containing compound, strictly should be called ammoniacal nitrogen
BOD	**Biochemical oxygen demand**: the amount of dissolved oxygen consumed by microbial activity over usually a 5-day test at 20° C (BOD_5)
Biofilm	A film of biomass or microbial cells attached to a surface usually submerged
BAF	**Biological Aerated Filter** that contains a submerged medium of a high surface area on which biomass can accumulate and which is aerated. The excess biomass is cleaned off (or back-washed) and settles to form sludge
BF	**Biological filter** or trickling filter which is usually a circular tank filled with media and a distribution system dispersing wastewater over the media
Cesspool	An underground watertight tank without outflow used for collecting domestic wastewater. It is a watertight vessel that stores the raw sewage until collected by a tanker
COD	**Chemical Oxygen Demand** is the amount of oxygen consumed by the chemical oxidation of the matter present in the wastewater sample
Crust	Accumulated material that collects on top of the primary liquor and which is removed when the system is de-sludged
Desludging	The removal of the accumulated crust, sludge and other solid material by suction tanker. NB Sludge removal reduces BOD loading.
DWF	**Dry Weather Flow** is the average daily volumetric flow received by the wastewater plant in a day which has originated directly from the premise connected to the plant.
EA/SEPA/NIEA	Environmental Regulators - Environment Agency (for England and Wales), Scottish Environment Protection Agency, Northern Ireland Environment Agency Department of Environment
Eutrophication	This is the enrichment of a water course or body by nutrients mainly phosphates and nitrates that usually leads to deterioration in the water quality by excessive growth of plants, algae and bacteria

Full flow to treatment The maximum flow a wastewater plant can treat and is usually expressed as a maximum flow for a set number of hours not repeated more that twice a day

Humus tank A settlement tank that follows secondary treatment

Mixed liquor The mixture of microbial solids and wastewater present in activated sludge aeration vessels

Organic loading The amount of BOD present in the wastewater expressed as grams or kilograms per day

Package treatment plant A self-contained sewage treatment plant that is manufactured in a factory and transported to site for installation. It can be more that one module

***Per capita* volume and loads** The wastewater volume in litres per person per day with the organic (BOD) and ammonia ($N\text{-}NH_4$) load expressed in grams

Population equivalent (pe) The notional value for wastewater equivalent to a domestic resident usually used for sizing a treatment plant, can also be used for sizing a treatment plant which receives some non-domestic wastewater which is given the equivalent "pe" value

Reedbed A gravel bed with reeds planted to provide some additional treatment

RBC **Rotating biological contactor** is a treatment plant that has a group of discs that rotate in the settled effluent to be treated; they may not be completely submerged. The biological treatment takes place on the discs

Septic tank A compartmentalised settling tank that provides a limited amount of anaerobic digestion

Sequencing batch reactor (SBR) A treatment vessel for a process that undergoes the sequence of filling, aeration (bio-mass growth and wastewater treatment), settlement and discharge, a sequence which is repeated successively

Submerged aerated filter (SAF) A fixed film treatment process in which the solid media is submerged in the effluent and on which the biofilm grows, a mechanical device introduces oxygen

Appendix C

Audit Procedure for Failing Plants (APFP)

Introduction

The procedure is only to be used in the following circumstances:

A) No maintenance has taken place on a plant and it is in very poor condition.

B) Plant has been badly neglected or abused.

C) The effluent quality is very poor.

D) There are sufficient concerns about the site and the way the plant is being operated.

General Notes

The forms contained within this appendix illustrate how the necessary information required to make a detailed appraisal of a failing packaged sewage treatment plant should be recorded.

Relevant information can be obtained from a variety of different sources such as contract files, product brochures and operation and maintenance manuals. More detailed plant and site information can be acquired through discussions with the plant owner and during a site visit. However, only data that is readily available should be recorded and it is not expected that the service engineer should spend time searching for information i.e. if the customer does not know what consent they have then nothing can be entered for this or if the customer is out or unavailable. The engineer should use reasonable endeavours to fill in as much of the form as is possible.

All APFP documents should be sent to the end user with a covering letter and a record kept by servicing company. Also, a note must be kept to record whether the end user has complied, or not, with the advice given by the servicing company. If no action is taken by the end user, then a reminder letter must be sent by the servicing company. Plant manufacturers may randomly check compliance with the recommendations following completion of APFP forms that apply to their plants.

Sheet 1

- Obtain plant details, e.g. name and type of system and all the relevant details of the treatment stages used within the system.
- Obtain the original design loadings and compare with the actual site data.
- Check and note discharge consent and compare with the sample results obtained from the Regulator and any site investigations.

Sheet 2

- Inspect the structural integrity of the system on site including manhole covers used and the plant internals.
- Check the general installation of the plant, including ventilation, levels and electrical connections.
- Inspect the mechanical and electrical items on site for correct operation (e.g. motors, blowers and pumps).
- Carry out a simple process evaluation through the treatment stages of the plant as relevant to plant or system design e.g. dissolved oxygen and temperature readings, biomass conditions and flow measurement - where ever possible and appropriate.
- Obtain samples from throughout the treatment stages of the plant for analysis to help identify the cause of the problem.

Sheet 3

- Identify any actions required or recommendations to improve the system performance.

Special Note:

If the customer does not have a permit or consent to discharge then they need to be informed that one is required unless the Regulator has specifically written to confirm that it is not required. However, in England and Wales this doesn't always apply to domestic properties producing <5m3/day.

Audit Procedure for Failing Plants (APFP) SHEET 1

Plant Details		
Address:	Date of Visit:	
	Contact Name:	
	Contact Tel:	
Definition of Problem:		
Plant Name and Type:		
Primary Treatment		
Type (e.g. cylindrical, spherical, integral):		
Dimensions / Volume:		
Desludging Interval (No. of days):		
Secondary Treatment		
Type (e.g. RBC, SAF, SBR):		
No. of Stages:		
Dimensions/volume:		
Final Clarification		
Type (e.g. integral, separate):		
Dimensions / Volume:		
Desludge Interval (No. of days):		
Tertiary Treatment		
Type (e.g. sand filter, UV, nitrify):		
Details:		
Dimensions / Volume:		
Plant Loadings	**Design**	**Actual**
Population Equivalent [p.e.]:		
Organic Load [gBOD_5/d]:		
Hydraulic Load [L/d]:		
Ammonia Load [gNH_4-N/d]:		
Discharge Consent [BOD:SS:NH_4-N:Oils & Greases]:		
General Notes / Remarks		

Audit Procedure for Failing Plants (APFP) SHEET 2

Structural Inspection

(e.g. manhole covers/lids, plant internals)

Installation Inspection

(e.g. plant, ventilation, electrical)

Mechanical / Electrical Inspection

(e.g. pumps, blowers, electrical internals)

Process Inspection

(DO/temperature readings, conditions of biomass, final effluent quality, flow measurement)

Sampling/Measurement

(e.g. inlet, settled sewage, final effluent)

Audit Procedure for Failing Plants (APFP) SHEET 3

Remarks

Actions

Recommendations

Engineer…….…….. Certificate number…….……..……

Service company:…….……...……..

……...…….

Appendix D

Outline of the British Water training course for Packaged Sewage Treatment Plant Service Engineers

Rationale

There are a large number of small sewage treatment plants of differing designs, sizes and ages across the country. The Environment Agency (EA) in England & Wales, Scottish Environment Protection Agency (SEPA) in Scotland and Northern Ireland Environment Agency (NIEA) are showing increasing concern about the potential amount of pollution these plants could cause.

One of the primary ways of preventing this pollution is to ensure the plant is properly and correctly maintained and serviced.

British Water has been working closely with the environmental regulators to develop a training and accreditation scheme for service engineers. The regulators regard this as an important factor in the prevention of pollution.

Aims and Objectives of training course

Aim: The overall aim is to ensure that the service engineer has a thorough understanding of the types, theory and operation of small sewage treatment plants.

Objectives: at the end of the course the service engineer will be able to:

- Describe the different types of small sewage treatment plant
- Describe the differences between fixed film and activated sludge type plants
- Describe the operation of the different types of plant
- Understand the causes of common failures / faults and know how to rectify them
- Understand the different types of permits and consents
- Understand the causes and effects of pollution
- Describe the importance of the measured parameters
- Complete the audit form for failing plant
- Understand the values and calculations used in the current British Water design code of practice Flows and Loads

Accreditation

The training course is supported by a questionnaire which is independently assessed. Success in the questionnaire leads to accreditation, and the issue of the 'Qualified Service Engineer' certificate and identity card. Accreditation is valid for three years, and illustrates that the engineer is skilled in servicing small sewage treatment plant. The regulators will recognise the importance of such a system in the prevention of pollution.

The Accredited Service Engineers' details will be posted in a dedicated section of the British Water web site. The section will be searchable by name, company, post code or other criteria.

The course content is as follows:

1 Introduction
- **1.1** Background to the course
- **1.2** Regulations

2 Treatment processes – Overview
- **2.1** Fixed Film
- **2.2** Suspended Growth

3 Packaged plants in detail

4 Pumps (short section)

5 Fault finding

6 Case Studies

7 Health & Safety
- **7.1** Precautions
- **7.2** Electrical
- **7.3** Confined space

8 Sampling and Testing

9 Knowledge assessment (Test)

The course management is as follows:

The course material consists of an extensive series of PowerPoint slides, case study information and a comprehensive set of course notes.

British Water subcontracts the provision of the training course to an established training provider who provides the 2-day course, carries out the examination, marks the assessments and issues British Water with a list of successful candidates.

British Water issues successful candidates with an Accredited Service Engineer certificate, a plastic photo identity registration card and enters the person's details on the register and the BW website. The accreditation is personal to the engineer.