

# “Towards a European Qualification Framework for Solid Waste Facilities” Managers”

## SWFM Review

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### **Review of Qualifications Framework and Info-Training Toolkit**

This review was undertaken following a request from Trust Waste Management Ltd (UK), a programme development partner.

The review was based on a determination of the purpose of the programme, the content as it applies to waste management, the logical order in which it has been presented and the relevance to current and emerging practice in waste management, internationally. The reviewer based comments on both the academic and practical elements of training in waste management, across a range of levels of study and practice, for a range of facilities from collection through transport, storage, sorting, recycling, treating and composting wastes and disposing of residual materials. Development of training materials, overviews, learning outcomes, qualifications of trainers and trainees, facilities for training and approaches to imparting information were all reviewed based on previous and current experience of the reviewer. The ease with which a candidate might take up the programme was considered, along with the potential to link the learning outcomes with practicalities on the work site.

It is acknowledged that materials have been developed by a number of contributors and the amount and scope of material is notable.

### **Overview**

There is a huge amount of material in this package and the effort from contributors and the detail in all units is acknowledged. The task of any facility manager to work through this programme will be large and it should be recognised that a phased approach should be considered. The requirements of a facility manager to undertake this programme, and the time to be devoted to it, are noted.

Any integrated waste management system relies on linkages across all initiatives (recycling, waste audit and reduction, resource recovery etc) and facilities, including transport and collection. The connections to ensure a total system runs smoothly must be included and highlighted in any training programme. An understanding of all elements of a total system is important for facility managers and the undernoted comments reflect this.

The following are notes and comments overall, followed by individual sections for each unit in the programme.

Across all units, there is variation in requirements for trainers and trainees. Whilst it is logical that different trainers might be involved in various units, is it assumed that the trainees will take the entire programme? If so, then the trainee requirements should be the same throughout. Or, is it assumed that trainees would take only the units that pertained to, say, operational management or environmental and then train only for that area? If it is expected that the graduate should cover several areas, then the trainee requirements should be consistent across the sections regarding facilities, equipment, and potential for site and facility visits. They are generally compliant with this, but should all read essentially the same.

It is clear that contributors have been generous in their requirements and have listed elements specific to their area. It is recommended that these requirements be considered for all units, perhaps in an overview document rather than repeated for each unit.

Some sections show sub-units, others show mandatory units which do not match the number coded units in the qualifications framework. Throughout, and for all elements of the programme, there should be consistency across the topics.

The vast wealth of backgrounds that contributed to this package could be complemented by a comprehensive reference list to allow candidate managers access to general and specific information relevant to waste management. Journals, handbooks and conference proceedings would be valuable additions to this package. In addition, and throughout the range of units, opportunities to visit sites, review case studies and meet with practitioners would enhance their training programme. All EU countries have systems in place that would provide views on the range of practices included in the programme.

## **Environmental**

The material in these documents is impressive and comprehensive.

Overall and lead-in: document needs some edit throughout, not a lot. The lead-in to the environmental section states that it provides updated knowledge of pollution control equipment. While I see procedures for environmental protection, these are managerial and not technical. I see no notes on equipment. The info-training toolkit lead-in also states that

the candidate will gain knowledge on pollution control equipment, but the outcomes do not show this.

**The Info-Training Toolkit for Environmental** does require that the trainer has an understanding of technology and equipment, so a link back into the detail of the units would be suitable. It might be useful to state that a requirement of a trainer is to have a membership in a professional body such as CIWM, IEMA or CIWEM.

For trainees, it is clear that qualifications and/or experience is required. Could this be more detailed to allow for those keen to enter this field? While their career aspirations might include this type of work, they would be encouraged if interests and background could be specified, for example, land use work, park management, community projects on recycling or green issues, waste recycling etc.

Training facilities and infrastructures are sensibly set out. Would there be potential to use a virtual learning environment and allow distance learning via the internet? Is there provision for site visits?

## **Qualifications Framework**

### Environmental ULO EM-1

This is a comprehensive section. The reviewer was surprised at the in-depth requirements for this level. Is the developer of the document sure that “advanced” knowledge and skills are required for EQF 6? Would it be more suitable for “appropriate”? Background required for “advanced” would supersede the contents of this document.

### Learning Outcomes

The list of LO could more closely relate to the descriptions following. The developer has given the same title (in yellow) to three sections that relate to LO 4,5,6. Suggest first statement, linking to LO4, could be “understand EA/EIA” and leave the text as is. Then, next yellow titles could be implement, review/audit/improve. This would match the list of LO and the text for each section.

### ULO EM-2

Suggest the “Work tasks:” be “Ensure the evaluation of environmental impacts in daily operations ...” rather than the impact of environmental management. The learning outcomes suggest this is a unit is for understanding, avoiding and mitigating impacts rather than reviewing the EMS. It seems to be for implementing the EMS to reduce impacts, which would be correct.

The requirement in this unit to identify aspects and impacts and follow with mitigation, training and emergency response plans suggest that an early, basic but over-arching presentation on earth science, environment, pollution sources and control should be used to set the scene. Identification of aspects and impacts would be a logical follow-on. The use

of EIA and EMS is absolute, but the insight required to identify issues and impacts should not be assumed initially.

This unit looks at EMS, but the previous unit requires skills in developing audit plans and organising EMS. The reviewer suggests that these two units be revisited to ensure that there is logical order in defining “environment”, “EMS”, what they are, what they are used for and how they are approached; then move on to actual implementation and management of issues ensuring impact avoidance or mitigation. This would make a more sensible flow of the topic across the units.

It is noted that this unit includes environmental impacts on a waste management site. Elsewhere in the programme there is inclusion of communication and conflict resolution. It is suggested that this unit include “site selection for waste management facilities” which would lead from the general knowledge of the environment and then lead in to the detail of impact management during facility operation. Included in this could be a piece on site closure. This should include physical closure, containment and ownership. While site selection is important for collection points, transfer stations and treatment plants, it is crucial for those sites entertaining any type of disposal, whether for treated or untreated materials, including filter cake from inorganics or ash from incinerated organics.

While facility managers would be employed at sites already selected, it is this reviewer’s experience that issues on site selection continue throughout the life of the facility. New neighbours, initiatives, regulations and politics all influence how a facility and its location are regarded. Therefore, it would be suitable for managers to understand how the location was chosen and the issues that might be raised. Among those issues would be environmental protection (particularly of surface and ground water and site drainage), air quality (smells and airborne debris, including fallout), property values, aesthetics, access, and involvement of the community in decision-making for the siting and operation of the facility. Such issues tend to reappear with each change in government or policy.

#### ULO EM-3

This unit is clear, but would also benefit from the above suggestion of initial staff briefings on what environmental hazards are and put this into the context of this unit on policy and procedure.

ULO EM4

This unit seems to absorb the three preceding it and is a strong, inclusive unit.

### **Financial and Contractual**

This is an important section and it is also an area that CIWM like to see in degree programmes. It is also a tricky area as societal, economic (ref here to FCM-2), climatic and locational factors influence the amount (how much OR little) of waste requires to be handled. From an environmental point of view, goals are for reducing. But, from a business point of view, goals are for throughput. It could be worth discussing (under other projects) the wider view of the business in participation in other ventures and eventually change the name of “waste facility” to “resource facility”. There is a move to this in many quarters already and it makes sense.

Trainers’ skills are limited in these units. Addition of some experience with contracts (either as manager or contractor) could be useful. The trainees’ skills required for FCM are much higher than those of the trainers!

ULO FCM-1

As a start to this series of unites, perhaps add in piece on where any funding or support comes from: local authority, national government, EU, private sector – depending upon the ownership of the facility. Is there a requirement here for understanding of on-line systems of spread sheets for costings, calculations etc?

ULO FCM-3 and FCM-4

It is not unusual in some businesses to have an external input to overseeing contracts. While this might not be necessary, it could be useful to include a note on potential for external audit in areas where there is an active development plan or construction that requires many contractors.

### **Human Resource Management**

There is good information in the list of units and learning outcomes. Equally, the sub-units are interesting and valuable. How do they fit in? Could the material in the sub-units be incorporated into the main units? Could the relevant sub-unit be noted under each main unit?

Team building, leadership, communication, conflict resolution are all part of professional skills, applicable to any business or work site. In waste management, it must be noted that

many site workers could be unskilled and these aspects are doubly important. Turn-over of staff on waste sites is often high, so this unit could be used to ensure that there is continuity of staffing, with an aim to keep staff as long as possible and ensure their career path.

The oral presentation element is valuable. Perhaps this can be incorporated throughout the programme with potential for candidates to practise their presentation skills across the range of topics. Under the HR section, then, they will be comfortable with their ability to communicate. Note here also that these skills will be needed in any requirement for presentations to the press or other media, as well as the local community when new facilities, or changes, are proposed. This is a crucial element of waste management in that all information should be open and honest in the public forum and the inclusion of communication skills is commended.

### **Health and Safety**

The Health and Safety element is important and increasingly being incorporated in waste management training for both operatives and managers.

The trainee requirements for this section seem to be more applicable to the overall programme rather than specifically to the health and safety component of the programme. The elements of inclusion, personal situations etc should be part of the original application review and not specific to health and safety. Again, there should be consistency across the wider programme as to the trainee requirements.

While the H&S section is correct, it does seem short in relation to other sections, for example Human Resources. Health and safety is vitally important and there is so much that could be covered. The strength should be in a presentation of legislation, in detail, as it pertains to the workplace. It is certainly noted that this programme is not specific to health and safety, but the links now through SQA, WAMITAB and CIWM to site and worker safety are clear. It is now the accepted view that managers of facilities must be up-to-date with the knowledge of requirements throughout the organisation, from upper management to operatives.

The sub-units are interesting and provide good further detail. Again, it would be useful to see a full course outline with these sub-units included at the relevant point within the main units, particularly with reference to OHSAS 18001 and its links to other standards for quality and environment.

The coverage of behaviour elsewhere in the programme should be cross-referenced to the HS units.

Equally, there is now an understanding of the links between health and safety, site practices, impact management and the environment. Again, cross-referencing among the units would be useful. Nowadays, it is often the same person with responsibility for quality, health and safety, and the environment, rather than different roles in the past.

A valuable resource for this section would be the latest edition of “Safety at Work” by John Ridley and John Channing. This frequently up-dated book covers many elements relevant to this programme, and not just in health and safety. The sections on employment law, risk management, liability, behaviour, use of machinery, environmental considerations (EMS) and waste management would all be specific to this programme and valuable for candidates.

Of note also are the National Examination Board in Occupational Safety and Health (NEBOSH) and the Institution of Occupational Safety and Health (IOSH). While it is noted that this programme spans the EU, these organisations could be included in the potential list of qualifications for trainers.

### **Operational Management**

This section is focussed on administration and personnel rather than the physical elements of operation. There are clear links here with the human resources and financial and contractual units. Again, cross referencing might be useful between the sections.

Of note is the “operating manual of the plant”. The preparation of this should be a priority and should come at the top of the list of tasks/aims/objectives. It will incorporate both the technical and personnel elements of site operation and be inclusive of all aspects under this unit. In addition, there should be cross-referencing to other units to ensure that all aspects are included. There is a strong cross-over with HR management in the daily management of staff and this should be easy to interpret within the documentation. In addition, there should be clear links with health and safety in normal daily operations of the facility.

### **New Projects Management**

New and clean technologies could be a focus of this section, with a connection back to site selection and sustainability for defining new approaches and locations for waste management facilities of all kinds and levels. Throughout the western world, there are examples of best practice in moving from “waste” to “resource” management and this could be a focus for this section. The business elements here for strategic planning are valuable. However, a more specific consideration of suitability of technologies would enhance this section.

Experience recently by this reviewer points to new project initiation, testing of technology, early trials of new approaches to, for example, recyclate sorting or incineration efficiency, are a crucial part of any waste facility programme.

In addition, the business generation element of important here and market research is included. Within this could be added a section on the issues and pitfalls of determining a design capacity for a facility. This hinges on accurate information from waste generators, and this is notoriously difficult to glean. An approach to moving information from generator or regulator and on to facility developers needs to be perfected to ensure neither under nor over development happens. Either of these causes considerable cost leading to reconsideration of the plan. Recent incidents in the UK (of facilities failing in start-up) support this recommendation.

## **Technical**

### **Recycling:**

This element includes units, particularly ULO REC-1, Monitoring Energy Consumption, REC-2, Manage Operations across the Site, REC-3, Manage Permission Regimes, Rec-4 Control of Incoming and Outgoing Streams following Legislative Requirements and REC-5, Treatment and Transport of Waste in Accordance with Law, which are not specific to recycling.

All these units are relevant to all the topics in the “technical” section. It is recommended that an overarching section be introduced which would cover all these, and be inclusive of all the options for waste management, treatment or disposal.

The Recycling material could begin with material on the potential for receipt of recyclates, their quality and quantity, then lead on to decision-making for the appropriate handling and machinery requirements for that type of waste. Waste materials vary depending upon geography, climate, economics and time of year, with festivals and mid-summer generating increased amounts of organics, food waste, bottles and house clear-outs. In winter, organics reduce. These fluctuations should be considered for the location and staffing, equipment, storage and management of the material adjusted to suit. In a built-up area, these considerations increase in importance.

This section has a focus on machinery, and does include training, quality control and some elements of safety. It is recommended that there be a section on health and safety regarding receipt, handling and forwarding of recyclates. This is an area that will increase in importance with EU guidance (as well as SQA and WAMITAB in the UK) for waste facilities. Strengthening the health and safety aspects will enhance the programme.

### **Composting:**

This section is thorough in its detail of material, processes, classifications, processing and handling of compostable materials and the resulting compost. While there is some overlap within the units, that is a sensible approach to ensuring all areas are covered.

Residual materials are covered. However, the beginning and end of processes could be included. While preferred sources are noted, more detail on sources of materials, procedures for acquiring raw materials, co-operation with local authority and with community, markets, shops, landscapers etc would be a valuable addition to this section (ULO-COM1). In addition, the “full circle” or completion of the process and the return of material either into the community, local parks or the marketplace would provide a full picture for composting.

Definitions of non-hazardous materials are covered and processes are clear. Competences do cover issues of leachate, rodents, odour management, and this could have strong links with on-going relationships with the community and a link back to the original siting of the facility. In addition, procedures for removing plastics, rope, metals etc could link back to sources of material, at-source segregation (as applicable for other sections) and integrity of the raw materials.

Specific attention could be given to food waste and the potential to remove it from the disposal or composting route. While this might be outwith the range of the facility manager, it is an important and growing topic throughout Europe and the world.

Again, legislative elements are clear and a cross-reference to other sections would be valuable – just in notation form to ensure full coverage across the range of topics.

### **Mechanical Treatment:**

The material here is well detailed. It would be sensible to re-order the units to ensure the first one in the series deals with delivery of waste material.

Two units ULO AD/MTB-5 and MTB-9 have the same title “Manage entering and outgoing waste streams in compliance with the legislation”. There is considerable overlap with both units regarding content. These two could possibly be combined.

**Landfill:**

As with other units, this would be enhanced by mention of visit/review/report on facilities elsewhere, whether they demonstrate best practice or not. Viewing the procedure of constructing, using, monitoring and closing a landfill is valuable in all regards and would provide a basis for the candidate to fully incorporate procedures into their own approach to landfill management.

Ensure that climatic conditions are included in the sections on compaction and cover as weather (wind, rain, snow in particular) influence activities at the working face and along the perimeters. In addition, they influence the efficiency of cover material.

Gas collection is sometimes just burned off and, at other times, incorporated into local energy schemes. This could be included.

Under infrastructure, ensure that drainage, water systems, access and leachate collection are linked to the site geography and existing drainage patterns prior to engineering of the site. This will influence the constructed water drainage and collection system.

Environmental impacts are clearly covered and should refer back to those impacts originally set out in the EIA for site selection. Avoidance and mitigation measures will be listed in the EIA document and should match the points and learning outcomes in ULO LF-8.

Site security is covered and could be extended to include a section on site closure and management in perpetuity, on-going monitoring and any conditions on access and future site use.

**Incineration:**

For reception of wastes for incineration, will there be an assumption that a facility will have a laboratory to confirm organics vs inorganics and mixed materials?

For facility managers, should there be distinction between incineration and physical/chemical treatment procedures. Also, is there an assumption that mixed wastes will arrive and an incinerator may be used for solid wastes, clinical wastes, hazardous wastes etc? If this is the case, the "procedures" sections should allow for these distinctions.

Decanting waste requires systems to keep the air clear of emissions from drums and tanks and also a system of burms in the event of spillage. These elements need to be covered following waste reception.

ULO INC-7 notes that the manager will have responsibility for liaison with authorities and the community. This communication is vital, so should be a larger element of competence. Once a facility is up and running, there is never an assurance that it will continue to be so if there is any doubt in the collective mind of the community. This section should be expanded

to include a local liaison person or group and the involvement of facility staff in imparting information from the on-going air and water monitoring programmes surrounding the facility site.

Site management and environmental monitoring in the area of an incinerator should incorporate response to any emergency and its impact on the wider community. Contingency plans (ULO INC-8) should provide a wider view into the community to ensure there is immediate notice given of any emission, leak or other catastrophic event, and tie in with local emergency services. This should be included in the outline of the unit.

### **Transfer Stations:**

This set of units covers legislation, procedures, waste handling, documentation, risk assessment, site security and contingency planning. All these elements apply to all types of waste management facilities. Throughout the programme, these elements have been noted. It could be considered to include them in an overarching unit which would then lead on to the specific types of waste facilities.

Specific to transfer stations, there could be an element that considered the range of types of stations, ranging from the simple segregation sites to the more structured and formal facilities that cater to business, industry and the general public.

The range of facilities within a transfer station could be noted, including, for some, aspects of sorting, pre-treatment, and movement of material back out into the marketplace. Civic amenity sites come into this category, and they can handle everything from textiles to used oil to electronic and white goods. Within this group of units, specific detail on these would be welcome. Again, as in other sections, communication with the community is key as any issue regarding waste, of any kind, can escalate and jeopardise the complete waste management system.