1. Module details

Module name

Waste Water Treatment and Storage

Module duration

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 36 - 40 hours.

Module code

NUE023

Discipline code

0702130

2. Module purpose

This module will provide the learner with the skills required to identify, operate and perform minor maintenance to the wastewater storage and treatment system.

3. Prerequisites

Nil.

4. Relationship to competency standards

This module provides part of the underpinning knowledge and skills in the 'Evidence Guide' of specific units of competency in the National Electrotechnology Training Package and provides similar support, where mapped, to equivalent units in the National Metals and Engineering Competency Standards. For details refer to the module to unit maps, available from NUEITAB.

5. Content

Identification and isolation of fault condition/s
Identifying fault/s
Types of fault/s
Make safe procedures
Isolating the fault/s
Gas and fume detection
Notification
Personal hygiene
Safety awareness

Emergency repairs and blockages
Identifying the emergency
Locating the emergency
Prioritising the repairs
Notifying the appropriate person/s
Public safety precautions
Breathing apparatus
Safety signage
Repairing the system
Reactivating the system
Personal hygiene
Safety awareness

Treatment and storage of pumping equipment maintenance
Identifying the systems pumping equipment
Identifying the systems control mechanism/s
Isolating the system
Make safe procedures
Operating the pumps
Maintenance of the system
Recording work details
Notification
Personal hygiene
Safety awareness

Manhole and grounds maintenance
Safety barricades and fences
Safety signage
Manhole cover condition
Clearing debris
Grounds maintenance
Personal hygiene
Safety awareness

Treatment pond maintenance
Weed and grass control
Pest control
Scraping of the pond/s
Closing pen stocks
Cleaning trash baskets
Reactivating the system
Removing the waste
Burying the waste
Housekeeping
Personal hygiene
Safety awareness

Instrumentation, reading and recording of information
Locating the instrumentation
Identify the instruments
Read the displayed information
Log the information
Notification
Personal hygiene
Safety awareness

6. Assessment strategy

Assessment methods

Assessment should be progressive reflecting a holistic approach to ensure the module purpose is met. To assist in ensuring validity, reliability and fairness assessment instruments should include practical exercises, assignments and written tests consisting of a number of item types, such as multiple choice, short answer and problem solving.

Conditions of assessment

Learning and assessment will take place in an environment that is conducive to a learner's development.

7. Learning outcome details

Learning outcome 1

Identify fault condition(s) and isolate the necessary area and or components to enable the fault to be rectified.

Assessment criteria

1.1 Describe the symptoms which may indicate that a fault has occurred within the system.

1.2 Describe the type of faults that may arise and the possible methods used to rectify the fault.

1.3 Record the position and location of the fault and notify the appropriate person(s).

1.4 Erect public protection barricades around the site and apply the necessary make safe protection devices including the appropriate safety signs.

1.5 Erect appropriate trench shoring (if applicable) and provide adequate means of access, egress and ventilation.

1.6 Pump out any excess water from in or around the fault site (if applicable).

Note *Do not run petrol powered equipment in or near trench excavations.*

1.7 Isolate the system to allow the necessary repairs or maintenance to take place.

1.8 Apply the necessary make safe devices to the equipment eg, tags, lashings, spades etc.

1.9 Notify the appropriate person(s) before any maintenance or repairs are performed on the equipment.

1.10 Explain what possible fumes and or gases may be present at the fault site and describe what method(s) of detection should be employed.

1.11 Discuss the possible dangers which may exist with the fumes and gases present at the fault site.

1.12 Describe the personal protective equipment which should be worn if fumes and gases are present at a particular site.

1.13 Explain the methods used to detect dangerous gases and fumes.

1.14 Detect any dangerous fumes and gases using the correct equipment.

1.15 Explain the care and maintenance procedures necessary for the detection equipment.

Note *Do not enter a contaminated area unless it has been checked for dangerous gases or fumes and never alone.*

1.16 Maintain a high level of personal hygiene.

1.17 Observe all safety procedures including the wearing of personal protective equipment.

Learning outcome 2	**Locate, identify and repair an emergency fault condition within the waste water treatment/storage system in a safe and effective manner.**	
Assessment criteria	2.1	Identify by instruments or other means that an emergency fault condition exists within the waste water system.
	2.2	Locate and record the position of the emergency condition.
	2.3	Notify the appropriate person(s) and assist them in the repair procedures.
	2.4	Erect public protection barriers and apply the appropriate signage.
	2.5	Isolate and apply make safe devices to the necessary equipment in order to perform the repairs.
	Note	*Steps 1.8 to 1.13 should be considered at this time. Do not enter a contaminated area unless it has been checked for dangerous gases or fumes and never alone.*
	2.6	Perform the work which is considered necessary to safely and effectively repair the emergency condition.
	2.7	Notify the appropriate person(s) of any further repairs which may be necessary.
	2.8	Reactivate the system and check that the operation is normal and there are no leaks.
	2.9	Remove all barricades and restore the site to its original condition.
	Note	*Do not remove barricades and signage if further work is required.*
	2.10	Record all repairs and maintenance work which is performed during the emergency.
	2.11	Maintain a high level of personal hygiene.
	2.12	Observe all safety procedures including the wearing of personal protective equipment.

Learning outcome 3	**Locate, identify and maintain the waste water treatment and storage systems pumping equipment.**	
Assessment criteria	3.1	Locate and identify the systems pumps and ancillary equipment.
	3.2	Identify the pumping systems control mechanisms both electrical and mechanical.
	3.3	Isolate the system or part of the system which requires repairs or maintenance.
	3.4	Apply all necessary make safe devices and appropriate safety signage.
	3.5	Perform repairs and maintenance to the equipment as instructed by the supervisor or appropriate person(s).
	3.6	Reactivate the pumping equipment and operate the systems pumps in accordance to instruction.
	3.7	Check all equipment repair work for leaks and correct operation.
	3.8	Record and report all repairs and maintenance procedures to the appropriate person(s) including further work requirements.
	3.9	Clean and store tools and equipment in the appropriate place.
	3.10	Maintain the waste water treatment plants building in a clean and tidy manner.
	3.11	Maintain a high level of personal hygiene.
	3.12	Observe all safety procedures including the wearing of personal protective equipment.

Learning outcome 4	**Perform repairs and maintenance to the waste water treatment and storage systems manholes and surrounding areas.**	
Assessment criteria	4.1	Record the position of all waste water treatment and storage system manholes.
	4.2	Check and repair all public protection equipment surrounding the manholes including safety signage.
	4.3	Check and report on the manhole covers general condition eg, no cracks, life hooks serviceable, gattic lifters etc.
	4.4	Maintain the manholes emergency personnel lifting equipment (if applicable).
	4.5	Check and repair if necessary all safety protection gates, fences and barricades that surround the waste water compound.
	4.6	Check that all locks and catches are operational and lock.
	4.7	Clear the grounds free of all debris and maintain the grounds in a neat and tidy condition.
	4.8	Maintain a high level of personal hygiene.
	4.9	Observe all safety procedures including the wearing of personal protective equipment.
Learning outcome 5	**Maintain the waste water treatment/storage ponds and ancillary equipment in a safe and effective manner.**	
Assessment criteria	5.1	Remove all grass, weeds and debris from around the edges of the treatment and storage ponds.
	5.2	Identify the chemicals which would be used in an effort to control pests.
	5.3	Describe the hazard that may exist while handling and applying the above chemicals.
	5.4	Describe the personal protective equipment that should be used while handling and applying the chemicals.

5.5 Notify all necessary person(s) when chemical treatment of the ponds will be performed.

5.6 Apply the appropriate pest control methods to the cut grass area around the ponds (personal protective equipment must be worn while handling the chemicals).

5.7 Store the chemicals and application equipment in an appropriate and safe location.

5.8 Ensure that the appropriate safety signs are displayed in the immediate area.

Note *The above procedures are of great importance in the effort to help eliminate mosquito breeding areas.*

5.9 Clean the accumulated crust from the top of the ponds.

5.10 Remove the waste and dispose of it by burying at a site well away from the community and the water supply.

Treatment Area

5.11 Close the pen stocks.

5.12 Raise and clean trash basket, replace the trash basket to its original position (repeat the process until all baskets have been cleaned).

5.13 Reactivate the system, and check for correct operation.

5.14 Remove the waste from the pump house.

5.15 Transport the waste to a place well away from the community and the water supply and bury it.

Note *The above step is critical, the waste must be buried.*

5.16 Maintain the treatment pumping house in a clean, tidy and hygienic condition.

5.17 Dispose of all soiled personal protective equipment in a safe and environmentally friendly manner eg gloves, disposable overalls etc.

5.18 Maintain a high level of personal hygiene.

5.19 Observe all safety procedures including the wearing of personal protective equipment.

Learning outcome 6	**Read and record the information displayed on the various instruments located in the waste treatment pumping house.**
Assessment criteria	6.1 Locate the instruments housed within the treatment pump house. 6.2 Identify the instruments requiring observation for efficient operation of the plant. 6.3 Read the information displayed on the instruments. 6.4 Log the above information and report any irregular readings to the appropriate person(s). 6.5 Observe all safety procedures including the wearing of personal protective equipment.

8. Delivery of the module

Delivery strategy	Delivery strategies must be suitable for learning both theoretical and practical aspects described in the module purpose. It is considered that the most effective method to achieve this is by integration of theory and practice where students learn by experimentation, research and reports. It is recommended that learning and assessment be facilitated in a holistic manner that may require learning outcome sequence other than that indicated in the module.
Resource requirements	Students will need access to an operational powerhouse to gain maximum benefit from this module. They will also need access to all service manuals for the equipment they are training on.
Occupational health and safety requirements	A safe and healthy environment will be provided for students and teachers as well as the particular safety procedures followed as part of the learning / teaching activity and content.