



# National Certificate IV **WATER SUPPLY SYSTEM OPERATION & MAINTENANCE**

## **LOG BOOK**



GREEN  
CLIMATE  
FUND

**MNSDA**



Ministry of Environment  
Climate Change & Technology

## STUDENT'S DETAILS

Passport Size  
3.5cm x 4.5 cm

Student Name

Std ID No.

Mobile

Address

Email

Date

Course

Centre

Batch

Signature

Authorized Signature

Stamp

# PEDGE OF THE PARTICIPANTS

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As a participant I recognize my roles and responsibilities as follows and I promise that:

1. I am undertaking this Course / Program to learn with confidence and enthusiasm and will strive to keep my level best to apply what I learn in my workplace.
2. I will learn my theory/concept lessons with much care, confidence and enthusiasm.
3. I will not disturb my participants within the classroom and workplaces.
4. I will understand and uphold, in letter and spirit, my behaviors, my attitudes and my perceptions of life and experiences with an open and sincere heart and mind seeking to learn to be a leader tomorrow.
5. I will refrain from bad-mouthing unfairness and disgracing my Employer, my Supervisors, my Trainers and other participants.
6. I will protect and preserve the rights of my family, my Employer, my Trainers, my Society and dignity of others and I will oppose discrimination, exploitation and unfairness.
7. I will report the performance, outcome and problems accurately, honestly with figures, reasons and logics that I face in applying the knowledge and skills I learn from the Course/Program.
8. I will share my knowledge, skills in developing myself and others and help my Employer, my Trainers to develop and improve success of my Employer and my Trainers.
9. I will attend all classes and activities that require attendance

In exercising my Pledge of Participation to the above-mentioned specific points, I recognize that my attitude, behavior and communication must set an example of confidence and enthusiasm and positive attitude. I will remain accountable to my own self, my Employer, my Trainer and my Society for my attitudes, actions and communications with confidence and enthusiasm to uphold these specific 9 points of my Pledge of Participation

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(Student Signature)

# INFORMATION ABOUT THE QUALIFICATION

1. Endorsement Application for Qualification 01		
2. NATIONAL CERTIFICATE IV IN WATER SUPPLY SYSTEM OPERATION AND MAINTENANCE		
<b>3. Qualification code:</b>	<b>Total Number of Credits: 124</b>	
<b>4. Purpose of the qualification</b> National Certificate IV in water supply system operation and maintenance provides comprehensive training for the water plant operators and technicians with up-to-date knowledge and skills related to smooth and effective operation and maintenance of water plants located across the islands and resorts.		
<b>5. Regulations for the qualification</b>		
<b>6. Schedule of Units</b>		
Unit No	Unit Title	Code
<b>Common Competencies</b>		
01	Write technical reports	
02	Apply and maintain Occupational Health and Safety	
03	Carry out data entry and retrieval procedures	
04	Apply Mathematics for Water Operations	
<b>Core Competencies</b>		
05	Prepare basic technical drawing	
06	Plan to undertake a routine task	
07	Apply science for Water Operations	
08	Store fluids in bulk	
09	Operate and monitor pneumatic systems and equipment	
10	Operate process control systems	
11	Monitor and operate water distribution systems	
12	Conduct chlorine dosing of water at the point of supply	
13	Perform sampling and testing of water	
14	Operate and Maintain water production systems	
15	Apply accident-emergency procedures	
16	Trouble shooting of control systems	
17	Apply sustainable and efficient operation	
18	Perform Chemical Cleaning	
19	Operate and maintain of power generation system (renewable energy)	
<b>7. Accreditation requirements</b>		
<b>8. Recommended sequencing of units</b>		

# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-1: Write technical reports

#	Activities	Mark “√” if completed	Date completed
<b>1</b>	<b>Plan the research and write the proposal</b>		
1.1	Purpose or objective of the research is identified, and confirmed with stakeholders		
1.2	Scope and nature of the information requirements are identified.		
1.3	All possible sources of the required information are researched and identified.		
1.4	A systematic research or information collection plan is designed to optimize the process.		
1.5	Resources are obtained and scheduled to service the research requirements		
<b>2</b>	<b>Conduct Research</b>		
2.1	Research is undertaken effectively in accordance with the plan		
2.2	Experiments and tests to support the research effort are conducted in a manner which ensures the demonstrable integrity of the outcomes or findings.		
2.3	Research findings are logged, documented and stored to maintain traceability.		
2.4	Preliminary analysis is conducted to identify requirements for variations or additions to the research plan		
<b>3</b>	<b>Analyze the information</b>		
3.1	Information is sorted, documented and prepared for the analytical process.		
3.2	Information and data is manipulated to enable reasonable comparisons and judgements.		
3.3	Clarification by way of expert advice and opinion is sought		
<b>4</b>	<b>Prepare and present the report</b>		
4.1	Report clearly defines the objectives, process, findings and further actions.		
4.2	Report addresses and satisfies the stated objective and timeframe		
4.3	Report and associated presentation materials are of a standard and quality for the intended audience		
4.4	Reader comprehension of the report is aided by use of executive summaries and attachments.		
4.5	Information management requirements, including documenting and repository actions are satisfied in accordance with enterprise procedures.		

I declare that theory and practical of the above unit and its elements have been taught

Date:.....

Signature:.....

# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-2: Apply and maintain Occupational Health and Safety

#	Activities	Mark "√" if completed	Date completed
<b>1</b>	<b>Perform all work safely</b>		
1.1	Use established work practices and personal protective equipment (PPE) to ensure personal safety and that of other laboratory personnel		
1.2	Clean, care for and store equipment, materials and reagents as required		
1.3	Minimise the generation of wastes and environmental impacts		
1.4	Ensure safe disposal of laboratory/hazardous wastes		
<b>2</b>	<b>Ensure others in the work group are able to implement safe work practices</b>		
2.1	Ensure hazard controls and PPE appropriate to the work requirements are available and functional		
2.2	Provide and communicate current information about workplace health and safety policies, procedures and programs to others		
2.3	Ensure <b>hazards</b> and control measures relating to work responsibilities are known by those in the work area		
2.4	Provide support to those in the work area to implement procedures to support safety		
2.5	Identify and address training needs within level of responsibility		
<b>3</b>	<b>Monitor observance of safe work practices in the work area</b>		
3.1	Ensure workplace procedures are clearly defined, documented and followed		
3.2	Identify any deviation from identified procedures and report and address within level of responsibility		
3.3	Ensure personal behaviour is consistent with workplace policies and procedures		
3.4	Encourage and follow up others to identify and report hazards in the work area		
3.5	Monitor conditions and follow up to ensure housekeeping standards in the work area are maintained		
<b>4</b>	<b>Participate in risk management processes</b>		
4.1	Report and address any identified hazards and inadequacies in existing <b>risk controls</b> within level of responsibility and according to workplace procedures		
4.2	Participate in risk assessments to identify and analyse risks		
4.3	Support the implementation of procedures to control risk (based on the hierarchy of control)		
4.4	Ensure records of incidents in the work area and other required documentation are accurately completed and maintained		
<b>5</b>	<b>Support the implementation of emergency procedure within the work group</b>		
5.1	Ensure that workplace procedures for dealing with incidents and emergencies are available and known by work group		
5.2	Implement processes to ensure that others in the work area are able to respond appropriately to incidents and emergencies		
5.3	Participate, as required, in investigations of hazardous incidents to identify their cause		

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# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-3: Carry out data entry and retrieval procedures

#	Activities	Mark "√" " if completed	Date completed
<b>1</b>	<b>Initiate computer system</b>		
1.1	The hardware components of the computer and their functions are correctly identified.		
1.2	Equipment is powered up correctly.		
1.3	Access codes are correctly applied.		
1.4	Appropriate software is selected or loaded from the menu		
<b>2</b>	<b>Enter Data</b>		
2.1	Types of data for entry correctly identified and collected.		
2.2	Input devices selected and used are appropriate for the intended operations.		
2.3	Manipulative procedures of Input device conform to established practices.		
2.4	Computer files are correctly located or new files are created, named and saved.		
2.5	Data is accurately entered in the appropriate files using specified procedure and format.		
2.6	Back-up made in accordance with operative procedures		
<b>3</b>	<b>Retrieve Data</b>		
3.1	The identity and source of information is established.		
3.2	Authority to access data is obtained where required.		
3.3	Files and data are correctly located and accessed.		
3.4	Integrity and confidentiality of data are maintained.		
3.5	The relevant reports or information retrieved using approved procedure.		
3.6	Formats of retrieved report or information conform to that required.		
3.7	Copy of the data is printed where required		
<b>4</b>	<b>Amend Data</b>		
4.1	Source of data/information for amendment is established.		
4.2	Data to be amended is correctly located within the file.		
4.3	The correct data/information is entered, changed or deleted using appropriate input device and approved procedures.		
4.4	The Integrity of data is maintained		
<b>5</b>	<b>Monitor the operation of equipment</b>		
5.1	The system is monitored for correct operation of tasks.		
5.2	Routine system messages are promptly and correctly dealt with.		
5.3	Error conditions within level of authority are dealt with promptly and uncorrected errors are promptly reported.		
5.4	Output devices and materials are monitored for quality		
<b>6</b>	<b>Access and transmit information via the internet</b>		
6.1	Access to the Internet is gained in accordance with the provider's operating procedures.		
6.2	Evidence of the ability to negotiate web sites to locate and access specified information and other services is efficiently demonstrated.		
6.3	E-mail is sent and retrieved competently		
<b>7</b>	<b>Close down computer system</b>		
7.1	The correct shut down sequence is followed.		
7.2	Problem with shutting down computer is reported promptly.		
7.3	All safety and protective procedures are observed		

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# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-4: Apply mathematics for water operations

#	Activities	Mark “√” if completed	Date completed
<b>1</b>	<b>Perform simple mathematic Calculations</b>		
1.1	Perform simple calculations on: fractions and decimals, calculations to a number of significant figures, decimal places		
1.2	Identify and use the multiples and sub-multiples of units		
1.3	Perform calculations on: perimeter and area of plane figures (i.e. square and rectangle, triangle, circle), volume and surface area (i.e. cube, rectangular prism, cylinder), mass of containers and their contents (i.e. cube, rectangular prism, cylinder)		
1.4	Perform mathematical calculations involving formulas, angles, triangles and geometric construction		
1.5	Identify and use formulas for SI quantities: length, area, volume, mass, density		
<b>2</b>	<b>Apply knowledge of mathematics in water operations</b>		
2.1	Identify and use units of Measurement		
2.2	Perform calculations on: Conversion Factors, Weight, Concentration, and Flow		
2.3	Perform mathematical calculations involving Typical Water/Wastewater Conversion Examples		
2.4	Perform Temperature Conversions and Population Equivalent (PE) or Unit Loading Factor		
2.5	Perform calculations on: Specific Gravity and Density, Flow and Detention Time		
2.6	Perform chemical Addition Conversions		
<b>3</b>	<b>Undertake water / waste water calculations</b>		
3.1	Perform Faucet Flow Estimation		
3.2	Calculate Service Line Flushing Time		
3.3	Perform Composite Sampling Calculation (Proportioning Factor) and Biochemical Oxygen Demand (BOD) Calculations		
3.4	Perform mathematical calculations on Moles and Molarity, Normality, Settleability (Activated Biosolids Solids), Settleable Solids, Biosolids Total Solids, Fixed Solids, and Volatile Solids		
3.5	Calculate Biosolids Volume Index (BVI) and Biosolids Density Index (BDI)		

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# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-5: Prepare basic technical drawing

#	Activities	Mark "√" " if completed	Date completed
<b>1</b>	<b>Identify drawing requirements</b>		
1.1	Requirements and purpose of drawing are determined from customer and/or work specification and associated documents.		
1.2	All data necessary to produce the drawing is identified and collected.		
1.3	Drawing requirements are confirmed with relevant personnel and timeframes for completion are established		
<b>2</b>	<b>Develop knowledge and proper techniques in preparing drawing and sketches</b>		
2.1	Drafting equipment is selected appropriate to the drawing method chosen.		
2.2	Drafting principles are applied to produce a drawing that is consistent with standard operating procedures within the enterprise.		
2.3	All work is undertaken safely and to prescribed procedure.		
2.4	Completed drawing is approved in accordance with standard operating procedures		
<b>3</b>	<b>Perform drawing and sketches to workplace requirements</b>		
3.1	Drawings and or parts lists records are completed in accordance with standard operating procedures.		
3.2	Approved drawings and or parts lists are copied and issued to relevant personnel in accordance with standard operating procedures.		
3.3	Approved drawings and or parts lists are stored and catalogued in accordance with standard operating procedures		

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# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-6: Plan to undertake a routine task

#	Activities	Mark "√" " if completed	Date completed
<b>1</b>	<b>Identify task requirements</b>		
1.1	Instructions and procedures are obtained, understood and where necessary clarified.		
1.2	Relevant specifications for task outcomes are obtained, understood and where necessary clarified.		
1.3	Task outcomes are identified.		
1.4	Task requirements such as completion time and quality measures are identified		
<b>2</b>	<b>Plan steps required to complete task</b>		
2.1	Based on instructions and specifications provided, the individual steps or activities required to undertake the task are understood and where necessary clarified.		
2.2	Sequence of activities is identified.		
2.3	Plan is checked to ensure it complies with specifications and task requirements		
<b>3</b>	<b>Review plan</b>		
3.1	Effectiveness of plan is reviewed against specifications and task requirements.		
3.2	If necessary, plan is revised to better meet specifications and task requirements		

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# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-7: Apply science for water operations

#	Activities	Mark "√" " if completed	Date completed
<b>1</b>	<b>Apply principals and theories of physics in real world</b>		
1.1	Perform scalars and vector arithmetic		
1.2	Understand kinetics and perform simple calculations		
1.3	Understand circulation motion, and governing laws		
1.4	Understand and apply the laws of Forces in real world examples		
1.5	Understand the Conservation of Energy principals and apply in real world		
1.6	Understand the momentum and impulse		
1.7	Understand kinematics		
1.8	Understand wave principals		
<b>2</b>	<b>Apply principals and theories of chemistry in real world examples</b>		
2.1	Understanding matter <ul style="list-style-type: none"> <li>• States of matter, and properties related to it</li> <li>• Pure substances and mixtures</li> </ul>		
2.2	Understanding atoms, molecules, elements and compounds, and basic understanding of chemical reactions		
2.3	Understanding solvents, solutions, saturation facts, and concentration limits		
2.4	Observing properties of acids and bases, and understanding strong and weak acids		

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# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-8: Store fluids in bulk

#	Activities	Mark "√" " if completed	Date completed
<b>1</b>	<b>Prepare for work</b>		
1.1	Identify work requirements		
1.2	Identify and control hazards		
1.3	Coordinate with appropriate personnel		
<b>2</b>	<b>Prepare storage / loading facilities</b>		
2.1	Ensure that products are being stored in the tank area to procedures		
2.2	Inspect storage facilities for leaks or damage		
2.3	Check and test safety equipment and systems to verify their operational condition and status, and report all equipment faults		
2.4	Confirm quantities and specifications of stored liquids in the tank area		
2.5	Identify all equipment requiring maintenance		
2.6	Take appropriate action		
<b>3</b>	<b>Transfer fluids to and from tanks</b>		
3.1	Confirm tank capacities and identification and quality of current contents, and determine if these are being maintained within the agreed product requirements prior to transfer		
3.2	Ensure all areas involved in the transfer are safe to allow transfer of liquids to occur		
3.3	Inspect all transfer equipment before transfer, including lines, hoses, pumps, fittings, instruments and controls		
3.4	Confirm that transfer destination has sufficient capacity for the transfer		
3.5	Take appropriate action		
3.6	Transfer liquids safely to procedures		
3.7	Conduct cleaning, purging or draining as required		
3.8	Record transfer as required		
<b>4</b>	<b>Isolate and de-isolate plant</b>		
4.1	Isolate plant		
4.2	Make safe for required work		
4.3	Check plant is ready to be returned to service		
4.4	Prepare plant for return to service		

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# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-9: Operate and monitor pneumatic systems and equipment

#	Activities	Mark "√" " if completed	Date completed
<b>1</b>	<b>Prepare for work</b>		
1.1	Identify work requirements		
1.2	Identify and control hazards		
1.3	Coordinate with appropriate personnel		
<b>2</b>	<b>Startup compressor systems / equipment</b>		
2.1	Perform pre-start-up checks		
2.2	Check the status of the system/equipment prior to commencing start-up process		
2.3	Check all required auxiliary systems, including oil and water, to confirm their operational condition		
2.4	Start up individual items of equipment and the entire compressor system as required		
2.5	Bring the system to required operating conditions		
<b>3</b>	<b>Control and monitor the compressor system</b>		
3.1	Initiate load-up through the selection of appropriate speed or cycle		
3.2	Monitor and adjust downstream equipment as required		
3.3	Monitor the operational condition and safety status of the unit/system and take appropriate action		
3.4	Adjust operational speeds and operating cycles as required		
3.5	Monitor or activate safety systems to ensure that any system shutdowns are controlled and conducted safely and effectively		
<b>4</b>	<b>Shut down compressor systems / equipment</b>		
4.1	Confirm shutdown cause with other personnel and plant operators before commencing to isolate or shut down the equipment/system		
4.2	Implement control measures to minimise damage and hazards		
4.3	Shut down system according to procedures		
4.4	Inspect the system/equipment as required by procedures		
4.5	Isolate and purge systems/equipment and prepare plant for maintenance as required		
<b>5</b>	<b>Maintain plant effectiveness</b>		
5.1	Frequently and critically monitor all plant throughout shift		
5.2	Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant		
5.3	Identify critical equipment/processes and tune their performance		
5.4	Identify issues likely to impact on plant performance and take appropriate action		
5.5	Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people		
5.6	Test trips and alarms as required		

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# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-10: Operate process control systems

#	Activities	Mark "√" " if completed	Date completed
<b>1</b>	<b>Prepare for work</b>		
1.1	Identify work requirements		
1.2	Identify and control hazards		
1.3	Coordinate with appropriate personnel		
<b>2</b>	<b>Use operator interface</b>		
2.1	Use keyboards, track ball and monitor and/or stand-alone controllers to access control system/panel		
2.2	Monitor the process using the operator interfaces		
2.3	Select appropriate controller modes		
2.4	Access historical data and information		
2.5	Acknowledge messages and alarm		
<b>3</b>	<b>Access control information</b>		
3.1	Obtain relevant data and information from the control system by applying systems knowledge		
3.2	Identify the status of individual pieces of equipment from the control panel and use information to identify potential faults		
3.3	Minimise fluctuations and variations in process through the interpretation of existing trends and control schematics		
3.4	Record process variations/irregularities to procedures		
<b>4</b>	<b>Control process variations and monitor operations</b>		
4.1	Use historical data to assist the identification of problems		
4.2	Process available information to identify potential faults		
4.3	Undertake required set point/output changes to meet plant and process requirements		
4.4	Optimise plant operating conditions in accordance with guidelines		
4.5	Adjust production in response to test results and control panel information		
4.6	Monitor key process and environmental variables and take appropriate action		
4.7	Adjust controller settings in accordance with procedures		
4.8	Use fine tuning software as appropriate		
4.9	Coordinate with up stream and downstream units as appropriate		
4.10	Record adjustments and variations to specifications/schedules		
4.11	Communicate to appropriate personnel as required		
<b>5</b>	<b>Facilitate planned and unplanned process start-ups and shut-downs</b>		
5.1	Select and apply procedures to planned startup and shutdown processes		
5.2	Select and apply procedures to unplanned shutdown processes		
5.3	Implement all required emergency responses		
5.4	Communicate necessary information to all personnel affected by events		
5.5	Log all required information		
<b>6</b>	<b>Respond to alarms or out of specification conditions</b>		
6.1	Identify system(s) affected by the alarm or condition		
6.2	Interpret alarms and prioritise actions to be taken		
6.3	Take appropriate action to respond to the alarm or incident		
6.4	Deal with any out of specification material in accordance with procedures		
6.5	Communicate the problem/solution to appropriate personnel		
6.6	Record the information as required		
6.7	Provide details of the alarm and action taken to the next shift at change over		



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# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-11: Monitor and operate water distributed systems

#	Activities	Mark "√" if completed	Date completed
<b>1</b>	<b>Gather information about network operation needs</b>		
1.1	Respond to and record messages and information received from field operations and pipeline system stations		
1.2	Interpret and acknowledge alarm codes correctly to ensure the correct response strategy is selected and applied to the situation		
1.3	Clarify additional information needs and select an appropriate communication medium to deliver the information required		
1.4	Improve operational efficiency through adequate and timely application of information provided		
1.5	Interpret and action customer/shipper gas forecasts to ensure correct gas flow rates into the pipeline system are achieved		
<b>2</b>	<b>Communicate network information</b>		
2.1	Monitor activities of pipeline personnel in the field and data from the control centre		
2.2	Evaluate internal messages and response communications concerning system alarms/incidents to establish the scope and severity of the alarm/ incident		
2.3	Convey pipeline system operation information to relevant personnel in other work areas to ensure safe and efficient operation of the pipeline system		
2.4	Relay information to technicians and other services/parties so that fault finding or safety checks can be conducted to identify risks to product supply, pipeline equipment, environment and personnel		
2.5	Authorise, record and monitor permits to work to allow operational activities to be undertaken or cancelled		
<b>3</b>	<b>Coordinate network systems operations</b>		
3.1	Monitor field and pipeline station operations data		
3.2	Monitor and observe equipment operating conditions, pressures and temperatures, and maintain correct equipment operating parameters		
3.3	Identify faults and initiate the required repair or reporting of the fault		
3.4	Isolate identified faults in the pipeline as appropriate		
3.5	Respond to system alarms and emergencies		
3.6	Determine the required course of action or emergency response to the identified system condition/ emergency		
3.7	Complete and document pre-shutdown checks		
3.8	Shut down the pipeline system under either normal or emergency conditions in accordance with operating procedures		
3.9	Confirm all identified maintenance is in compliance with the permit to work system and administer to ensure that all work complies with all issued permits		
<b>4</b>	<b>Record and report</b>		
4.1	Record and monitor field personnel movements to ensure the safety of all personnel in the field		
4.2	Report safety and environmental risks or faulty equipment to designated personnel for further action or advice concerning the selection of the appropriate response or course of action		
4.3	Interpret and maintain field inspection records and reports		
4.4	Complete operations and production reports		
4.5	Perform shift handover procedures		

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# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-12: Conduct chlorine dosing of water at the point of supply

#	Activities	Mark "√" " if completed	Date completed
<b>1</b>	<b>Prepare for chlorine dosing</b>		
1.1	Chlorines are used, handled and stored in accordance with organisational policies and procedures.		
1.2	Chlorine residue level is established via field water testing.		
1.3	Chlorine residue level is compared with national drinking water guidelines and information related to chlorine concentration to determine chlorine demand		
<b>2</b>	<b>Perform chlorine dosing</b>		
2.1	Chlorine dosing is conducted in accordance with organisational policies and procedures.		
2.2	Personal protective equipment is selected, fitted and used correctly.		
2.3	Dosing is monitored to maintain parameters of dosing to achieve desired chlorine residue level.		
2.4	Dosing faults are identified and acted on, in accordance with organisational policies and procedures		
<b>3</b>	<b>Monitor chlorine dosing performance</b>		
3.1	Dosing samples are collected and field tested to confirm chlorine residue level and water quality.		
3.2	Dosing data is collected, recorded and reported according to organisational policies and procedures.		
3.3	Observations outside defined parameters are reported for further action		

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Signature:.....

# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-13: Perform sampling and testing of water

#	Activities	Mark "√" " if completed	Date completed
<b>1</b>	<b>Confirm sampling and testing requirements</b>		
1.1	Confirm the sampling location, number and type of samples, and timing and frequency of sampling from the enterprise or client's sampling plan		
1.2	Check that all sampling and testing procedures are in accordance with client or enterprise requirements, relevant standards and codes		
<b>2</b>	<b>Prepare for water sampling</b>		
2.1	Identify site and sampling hazards and review enterprise safety procedures		
2.2	Liaise with relevant personnel to arrange site access and, if appropriate, all necessary clearances and/or permits		
2.3	Select sampling equipment and conditions to achieve representative samples and preserve sample integrity during collection, storage and transit		
2.4	Ensure all reagents, solutions, standards and blanks (as appropriate) are obtained and/or prepared ready for field use		
2.5	Select field test equipment/instruments and check operation and calibration, as required, in accordance with procedures and manufacturer instructions		
2.6	Assemble and check all sampling equipment, field test equipment, materials, containers and safety equipment		
2.7	Arrange suitable transport to, from and/or around site as required		
<b>3</b>	<b>Conduct sampling of water</b>		
3.1	Locate sampling sites and, if required, services at the site		
3.2	Conduct representative sampling in accordance with sampling plan and defined procedures for field and/or laboratory testing, as required		
3.3	Ensure all controls, blanks and replicate samples are properly integrated into the sampling process		
3.4	Record all information and label samples in accordance with traceability requirements		
3.5	Record environmental conditions and any atypical observations made during sampling that may impact on sample representativeness or integrity		
3.6	Transport all samples back to base according to enterprise procedures and relevant codes		
3.7	Distribute samples/sub-samples to required destinations for testing, maintaining sample integrity, traceability and chain of custody requirements, as necessary		
<b>4</b>	<b>Conduct field testing of water</b>		
4.1	Obtain sample or sub-sample for designated field test, or locate testing location for in-situ testing		
4.2	Check equipment/instruments set-up and reagents and calibrate, as necessary, to ensure safe operation and valid results		
4.3	Run quality control (QC) samples to check method validity		
4.4	Operate equipment/instruments in accordance with test method requirements		
4.5	Perform tests/procedures/observations on all samples, and standards, if appropriate, in accordance with specified methods		
4.6	Record all field observations and results and ensure that they are accurately transferred to enterprise information database		
<b>5</b>	<b>Maintain a safe work environment</b>		
5.1	Use defined safe work practices and personal protective equipment to ensure personal safety and that of others		

5.2	Minimise the generation of waste		
5.3	Rehabilitate sampling site to render it safe and minimise environmental impacts		
5.4	Clean all equipment, containers, work area and vehicles according to enterprise procedures		
5.5	Check serviceability of all equipment before storage		
5.6	Ensure the safe collection of all hazardous wastes for appropriate disposal		

I declare that theory and practical of the above unit and its elements have been taught

Date:.....

Signature:.....

# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-14: Operate and maintain water production systems

#	Activities	Mark "√" " if completed	Date completed
<b>1</b>	<b>Conduct local inspections and pre-operational safety checks</b>		
1.1	Local inspections and pre-operational safety checks are conducted within Occupational Health and Safety (OHS) regulations, environmental and safe working requirements/practices.		
1.2	Isolations are removed		
1.3	Availability of supplies for water system is confirmed		
1.4	Plant status and requirements are determined		
1.5	Sequencing for plant startup is confirmed		
<b>2</b>	<b>Startup water systems</b>		
2.1	Water systems are started up within OHS, housekeeping, SOP, environmental and safe working requirements and practices		
2.2	Water system is started up		
2.3	Water system is observed for correct startup operational response		
2.4	Startup variation conditions are detected and corrective action taken		
<b>3</b>	<b>Operate and control water treatment processes</b>		
3.1	Carry out routine plant inspections according to organisational and plant requirements.		
3.2	Conduct and analyse process tests and compare performance to plant operational requirements.		
3.3	Make integrated process adjustments to optimize system performance according to organisational and statutory requirements.		
3.4	Collect, interpret and record process according to organisational and plant requirements.		
3.5	Correctly select, fit and use required safety equipment, including personal protective equipment		
<b>4</b>	<b>Monitor and control water systems</b>		
4.1	Water systems are monitored and controlled within OHS, housekeeping, SOP, environmental and safe working requirements and practices		
4.2	Water system operation is monitored		
4.3	Water samples are taken and tested to maintain quality as required		
4.4	Routine checks of water systems are conducted as required		
4.5	Variations from operational parameters are identified		
4.6	Action is taken to restore water system to standard operational parameters		
4.7	Operator level maintenance is conducted as required		
<b>5</b>	<b>Conduct a water system shutdown</b>		
5.1	Water system shutdown is conducted within OHS, housekeeping, SOP, environmental and safe working requirements and practices		
5.2	Shutdown plan is confirmed and communicated to relevant personnel		
5.3	Shutdown procedures are implemented		
5.4	Plant is left in a safe condition for isolation as required		
<b>6</b>	<b>Respond to an unplanned shutdown</b>		
6.1	Unplanned shutdown is responded to within OHS, housekeeping, SOP, environmental and safe working requirements and practices		
6.2	Cause of shutdown is identified and actioned as required		
6.3	Sequence for systems shutdown of plant is completed		
6.4	Action taken is communicated to relevant personnel		
6.5	Plant is left in a safe condition for isolation as required		
<b>7</b>	<b>Maintain items of equipment used in water treatment processes</b>		

7.1	Identify maintenance requirements and schedules according to standard operating procedures.		
7.2	Complete maintenance and cleaning requirements of equipment.		
<b>8</b>	<b>Record and report water systems information</b>		
8.1	Water systems information is recorded and reported within OHS, housekeeping, SOP, environmental and safe working requirements and practices		
8.2	Water systems information is recorded as required		
8.3	Problems and related action are recorded and communicated to relevant personnel		

I declare that theory and practical of the above unit and its elements have been taught

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Signature:.....



# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-15: Apply accident-emergency procedures

#	Activities	Mark "√" " if completed	Date completed
<b>1</b>	<b>Respond to the incident</b>		
1.1	Response to the incident or accident is in accordance with workplace emergency procedures and relevant regulatory requirements		
1.2	Details of the cause(s) and effects of the incident are identified and reported		
1.3	Assistance requirements for accidents and emergencies are clarified and reported immediately to the appropriate parties		
1.4	Requests for assistance are made to relevant personnel and emergency services		
<b>2</b>	<b>Control and assist at accident or emergency site</b>		
2.1	Site is controlled and protected until the arrival of authorized personnel		
2.2	Assistance is provided to injured persons, within the limitations of duty of care and workplace procedures		
2.3	Relevant authorities at the site are cooperated with and assisted within workplace policies		
<b>3</b>	<b>Finalize accident - emergency process and complete records</b>		
3.1	Relevant information is exchanged in accordance with state/territory law and workplace procedures		
3.2	Documentation and reports are completed and processed in accordance with workplace and relevant regulatory requirements		

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# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-16: Perform trouble shooting of control systems

#	Activities	Mark "√" if completed	Date completed
<b>1</b>	<b>Find faults</b>		
1.1	Health and safety risk control measures and procedures for carrying out the work are followed.		
1.2	Develop relevant theoretical knowledge		
1.3	The need to test or measure live is determined in strict accordance with health and safety requirements.		
1.4	Apparatus is checked as being isolated where necessary in strict accordance health and safety requirements and procedures		
1.5	Fault finding is approached methodically drawing on knowledge of industrial processes and control apparatus and systems using measured and calculated values of system parameters.		
1.6	Apparatus components are dismantled where necessary and parts stored to protect them against loss or damage		
1.7	Faulty components are rechecked and their fault status confirmed.		
1.8	Unexpected situations are dealt with safely and with the approval of an authorized person		
1.9	.Fault finding activities are carried out without damage to apparatus, circuits, the surrounding environment or services and using sustainable energy principles		
<b>2</b>	<b>Rectify fault</b>		
2.1	Health and safety risk control measures and procedures for carrying out the work are followed.		
2.2	Apparatus is checked as being isolated where necessary in strict accordance to standard requirements and procedures		
2.3	Materials required to rectify faults are sourced and obtained in accordance with established procedures.		
2.4	Repairs are affected efficiently without damage to other components or apparatus and using sustainable energy principles.		
2.5	Effectiveness of the repair is tested in accordance with established procedures.		
2.6	Apparatus is reassembled, finally tested and prepared for return to customer		
<b>3</b>	<b>Completion and report fault finding and rectification activities</b>		
3.1	OHS work completion risk control measures and procedures are followed.		
3.2	Work area is cleaned and made safe in accordance with established procedures.		
3.3	Written justification is made for repairs to apparatus.		
3.4	Work completion is documented and appropriate person(s) notified in accordance with established procedures		

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# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-17: Apply sustainable and efficient operation

#	Activities	Mark “√” if completed	Date completed
<b>1</b>	<b>Assess and evaluate current resource utilisation</b>		
1.1	Reliable measurable indicators of resource utilisation are identified to provide data on resource consumption.		
1.2	Measurement is undertaken accurately and comprehensively.		
1.3	Comparisons are made against identified practice from a variety of sources and accepted standards of performance		
<b>2</b>	<b>Monitor and review effectiveness of ways to reduce resource usage</b>		
2.1	Regular data is collected and analyzed to provide accurate measures of performance.		
2.2	Comparisons are made with strategy objectives to assess effectiveness.		
2.3	Changes to implementation strategy are made as required in a timely manner to ensure outcomes are achieved or alternatives are introduced.		
2.4	Information obtained during monitoring and review is used to develop new strategies that are based on accumulated knowledge and experience.		
2.5	Information is shared on a regular basis with other councils and relevant agencies		
<b>3</b>	<b>Conduct routine checks of performance efficiency</b>		
3.1	Use appropriate hand tools and hand-held power tools to implement routine checks of machine performance and preventative maintenance strategy, in accordance with manufacturer instructions		
3.2	Assess and perform periodic servicing, such as lubrication and greasing, in accordance with manufacturer instructions		
3.3	Clean machine in accordance with manufacturer cleaning instructions and work environment		
<b>4</b>	<b>Perform preventative maintenance procedures</b>		
4.1	Inspect parts according to operating procedures and manufacturer instructions		
4.2	Maintain service and production records to assist with life cycle monitoring of parts and machine, as required		
4.3	Identify faulty parts for repair, replacement or adjustment and take necessary action		
4.4	Inspect, check and monitor replacement parts and consumables to ensure they comply with operational specifications		

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# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-18: Perform chemical cleaning

#	Activities	Mark "√" " if completed	Date completed
<b>1</b>	<b>Prepare for cleaning</b>		
1.1	Read or listen to work instructions from supervisor and clarify where needed		
1.2	Identify health and safety hazards in the workplace and tell supervisor		
1.3	Wear appropriate personal protective equipment and ensure correct fit		
1.4	Confirm that chemical stocks are available to meet cleaning and food safety requirements		
1.5	Confirm that services are available and ready for operation		
1.6	Plan equipment shut down and take equipment off-line for cleaning		
1.7	Configure equipment and related valves and pipework to confirm readiness for cleaning		
1.8	Set the plant for the cleaning cycle		
<b>2</b>	<b>Operate and monitor the cleaning process</b>		
2.1	Carry out the cleaning cycle as directed		
2.2	Monitor the cleaning process for completeness		
2.3	Record cleaning data appropriately		
2.4	Identify, rectify and report out-of-specification process and equipment performance		
<b>3</b>	<b>Dispose of waste and return plant to operating condition</b>		
3.1	Flush cleaning chemicals from plant and dispose of accordingly		
3.2	Set up plant to meet operational requirements		
3.3	Conduct work according to workplace environmental guidelines		

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Signature:.....

# ACKNOWLEDGEMENT OF TRAINING DELIVERY

## Unit-19: Operate and maintain of power generation system (Renewable energy)

#	Activities	Mark "√" if completed	Date completed
<b>1</b>	<b>Coordinate the solar power plant operations</b>		
1.1	Plant operational procedures are implemented in consultation with others and reviewed as required		
1.2	Resources and supplies are coordinated to meet plant requirements		
<b>2</b>	<b>Monitor solar power plant operations</b>		
2.1	Deviations from standard plant operations are identified and recorded		
2.2	Plant operation and/or condition is monitored against statutory and enterprise requirements taking into account constraints, budget requirements and performance indicators		
2.3	New requirements that may impact on operations are considered		
2.4	Operations are monitored for suitability/approval with statutory, industry and enterprise/site requirements		
<b>3</b>	<b>Test solar power plant operation</b>		
3.1	Tests are performed in accordance with defined procedures applicable to the operational test		
3.2	Plant is observed for correct operational response		
3.3	Correct action is taken when response is not in accordance with documentation, plant integrity or personnel safety requirements		
3.4	Plant is returned to required operational status upon completion of test		
<b>4</b>	<b>Report operations against strategy requirement</b>		
4.1	Data is collected and processed for review against the established strategy		
4.2	Plant operation and/or condition is reported against statutory and enterprise requirements taking into account constraints, budget requirements and performance indicators		
4.3	Abnormal operating conditions are reported		
4.4	Changes to the strategy are suggested in accordance with information received		

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Date:.....

Signature:.....

**DETAILS OF WORK UNDERTAKEN AT WORK SITE/TRAINING LAB**

Relevant  
Competency  
Unit (s):

**Date:**

**Work / Function / Task / Activity Performed**

Employer / Supervisor's/Trainer Signature/Stamp

**DETAILS OF WORK UNDERTAKEN AT WORK SITE/TRAINING LAB**

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WATER SUPPLY  
SYSTEM