REGULATION

دائـــــرة الـــطـــاقـــة
DEPARTMENT OF ENERGY

Water Quality Regulations 2021

EFFECTIVE DATE: 01/01/2021

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Foreword

The Department of Energy (DoE) was established by Law No. (11) of 2018 on 20 February 2018 (the Law). Under that Law, the DoE is the successor Entity to the Regulation and Supervision Bureau (RSB) and the Abu Dhabi Water and Electricity Authority (ADWEA). Accordingly, any references to the Regulation and Supervision Bureau, the Bureau, RSB, the Authority or ADWEA in any document, template or correspondence shall now be interpreted as referring to the DoE.

The DoE is responsible for setting policy, standards and regulation for the Energy Sector as defined under Law No. (11), which includes all persons, companies and Entities operating in the Water sector in Abu Dhabi.

These revised Regulations supersede those issued in 2014 (Revision 4) and are effective from 1 January 2021. They shall be cited as the Water Quality Regulations 2021 (Fifth Edition) referred to hereafter as the Regulations.

The Regulations are intended to provide for the supply of wholesome drinking water to Consumers and reflect the current guidance by the World Health Organization (WHO). They have been developed following extensive consultation with the sector companies and other relevant stakeholders.

They are also available in Arabic, but the reader should note they were first written in English. They may also be downloaded from the DoE's website at www.doe.gov.ae.

11/1/2021

MOHAMMED BIN JARSH AL FALASI

Undersecretary-Department of Energy

Acknowledgements

The DoE gratefully acknowledges the contributions and comments provided by the following organisations:

Licensees;

i. Abu Dhabi Distribution Company (ADDC)
ii. Abu Dhabi Transmission and Despatch Company (TRANSCO)
iii. Al Ain Distribution Company (AADC)
iv. Arabian Power Company (APC)
v. Emirates Aluminium Company Limited (EMAL)
vi. Emirates CMS Power Company A2 (ECPC)
vii. Emirates Sembcorp Water and Power Company F1 (ESWPC)
viii. Emirates Water and Electricity Company (EWEC)
ix. Fujairah Asia Power Company F2 (FAPCO)
x. Gulf Total Tractebel Power Company A1 (GTTPC)
xi. Mirfa International Power and Water Company (MIPCO)
xii. Ruwais Power Company S2 (RPC)
xiii. Shuweihat CMS International Power Company S1 (SCIPCO)
xiv. Taweelah Asia Power Company (TAPCO)

Government organisations & Stakeholders;

i. Abu Dhabi Agriculture and Food Safety Authority (ADAFSA)
ii. Abu Dhabi National Oil Company (ADNOC)
iii. Abu Dhabi Quality and Conformity Council (ADQCC)
iv. Abu Dhabi Waste Management Centre (Tadweer)
v. Department of Culture and Tourism (DCT)
vi. Department of Health (DoH)
vii. Department of Municipalities and Transport (DMT)
viii. Emirates National Accreditation System (ENAS)

ix. Environment Agency - Abu Dhabi (EAD)

x. Federal Authority for Nuclear Regulation (FANR)

xi. Ministry of Industry and Advanced Technology (MoIAT)

History of Revisions

Revision	Date	Prepared by	Checked by	Issued to
0.0	January 2000	JS	SN	Publication
1.0	February 2002	JS	SN	Publication
2.0	January 2004	JS, NA	LH	Publication
3.0	July 2009	JS, NA	CH	Publication
4.0	July 2013	JS, NA	NC	Publication
5.0	January 2021	MG, SD	TD	Publication

This is the fifth revision to the Water Quality Regulations, since their publication in July 2013. This revision incorporates the following:

- Stakeholders' feedback regarding sampling Parameters and Limits;
- Amendments to Chapter 4: Drinking Water Safety Plan, outlining the Safety Plan process and scope;
- Clarification regarding sampling and testing requirements and Accreditation in Chapter 5: Monitoring of Water Supplies;
- Updates to reporting requirements and timelines for the Initial Entries and Water Quality Reports;
- New Schedule 5 containing a chemicals application checklist to be used by Licensees and chemicals-related guidance; and
- Other changes concerning the Regulations' structure.

Document Numbering

These Regulations use the following numbering system:

Parts	are referenced by integers (e.g. 1, 2, 3, etc.)
Regulations	are referenced by one full stop between numbers (e.g. 1.1, 1.2, etc.)
Clauses	are referenced by two full stops between numbers (e.g. 3.1.2, etc.)
Notes	are indicated below the Clause in square brackets and italic text. For example, *[Note: this Clause does not apply to Installations that have been …]*

1. Introduction

1.1 Citation

1.1.1 These Regulations shall be cited as the Water Quality Regulations 2021 (Fifth Edition).

1.2 Commencement

1.2.1 These Regulations come into force on 1 January 2021.

1.2.2 These Regulations are issued by the DoE in accordance with Article (4) of Law No. (11) of 2018 and Article (62) of Law No. (2) of 1998.

1.2.3 These Regulations supersede and replace the Water Quality Regulations 2014 (Fourth Edition).

1.2.4 These Regulations may be amended or revoked by the DoE at any time.

1.3 Purpose

1.3.1 The purpose of these Regulations is to establish a legal framework for the provision of wholesome water to Consumers.

1.4 Scope

1.4.1 These Regulations apply to all Licensees, Entities and Consumers who operate or receive wholesome water.

1.4.2 Nothing in these Regulations is intended to conflict with or affect the operation of any relevant existing federal and Abu Dhabi Laws.

1.5 Relevant Regulations

1.5.1 These Regulations should be read in conjunction with the following regulations and codes:

a) Code of Practice for the Inspection and Cleaning of Customer Water Storage Tanks;

b) The Water Transmission and Distribution Codes;

c) The Customer Metering Regulations; and

d) The Incident Reporting Regulations;

1.5.2 Where conflict appears to exist between these Regulations and other regulations, codes, or any governmental legislation, the matter should be referred to the DoE for a binding decision in accordance with Part 8 of these Regulations.

1.6 Provision of Information

1.6.1 All Licensees and other relevant Entities are required to furnish the DoE with information to matters relating to these Regulations as the DoE may from time to time direct or request.

1.6.2 Failure to provide the requested information in the time and manner decided by the DoE shall be considered as a failure to comply with these Regulations.

1.7 Responsibility for Implementation

1.7.1 All parties mentioned in Clause 1.4.1 are responsible for implementing these Regulations.

1.8 References

1.8.1 References to a standard in these Regulations means the current edition of the standard cited or its replacement. Where relevant, UAE or Abu Dhabi mandatory standards which may be issued from time to time by the competent authorities shall be applied.

1.8.2 The DoE also considers the World Health Organization (WHO) Water Quality Guidelines as the primary reference for the Regulations. The DoE may also consider other relevant regulatory guidance regarding water quality, including but not limited to:

a) Australian Drinking Water Guidelines;

b) Drinking Water Standards for New Zealand;

c) FANR-REG-19 “Regulation for Existing Exposure Situations”;

d) GCC Standardization Organization (GSO) Drinking Water Standards;

e) Ministry of Industry and Advanced Technology;

f) National Primary Drinking Water Regulations; and

g) Safe Drinking Water Act.

1.8.3 Soft copies of the Regulations will be available on the DoE webpage.

2. Definitions

2.1 Interpretation

2.1.1 Words defined in this Part begin with capital letters when used in the Regulations.

2.1.2 Words and expressions used in these Regulations, other than those defined herein, shall have the meanings ascribed to them in Law No. (2) of 1998 or Law No. (11) of 2018 (as applicable).

2.1.3 Words and expressions to which meanings are assigned by these Regulations shall (unless the contrary intention appears) have the same respective meanings in any document issued by the DoE under these Regulations.

2.1.4 Unless the context otherwise requires, any reference in these Regulations to a numbered Part, Clause or Schedule is a reference to the Part, Clause or Schedule of these Regulations bearing that number.

2.1.5 Any reference in these Regulations to a table is a reference to the relevant table in the numbered Schedules of these Regulations.

2.1.6 Words using the singular or plural number also include the plural or the singular number respectively.

2.1.7 Unless otherwise specified, days shall mean calendar days.

2.2 Definitions

2.2.1 The following words and expressions shall have the following meanings in these Regulations unless the context otherwise requires:

Accreditation – means third-party attestation related to a conformity assessment body (e.g. laboratories), conveying formal demonstration of its competence to carry out specific conformity assessment tasks.

Accreditation Body – means any federal or local authority mandated or authorised to manage Accreditation schemes.

BCM – Business Continuity Management means a comprehensive management process, which highlights possible threats and impacts of such threats on the business operations of a Licensee.

Consumer –a person to whom water is supplied for a purpose mentioned in Clause 3.1.1.

Desalination – means any Plant or apparatus for the Desalination of water including a facility comprising one or more desalination units.

Distribution System – means the system consisting (wholly or mainly) of water pipelines owned or operated by the Licensee and used for the distribution of wholesome water to the point of delivery to premises or customers and includes any Plant and equipment, including metering equipment, owned or operated by the Licensee in connection with the distribution of water.

Distribution Company – means a Distribution Company or body holding a Licence from the DoE, pursuant to the Law.

DoE – means the Department of Energy in the Emirate of Abu Dhabi, established under Law No. (11) of 2018.

DBP – means Disinfection by-Product.

Entity – an individual, establishment, company, association, society, partnership, corporation, municipality, institution, government organisation, agency or group.

Incident Reporting Regulations – means the Incident Reporting Regulations issued by the DoE, as amended.

Law – means both Law No. (11) of 2018 and Law No. (2) of 1998 (unless the context indicates otherwise).

License – means a Licence to carry out a Regulated Activity granted by the DoE.

Licensee – refers jointly to the holder of a Power and Desalination Licence, Transmission Licence, or a Distribution and Supply Licence (including self-supply).

Licensed Activities – the Regulated Activities permitted to be carried out by the Licensee pursuant to the conditions of the Licence.

Licensed Transmission Operator – a person who is authorised by a Licence granted under the Law to transmit electricity and/or water.

Parameter – a property, element, organism or substance listed in the second column of the Tables in Schedule 1 to these Regulations.

Plant – all water Plants used in water abstraction for a purpose mentioned in Part 3 (e.g. and not limited to seawater, groundwater, and air) that describes the fixed infrastructure above and below ground.

Prescribed Concentration or Value (PCV) – in relation to any Parameter, means the maximum or minimum concentration or value specified in relation to that Parameter in the tables in Schedule 1 to these Regulations as measured by reference to the unit of measurement so specified.

Reduced Number or Increased Number - means any relevant Reduced or Increased sampling frequency shown in any of the Tables 1 to 6 of Schedule 2 as an alternative to the Standard Number.

Sampling Point – a point that is determined as such by a Licensee for the purposes of Part 5 of these Regulations.

Standard Number – means such number of sampling frequency specified in the column headed “Standard” in the Tables of Schedule 2 as is applicable to the Parameter in question**.**

Transmission – means the Licensee's relevant water Transmission System and/or its electricity Transmission System.

Transmission System – means the system consisting (wholly or mainly) of water pipelines owned or operated by the Licensee and used for the transmission of water from one or more Desalination facilities or water storage facilities to a pumping station or storage facility or between pumping stations and includes any Plant owned or operated by the Licensee in connection with the transmission of water.

UAE – United Arab Emirates.

Water Supply Zone – an area that is designated by a Licensee (whether by reference to a source of supply, the number of persons supplied from any source, or otherwise) for the purposes of the provisions of these Regulations.

Water Tanker – means a road vehicle registered by Abu Dhabi Police following certification of the Tanker for the purposes of supplying wholesome Water.

Water Transmission Code – means the code that defines the operating, planning and connection arrangements between the Licensed Transmission Operator and users of water. User refers to entities using the Licensed Transmission Operator’s Water Trunk Mains System, as more particularly identified in each section of the Transmission Code concerned.

Year – a calendar Year, according to the Gregorian calendar.

3. Wholesomeness

3.1 Purpose

3.1.1 Water supplied for the purposes of drinking, washing, cooking or for food production purposes must be wholesome, and shall be regarded as wholesome if the requirements of Clause 3.2.1 below are satisfied.

3.2 Definition

3.2.1 Water shall be regarded as wholesome if:

a) the water does not contain any element, organism or substance (other than a Parameter) at a concentration or value which, alone or in conjunction with any other element, organism or substance it contains would be detrimental to public health;

b) the water is in compliance with the Prescribed Concentrations or Values of the Parameters listed in Tables A to H in Schedule 1.

4. Drinking Water Safety Plan

4.1 Development of Drinking Water Safety Plan

4.1.1 A Drinking Water Safety Plan (DWSP) is the most effective means of consistently ensuring the safety of a water supply.

4.1.2 This is achieved through the use of a comprehensive risk assessment and risk management approach that encompasses all steps in water supply from catchment to Consumer.

4.1.3 Each Licensee must develop a DWSP covering its specific Licensed Activities for the supply of wholesome water.

4.1.4 The DWSP should describe the operational and management controls that will be employed by Licensees to protect public health and ensure that the water which is supplied is wholesome.

4.1.5 Where Desalination, Transmission, Distribution and supply systems are inter-connected, the Licensees must:

a) provide any information and resources to interconnected Licensees as reasonably required to develop a DWSP; and

b) advise the interconnected Licensee, where applicable, of any changes to the Licensed Activities, which will require a change to a DWSP.

4.2 Scope of Drinking Water Safety Plan

4.2.1 The DWSP should be developed following the guidance outlined in the Water Safety Plan Manual of the WHO.

4.2.2 The scope of the DWSP must include:

a) the roles and responsibilities of the Licensees and DWSP team members;

b) a description of the systems and capabilities related to the Licensed Activities;

c) identification of the hazards and hazardous events that can affect the safety of the water supply as related to the Licensed Activities;

d) an assessment of the risk presented by each hazard and hazardous event;

e) the operational and management controls and contingency plans for each hazard and hazardous event identified in Clause 4.2.2(c);

f) the monitoring programme referenced in Part 5 that will ensure the requirements of these Regulations are met and that the operational and management controls identified in Clause 4.2.2(e) are effective;

g) reporting and auditing requirements for the monitoring programme identified in Clause 4.2.2 (f) and in Part 5 of these Regulations; and

h) supporting programmes to improve employee awareness and involvement.

4.3 Review of Drinking Water Safety Plan

4.3.1 A new DWSP of a Licensee must be submitted to the DoE for review at least 60 days before the supply of water is due to start.

4.3.2 Existing Safety Plans must be resubmitted to the DoE for review:

a) a minimum of once every 5 Years;

b) following substantial changes to the source, Desalination, Transmission, Distribution, storage systems and tankering; and

c) following significant operational and/or environmental incidents.

4.3.3 The DoE shall complete a review of a Safety Plan within 60 days from the date of receiving the Plan.

4.3.4 The DoE will identify and report to the Licensee any changes it believes are required to protect public health.

4.3.5 Before the supply of water begins, the Licensee must adopt any representations made by the DoE under Clause 4.3.4 and submit a revised DWSP to the DoE.

4.3.6 An assessment of the DWSP arrangements may be conducted as required by the DoE and/or by a person appointed by the DoE for ensuring the DWSP achieves its intended purpose.

5. Monitoring of Water Supplies

5.1 Monitoring Programme

5.1.1 Each Year, Licensees shall sample and test each relevant Parameter listed in Schedule 1 of these Regulations to confirm that the quality of the Water conforms to the criteria outlined therein.

5.1.2 A Licensee shall determine such number and location of Sampling Points that is representative of the quality of the water supplied by it.

5.1.3 These Sampling Points must be designated within each of the Licensees Plants, Water Supply Zones or Water Tankers as related to the Licensed Activity.

5.1.4 Sampling Points in a Water Supply Zone should give good geographic representation of the water supply system.

5.1.5 Any sampling or analysis done by a Licensee as a condition of a monitoring programme must be done at the Licensee's expense.

5.2 Sampling Frequency

5.2.1 The sampling frequency shall not be less than the Standard Number of samples as listed in the tables of Schedule 2 in relation to the Parameter in question.

5.2.2 The DoE shall have the discretion to require the Licensee to sample according to the Reduced Number or Increased Number frequency as it finds necessary to do so; otherwise, the Standard Number shall apply.

5.2.3 A Licensee can request from the DoE, after submitting acceptable justification, a Reduced frequency in the annual sampling for one or more Parameters required in its monitoring activities.

5.2.4 The frequency of sampling at the Sampling Points within each Water Supply Zone must be representative of the distribution of the water within that zone.

5.2.5 The DoE shall have the discretion to require further sampling at particular Sampling Points in each Water Supply Zone.

5.3 Initial Entries

5.3.1 The monitoring programme details must be outlined by the Licensees in their annual initial entries submission.

5.3.2 The initial entries must contain:

a) a sampling schedule programme for the following Year;

b) test methods for each of the Parameters included in Schedule 1 of the Regulations;

c) the name or identification number of the zone or area, Water Tanker, well field, Desalination Plant, aquifer, reservoir or pumping plant, at which sampling will be performed;

d) as relevant, an estimate of the population or volume of water distributed to the zone or the capacity of water tank, aquifer, reservoir; Water Tankers and water Plant;

e) details of the water processes used at the Plant;

f) any relaxation granted under Regulation 8.4 which applies to water supplied in the zone; and

g) other relevant information in the initial entries forms A and B outlined in Schedule 3 of the Regulations.

5.3.3 The Licensees shall submit their initial entries to the DoE by 30 September of each Year.

5.4 Data Collection and Reporting

5.4.1 A Licensee shall collate all monitoring and sampling data generated by its monitoring programme.

5.4.2 The results of the sampling analyses shall be submitted to the DoE within 30 days of the sample collection date via a web-based portal, electronic format and/or in hard copy as directed by the DoE.

5.4.3 Sampling results that fail to comply with the Regulations must be reported to the DoE in accordance with Regulation 9.1.

5.4.4 The Licensee shall retain records of all sampling and monitoring data for at least twenty (20) Years.

5.5 Sampling and Testing Requirements

5.5.1 The Licensee shall carry out sampling collection and handling in accordance with ISO 5667-5: Guidance on sampling of drinking water from treatment works and piped distribution systems.

5.5.2 Sampling of water for Legionella testing shall be carried out by BS 7592: Sampling for Legionella bacteria in water systems (or equivalent).

5.5.3 Licensees must ensure that:

a) the sample is representative of the quality of the water at the time of sampling;

b) the sampling frequency from the Sampling Points are distributed at equal intervals throughout the Year;

c) the sample is not contaminated when being taken or transported;

d) the sample is kept at such temperature and in such conditions as will secure that there is no material and quality alteration of the concentration or value for the measurement or observation of which the sample is intended; and

e) the sample is analysed as soon as may be practicable after it has been taken:

i. by or under the supervision of personnel who are trained, competent and authorised to perform that task;

ii. with the use of such equipment as is suitable for the purpose, and has been validated for performance against Standard Methods and approved for use; and

iii. by applying such recognised analytical systems and methods capable of establishing, within acceptable limits of deviation and detection, whether the sample contains concentration or value which contravene the Prescribed Concentration or Value.

f) sampling activities shall be conducted in an accredited laboratory according to ISO/IEC 17025 for the required Parameters.

5.5.4 In accordance with Clause 5.5.3 (a), the appropriate physical Parameters outlined in Schedule 1, Table A of the Regulations should be determined on site as they can quickly degrade after sampling.

5.5.5 If a Licensee is unable to determine in this way, ensure that a representative sample is taken and that recommended filling, preservation and holding times are met.

5.5.6 The laboratory must be accredited by an Accreditation Body for all of the Parameters outlined in Schedule 1 of the Regulations.

5.5.7 The DoE does not accredit or approve laboratories.

5.5.8 Licensees shall notify the DoE within 3 working days about their laboratories Accreditation status, withdrawal or suspension of Accreditation, or if there is a change in the Accreditation scope.

5.6 Quality Compliance

5.6.1 Prescribed Concentrations or Values will be applied to the Parameters outlined in Tables A to H of Schedule 1.

5.6.2 If an exceedance of the Parameters outlined in Schedule 1, Table F is indicated, a repeat sample should be collected from the original sample location within one working day of the result being known. If the repeat sample also indicates an exceedance, the Licensee must implement the corrective actions outlined in their DWSP.

5.6.3 Licensees shall notify the interconnected Licensees regarding exceedances in accordance with the notification requirements of the applicable codes.

5.6.4 As soon as a Licensee has reasonable grounds for believing that any source of supply may not satisfy the provisions of Part 3, the Licensee shall take sufficient samples of water to establish whether or not the water is detrimental to public health, except if such provisions have been relaxed by an authorisation given under Regulation 8.4.

5.6.5 When testing for a Parameter not listed in Schedule 1, a Licensee shall take sufficient samples of water within a Plant, Water Supply Zone or from Water Tankers in order to establish whether or not the water is wholesome.

5.6.6 Licensees shall report to the DoE water quality incidents as defined under the operation incident classification in the Incident Reporting Regulations. The definition of an incident is a significant and unexpected or unusual deterioration in the quality of the water entering the supply that, by reason of its effect or likely effect, gives rise or is likely to give rise to a significant risk to the health of Consumers.

5.6.7 In reporting water quality incidents, the Licensee shall also take into account the reporting requirements under the Abu Dhabi Occupational Safety and Health System Framework (OSHAD SF), Mechanism 6.0 to the appropriate Sector Regulatory Authority (SRA).

5.7 Annual Water Quality Reports

5.7.1 A Licensee shall prepare for the DoE a report for each Year which includes:

a) a summary of the water quality compliance with the limits detailed in Schedule 1, process performance indicators and the quantity supplied by it;

b) water quality related issues that have affected the regulatory requirements with details on how and why the issues occurred e.g. water quality and sampling frequency, variation due to unplanned maintenance activities, change of sample monitoring frequency of zone and location and security of supply;

c) updated risk assessments and control measures to address the issues noted in Clause 5.7.1 (b);

d) the adherence to the sampling frequency requirements in Schedule 2;

e) details of any relevant relaxation granted under Regulation 8.4;

f) overview of the water related projects undertaken;

g) chemicals and products that come in contact with drinking water (e.g. trials and regulatory compliance);

h) incidents, Consumer complaints including feedback and corrective actions taken; and

i) conclusion and challenges including a statement as to the extent to which the water supplied by it complied with these Regulations.

5.7.2 The Licensees shall submit a copy of the annual water quality report to the DoE by 1 March of each Year.

6. Chemicals Use in Drinking Water

6.1 Application Process and Requirements

6.1.1 A Licensee shall not apply any substance or product to water, which is to be supplied in accordance with Part 3 of these Regulations unless:

a) the DoE has approved the application of that substance or product and it is applied in accordance with any conditions attached to that approval; and

b) the Licensee is completely satisfied that the chemical, substance or product either alone or in combination with other chemicals and compounds will not affect the wholesomeness of the drinking water quality or have any impact on the environment.

6.1.2 An application checklist and associated guidance are included in Schedule 5.

6.1.3 The application checklist must be submitted with the supporting documents outlined in Schedule 5a. Detailed guidance regarding the application is outlined in Schedules 5b-d.

6.1.4 An initial review of Licensee applications shall be completed by the DoE within 60 days receipt of the application.

6.1.5 Licensees shall have a further 60 days to submit any pending application requirements noted by the DoE, or the application will be considered void.

6.1.6 Any application approval made by the DoE may include such conditions as it considers appropriate.

6.2 Monitoring and Trial Requirements

6.2.1 Upon receiving the application approval from the DoE, the Licensee may proceed with the chemical trial in accordance with the requirements of Schedule 5c of the Regulations.

6.2.2 At the completion of the trial period the Licensee must submit a detailed report regarding the efficacy of the chemical application.

6.2.3 The DoE will assess, in coordination with the relevant parties, the report and associated data with a view to providing a no objection to put the chemical into use.

6.3 General Guidance

6.3.1 Licensees must ensure that chemicals operational monitoring, verification and efficiency evaluation are performed at all times.

6.3.2 Schedule 5d contains detailed guidance regarding risk assessment, HSE, storage, delivery and waste management requirements and further chemicals-related information.

6.4 Revocations and Variations

6.4.1 Subject to Clause 6.1.1, the DoE may revoke an approval it has previously given at any time. Additionally, the DoE may modify any such approval in writing by including conditions or varying existing conditions.

6.4.2 Except for any case in which the DoE is of the opinion that the immediate revocation, modification or prohibition is necessary in the interests of public health, the DoE shall give the Licensee at least 1 months' notice in writing of its intention to:

a) revoke any approval given for the purposes of these Regulations;

b) modify any condition; or

c) prohibit a Licensee from using any process.

6.5 Application Charges

6.5.1 The DoE may, by notice in writing, require the Licensee who makes an application for an approval under Regulation 6.1 to pay to it a charge which reflects the administrative expenses (excluding the costs of conducting any tests) incurred or likely to be incurred by the DoE in connection with that application.

6.5.2 In determining the amount of any charge, the DoE may adopt such methods and principles for its calculation as appear to it to be appropriate.

7. Audits and Assessments

7.1 DoE Audit

7.1.1 To ensure compliance with these Regulations the DoE may conduct periodic audits to assess the implementation of the Licensees DWSPs.

7.1.2 The audit may cover analytical arrangements, sampling processes, data quality and reporting. It may also include chemicals used in water treatment, Desalination, Transmission System, Distribution System (piped, non-piped and aquifers), transfer and storage processes for the supply of wholesome water. The audit may:

a) review and validate the results of the water submissions;

b) review the accuracy and reliability of the data collected by Licensees;

c) identify any shortcomings, failures, non-compliance and areas of concern; and

d) include other related matters in conjunction with these Regulations.

7.2 Third Party Audit

7.2.1 In order to establish whether Licensees are complying with their monitoring obligations, the DoE may appoint or request Licensees to appoint a technically competent third party auditor which may review and/or audit the items outlined in Regulation 7.1.

8. Review of DoE Decision

8.1 Application for Review

8.1.1 Any application for enquiry, clarification, or dispute relevant to these Regulations must be made in writing to the DoE and submitted with supporting documents.

8.2 Timescale for Application for Review

8.2.1 The timescale for application to be reviewed by the DoE is 30 days.

8.2.2 Licensees will be informed in case of any extension of time required for application for review.

8.3 DoE Request for Information

8.3.1 The DoE may request from an Entity making an application for a decision, any information or documentation it considers reasonable and necessary in the circumstances and the Entity must provide such information within the period specified by DoE.

8.4 Relaxation of Requirements

8.4.1 The DoE may, upon the written application of a Licensee, authorise a relaxation of certain requirements of these Regulations.

8.4.2 Subject to Clauses 8.4.3 and 8.4.4, the DoE may at any time modify or revoke an authorisation (whether or not the authorisation is expressly given for a specified period) pursuant to Clause 8.3.1 above.

8.4.3 The DoE shall not revoke or modify an authorisation without giving at least 3 months' notice or, if the holder of the authorisation agrees, at least 6 weeks' notice by the DoE of its intention to do so. However, the DoE may revoke or modify an authorisation without notice if it appears to the DoE that the immediate revocation or modification of the authorisation is required in the interests of public health.

8.4.4 A Licensee on whose application an authorisation has been given under this Part shall notify the DoE as soon as the circumstances which gave rise to the application for the authorisation cease to exist, and, notwithstanding Clause 8.4.3 above, the DoE shall thereupon revoke the authorisation.

8.4.5 Any application for a relaxation under Clause 8.4.1 shall provide sufficient information and data to allow the DoE to assess the appropriateness of authorising a relaxation together with a risk assessment and mitigation plans. The DoE requires a minimum of 3 months to assess any application made under Clause 8.4.1.

8.4.6 The DoE may require a Licensee who makes an application for a relaxation under Clause 8.4.1 to pay a charge which reflects the expenses incurred or likely to be incurred by the DoE in connection with that application. In determining the amount of any charge, the DoE may adopt such methods and principles for its calculation as appear to it to be appropriate and notify the Licensee of the relevant expenses.

8.5 DoE Decision

8.5.1 The DoE shall notify the Entity that made the application of its final decision.

8.5.2 The DoE may:

a) make any decision it sees fit in the circumstances; and/or

b) issue directions as it sees fit to the Entity that made the application for review and to any third party.

8.5.3 Any decisions or directions issued by DoE are binding on the Entity that made the application for review and any third party stated in these decisions or directions. Failure to comply with decisions or directions issued by DoE under this Part, shall be considered as a failure to comply with these Regulations.

9. Failure to Comply with Regulations

9.1 Reporting Failures and Incidents

9.1.1 Any failure to comply with these Regulations or any act that may be considered as a failure to comply with these Regulations must be reported to the DoE.

9.2 Enforcement Procedures

9.2.1 In case of failure to comply with these Regulations, the DoE may issue a written warning notice to the non-complying Entity.

9.2.2 The warning notice shall include:

a) the name of the Entity;

b) the regulation which was been violated;

c) a tolerance period to comply; and

d) the enforcement procedures to be taken against the Entity in case it does not comply with the Regulations within the tolerance period.

9.2.3 Pursuant to Article 66 of Law No. (2), an Entity that fails to comply with these Regulations may be subject to a fine of not less than AED 250,000.

9.2.4 If an Entity fails to comply with these Regulations for a second time, the fine may be doubled.

9.2.5 Without prejudice to Clauses 9.2.3 and 9.2.4 and pursuant to Articles (10) and (11) of Law No. (11) of 2018, an administrative fine of not more than (AED 10,000,000) ten million dirhams may be imposed by DoE on anyone who contravenes the provisions of these Regulations and/or any rules, policies, decisions, relaxations, plans, circulars, codes issued thereunder.

9.2.6 The DoE may rectify the violations of these Regulations at the expense of the violator if the latter does not rectify them within the period specified by DoE.

9.2.7 The DoE may take further administrative sanctions against violators in accordance with Article (11) of Law No. (11) of 2018.

9.2.8 Any grievance, appeal or reconciliation of fines and administrative sanctions issued by DoE under this Part shall be made to DoE in accordance with Articles (10) and (11) of Law No. (11) of 2018

10. Governing Law

10.1 Governing Law

10.1.1 These Regulations and the rights and duties of any parties hereunder shall be governed by the Laws of the Emirate of Abu Dhabi and the federal Laws of the UAE as applied by the courts of the Emirate of Abu Dhabi.

11. Schedules

Schedule 1: Parameters and Limits

Table A - Physical Parameters

Item	Parameter	Unit of Measurement	Concentration or Value (maximum unless otherwise stated)
1	Colour	mg/l pt/Co scale	15.0
2	Turbidity (i)	NTU (Nephelometric Turbidity Units)	4.0
3	Odour (including hydrogen sulphide)	Dilution number	Unobjectionable
4	Taste	Dilution number	Unobjectionable
5	Total dissolved solids (TDS) (ii)	mg/l	100 (minimum) 600 (maximum)
6	Calcium hardness	mg/l as CaCO3	200 at 25 ºC
7	Total hardness	mg/l as CaCO3	300 at 25 ºC
8	Langelier saturation index	Value shall be slightly positive at all times	0.0 (minimum) 0.5 (maximum)
9	Hydrogen ion	pH value	7.0 (minimum) 9.2 (maximum)
10	Residual chlorine (iii)	mg/l Cl2	0.2 (minimum) 0.5 (maximum)
11	Chlorine Dioxide (iv)	mg/l ClO2	0.1 (minimum) 0.4 (maximum)

Notes:

i. Turbidity should be kept below 1 NTU by Licensees to support effective disinfection. Where this is not practical, turbidity must be kept below 4 NTU at all times.

ii. The total dissolved solids (TDS) shall be measured using the Guide to Total Dissolved Solids (k factor) calculations which is the Summation Method (Anions and cations) measured according to the standard method at a frequency specified in the Guide to Total Dissolved Solids (k factor) calculations to establish the k factor. The k factor is the ratio adopted in determining the TDS from the measurement of electric conductivity in µmhos/cm. Where the TDS (by summation method) = k x EC in mg/l, k can only be in the range of 0.55 to 0.8.

iii. Residual chlorine ideal concentration shall be between 0.2 to 0.5 mg/l. However, it may increase to 1.00 mg/l or even above in situations where the Licensee or the Transmission System Operator request it in accordance with the Water Transmission Code or for controlling possible bacteriological contamination.

iv. If a new disinfection process or chemical is introduced such as Chlorine Dioxide, Chlorine will be monitored according to the same sampling frequency of Residual Chlorine in Table A.

Table B - Inorganic Chemical Parameters

Item	Parameter	Unit of Measurement	Concentration or Value (maximum unless otherwise stated)
1	Sulphate (SO4)	mg/l	250.0
2	Magnesium (Mg)	mg/l	30.0
3	Sodium (Na)	mg/l	150.0
4	Potassium (K)	mg/l	12.0
5	Chlorides (Cl)	mg/l	250.0
6	Nitrate (NO3)	mg/l	50.0
7	Nitrite (NO2)	mg/l	3.0
8	Ammonium (ammonia and ammonium ions) (NH4)	mg/l	0.5
9	Total organic carbon (TOC) (i)	mg/l	1.0
10	Aluminium (Al)	mg/l	0.2
11	Iron (Fe)	mg/l	0.2
12	Copper (Cu)	mg/l	1.0
13	Zinc (Zn)	mg/l	5.0
14	Phosphorus (P)	mg/l	2.2
15	Cyanide	µg/l	70.0

Notes:

i. The normally observed value of TOC in the network is < 1 mg/l during normal operation and < 2 mg/l in newly commissioned or repaired systems. Any increase over these values requires further investigation.

Table C - Inorganic Chemical Parameters (mostly trace elements)

Item	Parameters	Unit of Measurement	Concentration or Value (maximum unless otherwise stated)
1	Arsenic (As)	µg/l	10.0
2	Cadmium (Cd)	µg/l	3.0
3	Chromium (Cr)	µg/l	50.0
4	Mercury (Hg)	µg/l	6.0
5	Nickel (Ni)	µg/l	70.0
6	Lead (Pb)	µg/l	10.0
7	Antimony (Sb)	µg/l	20.0
8	Selenium (Se)	µg/l	40.0
9	Barium (Ba)	µg/l	700.0
10	Boron (B)	µg/l	2,400.0
11	Manganese (Mn)	µg/l	400.0
12	Fluoride (F)	µg/l	1,500.0

Table D - Miscellaneous Organic Parameters (mostly pesticides)

Item	Parameter	Unit of Measurement	Concentration or Value (maximum unless otherwise stated)
1	Endrine	µg/l	0.6
2	Lindane	µg/l	2.0
3	Methoxychlor	µg/l	20.0
4	2,4 dichlorophexy acetic acid	µg/l	30.0
5	2,4,5 trichlorophenoxy propionic acid	µg/l	9.0
6	Phenols	µg/l	0.5
7	Heptachlor	µg/l	0.03
8	Aldrin	µg/l	0.03
9	DDT	µg/l	1.0
10	Chlordane	µg/l	0.2
11	Dieldrin	µg/l	0.03
12	Heptachlor epoxide	µg/l	0.03
13	Alachlor	µg/l	20
14	1,2-dibromoethane	µg/l	0.4
15	1,2-dichloropropane	µg/l	40
16	1,3-dichloropropene	µg/l	20
17	1,2-dibromo-3 chloropropane	µg/l	1
18	Total pesticides (i)	µg/l	145

Notes:

i. Total pesticides - means the sum of all individual pesticides detected and quantified in the monitoring procedure. Those pesticides can be from the list of individual Parameters in the table above or outside it. Pesticides can be, but are not limited to insecticides, herbicides, fungicides, PCB's and PCT's.

Table E - Organic Parameters

Item	Parameter	Unit of Measurement	Concentration or Value (maximum unless otherwise stated)
1	Trichloroethene	µg/l	20.0
2	Tetrachloromethane	µg/l	3.0
3	Tetrachloroethene	µg/l	40.0
4	1,2-Dichloroethane	µg/l	30.0
5	Benzene	µg/l	10.0
6	Benzo(a) pyrene	µg/l	0.7
7	Dichloromethane	µg/l	20.0
8	Chlorobenzene	µg/l	300.0
9	1,2-Dichloroethene	µg/l	50.0
10	Toluene	µg/l	700.0
11	1,2-Dichlorobenzene	µg/l	1,000.0
12	1,4-Dichlorobenzene	µg/l	300.0
13	Vinyl Chloride	µg/l	0.3

Table F – Microbiological Parameters

Item	Parameter	Unit of Measurement	Concentration or Value (maximum unless otherwise stated)
1.	Total coliforms	Number/100ml	0
2.	E.coli or thermotolerant Faecal coliform bacteria	Number/100ml	0
3.	Intestinal Enterococci	Number/100 ml	0
4.	Legionella (i)[1]	CFU/l	<1.0
	Legionella (i)[2]	GU/l	Negative

Notes:

i. Legionella[1]: Cultural method; L. pneumophila; CFU: Colony Forming Unit.
Legionella[2]: Polymerase Chain Reaction method (PCR); GU:Genome Unit; Concentration or value is negative.

ii. The concentration for either E.coli, standard method Total coliforms or Enterococci is zero; i.e. must not be detectable in any 100 ml sample. If the presence of either E.coli, Total coliforms or Intestinal Enterococci is indicated, a repeat sample should be collected from the original sample location within 24 hours of the result of the original sample being known. If the repeat sample is non- compliant, the Licensee to implement their immediate corrective action as transcribed in their DWSP. All relevant parties to be notified e.g. regulator and health authority to discuss potential impact on water quality and enable further action to be determined.

iii. Pseudomonas aeruginosa and sulphite-reducing bacteria testing needs to be conducted at relevant locations in the Distribution System following any consumer complaints or observations associated with taste, odour and colour. Target should be zero organism.

iv. Under normal conditions cultural methods are followed. However, in cases where suspected detections are identified and immediate confirmations are required, PCR methods or any other appropriate accredited methods shall be used.

v. Drinking water shall be free at all times from algae, mould, parasites, insects and their eggs, larvae, and protozoa (including Amoebae).

Table G - Radioactive Parameters

Item	Parameter	Unit of Measurement	Concentration or Value (maximum unless otherwise stated)
1	Gross α	Bq/l	≤ 0.5
2	Gross ß	Bq/l	≤ 1

Notes:

i. Compliance with the guideline for radiological quality of drinking water should be assessed, initially, by screening for gross alpha and gross beta activity concentrations. The values for gross alpha and beta noted above are after subtraction of the contribution from potassium-40.
If either of these activity concentrations is exceeded, specific radionuclides outlined below should be identified and their activity concentrations determined by the Licensee. Further samples must be collected by the Licensee to confirm exceedances and assess the persistence of the chemical or radionuclide. The exceedances must be investigated and corrective action implemented.

ii. Licensees must consult the relevant authority for advice on suitable action taking into account the extent of exceedance, duration of exceedance, intake of the substance from sources other than drinking water, the toxicity of the substance, the likelihood and nature of any adverse effects, the practicality of remedial measures and the availability of alternative water supplies.

Item	Parameter	Unit of Measurement	Concentration or Value (maximum unless otherwise stated)
1	Uranium-238	Bq/l	10
2	Uranium-234	Bq/l	1
3	Thorium-230	Bq/l	1
4	Radium-226	Bq/l	1
5	Lead-210	Bq/l	0.1
6	Polonium-210	Bq/l	0.1
7	Thorium-232	Bq/l	1
8	Radium-228	Bq/l	0.1
9	Thorium-228	Bq/l	1
10	Caesium-134	Bq/l	10
11	Caesium-137	Bq/l	10
12	Strontium-90	Bq/l	10
13	Iodine-131	Bq/l	10
14	Tritium	Bq/l	10,000
15	Carbon-14	Bq/l	100
16	Plutonium-239	Bq/l	1
17	Americium-241	Bq/l	1

Notes:

If the following additive formula is satisfied, then no further action is required:

$\sum Ci/GLi \leq 1.0$

Where:

Ci= the measured activity concentration of radionuclide i

GL= the guidance level of radionuclide i

Occasionally, if the guidance levels are exceeded, national authorities will then need to make a decision regarding the need to implement remedial measures or to place some restriction on the continued use of the water supply for drinking purposes.

Table H - Disinfection and DBP's Parameters

Item	Parameter	Unit of Measurement	Concentration or Value (maximum unless otherwise stated)
1	Bromate (i)	mg/l	0.01
2	Chlorate	mg/l	0.7
3	Chlorite	mg/l	0.7
4	Bromoform	mg/l	0.1
5	Bromodichloromethane (BDCM)	mg/l	0.06
6	Chloroform	mg/l	0.3
7	Dibromochloromethane (DBCM)	mg/l	0.1
8	THMs (ii)	mg/l	≤ 1.0

Notes:

i. Licensees shall target to maintain a bromide ion concentration of less than 0.05 mg/l at all times and sample according to the same sampling frequency as Bromate.

ii. The sum of detected concentration of chloroform, bromodichloromethane (BDCM), dibromochloromethane (DBCM) and bromoform as calculated in the equation below:

$$\text{Total trihalomethanes} = \frac{\text{C Bromoform}}{\text{PCV Bromoform}} + \frac{\text{C DBCM}}{\text{PCV DBCM}} + \frac{\text{C BDCM}}{\text{PCV BDCM}} + \frac{\text{C Chloroform}}{\text{PVC Chloroform}} \leq 1$$

C = Measured concentration in mg/l

PCV = Prescribed Concentration or Value in mg/l

Schedule 2: Sampling Frequency

Sampling Frequency Requirements

Regulated activity	Relevant sampling testing criteria	
	Schedule I	Schedule II
Water Desalination by thermal process (e.g. MSF, MED & solar)	Table A, B, C, F, G & H	Table 3 & 6
Water Desalination by membrane process including hybrid Desalination (e.g. thermal + membrane)	Table A, B, C, E, F, G & H	Table 3 & 6
Water abstracted from well fields (ground water)	Table A, B, C, D, E, F, G & H	Table 4 & 6
Water Transmission	Table A, B, C, F & H (Table E: for GRP)	Table 2 & 6
Water Distribution	Table A, B, C, E, F, G & H	Table 1 & 6
Water Tanker	Table A, C & F (Table E: for internal coating)	Table 5

Table 1 - Sampling Frequency at Distribution Water Supply Zones

Water Supply Zone or combination of zones		Sampling frequency (number per annum)					
Volume distributed (m^3/d)	Population supplied	Table A Parameter			Table B Parameter		
		Reduced	Standard	Increased	Reduced	Standard	Increased
≤100	≤500	2	4	8	2	3	4
101-1,000	501-5,000	3	6	12	2	3	4
1,001-2,000	5,001-10,000	3	6	12	3	4	6
2,001-4,000	10,001-20,000	6	12	24	3	4	6
4,001-10,000	20,001-50,000	12	24	36	6	8	12
10,001-20,000	50,001-100,000	12	24	36	6	8	24
20,001-30,000	100,001-150,000	18	36	48	6	12	24
>30,000	>150,000	18	48	72	8	12	36

Volume distributed (m^3/d)	Population supplied	Table C Parameter			Table E Parameter		
		Reduced	Standard	Increased	Reduced	Standard	Increased
≤1,000	≤5000	2	3	4	2	3	4
1,001-10,000	5,001-50,000	3	4	6	2	3	4
10,001-30,000	50,001-150,000	4	6	8	3	4	6
>30,000	>150,000	6	8	10	4	6	8

Volume distributed (m^3/d)	Population supplied	Table F Parameter (i)			Legionella Parameter		
		Reduced	Standard	Increased	Reduced	Standard	Increased
≤2,000	≤10,000	6	12	24	1	2	4
2,001-10,000	10,001-50,000	12	24	48	2	4	8
10,001-30,000	50,001-150,000	18	36	72	4	8	16
>30,000	>150,000	36	48	72	6	12	24

Volume distributed (m^3/d)	Population supplied	Table G Parameter			Table H Parameter		
		Reduced	Standard	Increased	Reduced	Standard	Increased
≤2,000	≤10,000	1	2	3	3	6	12
2,001-10,000	10,001-50,000	1	2	3	6	9	24
>10,000	>50,000	1	2	3	9	12	48

Notes:

i. For all Table F Parameters, except Legionella.

Table 2 - Sampling Frequency at Transmission Water Supply Zones

Water pumping capacity	Sampling frequency (number per annum)					
Capacity (m^3/d)	Table A Parameter			Table B Parameter		
	Reduced	Standard	Increased	Reduced	Standard	Increased
≤4,000	2	4	8	2	4	8
4,001-30,000	3	6	12	3	6	12
30,001-100,000	6	12	24	6	12	24
100,001-150,000	12	24	36	6	12	24
>150,000	24	36	48	12	24	36

Capacity (m^3/d)	Table C Parameter			Table E Parameter (i)		
	Reduced	Standard	Increased	Reduced	Standard	Increased
≤4,000	2	4	8	1	2	3
4,001-10,000	2	4	8	2	3	4
10,001-30,000	3	6	12	2	3	4
30,001-100,000	3	6	12	3	4	6
100,001-150,000	6	12	24	3	4	6
>150,000	9	12	24	4	6	8

Capacity (m^3/d)	Table F Parameter (ii)			Legionella Parameter		
	Reduced	Standard	Increased	Reduced	Standard	Increased
≤4,000	2	4	8	1	2	4
4,001-20,000	3	6	12	2	3	6
20,001-100,000	6	12	24	3	4	8
100,001-150,000	12	24	48	4	8	16
>150,000	18	36	72	5	10	18

Volume distributed (m^3/d)	Population supplied	Table H Parameter		
		Reduced	Standard	Increased
≤10,000	≤10,000	3	6	12
10,001-100,000	10,001-50,000	6	9	24
>100,000	>50,000	9	12	48

Notes:

i. Table E Sampling is for GRP.
ii. For all Table F Parameters, except Legionella.

Table 3 - Sampling Frequency at Desalination Water Supply Zones

Plant capacity	Sampling frequency (number per annum)					
Capacity (m3/d)	Table A Parameter			Table B Parameter		
	Reduced	Standard	Increased	Reduced	Standard	Increased
≤1,000	12	30	48	2	4	8
1,001-10,000	15	36	60	3	6	12
10,001-20,000	30	60	240	3	6	12
20,001-50,000	60	120	240	6	12	24
50,001-100,000	60	180	240	6	12	24
100,001-200,000	180	240	360	12	24	48
200,001-300,000	240	360	720	12	24	48
>300,000	240	360	720	18	36	72

Capacity (m^3/d)	Table C Parameter			Table E Parameter (i)		
	Reduced	Standard	Increased	Reduced	Standard	Increased
≤50,000	2	4	8	2	4	8
50,001-300,000	3	6	9	3	6	12
>300,000	6	9	12	6	12	24

Capacity (m^3/d)	Table F Parameter (ii)			Legionella Parameter		
	Reduced	Standard	Increased	Reduced	Standard	Increased
≤20,000	2	4	8	1	2	4
20,001-200,000	3	6	12	2	3	6
200,001-300,000	5	12	20	3	5	10
300,001-500,000	12	24	40	4	8	12
>500,000	24	36	48	6	12	24

Capacity (m^3/d)	Table G Parameter			Table H Parameter		
	Reduced	Standard	Increased	Reduced	Standard	Increased
≤1,000	1	2	3	2	4	8
1,000-20,000	1	2	3	6	12	24
20,001-200,000	1	2	3	9	18	36
>200,000	1	2	3	12	24	48

Notes:

i. Table E Sampling is for Water Desalination by membrane process including hybrid Desalination (e.g. thermal + membrane).
ii. For all Table F Parameters, except Legionella.

Table 4 - Sampling Frequency at Well Field Water Supply Zones (Ground Water)

Production capacity	Sampling frequency (number per annum)					
Capacity (m^3/d)	Table A Parameter			Table B Parameter		
	Reduced	Standard	Increased	Reduced	Standard	Increased
≤100	2	4	8	2	4	8
101-1,000	3	6	12	2	4	8
1,001-2,000	6	12	24	2	4	8
2,001-4,000	12	24	48	3	6	12
4,001-10,000	30	60	120	3	6	12
>10,000	30	60	120	6	12	24

Capacity (m^3/d)	Table C Parameter			Table D Parameter		
	Reduced	Standard	Increased	Reduced	Standard	Increased
≤1,000	2	4	8	2	3	4
1,001-4,000	3	6	12	3	6	12
4,001-10,000	6	12	24	6	12	24
>10,000	12	24	36	6	12	24

Capacity (m^3/d)	Table E Parameter			Table F Parameter (i)		
	Reduced	Standard	Increased	Reduced	Standard	Increased
≤2,000	2	4	8	2	4	8
2,001-4,000	4	6	12	3	6	12
4,001-10,000	4	6	12	6	12	24
>10,000	8	12	24	12	24	48

Capacity (m^3/d)	Legionella Parameter			Table G Parameter		
	Reduced	Standard	Increased	Reduced	Standard	Increased
≤2,000	1	2	4	1	2	3
2,001-4,000	2	3	6	1	2	3
4,001-10,000	4	6	12	1	2	3
>10,000	5	8	16	1	2	3

Capacity (m^3/d)	Table H Parameter		
	Reduced	Standard	Increased
≤1,000	6	12	24
>1,000	12	24	48

Notes:

i. For all Table F Parameters, except Legionella.

Table 5 - Sampling Frequency for Water Tankers

Tanker's capacity / size	Sampling frequency (number per annum)					
Capacity	Table A Parameter			Table C Parameter		
	Reduced	Standard	Increased	Reduced	Standard	Increased
For all sizes	1	2	4	1	2	4
Capacity	Table E (i) Parameter			Table F Parameter (ii)		
	Reduced	Standard	Increased	Reduced	Standard	Increased
For all sizes	1	2	4	1	2	4
Capacity	Legionella Parameter					
	Reduced	Standard	Increased			
For all sizes	1	2	4			

Notes:

i. Tankers internally coated (paint) are required to test for total organic compounds (TOC) and relevant Parameters from Table E (1, 2-Dichloroethane, Toluene, 1, 2-Dichlorobenzene, 1, 4- Dichlorobenzene, Vinyl Chloride).
ii. For all Table F Parameters, except Legionella.

Table 6 - Sampling Frequency for Water Storage Tanks, Reservoirs and Water Towers

Per water body	Sampling frequency (number per annum)					
Capacity (m^3)	Table A Parameter			Table F Parameter (i)		
	Reduced	Standard	Increased	Reduced	Standard	Increased
<2,000	2	2	8	2	2	8
2,000-10,000	2	2	8	2	2	8
10,001-50,000	2	3	9	2	3	9
50,001-200,000	3	4	9	3	4	9
>200,000	4	6	12	4	6	12

Capacity (m^3)	Legionella Parameter		
	Reduced	Standard	Increased
<2,000	2	2	8
2,000-10,000	2	2	8
10,001-50,000	2	4	9
50,001-200,000	3	4	9
>200,000	4	6	12

Notes:

i. For all Table F Parameters, except Legionella.

Schedule 3: Initial Entries Forms

Form A - Water Desalination Licensee

	Desalination Plant
Name of Licensee	
Site location	
Total production capacity	
Desalination technology and type	
Number of Desalination units	
Year of Desalination units construction/ refurbishment	
Desalination unit ID number	
Desalination unit Production capacity	
Remineralisation plant name and description	
Year of remineralisation plant construction/ refurbishment	
Sample point ID (Identification number)	
Chemical injection points	
Remarks	
	Storage capacity
Number of storage tanks and name	
Site location	
Storage tank type	
Storage tank capacity	
Material of construction and internal coating	
Sample point ID (before and/ or after storage) (Identification number)	
Chemical injection points	
Remarks (e.g. chlorine contact time, residence and retention times)	
	Testing method (according to the sampling testing criteria table)
Test method No.	
Parameter	
Name of test method	
Method standard	
Description	
Internal or external lab	

(name of lab)	
Test Accreditation	
Time (time required from sampling to test result made readily available)	
Remarks (e.g. instant testing availability)	
Sampling Testing Criteria Table (Daily Basis)	
Month/ day	
WQR Table	
Sampling Point & Description	
Total no. of samples	

Notes:

i. Please attach process flow diagram/ schematic of the process and remineralisation and Sampling Points location.

Form B - Water Transmission/ Distribution Licensee

	Desalination Plant (i)
Name of Licensee	
Site location	
Total production capacity	
Desalination technology and type	
Number of Desalination units	
Year of Desalination units construction/ refurbishment	
Desalination Unit ID number	
Desalination unit Production capacity	
Remineralisation plant name and description	
Year of remineralisation plant construction/ refurbishment	
Sample point ID (Identification number)	
Chemical injection points	
Remarks	
Site information	
Region ID	
Site and zone ID	
Site and zone description	
Site location	
Volume (m^3/d)	
Population	
Annual frequency plan	
Chemical injection points	
Remarks	
Storage capacity	
Number of storage tanks and name	
Site location	
Storage tank type	
Storage tank capacity	
Material of construction and internal coating	
Sample point ID (before and/ or after storage) (Identification number)	
Chemical injection points	
Remarks (e.g. chlorine contact time, residence and retention times)	

	Testing method (according to the sampling testing criteria table)
Test method No.	
Parameter	
Name of test method	
Method standard	
Description	
Internal or external lab (name of lab)	
Test Accreditation	
Time (time required from sampling to test results made readily available)	
Remarks (e.g. instant testing availability)	
Sampling Testing Criteria Table (Daily Basis)	
Month/ day	
WQR Table	
Sampling Point & description	
Total no. of samples	

Notes:

i. To be updated if Desalination Plant is available.

Schedule 4: Drinking Water Performance Indices

Water Distribution Licensee Index

I - Disinfection & DBP index (DCI) according to Table 1 of Schedule 2				
Parameter	Required tests according to Schedule 2	Done	Failed	Passed
Residual Cl2				
Chlorine Dioxide				
Nitrate				
Nitrite				
Total Coliforms				
E.Coli				
Intestinal Enterococci				
Legionella				
Bromate				
Chlorate				
Chlorite				
THM's				
Total				
II - Reservoirs integrity index (RII) according to Table 6 of Schedule 2				
Parameter	Required tests according to Schedule 2	Done	Failed	Passed
Residual Cl2				
Chlorine Dioxide				
Total Coliforms				
E.Coli				
Intestinal Enterococci				
Legionella				
Total				
III - Production operational index (POI) according to Table 1 of Schedule 2				
Parameter	Required tests according to Schedule 2	Done	Failed	Passed
Colour				
Turbidity				
Taste				
Odour				
TDS				
Calcium Hardness				

Total Hardness	
LSI	
pH	
TOC	
Aluminium	
Iron	
Copper	
Cyanide	
Arsenic	
Cadmium	
Chromium	
Mercury	
Selenium	
Antimony	
Lead	
Barium	
Boron	
Manganese	
Fluoride	
Trichloroethene	
Tetrachloromethane	
Tetrachloroethene	
1,2-Dichloroethane	
Benzene	
Benzo(a) pyrene	
Vinyl Chloride	
Total	

Water Transmission Licensee Index

I - Disinfection & DBP control index (DCI) according to Table 2 of Schedule 2				
Parameter	Required tests according to Schedule 2	Done	Failed	Passed
Residual Cl2				
Chlorine Dioxide				
Nitrate				
Nitrite				
Total Coliforms				
E.Coli				
Intestinal Enterococci				
Legionella				
Bromate				
Chlorate				
Chlorite				
THM's				
Total				

II - Reservoirs integrity index (RII) according to Table 6 of Schedule 2				
Parameter	Required tests according to Schedule 2	Done	Failed	Passed
Residual Cl2				
Chlorine Dioxide				
Total Coliforms				
E.Coli				
Intestinal Enterococci				
Legionella				
Total				

III - Production operational index (POI) according to Table 2 of Schedule 2				
Parameter	Required tests according to Schedule 2	Done	Failed	Passed
Colour				
Turbidity				
Taste				
Odour				
TDS				
Calcium Hardness				
Total Hardness				
LSI				
pH				
TOC				

Aluminium	
Iron	
Copper	
Cyanide	
Arsenic	
Cadmium	
Chromium	
Mercury	
Selenium	
Antimony	
Lead	
Barium	
Boron	
Manganese	
Fluoride	
Trichloroethene	
Tetrachloromethane	
Tetrachloroethene	
1,2-Dichloroethane	
Benzene	
Benzo(a) pyrene	
Vinyl Chloride	
Trichloroethene	
Tetrachloromethane	
Total	

Notes:

i. Table E Parameters to be included for GRP.

Water Desalination Licensee Index

I - Disinfection & DBP control index (DCI) according to Table 3 of Schedule 2				
Parameter	Required tests according to Schedule 2	Done	Failed	Passed
Residual Cl2				
Chlorine Dioxide				
Nitrate				
Nitrite				
Total Coliforms				
E.Coli				
Intestinal Enterococci				
Legionella				
Bromate				
Chlorate				
Chlorite				
THM's				
Total				

II - Reservoirs integrity index (RII) according to Table 6 of Schedule 2				
Parameter	Required tests according to Schedule 2	Done	Failed	Passed
Residual Cl2				
Chlorine Dioxide				
Total Coliforms				
E.Coli				
Intestinal Enterococci				
Legionella				
Total				

III - Production operational index (POI) according to Table 3 of Schedule 2				
Parameter	Required tests according to Schedule 2	Done	Failed	Passed
Colour				
Turbidity				
Taste				
Odour				
TDS				
Calcium Hardness				
Total Hardness				
LSI				
pH				
TOC				

Aluminium	
Iron	
Copper	
Cyanide	
Arsenic	
Cadmium	
Chromium	
Mercury	
Selenium	
Antimony	
Lead	
Barium	
Boron	
Manganese	
Fluoride	
Total	

Notes:

i. Table E Parameters to be included for Water Desalination by membrane process including hybrid Desalination (e.g. thermal + membrane).

Schedule 5: Chemicals Use in Drinking Water

Schedule 5a: Checklist of the Requirements for Chemicals Application

1. General	Y/N
i. Formal correspondence addressed to the DoE about the proposed chemical or substance.	
ii. Subject matter expert to be identified as focal point of contact for technical discussions and follow up.	
2. Legal and Compliance	**Y/N**
i. A statement that to the best of the Licensee's knowledge, the Licensee is satisfied that the chemical and its by-products alone or in combination with any other chemicals and compounds will not affect the wholesomeness of the drinking water quality and have any impact on the environment.	
3. Licensees & Stakeholders	**Y/N**
i. No objection Letter from EWEC (TRANSCO to be included in the correspondence).	
Environmental no objection. Licensee to choose one of the below: i. EAD no objection Letter. ii. No objection Letter from relevant Environmental authority/ Entity for Licensees premises located outside the Emirate of Abu Dhabi. iii. If the chemical has already been approved for use by EAD, a copy of no objection letter granted to user (DoE Licensee).	
4. Certifications and Technical Information	**Y/N**
i. Shelf life certificate.	
ii. Certificate of Analysis.	
iii. Certification that the chemical is used for wholesome water applications.	
iv. Valid contact details of references.	
v. Certificate of chemical application ratified by DoE Licensee if applicable.	
vi. Manufacturing, storage, and delivery certifications.	
vii. Quality Management Systems certified by an independent Accreditation Body.	
viii. (M)SDS.	
ix. Technical Information.	
5. Chemical analysis	**Y/N**
i. Sampling analysis of the proposed chemical from an accredited laboratory.	

Notes:

i. The checklist contains the documents required during the initial phase of the chemicals application process.
ii. Please refer to Schedules 5 (b-d) for detailed Licensee obligations.

Schedule 5b: Chemicals Application Process - Licensee Obligation Guideline

Licensee Obligation	Licensee Obligation Guideline
1) Material Change	i. In the material change notification (encapsulating the purpose of the change and possible advantages and disadvantages), the Licensee is required to submit the information as set out in this table to the DoE. ii. Material change does not include chemicals from agricultural activities e.g. pesticides, residential chemicals e.g. sewage and waste disposal, chemicals used in industrial activities e.g. mining and processing and natural occurring chemicals e.g. soils or any other chemicals as stated by DoE. iii. From time to time, the DoE may publish a chemical guideline (e.g. ledger summary list of chemicals that had previously been approved by it) for the benefit of the Licensees. The Licensee is still required to inform the DoE prior to conducting a material change from the ledger summary. Please note that this chemicals ledger does not include chemicals that were in use before the existence of the Water Quality Regulations and does not relieve the Licensee from satisfying and conforming to the Water Quality Regulations requirements. The chemical guideline is confidential and must not be circulated, reproduced, transmitted, in any form without the prior permission and authorization of the DoE. **iv. <u>A material change involves, but is not limited to:</u>** ○ Chemicals (chemical, material and product) that come in contact with drinking water in the process of water Desalination, Transmission System, Distribution System (piped, non-piped and aquifers), storage, transfer and supply; ○ modifying the chemical dosage rate/ consumption beyond the limits transcribed in P(W)PA's and/ or any other certificate(s) or agreement, documents and correspondence(s); ○ modifying the chemical physical and chemical properties transcribed in certificate(s), toxicology profile information, MSDS and/ or any other certificate(s), submission(s) and document(s) changes with or without the manufacturer notifying the certification body; ○ Chemical withdrawn permanently or temporarily due to operational and/ or quality or any other issues; ○ Change of supplier/ commercial name, information, and brand and/ or change of origin of manufacturer;

	○ Emergency state of affairs. This is case by case review and evaluation process. A monitoring period will be set by the DoE; ○ Any other reason requested by the DoE.
2) Legal and Compliance	i. A statement that to the best of the Licensee's knowledge, the Licensee is satisfied that the chemical and its by-products alone or in combination with any other chemicals and compounds will not affect the wholesomeness of the drinking water quality and have any impact on the environment. ii. Satisfying the compliance with the Water Quality Regulations does not relieve Licensee from the responsibilities towards the safe use and handling of the chemical and the compliance with all applicable Laws, Codes, Regulations, Guides and Standards.
3) Licensees & Stakeholders	**i. <u>EWEC</u>** ○ The commercial or contractual part is completed and assessed by EWEC. Licensee needs to obtain any necessary clearance on contractual matters with EWEC as the P(W)PA's contain requirements and obligations in regards to the use of these chemicals. Licensees I(W)PP's have entered into long term agreements with EWEC by means of P(W)PA's. The P(W)PA's specify some of the chemicals to be used, recommend dosing rates and specific consumption and stipulate performance criteria to be met by the Licensees. ○ Licensee to acquire a no objection from EWEC in regards to using the chemical that come in contact with drinking water in terms of trial and/ or in continuous operation. ○ The modification to the chemical may reflect certain commercial and contractual aspects which are overseen by EWEC. **ii. <u>Non EWEC Licensees</u>** ○ Licensees who did not enter into a ratified contractual agreement with EWEC for water and power production, supply and connection to the Transmission/ Distribution Systems (for example self-supply Licensee), are exempted from EWEC no objection. They are still obliged to submit no objection from the relevant authorities/ Entities. **iii. <u>TRANSCO</u>** ○ The change to the chemical may also have an impact on the TRANSCO water Transmission System and hence Licensees are required to adhere to the requirements of the Water Transmission Code and any other relevant TRANSCO Codes. ○ Other Entities may be included in the circulation as per the DoE direction. **iv. <u>EAD</u>**

	○ If the Licensee submits a no objection letter issued by EAD to use the same chemical granted to another DoE Licensee (for Licensees operating in the Emirate of Abu Dhabi), then there is no requirement for EAD no objection letter submission unless deemed necessary by EAD and/ or DoE. Licensee to engage with EAD for any further requirements. ○ EAD no objection letter issued by EAD to use a chemical granted to DoE Licensee is valid for three Years unless stated otherwise by DoE and/ or EAD. ○ Engage with EAD to comply with all their legally binding and obligatory conditions. ○ There is no requirement to submit EAD no objection letter for remineralisation chemicals (hydrated lime and limestone) unless stated otherwise. **v. <u>Licensees premises located outside the Emirate of Abu Dhabi</u>** ○ Engage with pertinent environmental/ municipal Entity to comply with all their legally binding and obligatory conditions. **vi. <u>Notes</u>** ○ The DoE, EWEC, TRANSCO and any other party as declared by the DoE to be kept in the loop in all correspondences in regards to that matter. ○ Licensee to notify the environmental and/ or municipal Entity outside the Emirate of Abu Dhabi with its intention to use chemical and acquire all the necessary approvals and conform to all their legally binding and obligatory conditions.
4) Certifications and Technical Information	**i. <u>Certification</u>** ○ The certificate must demonstrate that the chemical has been tested to confirm compliance with defined standards and certified to be of suitable quality and type to be used in wholesome water applications. ○ Consideration of process and local conditions e.g. climate conditions ,chemical concentration change, distance, temperature, pipe and tank walls and time (e.g. retention, residence and contact). ○ The certification body must demonstrate a process of accrediting and auditing (e.g. manufacturing, storage, delivery) a chemical. Such Accreditation must include random site visits by the certification body, relevant regulatory agency and, if authorized, the relevant water authority. ○ The DoE may request the certification body audit report of the chemical manufacturer/ supplier. ○ The certification must demonstrate that the chemical used or associated by products do not pose a risk to health.

- Some chemicals may not require certification but requires impurity tests.
- Attestation of the chemical document by UAE Embassy and/ or any other Embassy as instructed by DoE may be required.
- If the raw material(s) and not the chemical brand name is transcribed in the certification(s), the Licensee to confirm its acceptance and satisfaction of the chemical.
- The Licensee must not exceed the dosage rate transcribed in the certification. If the Licensee wishes to exceed the dosage they must notify the DoE with justifications where necessary, prior to use.
- If the chemical is no longer certified by certification body and/ or any other approved/ relevant certificates, Licensee to notify the DoE immediately and provide alternative certificates if available, otherwise the product will be deemed null and void unless stated otherwise by the DoE.
- If the chemical information changes for example the product name and the formula of the chemical transcribed in the certificates and/ or any other approved/ relevant certificate(s) and submissions, new certificate(s) and/ or document(s) must be issued and submitted immediately to the DoE, otherwise the product will be deemed null and void unless stated otherwise by the DoE.
- If the chemical manufacturing facility changes the Licensees must notify the DoE immediately, otherwise the product will be deemed null and void unless stated otherwise by the DoE.

ii. Performance (Manufacturer and Supplier)

- The provision of chemical performance suitability by a recognized and creditable agency will be an advantage. Certificates of chemical trials and performance approvals by Plants or research Entities with preference to Entities located in UAE/ GCC. Best Available peer reviewed science and supporting studies performed in accordance with sound and objective scientific practices.
- Performance authentication by DoE Licensee and/ or Entity.
- Chemical must comply with the operation, process and treatment technique of Licensee.
- Ensure contact details of references have been verified and are up to date and authentic.

iii. Technical Information

- Registered Name, Brand Name and Trademark.
- Description, chemical formula, structure, properties, reactivity, thermal stability, application, dose Level, certificates, storage, materials, shipping and handling and HSE.

	○ Dosage depends on and not limited to characteristic and chemical composition of water and physical factors like water temperature and mixing conditions. **iv. <u>(M)SDS & Shelf Life</u>** ○ A typical (M)SDS may include hazards identification, composition/ ingredient information, specific impurity levels, maximum contaminant levels, solids content, first aid measures, fire fighting measures, accidental release measures, handling and storage, exposure controls, personal protection, physical and chemical properties, stability and reactivity, toxicological information, ecological information, disposal considerations, transport information, regulatory information, other information, health risks (quantifiable and non quantifiable), reaction with material of construction and type of flow. ○ Results of a toxicity study performed on the chemical in question by a well-reputed institute. Types of toxicological effects that are most relevant to contaminants exposure in drinking water are and not limited to systematic toxicity, carcinogenicity, reproductive toxicity, developmental toxicity, teratogenicity, genotoxicity and mutagenicity. ○ Shelf life certificate.
5) Chemical Analysis	**i. <u>Analysis and Testing</u>** ○ Only Chemical analysis certificate from accredited laboratory is accepted. ○ Where Accreditation is not available the DoE shall consider alternative laboratory analyses on a case by case basis. ○ Ensure Licensee capability of managing analytical testing of chemicals as far as practicable. ○ Analysis for chemicals and products that come in contact with drinking water to be conducted at least once per Year and as and when required by the DoE. ○ The test Parameters and frequency to be discussed and agreed with the DoE.

Schedule 5c: Trial, Monitoring and Documentation Requirements

Licensee Obligation	Licensee Obligation Guideline
General Monitoring	i. A quality control procedure to manage and monitor chemicals and products that come in contact with drinking water must be underpinned by the applicable water quality compliance, operational monitoring and testing. The monitoring must cover all modes of operation e.g. trial, operation and emergency. Chemicals like chlorine and coagulants must have multiple check and monitoring systems for feed rate and concentration. ii. New disinfection processes or chemicals other than chlorine (e.g. chloramine, monochloramine, chlorine dioxide, ozone and ultraviolet) shall be subject to the same conditions of this Part and, where approval is granted by the DoE, they shall be monitored according to the same sampling frequency of chlorine. iii. Licensees are advocated to establish their own performance targets to determine how the chemicals will achieve those targets. Where chemicals are used for example for disinfection, the disinfection efficacy should never be compromised by attempts to meet standards for DBP's. However, standards for DBP's are not as high priority as other contaminants such as arsenic. Chemicals effectiveness must be monitored for example using performance targets of turbidity and pH in determining the disinfection efficacy. The efficiency of the chemical process application must be verified. iv. Water quality compliance and operational monitoring encapsulates measurements and observations to assess whether the critical components of the pertinent Regulations, Codes, Guides, Laws and documents are operating properly. v. Appropriate chemical feed equipment to be selected. vi. Verify that best risk management, assessment and control procedures and techniques of risk prevention are effective and correctly implemented. vii. Long-term monitoring and testing procedures to be applied to chemicals and materials to assess their contribution to drinking water exposure.
Trial	i. The water quality monitoring program is required to be implemented. Tables, Parameters and frequency of tests to be monitored are to be submitted to the DoE and the relevant parties and agreed upon in advance of such programme. ii. Water quality samples to be verified by accredited laboratory at least three times during the duration of the trial (initial phase; mid-term and

	final phase) and/ or when deemed necessary as determined in coordination with DoE technical team. iii. In some cases, the trial may have to cover different conditions e.g. weather and seasonal variations. iv. For material change using a chemical that is currently used by DoE Licensee, the trial period shall be no less than one calendar month (30 operational days). v. For material change using a chemical that is not currently used by DoE Licensee, the trial period shall be no less than three calendar months (90 operational days). vi. Pre-trial baseline data of no less than six months to be provided to the DoE and the relevant parties. vii. The report subject matter, structure and content to be agreed with DoE. The comprehensive technical report must include the performance calculations and its calculation Parameters and methodology for specified time before and during (after the trial if deemed necessary) the trial/ use period. Factors that affect the performance of the chemical or process must be accounted for. The trial data and baseline data to be included in the report. The gap between the baseline data and trial data must not exceed 5 days, otherwise a justification must be submitted. viii. Throughout the review process the DoE will only liaise with the Licensee or Licensee representative as a focal point of correspondence and will not engage directly with chemical manufacturer/ supplier unless deemed necessary.
Documentation	i. All records and information (for e.g. and not limited to data, reports, exemptions, variance, submissions, communications, surveys) conducted by the Licensee and/ or third party to be kept for a period no less than 20 Years from the date of chemical usage. ii. Ensure proper data handling and reporting procedures are followed (for e.g. quality, operational).

Schedule 5d: Chemicals Application Process - Licensee Obligation General Guideline

Licensee Obligation	Licensee Obligation Guideline
Other Information	i. The Licensee should only consider appropriate chemicals for use accounting for and not limited to best technology, treatment techniques and any other means to ensure maintaining the WQR's compliance.
Security of Supply	i. Licensee to ensure security of supply by using BCM best practices (e.g. ensure the availability of alternative chemicals and products that come in contact with drinking water by increasing the chemical stock availability and ensure minimum stock of chemicals is maintained with consideration of shipping and delivery times). ii. Ensure the access for relevant personnel, vehicles and materials is provided at all times.
Risk Assessment	i. Licensee to encapsulate all pertinent hazards associated with chemical in the DWSP in order to assess the risks and optimise risk management. A robust system must include a process to mitigate Hazards. ii. Must take into consideration the chemical potential to interact with any other added and existing chemicals and compounds. iii. Must take into consideration that the chemical concentration may vary in the Desalination, Transmission, Distribution, storage and tankering System. iv. Ensure management and control of chemicals risks are evaluated, implemented and monitored. v. Risk control measures and specifications adopted for chemicals and their residuals must account for interactions with other chemicals and compounds, and control of under/ overdosing. vi. Licensee to inspect and authenticate the chemicals and products that come in contact with drinking water. vii. If a chemical dose has exceeded the limits transcribed in the certification(s) and set by the Licensees, the Licensee must inform the DoE immediately. The Licensee must ensure to mitigate the risk and take appropriate action to ensure compliance. viii. All risks and exceedances associated with the chemical use must be recorded including all monitoring results, actions taken by Licensee and outcomes. ix. Noncarcinogen risk assessment to include and not be limited to point of departure, uncertainty factors, exposure assumptions and relative source contribution.

	x.	Carcinogen risk assessment encapsulates and not be limited to non-threshold versus threshold assumption, examination of cancer risk and health based drinking water concentration.
HSE, Storage, Delivery & Waste Management	i.	Maintain a “Responsible Care” culture in regards to the HSE and all applicable compliance with Laws, Codes, Regulations, Policies, Guides and Standards. Ensure Fire Fighting and Gas detector systems are in place, operational and well maintained.
	ii.	Ensure safety and wellbeing of staff and contractors handling chemical and secure safe storage (dry/ wet).
	iii.	Ensure no contamination of the chemical during or before transport and storage.
	iv.	Develop and implement a chemical delivery procedure to ensure timely delivery of chemicals.
	v.	Ensure compliance with safety, corrosion and disposal requirements.
	vi.	Ensure unsafe dosage of chemicals is controlled.
	vii.	Ensure safe and appropriate storage to reduce the risk of factors like elevated temperatures, cross contamination, toxic atmospheres and chemical contact.

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