



Water Quality

Technical Standard

TS 0800 – Materials in contact with drinking water

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**Government of
South Australia**

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Documents superseded by this standard

The following documents are superseded by this version of TS 0800:

- a. TS 0800, Version 1.0

Significant/major changes incorporated in this edition

Updated in accordance with the SA Water Technical Standard Template Version 8.1 and the SA Water Style and Writing Standard Version 2.0.

Internal references updated.

Document controls

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Approvers

Approver Name	Approver Role	Signature
Ramon Salazar Romero	Principal Engineer Materials Science	<div style="text-align: right;">17/02/2025</div>  <hr/> X Ramon Salazar Romero Principal Engineer Materials Science Signed by: SA003587
Keturah Stock	Water Quality Improvement and Compliance Officer	<div style="text-align: right;">17/02/2025</div>  <hr/> X Keturah Stock Water Quality Improvement and Compliance... Signed by: ST001819
Matthew Davis	Manager Engineering Quality and Innovation	<div style="text-align: right;">17/02/2025</div>  <hr/> X Matthew Davis Manager Engineering Quality and Innovation Signed by: DA003681
Amber Lang	Manager Water Quality Improvement and Compliance	<div style="text-align: right;">18/02/2025</div>  <hr/> X Amber Lang Manager Water Quality Improvement and C... Signed by: LA000504

Reviewers

Name	Role	Version	Review Date
Matthew Davis	Manager Quality and Innovation	2.0	29-10-2024
Neil Smith	Senior Standards Engineer	2.0	29-10-2024

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1 Introduction

SA Water is responsible for the construction and commissioning of an extensive amount of engineering infrastructure such that it is safe and functional.

This standard has been developed to assist in the design, maintenance, construction, and management of this infrastructure.

1.1 Purpose

The purpose of this standard is to detail minimum requirements to ensure that assets covered by the scope of this standard are constructed and maintained to consistent standards and attain the required asset life.

1.2 Glossary

Terms and Abbreviations utilised in this Standard are included in the following sections. The definitions presented below are to be used when interpreting this Standard and actions undertaken in relation to this Standard. Where a conflict exists, clarification is to be sought from SA Water.

1.2.1 Terms and Definitions

The following is a list of Terms applicable to this document:

Term	Description
Accepted	Determined to be satisfactory by SA Water's Representative.
Accredited Consultant	Consultants who work on developer-funded assets for land development projects.
Agent	Person or organisation that engages a Designer.
Authoriser	Ensures that the relevant review and verification activities/process of a given output have been carried out as per contract.
Allow	Means that the cost of the item referred to is the responsibility of the Constructor
Constructor	The organisation responsible for constructing and installing infrastructure for SA Water whether it be a third party under contract to SA Water or an in-house entity.
Contract	A set of documents supplied to Constructor as the basis for construction; these documents contain contract forms, contract conditions, specifications, drawings, addenda, and contract changes.
Designer	The organisation responsible for designing infrastructure for SA Water whether it be a third party under contract to SA Water or a Constructor, or an in-house entity. A Designer is a person who effects design, produces designs or undertakes design activities as defined in the Work Health and Safety Act 2012 (SA).
Drawing	A document intended to provide sufficient technical information in detail about the work to be constructed, and to provide a record of works undertaken.
Informative	Means "provided for information and guidance".
Manufacturer	A person, group, or company that owns and operates a manufacturing facility that provides materials for use in SA Water infrastructure.
Person/s	Each word implying a person, or persons shall, where appropriate, also be construed as including corporations.
Provide	Means "supply and install".

Term	Description
Responsible Discipline Lead	The engineering discipline expert identified in the 'Approvers' table (via SA Water's Representative).
SA Water Representative	The SA Water representative with delegated authority under a Contract or engagement, including (as applicable): <ul style="list-style-type: none"> • Superintendent's Representative (e.g. AS 4300 and AS 2124 etc.) • SA Water Project Manager • SA Water nominated contact person
Must	Indicates a requirement that is to be adopted in order to comply with the Standard.
Should	Indicates practices which are advised or recommended, but is not required
Supplier	A person, group or company that provides goods for use in SA Water infrastructure.
Technical Dispensation Request Form	This form is part of SA Water's Technical Dispensation Request Procedure which details the process by which those required to comply, or ensure compliance, with SA Water's technical requirements may seek dispensation from those requirements.
Technical Governance	SA Water's primary method for articulating required technical outcomes to stakeholders, usually via Technical Standards, Standard Drawings etc. as described in TG 0103.
Work	Elements of a project which require design and/or construction.

1.2.2 Abbreviations

The following is a list of Abbreviations, Acronyms and Initialisms used in this document:

Abbreviation	Description
ABCB	Australian Building Codes Board
ADWG	Australian Drinking Water Guidelines
AS	Standards Australia
BS	British Standards
NZS	Standards New Zealand
AS/NZS	Joint Standard for Standards Australia and Standards New Zealand
DWQMS	Drinking Water Quality Management System
NDMA	N-Nitrosodimethylamine
NHMRC	National Health and Medical Research Council
PM	Project Manager
PTFE	Polytetrafluoroethylene
SA Water	South Australian Water Corporation
TDRF	Technical Dispensation Request Form
TG	SA Water Technical Guideline
TS	SA Water Technical Standard
WSAA	Water Services Association of Australia
NSF	National Sanitation Foundation
ANSI	American National Standards Institute

1.2.3 Terminology

The following is a list of specific interpretations for Terminology used in this standard.

- Where an obligation is given and it is not stated who is to undertake these obligations, they are to be undertaken by the Constructor.
- Directions, instructions and the like, whether or not they include the expression "the Constructor shall" or equivalent, shall be directions to the Constructor, unless otherwise specifically stated.
- Where a submission, request, proposal is required and it is not stated who the recipient should be, it is to be provided to SA Water's Representative for review.
- Each word imparting the plural shall be construed as if the said word were preceded by the word "all".
- "Authorised", "approval", "approved", "selected", "directed" and similar words shall be construed as referring to the authorisation, approval, selection or direction of SA Water's Representative in writing.
- "Submit" mean "submit to the SA Water Representative or their nominated delegate".
- Unless noted otherwise, submissions, requests, proposals are to be provided at least 10 business days prior to work commencing or material ordering (unless noted otherwise).

1.3 References

1.3.1 Australian and international

The following table identifies Australian and International standards and other similar documents referenced in this document:

Reference	Title
AS/NZS 4020	Testing of products for use in contact with drinking water
WSA 03	WSAA - Water Supply Code of Australia WSA 03 - 2011
BS 6920	British Standard - Suitability of non-metallic materials and products for use in contact with water intended for human consumption with regard to their effect on the quality of the water
NSF/ANSI 61	National Science Foundation/American National Standards Institute - Drinking Water System Components

1.3.2 SA Water documents

The following table identifies the SA Water standards and other similar documents referenced in this document:

Reference	Title
TG 0103	Approach to technical governance
TS 0105	Quality Requirements
TS 0500	Authorised products for maintenance of water and sewer systems
TS 0503	Authorised product water systems

1.4 Act, regulations and guidelines

SA Water is regulated by the Department for Health and Wellbeing. We are required to comply with the Safe Drinking Water Regulations 2012 (under the Safe Drinking Water Act 2011).

Section 4 of the Safe Drinking Water Regulations 2012 states that SA Water has a general obligation to observe the ADWG about the quality and supply of our drinking water.

Element 4 of the Framework for Drinking Water Quality in the Australian Drinking Water Guidelines (ADWG) (NHMRC 2011) focuses on operational procedures and process control. This includes the use of acceptable materials that come in contact with the drinking water

The ADWG outlines that:

“The products used in water systems should be subjected to an audited system of quality control. The effectiveness of preventive measures is highly dependent upon the design and implementation of associated process control programs. To consistently achieve a high-quality water supply it is essential to have effective control over the processes and activities that govern drinking water quality (NHMRC 2011)”. 5

In addition, the ADWG outlines that:

“Contaminants may also be introduced when water comes into contact with materials such as filter media, protective coatings, linings and liners, joining and sealing products, pipes and fittings, valves, meters and other components. Materials used should comply with Australian Standard AS/NZS 4020 Products for use in contact with drinking water”.

SA Water has a sound and robust approval process for selecting chemicals for use in drinking water systems. This is an endorsed process which is part of the Drinking Water Quality Management System (DWQMS).

2 Scope

2.1 Scope and application of this Technical Standard

The scope of this Technical Standard is to provide basic principles for the selection of materials that come in contact with drinking water and recycled water supplies, thereby mitigating or reducing potential risks to water quality and public health.

This Standard is applicable to new or existing ADWG compliant water and non-drinking water systems, including repairs, upgrades, operations, and maintenance.

In the interests of public health protection, all SA Water employees, Designers and Constructors are responsible for the management and provision of drinking water supplies and shall ensure compliance with the requirements of this document during the design or upgrade of any infrastructure.

All products that are installed and required to cure (such as epoxies) must be fully cured before immersion in drinking water. This is typically 7 days at 20°C for adhesives and coatings.

The objectives of this Standard are:

- Consideration for water quality design requirements at a very early stage of the project development to mitigate health risks to the public.
- Elaborate on SA Water's water quality requirements.
- Outline the process to achieve compliance.
- Stipulate the responsibilities of various parties involved in the development of a project.

The applications of this Standard are:

- a. New and remediated drinking water infrastructure, including pipework and associated fittings.
- b. New and remediated recycled water infrastructure, including pipework and associated fittings.
- c. All materials within the interior of a tank interiors, including air space and roof.
- d. All materials in direct contact with drinking/recycled water.
- e. Bore infrastructure and casing.
- f. Reservoir infrastructure and surroundings.

2.2 Works not in scope

The following assets are excluded from the scope of the technical standard:

- a. Materials within drinking/recycled water but concealed by another compliant material that maintains its integrity throughout the life of the product.
- b. Chemical dosing systems.
- c. Sludge/waste management.
- d. Cleaning systems

2.3 Technical dispensation

Departure from any requirement of this Technical Standard shall require the submission of Technical Dispensation Request Form (TDRF) for the review and approval (or otherwise) of SA Water Principal Engineer listed in Page 3, on a case-by-case basis.

The Designer shall not proceed to document/incorporate the non-conforming work before the Principal Engineer has approved of the proposed action in writing via the Technical Dispensation Request Form (TDRF).

SA Water requires sufficient information to assess dispensation requests and their potential impact. The onus is therefore on the proponent to justify dispensation request submissions and provide suitable evidence to support them.

Design works that are carried out without being appropriately sanctioned by SA Water shall be liable to rejection by SA Water and retrospective rectification by the Designer/Constructor.

2.4 Hazards

Not applicable.

3 Hold points and witness points

3.1 Hold points

Hold points applicable to this Technical Standard can be found in Appendix A. Please refer to TS 0105 for further detail on hold points.

3.2 Witness points

Witness Points applicable to this Technical Standard can be found in Appendix A. Please refer to TS 0105 for further detail on witness points.

3.3 Non-conformance

Please refer to TS 0105 for the requirements relating to non-conformance.

4 Materials in contact with drinking water

4.1 Compliance requirements

The Australian Drinking Water Guideline (ADWG) states that:

“Materials used should comply with Australian Standard AS/NZS 4020 Products for use in contact with drinking water (NHMRC 2011).”

The Water Services Association of Australia (WSAA Codes) have been Gazetted by the Office of the Technical Regulator as the minimum Standard requirements for Water and Wastewater infrastructure. Section 4.1 of the Water Supply Code (WSA 03 - 2011) highlights the compliance requirements to AS/NZS 4020.

“All products and materials used in contact with drinking and non-drinking water shall comply with AS/NZS 4020” (WSAA 2011).”

In addition,

“Unless otherwise permitted by the Water Agency, only Water Agency ‘approved’ products and materials shall be used.”

4.1.1 SA Water requirements

SA Water requires that products in contact with drinking water (including elements that may affect drinking water indirectly – see section 0) to comply with AS/NZS 4020 and have a current approval certificate to this Standard. From September 2019, all new products intended for water applications and approved by SA Water, are required to comply with AS/NZS 4020 (2018).

Compliance testing of products against the AS/NZS 4020 Standard, shall be undertaken by the Manufacturer at any change in materials, formulation, design, or manufacture of the product or every 5 years (whichever occurs first). In addition, if there is a change to the AS /NZS 4020 Standard, the product must be re-verified within two years of this change. SA Water will accept an abridged testing program for the re-verification of a product. This will be in the form of gap-testing, which will capture the differences in testing requirements.

Clause 6.8 of AS/NZS 4020 (2018), states that organic compounds detected shall not exceed the health limit guideline values, listed in the ADWG (with the exception of pesticides), which sets the limit for NDMA leaching at 100 ng/L. In addition, products that are tested with monochloramine shall meet an NDMA limit of 30 ng/L. SA Water uses monochloramine to disinfect drinking water in some distribution systems. Therefore, elastomeric components shall comply with extra test requirements. The results of this testing must be provided to SA Water along with the AS/NZS 4020 (2018) test certificate

Section 6 of this Technical Standard is included to provide guidance on the material types (metals, polymeric and inorganic/cementitious) and the tests required to demonstrate compliance to AS/NZS 4020 when assessing the test report details to ensure the entire suite has been conducted.

Satisfaction of the requirements of this clause (including citing the AS/NZS 4020 certificate) constitutes a **HOLD POINT** under this Technical Standard.

4.1.2 Approved products for reticulation networks

Approved products for reticulation networks are documented in:

- TS 0500 – Authorised products for maintenance of water and sewer systems.
- TS 0503 – Authorised products water system.

Products in these documents have already been approved for use and have AS/NZS 4020 approval. However, these standards do not list all AS/NZS 4020 products available and do not cover all assets required in the transmission, pumping and storage of drinking water.

4.2 Material risk categorisation

SA Water groups materials into three categories:

- Group 1 – Materials which have current AS/NZS 4020 certification (as per section 0) or:
 - Stainless steel 304L, 316L, or higher grades.
 - Copper.
 - Brass Dezincification Resistant (DR).
 - Aluminium 5000/6000 series.
 - Galvanised mild steel.
 - Mild steel.
 - Cast iron.
 - Ductile iron.
 - Concrete that does not contain chemicals/additives which may leech out.
- Group 2 - Materials which do not have AS/NZS 4020 but have certification to BS 6920 or NSF/ANSI 61 approval or products not directly in contact with drinking water.
- Group 3 – Materials which do not have AS/NZS 4020 certification or another international standard certification (BS 6920 or NSF/ANSI 61).

4.3 Material risk groups

Refer to the Materials in Contact with Drinking Water Flowchart (Appendix B) for details on the use/approval process for each product.

4.3.1 Group 1 - AS/NZS 4020 certification or approved metals

Group 1 are products which are approved for use in SA Water systems, provided they also meet other specifications required by SA Water. Group 1 products are SA Water's strong preference for drinking/recycled water supplies.

Certification and product data sheets shall be provided upon request.

4.3.1.1 Group 1A - AS /NZ 4020 certification

Products which have a current compliance certificate to AS /NZ 4020 can be used in SA Water drinking water supplies provided they also meet other specifications required by SA Water.

A current compliance certificate is:

- a. A test certificate that was issued after 1 October 2016 to AS/NZS 4020, and a supplementary (gap test) report for the extra tests have been conducted to the 2018 edition (mutagenic, organics (including NDMA) and metallic value limitations).
- b. The test report was issued after 1 October 2020 to AS/NZS 4020.
- c. Test report to AS/NZS 4020:2005 and is less than 5 years old.
- d. If a polymeric compound is used in higher temperatures environments (i.e., greater than 25°C), additional testing may be required to confirm the suitability of the product in accordance with Appendix J of AS/NZS 4020. This extra testing shall be explicitly asked for at the time of testing or supplementary gap testing conducted.
- e. An example of a compliance report can be found in Appendix C.

Gap testing to meet the requirements of AS/NZS 4020 (2018) may also be necessary.

4.3.1.2 Group 1B – Approved metals

Some materials made from certain metals are considered low-risk materials and can be used in SA Water's supplies.

- a. Stainless steel 304L, 316L or higher grades.
- b. Copper¹.
- c. Brass Dezincification Resistant (DR)¹
- d. Aluminium 5000 series.
- e. Galvanised mild steel.
- f. Mild steel.
- g. Cast iron.
- h. Ductile iron.

4.3.2 Group 2 - International standards certification/products not in direct contact with water

Group 2 products are not SA Water's preferred product for use. In all circumstances, an alternate Group 1 product should be sought before considering a Group 2 product. A risk assessment is required for all products that fall into this group before their use in drinking water supplies (following receipt of a TDRF). SA Water's Water Quality Improvement and Compliance team will store and assist with completing the risk assessments.

¹ SA Water shall align with WSA TN Version 3, which aligns with the ABCBs Watermark Certification Scheme Direction of 2024/1.1. This TN requires that all Copper and Brass Dezincification Resistant (DR) products have an allowable weighted average lead content of not more than 0.25%. This shall be applicable to all newly installed components, with a transition period of 3 years; full compliance is required by May 2026.

4.3.2.1 Group 2A - International standards certification (BS 6920 and NSF/ANSI 61)

Products with BS 6920 and NSF/ANSI 61 are required to be risk assessed, should they wish to be used in SA Water's drinking water systems. Due to possible deficiencies in these international testing protocols, a risk assessment with SA Water stakeholders is required (conducted by Water Quality Improvement and Compliance, SA Water). Each product that does not have AS/NZS 4020 compliance will be assessed on an individual product and site-specific basis before approval for use is granted for the specific application. Extra product or commissioning testing to meet current AS/NZS 4020 requirements may be required (on a product which has international certification). The manufacturer may choose to have their product tested to AS/NZS4020 at their cost.

4.3.2.2 Group 2B - Products not directly in contact with water

Tank roof structures are not in direct contact with water, but condensation can form and lead to indirect contact with water. Products which SA Water deems low risk when not in contact with water (e.g. PTFE or Teflon products), may be enabled to be used in these structures. These require specific approval by SA Water and are considered on a site-specified, case-by-case basis.

Decisions made shall not be seen as a precedence for any similar requests. A risk assessment will be conducted by SA Water, which will not only consider material/product and location but also inputs, such as the size, quantity, and condition of the exposed surfaces.

4.3.3 Group 3 – Materials without AS /NZ 4020 certification

For products or materials that do not fall into Groups 1 or 2, SA Water will direct to use an alternate product or material, that does comply with this standard.

If no alternate product or material is available, SA Water may require the manufacturer to have the product or material tested to validate its compliance with AS/NZS 4020. In some cases, SA Water may approve a dispensation (upon receiving a TDRF) for a non-compliant product in some one-off circumstances, as supported by materials specialists and risk assessments, depending on the product material.

SA Water's preference is that alternate products should be sought.

5 Installed products/materials that do not comply with this Standard

For any products or materials that are currently installed in SA Water drinking water supplies, that do not comply with this Standard, SA Water's approach is as follows (not all steps in this process may be required, subject to consultation with Water Quality Improvement and Compliance should such a product be identified):

- a. Undertake relevant water quality monitoring, in the SA Water supply to ensure the safety of the drinking water (this may already be completed by way of the routine monitoring program or may require a specific monitoring program).
- b. Undertake necessary AS/NZS 4020 testing of the non-compliant product/material. This may only be required if monitoring results detect unusual levels which may attributed to the non-compliant product being installed.
- c. Report findings of items 1) and 2) to SA Health.
- d. Undertake a risk assessment of current product/material within the water supply system with relevant stakeholders.
 - For high-risk products/materials (as defined by risk assessment) – immediately replace the non-compliant product/material with a compliant product/material.
 - For low-risk products/materials (as defined by risk assessment) - As part of the routine asset replacement program within drinking water networks, replace the non-compliant product/material with a compliant product/material within an agreed timeframe.
- e. Document the non-compliant product/material, with supporting evidence.
- f. Communicate that the non-compliant product/material can no longer be used with relevant stakeholders (PMs, Constructors, Customer Technical Services, Field Operations and anyone who purchases stock).
- g. Remove non-compliant product/materials from drinking water stocks held within SA Water's (and relevant partners) stores/workshops/depots etc.
- h. Notify the product/material manufacturer of non-compliance issues and remove the product from the relevant SA Water Technical Standard.
- i. Order and stock replacement products/materials that are compliant with this Standard.

6 Material testing guidance

The following shall be considered when assessing a material as compliant (and the testing required) by AS/NZS 4020 Table 1:

- a. The environment that the material is exposed to (e.g., water, chlorinated water, chloraminated water, raw water, permeate, tank head space).
- b. The exposure of the material within the system (e.g., coating vs gasket).
- c. The temperature of the environment, testing to Appendix J of AS/NZS 4020 (standard test temperature 25°C vs elevated temperature (tanks head space up to 50°C)). Where products are to be used in areas exceeding 25°C, then extra testing is required to Appendix J.
- d. The potential leachates of the generic materials.
- e. The generic material class of material (metals, epoxies, cementitious).

Changes to products (metals, inorganics, polymers) shall be retested if the parameters stated in Appendix O of AS/NZS 4020 change.

Table 1: Testing requirements for product groups

Test	AS/NZS 4020 Appendix	Metals	Polymeric	Inorganic
Sample Preparation	A	A.9	Coatings A7.4 Sealant A7.5 Jointing A7.6	A.8
Scaling of test	B	Yes	Yes	Yes
Taste	C	Yes	Yes	Yes
Appearance	D	No	Yes	No
Microbial	E	Yes	Yes	No
Cytotoxicity	F	Yes	Yes	Yes
Mutagenicity	G	No	Yes	No
Metals	H to J	Yes Table 2 limits	No	Yes
High temp	J	Yes Where products exposed to greater than 25°C	Yes Where products exposed to greater than 25°C	Yes Where products exposed to greater than 25°C
End of line	I	Yes	Yes	No
Water heaters	K	No	No	No
Organic	Clause 6.8 (2018) including nitrosamines	No	Yes	Yes
Hot water	J	Yes	Yes	No

A Schedules of hold points, witness points and identified records

A1 Schedule of hold points and witness points



Section	Type	Description
4.1.1	Hold	Compliance with SA Water requirements with respect to AS 4020

C Example of AS/NZS 4020 report

PO Box 1751 250 Victoria Square
Adelaide SA 5001 Adelaide SA 5000

Tel: 1300 653 366
Fax: 1300 883 171

Internet: www.awqc.com.au Email: producttesting@awqc.com.au




27/12/2019

Dear [REDACTED]


Please find the attached report to AS/NZS 4020:2018 for Cement Mortar Lining for Ductile Iron Pipes submitted for testing.

Should you have any enquiries about the report or any other matters pertaining to the Standard please contact the laboratory on 61 8 7424 1512

Yours sincerely,




Michael Glasson
Supervisor Product Testing



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ACCREDITATION

ABN 69336525019

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A business unit of the South Australian Water Corporation

PO Box 1751 250 Victoria Square
Adelaide SA 5001 Adelaide SA 5000

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Fax: 1300 883 171



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FINAL REPORT

Report ID : XXXXXXXXXX

Summary of Results

APPENDIX/CLAUSE	RESULTS
C – Taste	Passed at the in-product exposure (51,280 mm ³ /L).
D – Appearance	Passed at the in-product exposure (51,280 mm ³ /L).
F – Cytotoxic Activity	Passed at the in-product exposure (51,280 mm ³ /L).
H – Metals	Passed at the in-product exposure (51,280 mm ³ /L).

Test Methods

Test(s) in Appendix	AWQC Test Method	Reference Method
C	T0320-01	AS/NZS 4020:2018
D	T0029-01 & T0018-01	APHA 2120c & APHA 2130b
F	TM-001	AS/NZS 4020:2018
H	TIC-008	EPA 200.8

Summary Comment : Twelve sequential soakings were performed to obtain a pH < 9.0. In accordance with section A8 (Cementitious Products).



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Fax: 1300 883 171



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FINAL REPORT

Report ID : [REDACTED]

CLAUSE 6.3 Appearance

Sample Description The sample consisted of a 300 mm length of cement lined pipe (78mm internal diameter) providing an in-product exposure of approximately 51,280 mm² per Litre. Extracts were prepared using 500 mL volumes of pre-conditioning water (AI 12.6).

Extraction Temperature 20°C ± 2°C.

Test Method Appearance (Appendix D)

Scaling Factor Not applied.

Results

	<u>Test (- Blank)</u>	<u>Maximum Allowed</u>	<u>Units</u>
Colour	<1	5	HU
Turbidity	<0.1	0.5	NTU

Evaluation The product passed the requirements of clause 6.3 when tested at the in-product exposure.

Number of Samples 1.

Test Comment Not applicable.

Andrew Paul Ford

Andrew Ford
APPROVED SIGNATORY





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FINAL REPORT			
Report ID :	<input type="text" value="67000000000000000000000000000000"/>		
CLAUSE 6.5	Cytotoxic Activity		
Sample Description	The sample consisted of a 300 mm length of cement lined pipe (78mm internal diameter) providing an in-product exposure of approximately 51,280 mm ² per Litre. Extracts were prepared using 500 mL volumes of pre-conditioning water (AI 12.6).		
Extraction Temperature	20°C ± 2°C.		
Test Method	Cytotoxic Activity (Appendix F)		
Scaling Factor	Not applied.		
Results	Non- cytotoxic (sample and controls).		
Evaluation	The product passed the requirements of clause 6.5 when tested at the in-product exposure.		
Number of Samples	1.		
Test Comment	The test extracts and blank extracts were used to prepare nutrient growth medium and subsequently used to grow a cell line (ATCC Number CCL 81) in the analysis. In addition zinc sulphate (0.4 mmol) was used for the positive control in the analysis.		




Stella Fanok
APPROVED SIGNATORY



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A business unit of the South Australian Water Corporation

PO Box 1751 250 Victoria Square
Adelaide SA 5001 Adelaide SA 5000

Tel: 1300 653 366
Fax: 1300 883 171



Internet: www.awqc.com.au

Email: producttesting@awqc.com.au

FINAL REPORT

Report ID : XXXXXXXXXX

CLAUSE 6.7

Metals

Sample Description

The sample consisted of a 300 mm length of cement lined pipe (78mm internal diameter) providing an in-product exposure of approximately 51,280 mm³ per Litre. Extracts were prepared using 500 mL volumes of pre-conditioning water (AI 12.6).

Extraction Temperature

20°C ± 2°C.

Test Method

Metals (Appendix H)

Scaling Factor

Not applied.

Method of Analysis

All methods used to determine concentrations of metals are based on those described in the US EPA method 200.8 Determination of Trace elements in Waters and Wastes by Inductively Coupled Plasma - Mass Spectrometry. The methods have been adapted for the instrumentation in use at the Australian Water Quality Centre.

Concentration of the metals described in Table 2 of the AS/NZS 4020:2018 are determined as follows:

Aluminium, Antimony, Arsenic, Barium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium and Silver by Inductively Coupled Plasma Mass Spectrometry.

Results	Limit of Reporting mg/L	Blank mg/L	Test 1 mg/L	Test 2 mg/L	Max Allowed mg/L
Final Extract					
Aluminium	0.001	0.027	0.027	0.028	0.2
Antimony	0.0005	<0.0005	<0.0005	<0.0005	0.003
Arsenic	0.0003	<0.0003	<0.0003	0.0003	0.01
Barium	0.0005	0.0268	0.0279	0.0278	0.7
Boron	0.020	<0.020	<0.020	<0.020	1.4
Cadmium	0.0001	<0.0001	<0.0001	<0.0001	0.002
Chromium	0.0001	0.0001	0.0001	0.0002	0.05
Copper	0.0001	0.0938	0.0898	0.0907	2.0
Iron	0.0005	0.0131	0.0159	0.0172	0.3
Lead	0.0001	0.0003	0.0004	0.0004	0.01
Manganese	0.0001	0.0003	0.0003	0.0005	0.1
Mercury	0.00003	<0.00003	<0.00003	<0.00003	0.001
Molybdenum	0.0001	0.0002	0.0002	0.0002	0.05
Nickel	0.0001	0.0005	0.0005	0.0007	0.02
Selenium	0.0001	<0.0001	<0.0001	<0.0001	0.01
Silver	0.00003	<0.00003	<0.00003	<0.00003	0.1

Evaluation

The product passed the requirements of clause 6.7 when tested at the in-product exposure.

Number of Samples

1.

Test Comment

Not applicable.

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