
**WATER ASSESSMENT AND PLANNING
BRANCH**

**COMMUNITY WATER QUALITY
SAMPLING PROTOCOLS &
STANDARDS**



action
Salinity & Water
AUSTRALIA

*Reference resources of State, Australian and International standards for
water quality monitoring*

September 2004



Tasmania

Department of Primary Industries Water & Environment

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1 INTRODUCTION

The Community Water Quality Sampling Protocols and Standards provides a resource for local community groups to develop water quality monitoring protocols that follow International, National and State standards. Protocols refer to procedural processes that should be followed for developing and undertaking a monitoring and reporting program. Standards refer to the International and National standards that should be applied when developing new protocols to ensure uniformity consistency of methodologies and values for water quality measurement.

This guide is just that, a guide, and a summary of relevant standards developed using Australian Standards (refer section 1.2) and it is strongly recommended that these documents should be purchased and referred to in conjunction with this guide. There are also several publications similar to this, that have been prepared by other State Governments. The Queensland Governments Environmental Protection Agency have produced a *Water Quality Sampling Manual* that is available on-line (<http://www.env.qld.gov.au/publications?id=330>) and is another good source of information.

Water Quality monitoring may be carried out for a number of different reasons and the data collected will have different uses and different levels of data confidence associated with it. This manual prescribes to the level of data confidence required for National and State water resource management defined by the *ANZECC Guidelines for Water Quality Monitoring and Reporting (2000)* and the Natural Resource Management (NRM) Monitoring and Evaluation Framework.

2 NATIONAL GUIDELINES FOR WATER QUALITY MONITORING

In Australia the State and National Water Quality Monitoring Strategies conform to the *ANZECC Guidelines for Water Quality Monitoring and Reporting (2000)*. This document sets the national framework for water quality monitoring and reporting protocols used by Australian Federal and State Government agencies in the monitoring of water resources.

The *ANZECC Guidelines for Water Quality Monitoring and Reporting (2000)* <http://www.deh.gov.au/water/publications/quality> are supplemented by the *Guidelines for Fresh and Marine Water Quality (ANZECC & ARM CANZ 2000)* (A.K.A The Water Quality Guidelines) <http://www.deh.gov.au/water/publications/quality>. The Water Quality Guidelines provide additional practical and scientific information for applying national and regional guidelines to local site specific applications. The main objective of the Water Quality Guidelines is to provide an over arching national resource to the current scientific advice for the development of site specific water quality monitoring and management at the local and regional scale.



2.1 National Water Quality Targets

The Water Quality Guidelines also set national default trigger values for water quality relating to a range of environmental values that can be applied in the absence of verifiable local water quality data <http://www.deh.gov.au/water/quality/targets/map.php> . These trigger values are however, very broad and in most cases are a broad scale risk based assessment. The only way to develop representative guidelines for specific sites is to undertake long term monitoring. There are many sites that do not fall strictly within these guidelines due to site-specific variation and local conditions. This must be kept in mind when applying these general guidelines.

The default trigger levels provide a broad scale, risk based assessment of environmental condition and are a starting point for water resource managers to refine these guidelines and develop more site specific guidelines at a local scale based on sound local knowledge and long term water resource data. Parameters that fall outside the guidelines indicate that there is a high risk of causing environmental harm if these levels are sustained and indicate that further site specific investigations should be conducted to determine the level of risk using more detailed site specific information.

A full list of Federal Government publications including the ANZECC Guidelines (Water Quality) and several other useful sources of information for environmental monitoring can be found at:

<http://www.deh.gov.au/water/publications/index.html#quality>

3 NATIONAL STANDARDS FOR WATER QUALITY MONITORING

The International Organisation for Standardisation (ISO, <http://www.iso.ch>) is a worldwide federation of national standards bodies from some 100 countries, established as a non-governmental organisation in 1947.

Standards Australia (<http://www.standards.com.au>) represents Australia within the ISO, to meet the needs of national technical infrastructure for contemporary, internationally aligned Standards. Coordinated across these two organisations is a range of standards relevant to a water data infrastructure, covering aspects of data delivery, spatial representation and technical content.

3.1 National Water Quality Standards

The Australian and New Zealand Standards (AS/NZS 1998) describe National standard methods for the collection of water quality samples. The following documents are available for purchase on line at <http://www.standards.com.au> (other relevant water quality standards are documented in **APPENDIX 1**):



- AS/NZS 5667.4:1998
Water quality - Sampling - Guidance on sampling from lakes, natural and man-made
- AS/NZS 5667.6:1998
Water quality - Sampling - Guidance on sampling of rivers and streams
- AS/NZS 5667.1:1998
Water quality - Sampling - Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples.

3.2 Standard Operating Procedures & Useful Documents

There are numerous other documents that have been developed to provide National guidelines for the development of Standard Operating Procedures. Of relevance to the collection of Water Quality Samples the following documents contain some useful information.

- ***A Preliminary Guide to the Standard Operating Procedures for Sampling Contaminated Groundwater*** Occasional Paper No. 2 Water Resources Management Committee, The Australian Water Resources Council, September, 1991 (**Refer Chapter 6.0 Surface Water Sampling, 7.0 Field Measurements**)
- The Queensland Governments Environmental Protection Agency have produced a *Water Quality Sampling Manual* that is available online and is a comprehensive source of information and standard operating procedures and protocols (<http://www.env.qld.gov.au/publications?id=330>)

4 DPIWE PROTOCOLS FOR WATER SAMPLE COLLECTION, TRANSPORT AND STORAGE

Where at all possible water quality measurements should be made *instu* and in a site location that is representative of the conditions at the sampling site. However, this section refers to laboratory samples collected for analysis *ex situ* by a certified NATA accredited laboratory.

These Standard Operating Procedures (SOPs) have been developed by The Department of Primary Industries Water and Environment (DPIWE), Tasmania, for use by their staff in collecting field water samples. These procedures have been developed to comply with Australian and International standards. These procedures may not fulfil the requirements of all water monitoring applications. Each organisation should develop their own specific SOP's to suit their requirements using the relevant Australian Standards (See APPENDIX 2).



AUSTRALIAN STANDARDS

All methods and equipment used in water quality sampling must meet the relevant Australian and/or ISO Standard (AS/NZS 1998: Australian/New Zealand AS/NZS 5667.1:1998. *Water Quality – Sampling – Guidance on the design of sampling Programs, Sampling Techniques and the Preservation and Handling of samples.*

4.1 Equipment

- Single-use **sample bottles, filters** and **syringes** are available from Analytical Services Tasmania (AST). Sample bottles have colour coded labels for specific types of water quality analysis and testing. Sample Bottles Types (**Refer to Appendix 2**)
- Extra bottles, syringes and filters should be carried in the field. In particular extra filters are often required for samples of elevated turbidity. Maintain a good supply of filters, syringes and bottles that can be used as spares or if there is a problem with availability.
- A **sampling pole** can be made from an aluminium pool net pole or wooden handle with a large clamp or bicycle water bottle holder attached to the end. The sample bottle can be secured on the end of the pole and will allow greater reach to sample from the main flow of larger creeks and rivers.

4.2 General Rules

- Complete label details with waterproof pen before collecting sample.
- Wear disposable vinyl gloves if possible.
- Use laboratory supplied single use sample containers unless instructed by laboratory to do otherwise. Do not reuse or use previously opened bottles.
- Do not touch or contaminate any part of the bottle that will come into contact with the sample (i.e. inside of lids or mouth of sample bottle)
- Collect sample directly into sample container if possible. If not, collect in a sampling beaker (rinse out twice with water to be sampled) and transfer immediately to the sample container.
- If the bottle contains a preservative do not over fill the bottle as preservative may be diluted or lost.
- Collect sample in an open channel sample where the flow is greatest. Invert the bottle and lower until the mouth of the bottle is 10cm below the surface but ensure that it does not pick up any settled solids from the base of the channel. Take sample by facing the mouth of the bottle upstream and turn the bottle upright until it fills.
- Keep your hand downstream and/or out of the flow as much as possible.
- Take spare bottles.
- Document sampling site by GPS coordinates, detailed description, photo etc. Field notes must accurately describe where samples were collected, to allow cross-checking with the sampling locations.



- Fill in field data sheets, describe the sample taken, their labels and all other variables measured prior to leaving a sampling site. It is particularly important to record comments on sampling conditions and recent weather and flow conditions as these will directly influence water quality.
- Record all times in Eastern Standard Time.
- Bottles containing general ions, heavy metals and bacteriological samples should be filled completely.
- Do not fill nutrient bottles to the top allow room for expansion when frozen.
- Immediately after collection all samples are to be placed in an eski with an adequate supply of ice bricks for cooling. Bacteriological bottles must be kept out of sunlight by wrapping in a brown paper bag or foil.

4.3 Sample Storage and Preservation (AS/NZS 5667.1:1998 Section 11)

- Consult with the laboratory to determine the most suitable methods for the storage and preservation of water quality samples. Storage and preservation methods will be specific for the type of sample that is being taken. Discuss this with the laboratory.
- If samples cannot be returned to the testing laboratory at the end of the day, arrangements must be made for nutrient samples to be frozen and for all other samples to be refrigerated. **Samples are not to be refrigerated along side other food stuffs as this can lead to contamination.** Do not let samples defrost or partially defrost.
- Samples can only be stored for a finite period of time, even if frozen. Ensure they are delivered to the laboratory as soon as possible. Consult with laboratory for storage times.
- Bacteriological samples must be delivered to the testing laboratory on the day of collection.
- Completed sample submission forms that should be available from the analyst or lab, must accompany samples delivered to the testing laboratory.
- Problems and errors in sampling are to be recorded on field sheets and on the sample submission form that is given to the testing laboratory.

DO NOT

- Smoke during operations.
- Rinse sample bottle with waters to be sampled unless specified to do so by the laboratory.
- Risk loss of preservatives by overfilling containers.

5 DPIWE FILTERED SAMPLE METHOD FOR DISSOLVED NUTRIENTS (AS 5667.1:1998 Section 11.7)



Australian Standard, AS 5667.1:1998 Section 11.7, recommends that field filtration be done at time of collection to guarantee the soluble nutrient concentrations do not alter.

5.1 Preventing Contamination of Filtered Samples

- Use disposable vinyl gloves.
- Do not touch filter or syringe tips.
- Do not smoke.
- Ensure cooler box is clean.
- Do not store samples or equipment near fish products or food.
- Leave bottle lids up side down while sub sampling.
- Wash hand after going to the toilet or eating food when taking bacteriological or nutrient samples.

5.2 Sample collection

- Collect directly into 250 ml green label bottle (do not rinse) or sampling device.
- Collect sample in an open channel sample where the flow is greatest.
- Invert the bottle and lower until the mouth of the bottle is 10cm below the surface but ensure that it does not pick up any settled solids from the base of the channel.
- Take sample by facing the mouth of the bottle upstream and turn the bottle upright until it fills.
- Keep your hand downstream and/or out of the flow as much as possible.
- Make a field note of the conditions at the sample site at the time of sampling

5.3 Filtration procedure for soluble nutrients

- Shake sample bottle thoroughly
- Rinse syringe with ~ 5 ml of sample by removing plunger and pouring sample directly from bottle to syringe to avoid cross contamination. Discard rinse water.
- Connect filter unit without touching any of the filter (remove foil and hold by plastic cover).
- Shake sample bottle thoroughly, remove plunger and fill syringe with sample by pouring directly from sample bottle into syringe.
- Replace plunger and discard the first 5-10 drops of water.
- Collect remainder of filtered water in a 50 ml tube labelled "Filtered for Dissolved Nutrients".
- If the syringe filter fouls before the sample has been completely filtered, invert the syringe so that the point is up, remove the filter unit and replace with a new unit, discard 5-10 drops and continue to filter.
- Discard syringe and filter.
- One pass through the syringe will deliver ~30 ml of sample which is sufficient for analysis of soluble nutrients.
- Quality Assurance. Collect a duplicate filtered sample as for laboratory QA, one for every ten samples.

5.4 Total nutrients

- The remainder of the sample (~150-200 ml) is used for total nutrient determination
- Leave a headspace (~10% of container volume) for aeration, mixing and thermal expansion that occurs during freezing.

5.5 Preservation

- Return to lab immediately in chilled container. If this is not possible, freeze, ensuring the freezer has not been used for storage of material that could contaminate the sample, eg food products.

6 Quality Assurance Quality Control: Blanks and Duplicates (AS/NZS 5667.1:1998 Section 5)

- Blank samples should be used periodically to check on field procedures, containers, equipment and transport. These should be processed in the field following normal field procedures as appropriate i.e. filtration.
- Duplicate samples should be taken to reveal the magnitude of errors (contamination, random and systematic) occurring between sampling and sample analysis.
- Ensure equipment is calibrated and functioning accurately prior to departure.
- Use sample bottles supplied by analytical laboratory.
- Only use bottles particular to each parameter being sampled. Bottles are prepared specifically depending on the parameter they are measuring.
- Bottles that have been used should be discarded.
- The insides of bottles and lids should not come into contact with hands or objects.

6.1 Laboratory Washing Procedures for Plastic HDPE Bottles

- Currently required for re-usable sample bottles only.
 - Removing labels from the outside of the bottles and using methylated spirits to clean permanent marker from the outside of bottles, the following procedure should be used to thoroughly clean the inside of the bottle;
1. Mix up a solution of Decon / CONTRAD (low phosphorus detergent) at a ratio of 50mL detergent : 500mL deionised water.
 2. Add about 10mL of this solution to each bottle and top the bottle up with hot tap water. Screw lid loosely back onto the bottle and leave bottle to soak for 2 hours.



3. After 2 hours, rinse out the bottle with hot tap water, rinsing at least 3 times to ensure all suds are removed. If there is still some dirt or other marks remaining on the inside bottom of the bottle, try and remove with a bottle-brush. Otherwise, discard the bottle.
 4. Finally, rinse bottle out 3 time using deionised water (filling the bottle to about ½ full every rinse.
- When a new batch of bottles is received, they need to be washed and blanks sent to the lab for analysis (QA/QC).

Blanks and replicates should be tested during any monitoring program at least once every 4 months or upon any change in monitoring procedure.

7 Procedures for the Use of Hand Held Meters

There are limited national standards for the use of hand held meters and the accepted convention is to **undertake measurements in accordance with the operation manual supplied by the manufacturer**. The Australian Water Resources Council has developed *A Preliminary Guide to the Standard Operating Procedures for Sampling Contaminated Groundwater* (Refer Chapter 6.0 Surface Water Sampling, 7.0 Field Measurements) for a national guide to developing Standard Operating Procedures for field instrument operation.

7.1 General Rules

- Take all measurements *insitu* where possible (exception for turbidity cells)
- Follow manufactures instructions on use, maintenance and storage.
- Calibrate all meters prior to each field trip. Some meters will require calibration before each sample. Check with manufactures recommendations.
- Maintain a regular service regime for all meters (depending on usage) using an accredited service and repairer (Imbros).
- Transport in a shockproof and waterproof container i.e. Pelican case.
- Carry required equipment in the field for calibrations.
- Carry required equipment in the field for basic repairs such as replacement of DO meter membranes and batteries.
- Maintain a log for each meter detailing service history, repairs and other relevant information.
- Dry out meter case at the end of each day.
- Place probes in the stream rather than drop them.
- For river sampling, probes should ideally be placed well below the surface in moving water or as close as possible to the main stream (DO meters should not be placed in white water).



7.2 Dissolved Oxygen Meters

- Meters such as YSI 550 require calibration for changes in altitude. These meters should be turned on 30 minutes prior to the first calibration and sample, at the beginning of the day and left on throughout the day to allow for an accurate calibration at each site. In general most DO meters require stabilisation before an accurate reading can be taken and should be left on throughout the day.
- Most dissolved oxygen meters require running water past the probe membrane. If the site is a still water site the probe must be moved steadily through the water. Consult manufactures instructions for recommended water velocity past the probe.
- Do not sample immediately below or in white water.

7.3 pH Meters

- Make sure the probe is stored in the wetting cap and that there is a small amount of water in it. Do not use distilled water in the wetting cap. Use the manufacturers storage solution in the wetting cap for long term storage of the probe.
- Calibration should be conducted using a 2 point calibration procedure using two buffered standards in the pH range of normal field measurements.

7.4 Turbidity Meters

- Do not leave the sample cell in the meter. It should be stored securely to avoid scratching the glass.
- Rinse the cell at least twice at the sample site and take the sample below the surface.
- Empty the sample at each site.
- Wipe a small amount of silicon oil on the outside of the tube once or twice a day and wipe the glass clean.
- Collect the sample directly into the sampling cuvet (cell) as per bottle sampling.
- Wipe water from outside of the cell and ensure that the outside of the cell is clean before placing the cell in to the meter.

7.5 Electrical Conductivity Meters

- In the absence of a dedicated temperature probe or thermometer it is a national convention to record the field temperature from the conductivity meter.



APPENDIX 1- ISO AND AS STANDARDS FOR WATER QUALITY MONITORING

The International Organisation for Standardization (ISO, <http://www.iso.ch>) and Standards Australia (AS, <http://www.standards.com.au>) have also developed standards of relevance to the content of water-related databases, including:

- (i) *AS 3778.1-2001: Measurement of water flow in open channels - Vocabulary and symbols*, identical to and has been reproduced from ISO 772:1996
- (ii) *AS 4276.1-1995: Water microbiology - General information and procedures*, sets out information on the microbiological examination of water using the methods in this series
- (iii) *AS/NZS 5667.1:1998: Water quality - Sampling - Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*, provides general principles to be applied in the design of sampling programs, general guidance on sampling techniques and guidance on the procedures to be taken to preserve and transport samples for the physical, chemical and radiological analysis of waters and wastewaters, including bottom sediment and sludges, for the purposes of process control, quality characterization, identification of sources of pollution, compliance with water quality guidelines or standards, and other specific reasons.
- (iv) *AS/NZS 5667.10:1998: Water quality - Sampling - Guidance on sampling of waste waters*, provides detailed guidance on the design of sampling programs, sampling techniques and the handling and preservation of samples of waste water. It is identical with and has been reproduced from ISO 5667-10:1992.
- (v) *AS/NZS 5667.11:1998: Water quality - Sampling - Guidance on sampling of groundwaters*, part of ISO 5667 that provides guidance on the design of sampling programmes, sampling techniques and the handling of water samples taken from groundwater for physical, chemical and microbiological assessment.
- (vi) *AS/NZS 5667.12:1999: Water quality - Sampling - Guidance on sampling of bottom sediments*, part of ISO 5667 that provides guidance on the sampling of sedimentary materials from inland rivers and streams; lakes and similar standing bodies; and estuarine and harbour areas.
- (vii) *AS/NZS 5667.4:1998: Water quality - Sampling - Guidance on sampling from lakes, natural and man-made*, provides detailed guidance on the design of sampling programs, sampling techniques and the handling and preservation of samples of water from natural and man-made lakes. It is technically equivalent to and has been reproduced from ISO 5667-4:1987.
- (viii) *AS/NZS 5667.6:1998: Water quality - Sampling - Guidance on sampling of rivers and streams*, part of ISO 5667 that sets out the principles to be applied to the design of sampling programmes, sampling techniques and the handling of water samples from rivers and streams for physical, chemical and microbiological assessment.
- (ix) *AS 2368-1990: Test pumping of water wells*, relating to factors which need to be considered and the measurements which need to be made when designing and performing



- a pumping test. It details the types of pumping tests carried out for water supply purposes, in which water is abstracted from a well. The minimum set of data that needs to be collected before and during a pump test is defined, as presented in the suggested data forms
- (x) *AS 1726-1993: Geotechnical site investigations*, which sets out minimum requirements for a geotechnical site investigation, as a component in the engineering design, construction, commissioning and operation of civil engineering and building works. Comprehensive appendices are provided dealing with preferred systems of geotechnical investigations and commonly considered laboratory tests. A typical project brief for a geotechnical site investigation is given and the commentary sets out guidelines on construction assessment, maintenance and evaluation of failures. First published as AS 1726-1975. Second edition (including Add. No.1-1978) 1981. Third edition 1993.
 - (xi) *ISO 6107 Series Water quality – Vocabulary*, containing Parts 1 to 9 and defines a list of terms used in certain fields of water quality characterisation.
 - (xii) *ISO 8689-1:2000 Water quality -- Biological classification of rivers -- Part 1: Guidance on the interpretation of biological quality data from surveys of benthic macroinvertebrates*
 - (xiii) *ISO 8689-2:2000 Water quality -- Biological classification of rivers -- Part 2: Guidance on the presentation of biological quality data from surveys of benthic macroinvertebrates*



APPENDIX 2 – AST SAMPLE CONTAINER INFORMATION SHEET

ANALYTICAL SERVICES TASMANIA



Tasmania

DEPARTMENT of PRIMARY INDUSTRIES, WATER and ENVIRONMENT

Sample Container Information Sheet

*Container Selection for Water and Soil Samples
How to Use Them*



Label: Yellow

Container: Amber Glass bottles*

Analytes: Organic Compounds

Pesticides: eg Organochlorine & organophosphate pesticides including DDT, Chlordane, Dieldrin etc

Polycyclic aromatic hydrocarbons (PAH)

Herbicides (eg Atrazine, Simazine, Glyphosate, etc.)

Organic substances: Total Petroleum Hydrocarbons (TPH), BTEX, Poly Chlorinated Biphenyls (PCB)

Filling Instruction: Do not rinse bottles with sample. For hydrocarbons leave a headspace of 1-2 cm depth.

* Cap to have Aluminium or PTFE insert

Label: Small White

Container: Headspace Vial

Analytes: Volatile Organic Compounds (VOC's)

Filling Instruction: Fill completely to exclude air.

Label: Orange

Container: Glass 1L, wide neck

Analytes: Oil and Grease

Filling Instruction: Do not rinse bottles with sample. Leave headspace of ~ 2 cm depth.

Label: Green

Container: Plastic Bottle

Analytes: **Nutrients:** Nitrate, Nitrite, Ammonia Phosphorus- dissolved reactive, Nitrogen-Total, Nitrogen-Total Kjeldahl, Phosphorus-Total

Filling Instruction: Do not rinse bottles with sample.

Soluble nutrients: Filter through 0.45µm filter at time of collection, then freeze.

Total nutrients: freeze.

Label: Red

Container: Plastic Bottle

Analytes: All metals, ie Cadmium, Copper, Lead, etc. including Arsenic & Mercury

Other: Chemical Oxygen Demand (COD), AOX, tannin and lignin.

Filling Instruction: For 'Dissolved' form filter on site.

Seek advice from lab personnel before filtering or acidifying samples.

Do not use for nutrient samples.

Label: Blue

Container: Plastic Bottle

Analytes: **General:** Whilst these bottles are labelled as general they are not universally suitable for all analytes. Always use bottles appropriate to the analysis to be completed.

pH, conductivity, Alkalinity, Acidity, Total Suspended Solids, Total Dissolved Solids, DOC, Anions (Fluoride, Chloride, Sulphate), Microscopic Examination, Colour, Turbidity, Biochemical Oxygen Demand (BOD₅).

Filling Instruction:



Alkalinity, Acidity, BOD5, Total Dissolved Solids: Fill container completely to exclude air.

Other Analyses

Anionic Surfactants (MBAS): Amber Glass bottle, methanol rinsed

Chlorophyll: Blue Label, Plastic Bottle. Store in dark

Dissolved Oxygen: Glass DO bottles. Fill completely, excluding all air bubbles.

Cyanide: Blue Label Plastic Bottle with preservative added.

Hydrogen Sulphide: Blue Label, Plastic Bottle with preservative added.

Soil

Container: Glass Jar

Label: White

Analytes: All Analyses

Filling Instruction: Cap the jar immediately following sampling, ensuring the PTFE liner is in place. Keep chilled.

Sample collection

General rules:

- Complete label details with waterproof pen before collecting sample.
- Wear disposable vinyl gloves if possible.
- Collect sample directly into sample container if possible. If not, collect in a sampling beaker and transfer immediately to the sample container.
- If the bottle contains a preservative, do not overfill the bottle as preservative may be lost or diluted.
- Collect sample in an open channel sample where the flow is greatest. Hold container ~10 cm below the surface but ensure that it does not pick up any settled solids from the base of the channel.
- Keep your hand out of the flow as much as possible.
- Sampling from a boat. Wait until sediment settles if the boat movement creates turbulence.
- Take spare bottles.

Do not

- Smoke during operations
- Rinse sample containers with waters to be sampled.
- Risk loss of preservatives by overfilling containers.

SPECIAL REQUIREMENTS & PRESERVATION OF SAMPLES

It is important to sample correctly to ensure results are representative of true concentrations in the field.

It is beyond the scope of this information sheet to list all possible preservation methods and further advice should be obtained from the laboratory prior to sampling.

Parameters that may need to be controlled include container type, container preparation, sample volume, sample temperature, sample pH, storage time, headspace requirements, seals to be used, preservation techniques, delivery schedule, etc.

The laboratory is also available for general advice regarding sampling procedures, sample treatment or assistance with sampling programs.

When unfamiliar with the relevant requirements please contact the Laboratory.



OTHER SERVICES

- Field services: sample collection, field equipment calibration.
- Algae: counting and identification
- Asbestos: counting and identification
- Food testing: chemical

WHAT ELSE SHOULD I KNOW?

We recommend clients use bottles and containers prepared and supplied by laboratory staff. Deliver the samples to the laboratory as soon as possible after sampling. Ensure samples are well identified and sample submission forms are completed accurately. Inform laboratory staff if you believe samples are likely to be hazardous in any way. If it appears that samples are inappropriate for the analysis proposed the laboratory staff will contact you for further instructions.

SANDY BAY LABORATORY

Analytical Services Tasmania
C/- Chemistry Department,
University of Tasmania, GPO Box 252-75
Sandy Bay, Hobart, 7005
Phone: (03) 6226 7175
Fax: (03) 6226 7825
E-mail: ast.sandybay@dpiwe.tas.gov.au

NEW TOWN LABORATORY

Analytical Services Tasmania
20 St Johns Avenue New Town TAS 7008
Phone: (03) 6278 5690
Fax: (03) 6278 5693

Air cylinder testing: occupational diving

ACCREDITATION NO: 5589

Analytical Services Tasmania

New Town Laboratory
20 St Johns Avenue
NEW TOWN
HOBART TAS 7008

CONTACT: Ms R Pyrke

PHONE: (03) 6278 5643 FAX: (03) 6278 5693 MOBILE:

EMAIL: ros.pyrke@dpiwe.tas.gov.au

WEB SITE: <http://>

FACILITIES: Conditionally available for public testing

This laboratory complies with the requirements of ISO/IEC 17025 (1999)

7.51 Foods

.04 Meat and meat products

Analysis by classical techniques

by the methods of -

In-house 6005, 6006, 6201, 6203, 6401

for the following determinations -

Ash; Crude fat; kjeldahl nitrogen; moisture; phosphorus

.05 Fish, crustaceans and molluscs

Analysis of abalone

Analysis by classical techniques

by the methods of -

In-house 6203

for the following determinations -

Phosphorus

.33 Preservatives in foods

Analysis of meat and meat products, fruit and fruit products, canned abalone,
vegetables and alcoholic and non-alcoholic beverages

Analysis by classical techniques

by the methods of -

In-house 6101

for the following determinations -

Sulphur dioxide

7.66 Waters

Analysis by ISE, FIA and classical techniques

by the methods of -



in-house 1001, 1002, 1004, 1005, 1007, 1101, 1152, 1353, 1401, 1416, 1451, 1452, 1453
for the following determinations -

Alkalinity; biochemical oxygen demand; chemical oxygen demand; chloride; colour;
conductivity; dissolved oxygen; elements as listed under 7.84.01; fluoride; hardness (by
calculation); nutrients as listed under 7.84.51; oil and grease; pH; silica (molybdate
reactive); solids - total dissolved, total suspended; sulphate; turbidity

- .01 Waters for potable and domestic purposes
- .02 Waters for irrigation and stock
- .03 Waters for industrial and steam-raising purposes
- .04 Sewage
- .05 Trade wastes

7.71 Biological monitoring

- .03 Fluoride

Analysis of urine
Analysis by ISE techniques
by the methods of -
in-house 5151

7.81 Constituents of the environment

- .11 Waters other than saline

As listed under 7.66

7.82 Workplace environment and hazards

- .01 Asbestos fibre counting

Estimation of airborne asbestos dust by the membrane filter method as described in the National
Occupational Health and Safety Commission Guidance Note (1988) and AST method 4652 - Filter

- .31 Asbestos identification

Qualitative identification in bulk samples
Analysis by Polarised Light Microscopy (including dispersion staining) techniques
by the methods of -
in-house 5651
for the following determinations -
Amosite; chrysotile; crocidolite

7.84 Residues in constituents of the environment

- .51 Nutrients

Analysis of waters
Analysis by autoanalyser, classical, FIA and IC techniques
by the methods of -
in-house 1205, 1206
for the following determinations -
Nitrogen - ammonia, Kjeldahl, nitrate, nitrite; phosphorus - dissolved, reactive, total



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Tasmania

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