



Hill Laboratories

Hamilton

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Authorised Representative

Ms Leisle Jacobsen
Quality Manager/Lead Auditor

Programme

Chemical Testing Laboratory

Accreditation Number 365

Initial Accreditation Date 15 April 1988

Conformance Standard

ISO/IEC 17025:2017

General requirements for the competence of testing and calibration laboratories

Laboratory Services Summary

Plants and Soils

2.36 Agricultural Products and Agricultural Materials

Inorganics

2.31 Foods
2.41 Waters
2.58 Environmental Monitoring

ICP

2.24 Textiles and Textile Products
2.31 Foods
2.32 Drugs and Pharmaceuticals
2.41 Waters
2.58 Environmental Monitoring

Organics

2.31 Foods
2.41 Waters
2.58 Environmental Monitoring
2.70 Instrumental Techniques

Food and Bioanalytical

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2.31 Foods
 2.32 Drugs and Pharmaceuticals
 2.36 Agricultural Products and Agricultural Materials
 2.70 Instrumental Techniques

Work Place Drug Testing

2.61 Biological Specimens

Air Quality

2.58 Environmental Monitoring

Key Technical Personnel

Plants and Soils

Ms Fiona Calvert 2.36
 Mrs Karen Currie 2.36
 Mrs Shelley Edhouse 2.36
 Mr Stephen Haylett-Petty 2.36
 Mrs Caroline Hill 2.36
 Ms Wendy Homewood 2.36
 Ms Chrystal Kelly 2.36
 Mr Andrew Whitmore 2.36

Inorganics

Ms Helena Bertram 2.41, 2.58
 Mr Mark Bryant 2.31
 Mr Graham Corban 2.31, 2.41, 2.58
 Mr Martin Cowell 2.31, 2.41, 2.58
 Mr Jon Harris 2.41 (selected), 2.58
 Miss Kim Harrison 2.41, 2.58
 Miss Ara Heron 2.31, 2.41, 2.58
 Dr Jane Sherrard 2.41 (selected), 2.58
 Mrs Sukhjeet Singh 2.31

ICP

Ms Helena Bertram 2.41, 2.58 (selected)
 Mr Mark Bryant 2.24, 2.31, 2.32, 2.58 (d)
 Mr Graham Corban 2.41, 2.58 (selected)
 Mr Martin Cowell 2.41, 2.58 (selected)
 Mr Jon Harris 2.41, 2.58 (selected)
 Miss Kim Harrison 2.41; 2.58 (selected)
 Miss Ara Heron 2.41, 2.58 (selected)
 Ms Giselle Jeannes 2.24, 2.31, 2.32, 2.58 (d)
 Dr Jane Sherrard 2.41, 2.58 (selected)
 Mrs Kim Thomas 2.24, 2.31, 2.32, 2.58 (d)

Organics

Ms Helena Bertram 2.41; 2.58; selected
 Mr Alastair Boyd 2.41, 2.58; selected, 2.70 (a1)(a2)(b)(d2)

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CERTIFICATE OF ACCREDITATION



Mr Mark Bryant	2.31
Mr Graham Corban	2.31, 2.41, 2.58
Mr Martin Cowell	2.31, 2.41, 2.58
Miss Kim Harrison	2.41, 2.58; selected
Miss Ara Heron	2.31, 2.41, 2.58
Miss Yu-Hsuan (Coco) Hsueh	2.58; selected
Mrs Sukhjeet Singh	2.31

Food and Bioanalytical

Mr Mark Bryant	2.31 (selected), 2.32 (e), 2.36 (c)
Mr Shaun Clay	2.31 (selected), 2.32(i), 2.36 (h)(i), 2.70 (a1)(a2)(b)(d2)
Mr Stephen Haylett-Petty	2.31 (n)(selected)
Ms Giselle Jeannes	2.31 (selected), 2.36 (c)
Ms Helen McGowan	2.31 (selected), 2.32 (e)(i), 2.36 (h)(i)
Dr Bruce Morris	2.31 (selected), 2.36 (h)(i), 2.70 (a1)(a2)(a3)
Mr Richard Schriener	2.31 (selected), 2.70 (b)(d2)
Mrs Kim Thomas	2.31 (selected), 2.36 (c)
Mr Andrew Whitmore	2.31 (n)(selected)

Work Place Drug Testing

Mr Shaun Clay	2.61
Mr Armin Kiani	2.61
Mrs Freya Turner-Wright	2.61

Air Quality

Mr Graham Corban	2.58
Dr Ian Graves	2.58
Mr Jon Harris	2.58 (selected)
Miss Ara Heron	2.58

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Plants and Soils

2.36 Agricultural Products and Agricultural Materials

In accordance with in-house test methods except where otherwise indicated.

(c) Stockfoods and licks

Crude fibre AOAC 962.09 (modified)

(g) Soils

Anion storage capacity	
Base saturation percent of calcium	By calculation
Base saturation percent of magnesium	By calculation
Base saturation percent of potassium	By calculation
Base saturation percent of sodium	By calculation
Cation exchange capacity	By calculation
Lime requirement	By calculation
Organic matter	Dumas combustion / calculation
pH of soils and soil extracts	
Phosphorus (Olsen extractable)	
Phosphorus (Resin extractable)	
Potentially available nitrogen (anaerobic mineralisable nitrogen)	
Soluble salts	
Sulphate-sulphur	Ion chromatography
Total carbon	Dumas combustion
Total nitrogen	Dumas combustion
Volume weight	

The following elements in soil in accordance with ICP-OES methodology (including extraction):

Aluminium (CaCl₂ extractable)
 Boron (hot water extractable)
 Exchangeable Calcium (ammonium acetate extractable)
 Exchangeable Magnesium (ammonium acetate extractable)
 Exchangeable Potassium (ammonium acetate extractable)
 Exchangeable Sodium (ammonium acetate extractable)
 Extractable Cobalt (EDTA extractable)
 Extractable Copper (EDTA extractable)
 Extractable Iron (EDTA extractable)
 Extractable Manganese (EDTA extractable)
 Extractable Organic Sulphur
 Extractable Zinc (EDTA extractable)

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Reserve Potassium (TBK)
 Total Phosphorus (Aqua Regia digestion)
 Total Sulphur (Aqua Regia digestion)

The following elements in soil in accordance with ICP-MS methodology (including extraction):

Total Selenium (Aqua Regia digestion)

(h) Plants

Acid detergent fibre (Direct)	Ankom fibre instrument
Acid detergent fibre (Sequential)	AFIA method 1.9A (a) (modified)
Acid detergent lignin	Ankom method 9 (modified)
Ash	AOAC 942.05
Chloride	
Crude fat	AOCS AM 5-04
Crude protein	Dumas combustion / calculation
Crude protein	(NIR) By calculation
Digestibility Pepsin Cellulase (DOMD)	AFIA7R (modified)
Metabolisable Energy (ME) calculated from DOMD	AFIA7R (modified) / AFRC calculation
Neutral detergent fibre	AFIA Method 1.8A(a) (modified)
Nitrate - nitrogen	
Residual moisture	NFTA 2.1.4 (3hrs @ 105°C)
Residual moisture	NIR
Soluble sugars	Colorimetric method
Total nitrogen	Dumas combustion
Total nitrogen	NIR
Total starch (Megazyme)	AOAC 996.11 (modified)

The following elements in plants in accordance with ICP-MS methodology:

Cobalt (microwave digestion)
 Iodine (TMAH extraction)
 Molybdenum (microwave digestion)
 Selenium (microwave digestion)

The following elements in plants in accordance with ICP-OES methodology by microwave digestion:

Aluminium	Boron	Calcium	Copper
Iron	Magnesium	Manganese	Phosphorus
Potassium	Sodium	Sulphur	Zinc

(i) Other agricultural products and related materials

Nutrient solutions:

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Ammonium - nitrogen
 Chloride
 Conductivity
 Nitrate - nitrogen
 pH

The following elements in accordance with ICP-MS methodology:

Molybdenum

The following elements in accordance with ICP-OES methodology:

Boron	Calcium	Copper	Iron
Magnesium	Manganese	Phosphorus	Potassium
Sodium	Sulphur	Zinc	

Growing media (potting mix, composts):

Ammonium - nitrogen
 Conductivity
 Nitrate - nitrogen
 pH

Media DTPA extraction for the following metals by ICP-OES:

Boron	Copper	Iron	Manganese
Zinc			

Media water extraction for the following metals by ICP-OES:


Calcium	Magnesium	Phosphorus	Potassium
Sodium	Sulphur		

References:

AOAC AOAC International

Inorganics

2.31 Foods

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(j) Alcoholic beverages (Wine)

Sulfate in Wine
Sulfate as K₂SO₄

Ion Chromatography (IC) In-House
By Calculation

2.41 Waters

- (a) Potable waters**
- (b) Non-potable waters**
- (c) Sewage**
- (d) Effluents and trade wastes**
- (h) Boiler waters**

The following tests are in accordance with APHA “Standard Methods for the Examination of Water and Wastewater” (23rd Edition) except where otherwise indicated.

Acidity	2310 B
Alkalinity (as CaCO ₃)	2320 B (modified)
Ammonium (nitrogen)	4500-NH ₃ F (modified, discrete analyser)
Ammonium (nitrogen)	4500-NH ₃ H
Ammonium (nitrogen)	4500-NH ₃ H (modified)
Ammonium (nitrogen)	In-house
Ash	2540 E (modified) (by calculation)
Ash from suspended solids	In-house (by calculation)
Bicarbonate	4500-CO ₂ D
Biochemical oxygen demand	5210 B (modified)
Biochemical oxygen demand	In-house
Bromate	USEPA 300.1 Part B (modified)
Bromide	4110 B (modified)
Bromide	USEPA 300.1 (modified)
Bromide	USEPA 300.1 Part B (modified)
Carbonate	4500-CO ₂ D
Chemical oxygen demand	5220 D
Chloramines	4500-Cl G
Chlorate	USEPA 300.1 Part B (modified)
Chloride	4110 B (modified)
Chloride	USEPA 300.1 (modified)
Chlorine	4500-Cl G
Chlorite	USEPA 300.1 Part B (modified)
Chlorophyll A	10200 H (modified)
Chromium (VI)	3500-Cr B (modified, discrete analyser)
Chromium (III) Total	In-house (by calculation)
Colour (Hazen)	2120 C (modified)
Conductivity	2510 B
Cyanide (total)	4500-CN C (modified)

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Cyanide (total)	ISO 14403: 2012 (e)
Cyanide	4500-CN E (modified, discrete analyser)
Cyanide (weak acid dissociable)	4500-CN I (modified)
Cyanide (weak acid dissociable)	4500-CN O (modified)
Dissolved Inorganic Nitrogen	In-house (by calculation)
Dissolved Organic Carbon	5310 C (modified) (by calculation)
Dissolved reactive phosphorus	4500-P G
Dissolved reactive phosphorus	4500-P G (modified)
Fluoride (potable water only)	4110 B (modified)
Fluoride (potable water only)	USEPA 300.1 (modified)
Fluoride	4500-F C
Free carbon dioxide	4500-CO ₂ D
Hardness	2340 B
Hydroxide Alkalinity from Alkalinity	2320 B (by calculation)
Hydroxide Alkalinity from pH	4500-CO ₂ D (by calculation)
Ion Balance	1030 E
Langelier saturation index (LSI)	2330 B
Mercury	USEPA 245.7 (CVAF)
Nitrate	4110 B (modified)
Nitrate	USEPA 300.1 (modified)
Nitrate (nitrogen)	4500-NO ₃ I (modified)
Nitrite	USEPA 300.1 (modified)
Nitrite (nitrogen)	4110 B (modified)
Nitrite (nitrogen)	4500-NO ₃ I (modified)
Oil and Grease	5520 D (modified)
pH	4500-H B
Phenols	5530 B (modified)
Phenols	5530 D (Auto analyser)
Phosphate	4110 B (modified)
Phosphate	USEPA 300.1 (modified)
Phosphate from DRP	In-house (by calculation)
Reactive silica	4500-SiO ₂ F (modified)
Reactive silica	4500-SiO ₂ F (modified, discrete analyser)
Ryznar index (RI)	In-house
Sulphate	4110 B (modified)
Sulphate	USEPA 300.1 (modified)
Sulphide	4500-S ² I (modified, FIA)
Sulphide	4500-S ₂ E (modified)
Sulphite	4500-SO ₃ B
Tannins and lignins	5550 B (modified)
Total and nonpurgeable organic carbon	5310 C (modified)
Total dissolved nitrogen	In-house (by calculation)
Total dissolved solids	2540 C (modified)
Total inorganic nitrogen	In-house (by calculation)
Total Kjeldahl nitrogen	4500-N _{org} D (modified, discrete analyser)
Total Kjeldahl nitrogen	4500-N _{org} D (modified)
Total nitrogen	4500-N C

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Total nitrogen	4500-NO ₃ I (modified)
Total nitrogen	In-house (by calculation)
Total organic nitrogen	In-house (by calculation)
Total organic nitrogen (trace level)	In-house (by calculation)
Total phosphorus	4500-P B / E (modified, discrete analyser)
Total phosphorus	4500-P H (modified)
Total solids	2540 B (modified)
Total suspended solids	2540 D (modified)
Turbidity	2130 B (modified)
Turbidity	ISO 7027:1999 (modified)
Ultraviolet absorption	5910 B
Unionised hydrogen sulphide	4500-S ² H (modified) (by calculation)
Urea (nitrogen)	In-house
Volatile fatty acids	In-house by IC
Volatile fatty acids (total)	In-house (by calculation)
Volatile suspended solids	2540 E (modified)
Volatile total solids	2540 E (modified)

(g) Marine waters

Ammonium (nitrogen)	4500-NH ₃ H
Ash	2540 E (modified) (by calculation)
Ash from suspended solids	In-house (by calculation)
Chlorophyll A	10200 H (modified)
Conductivity	2510 B
Dissolved Inorganic Nitrogen	In-house (by calculation)
Dissolved reactive phosphorus	4500-P G
Hydroxide Alkalinity from pH	4500-CO ₂ D (by calculation)
Nitrate (nitrogen)	4500-NO ₃ I (modified)
Nitrite (nitrogen)	4500-NO ₃ I (modified)
pH	4500-H+
Phosphate from DRP	In-house (by calculation)
Reactive silica	4500-SiO ₂ F (modified, discrete analyser)
Total inorganic nitrogen	In-house (by calculation)
Total nitrogen	4500-N C
Total nitrogen	4500-NO ₃ I (modified)
Total organic nitrogen (trace level)	In-house (by calculation)
Total phosphorus	4500-P H (modified)
Total suspended solids	2540 D (modified)
Turbidity	2130 B (modified)

2.58 Environmental Monitoring

(a) Waters

The following tests are in accordance with APHA "Standard Methods for the Examination of Water

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and Wastewater" (23rd Edition) except where otherwise indicated.

Acidity	2310 B
Alkalinity (as CaCO ₃)	2320 B (modified)
Ammonium (nitrogen)	4500-NH ₃ F (modified, discrete analyser)
Ammonium (nitrogen)	4500-NH ₃ H
Ammonium (nitrogen)	4500-NH ₃ H (modified)
Ammonium (nitrogen)	In-house
Ash	2540 E (modified) (by calculation)
Ash from suspended solids	In-house (by calculation)
Bicarbonate	4500-CO ₂ D
Biochemical oxygen demand	5210 B (modified)
Biochemical oxygen demand	In-house
Bromate	USEPA 300.1 Part B (modified)
Bromide	4110 B (modified)
Bromide	USEPA 300.1 (modified)
Bromide	USEPA 300.1 Part B (modified)
Carbonate	4500-CO ₂ D
Chemical oxygen demand	5220 D
Chloramines	4500-Cl G
Chlorate	USEPA 300.1 Part B (modified)
Chloride	4110 B (modified)
Chloride	USEPA 300.1 (modified)
Chlorine	4500-Cl G
Chlorite	USEPA 300.1 Part B (modified)
Chlorophyll A	10200 H (modified)
Chromium (III) Total	In-house (by calculation)
Chromium (VI)	3500-Cr B (modified, discrete analyser)
Colour (Hazen)	2120 C (modified)
Conductivity	2510 B
Cyanide (total)	4500-CN C (modified)
Cyanide (total)	ISO 14403: 2012 (e)
Cyanide	4500-CN E (modified, discrete analyser)
Cyanide (weak acid dissociable)	4500-CN I (modified)
Cyanide (weak acid dissociable)	4500-CN O (modified)
Dissolved Inorganic Nitrogen	In-house (by calculation)
Dissolved Organic Carbon	5310 C (modified) (by calculation)
Dissolved reactive phosphorus	4500-P G
Dissolved reactive phosphorus	4500-P G (modified)
Fluoride (potable water only)	4110 B (modified)
Fluoride (potable water only)	USEPA 300.1 (modified)
Fluoride	4500-F C
Free carbon dioxide	4500-CO ₂ D
Hardness	2340 B
Hydroxide Alkalinity from Alkalinity	2320 B (by calculation)
Hydroxide Alkalinity from pH	4500-CO ₂ D (by calculation)
Ion Balance	1030 E

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Langelier saturation index (LSI)	2330 B
Mercury	USEPA 245.7 (CVAF)
Nitrate	4110 B (modified)
Nitrate	USEPA 300.1 (modified)
Nitrate (nitrogen)	4500-NO ₃ I (modified)
Nitrite	USEPA 300.1 (modified)
Nitrite (nitrogen)	4110 B (modified)
Nitrite (nitrogen)	4500-NO ₃ I (modified)
Oil and Grease	5520 D (modified)
pH	4500-H B
Phenols	5530 B (modified)
Phenols	5530 D (Auto analyser)
Phosphate	4110 B (modified)
Phosphate	USEPA 300.1 (modified)
Phosphate from DRP	In-house (by calculation)
Reactive silica	4500-SiO ₂ F (modified)
Reactive silica	4500-SiO ₂ F (modified, discrete analyser)
Ryznar index (RI)	In-house
Sulphate	4110 B (modified)
Sulphate	USEPA 300.1 (modified)
Sulphide	4500-S ² I (modified, FIA)
Sulphide	4500-S ₂ E (modified)
Sulphite	4500-SO ₃ B
Tannins and lignins	5550 B (modified)
Total and nonpurgeable organic carbon	5310 C (modified)
Total dissolved nitrogen	In-house (by calculation)
Total dissolved solids	2540 C (modified)
Total inorganic nitrogen	In-house (by calculation)
Total Kjeldahl nitrogen	4500-N _{org} D (modified, discrete analyser)
Total Kjeldahl nitrogen	4500-N _{org} D (modified)
Total nitrogen	4500-N C
Total nitrogen	4500-NO ₃ I (modified)
Total nitrogen	In-house (by calculation)
Total organic nitrogen	In-house (by calculation)
Total organic nitrogen (trace level)	In-house (by calculation)
Total phosphorus	4500-P B / E (modified, discrete analyser)
Total phosphorus	4500-P H (modified)
Total solids	2540 B (modified)
Total suspended solids	2540 D (modified)
Turbidity	2130 B (modified)
Turbidity	ISO 7027:1999 (modified)
Ultraviolet absorption	5910 B
Unionised hydrogen sulphide	4500-S ₂ H (modified) (by calculation)
Urea (nitrogen)	In-house
Volatile Fatty Acids	In-house by IC
Volatile Fatty Acids (total)	In-house (by calculation)
Volatile suspended solids	2540 E (modified)

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Volatile total solids 2540 E (modified)

(c) Soils and sludges

Oil and Grease 5520 E (modified)

ICP

2.24 Textiles and Textile Products

(c) Chemical tests

2.31 Foods

(c) Nuts, fruits and vegetables and derived products

(f) Dairy products

Microwave Digestion of textiles, food and biological specimens for Elemental Analysis, in accordance with in-house procedures:

Aluminium	Antimony	Arsenic	Barium
Boron	Cadmium	Caesium	Calcium
Cerium	Chromium	Cobalt	Copper
Dysprosium	Erbium	Europium	Gadolinium
Holmium	Iron	Lanthanum	Lead
Lithium	Lutetium	Magnesium	Manganese
Molybdenum	Neodymium	Nickel	Potassium
Praseodymium	Rubidium	Samarium	Selenium
Sodium	Strontium	Thulium	Tin
Uranium	Vanadium	Ytterbium	Yttrium
Zinc			

(f) Dairy products

The following elements by ICP-OES in accordance with in-house procedures based on APHA 3030 and 3120:

Calcium	Iron	Magnesium	Phosphorus
Potassium	Sodium	Sulphur	Zinc

The following elements by ICP-MS in accordance with in-house procedures based on alkaline digestion or APHA 3030 and 3125:

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Aluminium	Antimony	Arsenic	Bismuth
Boron	Cadmium	Chromium	Cobalt
Copper	Iodine	Lead	Lithium
Manganese	Mercury	Molybdenum	Nickel
Selenium	Silver	Tin	Zinc

(g) Meat, poultry and derived products

The following elements by ICP-MS in accordance with in-house procedures based on alkaline digestion or APHA 3030 and 3125:

Arsenic	Cadmium	Lead	Mercury
Selenium			

(h) Fish and fish products

The following elements by ICP-MS in accordance with in-house procedures based on alkaline digestion or APHA 3030 and 3125:

Aluminium	Antimony	Arsenic	Barium
Beryllium	Bismuth	Boron	Cadmium
Caesium	Chromium	Cobalt	Copper
Lanthanum	Lead	Lithium	Manganese
Mercury	Molybdenum	Nickel	Rubidium
Selenium	Silver	Strontium	Thallium
Tin	Uranium	Vanadium	Zinc

(j) Alcoholic beverages (wine)

The following elements by ICP-MS in accordance with in-house procedures based on APHA 3030 and 3125:

Antimony	Arsenic	Bismuth	Boron
Cadmium	Chromium	Copper	Lead
Manganese	Mercury	Nickel	Silver
Tin	Zinc		

The following elements by ICP-OES in accordance with in-house procedures based on APHA 3030 and 3120:

Calcium	Iron	Potassium	Sodium
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(o) Other specified foods (honey, propolis and related products)

The following elements by ICP-MS in accordance with in-house procedures based on alkaline digestion or APHA 3030 and 3125:

Aluminium	Antimony	Arsenic	Cadmium
Chromium	Copper	Iodine	Lead
Mercury	Selenium	Zinc	

2.32 Drugs and Pharmaceuticals

(i) Other products – Cannabis (plant and oil)

The following elements by ICP-MS in accordance with in-house procedures based on EU Pharmacopeia 2.4.27

Arsenic (plant only)	Cadmium	Lead	Mercury
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The following element by ICP-MS in accordance with in-house procedures based on alkaline digestion

Arsenic (oil only*)

*Finished medicinal cannabis and ethanol extracts only

2.41 Waters

- (a) Potable waters**
- (b) Non-potable waters**
- (c) Sewage**
- (d) Effluents and trade wastes**
- (h) Boiler waters**

The following elements by ICP-MS in accordance with APHA 3030 (modified), 3125 and USEPA 1638, 200.1:

Aluminium	Antimony	Arsenic	Barium
Beryllium	Bismuth	Boron	Cadmium
Caesium	Calcium	Chromium	Cobalt
Copper	Iodine	Iron	Lanthanum
Lead	Lithium	Magnesium	Manganese
Mercury	Molybdenum	Nickel	Phosphorus
Potassium	Rubidium	Selenium	Silicon
Silver	Sodium	Strontium	Sulphur
Thallium	Thorium	Tin	Uranium

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Vanadium Zinc

The following element by ICP-OES in accordance with APHA 3030 (modified) and 3120:

Sulphur

Borate (B₄O₇) In-house (by calculation)

(g) Marine waters

The following elements by ICP-MS in accordance with APHA 3030 (modified), 3125 and USEPA 1638, 200.1:

- | | | | |
|------------|-----------|------------|-----------|
| Aluminium | Antimony | Arsenic | Barium |
| Beryllium | Bismuth | Boron | Cadmium |
| Caesium | Calcium | Chromium | Cobalt |
| Copper | Iron | Lanthanum | Lead |
| Lithium | Magnesium | Manganese | Mercury |
| Molybdenum | Nickel | Phosphorus | Potassium |
| Rubidium | Selenium | Silica | Silver |
| Sodium | Strontium | Sulphur | Thallium |
| Tin | Uranium | Vanadium | Zinc |

Borate (B₄O₇) In-house (by calculation)

2.58 Environmental Monitoring

(a) Waters

The following elements by ICP-MS or ICP-OES in accordance with APHA 3030 (modified), 3120, 3125 and USEPA 1638, 200.1

Detection limits for potable and non-potable water depend in the technique used e.g. ICP-MS or ICP-OES and are available from the laboratory on request.

- | | | | |
|-----------|------------|-----------|------------|
| Aluminium | Antimony | Arsenic | Barium |
| Beryllium | Bismuth | Boron | Cadmium |
| Caesium | Calcium | Chromium | Cobalt |
| Copper | Iodine | Iron | Lanthanum |
| Lead | Lithium | Magnesium | Manganese |
| Mercury | Molybdenum | Nickel | Phosphorus |
| Potassium | Rubidium | Selenium | Silicon |

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Silver	Sodium	Strontium	Sulphur
Thallium	Thorium	Tin	Uranium
Vanadium	Zinc		

Borate (B₄O₇) In-house (by calculation)

(c) Soils and sludges

Acid extractable using USEPA 200.2 digestion procedures and TCLP/SPLP USEPA 1311 and 1312 extractable metals by ICP-MS in accordance with APHA 3125:

Detection limits depend on the matrix tested e.g. soils or marine sediments and are available from the laboratory on request.

Aluminium	Antimony	Arsenic	Barium
Beryllium	Bismuth	Boron	Cadmium
Caesium	Calcium	Chromium	Cobalt
Copper	Iron	Lanthanum	Lead
Lithium	Magnesium	Manganese	Mercury
Molybdenum	Nickel	Phosphorus	Potassium
Rubidium	Selenium	Silver	Sodium
Strontium	Thallium	Tin	Uranium
Vanadium	Zinc		

OLEM 9200.2-164, Standard Operating Procedure for an In Vitro Method for the determination of Arsenic and Lead Bioaccessibility (April 20, 2017) / APHA 3125

(d) Other materials (fish and shellfish)

Detection limits depend on the technique used e.g. ICP-MS or ICP-OES and are available from the laboratory on request.

The following elements by ICP-MS in accordance with in-house procedures based on alkaline digestion or APHA 3030 and 3125:

Aluminium	Antimony	Arsenic	Barium
Beryllium	Bismuth	Boron	Cadmium
Caesium	Chromium	Cobalt	Copper
Lanthanum	Lead	Lithium	Manganese
Mercury	Molybdenum	Nickel	Rubidium
Selenium	Silver	Strontium	Thallium
Tin	Uranium	Vanadium	Zinc

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The following element by ICP-OES in accordance with in-house procedures based on APHA 3030 and 3120:

Calcium	Iron	Magnesium	Potassium
Sodium			

References:

APHA APHA "Standard Methods for the Examination of Water and Wastewater" (23rd Edition)
 USEPA United States Environmental Protection Agency

Organics

2.31 Foods

(j) Alcoholic beverages (Wine)

The following tests in wine in accordance with the requirements of the MPI Wine Notice Requirements for Recognised Agencies and Persons (10 March 2022)

Solvents in Wine (including methanol)	GC-FID/FID In-House
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2.41 Waters

- (a) Potable waters
- (b) Non-potable waters
- (c) Sewage
- (d) Effluents and trade wastes
- (h) Boiler waters

The following tests are in accordance with validated in-house methods and based upon standard methods where indicated. A full listing of compounds and detection limits are available from the laboratory upon request.

GC-ECD

Organochlorine pesticides (OCP)	In-house based on USEPA 8081
Pentachlorophenol (PCP)	

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GC-FID

Gases in ground water

GC-MS

Amine acid chelating agents (EDTA & NTA) (potable only)

Halogenated acetic acids (HAA) (potable only)

In-house based on USEPA 552

Halogenated volatile disinfection by-products (HVDB) (potable only)

In-house based on USEPA 551

Tributyltin compounds (MBT, DBT, TBT, TPHT)

Volatile organic compounds (VOC) incl. compound classes:

In-house based on USEPA 8260, 5021

- BTEX
- Haloaromatics
- Halogenated aliphatics
- Ketones
- Monocyclic aromatic hydrocarbons
- Trihalomethanes

Semi-volatile organic compounds (SVOC) incl. compound Classes:

In-house based on USEPA 8270

- Acid herbicides (AHB)
- Multiresidue pesticides
- Organochlorine pesticides (OCP)
- Polychlorinated biphenyls (PCB)
- Polycyclic aromatic hydrocarbons (PAH)

GC-MS and GC-FID

Total petroleum hydrocarbons (TPH) (covering C6 – C9)

In-house based on USEPA 5021 and 8260 (GC-MS Head Space)

Total petroleum hydrocarbons (TPH) (covering C7 – C44)

In-house based on USEPA 8015 (GC-FID)

GC-MS/MS

Organochlorine Pesticides

In-house based on USEPA 8081, 8270

Polycyclic Aromatic Hydrocarbons (PAH)

In-house based on USEPA 8270

LC-MS/MS

Acid Herbicides (including PCP)

Acrylamide

Formaldehyde

Microcystins and Nodularins (potable and non-potable)

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Potable water only

Aldicarb (including Sulfoxide & Sulphone)
 Isoproturon
 Oryzalin
 Oxamyl
 Primisulfuron Methyl
 Thiabendazole

2.58 Environmental Monitoring

(a) Waters

The following tests are in accordance with validated in-house methods and based upon standard methods where indicated. A full listing of compounds and detection limits are available from the laboratory upon request.

GC-ECD

Organochlorine pesticides (OCP) In-house based on USEPA 8081
 Pentachlorophenol (PCP)

GC-FID

Gases in ground water

GC-MS

Tributyltin compounds (MBT, DBT, TBT, TPhT)
 Volatile organic compounds (VOC) including: In-house based on USEPA 5021 and 8260

- BTEX
- Haloaromatics
- Halogenated aliphatics
- Ketones
- Monocyclic aromatic hydrocarbons
- Trihalomethanes

Semi-volatile organic compounds (SVOC) including compound classes: In-house based on USEPA 8270

- Acid herbicides (AHB)
- Multiresidue pesticides
- Organochlorine pesticides (OCP)
- Polychlorinated biphenyls (PCB)
- Polycyclic aromatic hydrocarbons (PAH)

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GC-MS and GC-FID

Total petroleum hydrocarbons (TPH) (covering C6 – C9)	In-house based on USEPA 5021 and 8260 (GC-MS Head Space)
Total petroleum hydrocarbons (TPH) (covering C7 – C44)	In-house based on USEPA 8015 (GC-FID)

GC-MS/MS

Organochlorine Pesticides	In-house based on USEPA 8081, 8270
Polycyclic Aromatic Hydrocarbons (PAH)	In-house based on USEPA 8270

LC-MS/MS

Acid Herbicides (including PCP)
Acrylamide
Formaldehyde
Microcystins and Nodularins

(c) Soils and sludges

The following tests are in accordance with validated in-house methods and based upon standard methods where indicated. A full listing of compounds and detection limits are available from the laboratory upon request.

Extraction and analysis of TCLP/SPLP extractions

GC-ECD

Organochlorine pesticides (OCP)	In-house based on USEPA 8081
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GC-FID

Total petroleum hydrocarbons (TPH)	In-house based on USEPA 8015
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GC-MS

Organonitrogen and Organophosphorus (ON/OP) Pesticides Tributyltin compounds (MBT, DBT, TBT, TPhT)	In-house based on USEPA 8260, 5021
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Volatile organic compounds (VOC) including compound: classes	In-house based on USEPA 8260, 5021
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- BTEX
- Haloaromatics
- Halogenated aliphatics
- Ketones

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- Monocyclic aromatic hydrocarbons
- Trihalomethanes

Semi-volatile organic compounds (SVOC) including compound classes: In-house based on USEPA 8270

- Acid herbicides (AHB)
- Multiresidue pesticides
- Organochlorine pesticides (OCP)
- Polychlorinated biphenyls (PCB)
- Polycyclic aromatic hydrocarbons (PAH)

GC-MS/MS

Organochlorine Pesticides

In-house based on USEPA 8081, 8270

Polycyclic Aromatic Hydrocarbons (PAH)

In-house based on USEPA 8270

LC-MS/MS

Acid Herbicides (including PCP)

(d) Other materials (Fish and shellfish)

GC-MS

Tributyltin compounds (MBT, DBT, TBT, TPhT)

(d) Other materials (Environmental wipes)

LC-MS/MS

Methamphetamine Drug Suite by LC-MS/MS

NIOSH 9111 (modified)

2.70 Instrumental Techniques

(a1) Gas chromatography (2.41, 2.58)

(a2) Gas chromatography, (including Mass Selective Detection (MSD)) (2.41, 2.58)

(b) High performance liquid chromatography (including UPLC) (2.41)

(d2) Liquid chromatography – mass spectrometry mass spectrometry (2.41, 2.58)

All techniques pertain to classes of test shown in parenthesis detailed above.

Explanatory Note:

This 2.70 class of test allows specifically approved senior analysts to develop, validate and use a new test method by the specified instrumental technique for a non-routine analysis in the classes of tests specified.

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The report over the analyst's personal signature may be endorsed with the IANZ logo. Should the method become routine, an IANZ technical assessment is required before the method can appear on the laboratory's scope of routine accredited tests.

Food and Bioanalytical

2.31 Foods

- (a) Cereals and cereal products
- (b) Edible oils, fats and their products
- (c) Nuts, fruits and vegetables and derived products
- (d) Sauces, herbs, spice and condiments
- (f) Dairy products
- (g) Meat, poultry and derived products
- (h) Fish and fish products
- (i) Eggs and egg products
- (k) Non-alcoholic beverages
- (o) Other prepared foods

The following tests in selected matrices in accordance with validated in-house methods except where otherwise indicated:

Ash	AOAC 942.05 (modified)
Crude protein	AOAC 992.15 (modified)
Moisture	AOAC 945.15 (modified)
Total nitrogen	In-house based on AOAC 992.15

(n) Residues in foodstuffs and crops

In accordance with validated in-house methods in selected matrices by the techniques specified.

GC-MS

Total dithiocarbamates as carbon disulfide
p-Dichlorobenzene (pDCB) (honey, propolis, bee's wax)(SPME)

GC-MS/MS

Multi-residue screening by Citrate buffered QUECHERS (fruit, vegetables, crops, wine and derived products, honey, milk)

LC-MS/MS

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Acidic herbicides (milk, fruit, vegetables, crops and derived products)
 Glyphosate, Glufosinate and AMPA (honey, fruit, vegetables, crops and derived products)
 Glyphosate, Glufosinate and Metabolites (honey)
 Mycotoxins (grain and grain products, feed)

- Aflatoxins (plus peanuts and derived products, and spices)
- Aflatoxins M1 (milk)
- Fumonisin
- Ochratoxin A
- Trichothecenes

Multi-residue screening by Citrate buffered QUECHERS (fruit, vegetables, wine, crops & derived products, honey, milk)
 Polar triazines and their precursors in milk
 Streptomycin, Dihydrostreptomycin and Kasugamycin (Kiwifruit)
 Tutin (honey: water extraction)
 Tutin (honey: acetonitrile extraction)

LC-HRAM-MS

Glucosinolates and SMCO (brassicac)

(o) Other prepared foods

Colour in honey	In-house (spectrophotometer)
Diastase in honey	IHC Method 6.2 (modified)
Gluten (ELISA)	AOAC 2012.01
Moisture in honey	IHC Method 1 (modified)

uHPLC / UV-Vis

3 in 1 Honey (DHA, HMF and MGO)

- Dihydroxyacetone (DHA)
- 5-hydroxymethylfurfural (HMF)
- Methylglyoxal (MGO)

Unique Manuka Factor ® (UMF) / Non-Peroxide Activity as % Phenol Equivalence by calculation from methylglyoxal concentration

Isotopic Ratio Mass Spectroscopy (IRMS)

C-4 Sugars in honey	AOAC 998.12
C-4 Sugars in honey - Screen	AOAC 998.12 (modified)

LC-MS/MS

Analysis of the following analytes in New Zealand Manuka Honey by LC-MS/MS in accordance with in-house procedures:

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Four Chemical Characterisation (NZ Manuka Honey)

- 2-Methoxyacetophenone (2-MAP)
- 2-Methoxybenzoic acid (2-MBA)
- 3-Phenyllactic acid (3-PA)
- 4-Hydroxyphenyllactic acid (4-HPA)

Leptosperin (NZ Manuka Honey)

References:

AOAC AOAC International

2.32 Drugs and Pharmaceuticals

(e) Hormones and their preparations

Progesterone in powder	HPLC (in-house)
Progesterone in silicone implants	HPLC (in-house)

(i) Other products – Cannabis

Cannabinoids in cannabis	LC-MS/MS (in-house)
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2.36 Agricultural Products and Agricultural Materials

(c) Stockfoods

Ash	AOAC 942.05 (modified)
Crude fat	AOAC 960.39
Crude fat	AOAC 991.36 (modified)
Crude protein	AOAC 992.15 (modified)
Moisture	AOAC 945.15 (modified)
Total nitrogen	In-house based on AOAC 992.15

(h) Plants

GC-MS/MS

Multi-residue screening by Citrate buffered QUECHERS

LC-MS/MS

Multi-residue screening by Citrate buffered QUECHERS

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(i) Other agricultural products - Agricultural chemicals

Amino alcohols	LC-MS/MS (in-house)
Quaternary Ammonium Compounds (QAC)	LC-MS/MS (in-house)
<ul style="list-style-type: none"> • Benzalkonium chloride • Didecyldimethylammonium chloride 	

2.70 Instrumental Techniques

- (a1) Gas chromatography (2.31)**
- (a2) Gas chromatography, (including Mass Selective Detection (MSD)) (2.31)**
- (a3) Gas chromatography, (including Mass Selective Mass Selective) (2.31)**
- (b) High performance liquid chromatography (including UPLC) (2.31)**
- (d2) Liquid chromatography – mass spectrometry mass spectrometry (2.31)(2.32)**

All techniques pertain to classes of test shown in parenthesis detailed above.

Explanatory Note:

This 2.70 class of test allows specifically approved senior analysts to develop, validate and use a new test method by the specified instrumental technique for a non-routine analysis in the classes of test specified. The report over the analyst’s personal signature may be endorsed with the IANZ logo. Should the method become routine, an IANZ technical assessment is required before the method can appear on the laboratory’s scope of routine accredited tests.

Work Place Drug Testing

2.61 Biological Specimens

(a) Residues in specified human specimens

In accordance with the general requirements of the Australian/New Zealand Standard AS/NZS 4308:2008 “Procedures for the collection, detection and quantitation of drugs of abuse in urine”

Screening and confirmation of the following drugs of abuse in urine specimens by LC-MS/MS:

Amphetamine Type Substances (ATS)

Amphetamine	Ephedrine	MDA	MDMA
Methamphetamine	Phentermine	Pseudoephedrine	

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Opiates and Opioids

6-Monoacetylmorphine (MAM)	Codeine	Fentanyl	Hydrocodone
Hydromorphone	Morphine	Oxycodone	Oxymorphone
Tramadol			

Cocaine metabolites

Benzoyllecgonine	Ecgonine Methyl Ester (EME)
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Benzodiazepines

Alprazolam*	Clonazepam*	Diazepam	Flunitrazepam*
Lorazepam	Midazolam*	Nitrazepam*	Nordiazepam
Oxazepam	Temazepam	Triazolam*	

*The following Benzodiazepine metabolites are analysed and reported:

7-amino-clonazepam	7-amino-flunitrazepam	7-amino-nitrazepam
alpha-hydroxy-alprazolam	alpha-hydroxy-midazolam	alpha-hydroxy-triazolam

Cannabis

THC-COOH

Air Quality

2.58 Environmental Monitoring

(b) Air

A full listing of the compounds and their detection limits are available from the laboratory on request. The laboratory is accredited for analysis only for the methods below.

GC-FID/FID

NIOSH 1403 (charcoal tubes only) (modified)
Alcohols IV

NIOSH 1501 (charcoal tubes and badges) (modified)
Monocyclic Aromatic Hydrocarbons

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GC-MS

US EPA TO-15

Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS)

HPLC

US EPA TO-11A (modified) (DNPH impregnated silica tubes and badges)

Determination of Formaldehyde in Ambient Air Using Adsorbent Cartridge Followed by High Performance Liquid Chromatography (HPLC) [Active Sampling Methodology]

US EPA TO-11A (modified) (DNPH impregnated silica tubes and badges)

Determination of Acetaldehyde in Ambient Air Using Adsorbent Cartridge Followed by High Performance Liquid Chromatography (HPLC) [Active Sampling Methodology]

US EPA TO-11A (modified) (DNPH impregnated silica tubes and badges)

Determination of Carbonyl compounds in Ambient Air Using Adsorbent Cartridge Followed by High Performance Liquid Chromatography (HPLC) [Active Sampling Methodology]

NIOSH 2016 (modified) (DNPH impregnated silica tubes and badges)

Formaldehyde

NIOSH 2532 (modified) (DNPH impregnated silica tubes and badges)

Glutaraldehyde

Gravimetric

AS 3640:2009

Gravimetric determination of inhalable dust in workplace atmospheres

AS 2985:2009

Gravimetric determination of respirable dust in workplace atmospheres

AS/NZS 3580.9.3:2003

Determination of suspended particulate matter total - Suspended particulate matter (TSP) High volume sampler – gravimetric method

AS/NZS 3580.9.6:2003


Determination of suspended particulate PM₁₀ high volume sampler with selective size inlet – gravimetric method

AS 3580.9.9:2017 (modified)

Determination of suspended particulate PM₁₀ low volume sampler– gravimetric method

AS 3580.9.10:2017 (modified)

Determination of suspended particulate PM_{2.5} low volume sampler – gravimetric method

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References:

- AS Australian Standard
- AS/NZS Australian and New Zealand Standard
- NIOSH National Institute for Occupational Safety and Health
- USEPA United States Environmental Protection Agency

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