

September 2008



Rapid Ultra-trace analysis for MIB and Geosmin in Water.

Geosmin and 2-Methylisoborneol (MIB) are naturally occurring compounds associated with musty or earthy off-flavours in drinking water. These compounds are often tested in the Catchment Monitoring, Recycled Water and Drinking Water sectors. With increasing demand for faster analysis and lower detection limits, ALS is now able to offer NATA accredited and extremely rapid determination of these compounds at the low ng/L (ppt) levels.

MIB and Geosmin are naturally occurring terpene alcohols which can be produced by blue green algae (Cyanobacteria) and filamentous bacteria (Actinomycetes). Although these organic compounds are usually only present at ultra-trace levels, the human nose can detect Geosmin at concentrations as low as 5 parts per trillion or 0.000005 mg/L. For this reason Geosmin and/or MIB in drinking water can create considerable public concern particularly related to (foul smelling) drinking water.

In cases where drinking water supplies or potential drinking water sources include a high surface water component, the presence of Geosmin and/or MIB can often lead to episodes of distinctly unpleasant tasting/smelling water when released into the water supply. The problem is further compounded by the difficulty in removing these by conventional water treatment techniques (such as utilising activated carbon). As a result, the water industry often requires this incredibly low level analysis to be performed in a very short timeframe. In the past, the analysis of the compounds to the ppt level in any time less than 5-10 days has been extremely difficult and hence the need for a more rapid service.

New Developments at ALS

Following an extensive R&D programme at ALS over the last year, methodologies have been developed that not only improve the Level of Reporting (LOR) available, but also allow these analytes to be determined more rapidly.

ALS (Sydney) has subsequently invested in dedicated specialist equipment to cater for the anticipated demand for determination of this important aesthetic water quality parameter.

Agilent Technologies is the preferred supplier of GC/MS instrumentation to Australian Laboratory Services



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Analysis by GC/MS

The analysis of MIB and Geosmin is performed using specialised equipment including high sensitivity GC/MS. Peak confirmation uses established qualifier ions as per USEPA protocols. The analytical methodology adopted by ALS is extremely sensitive. The adjacent chromatogram shows the elution of both MIB and Geosmin at a concentration of 5.0 ppt (5.0 ng/L) in sample.

This NATA accredited methodology has demonstrated high degrees of precision and accuracy at incredibly low levels, as shown by the 1.0ng/L LOR

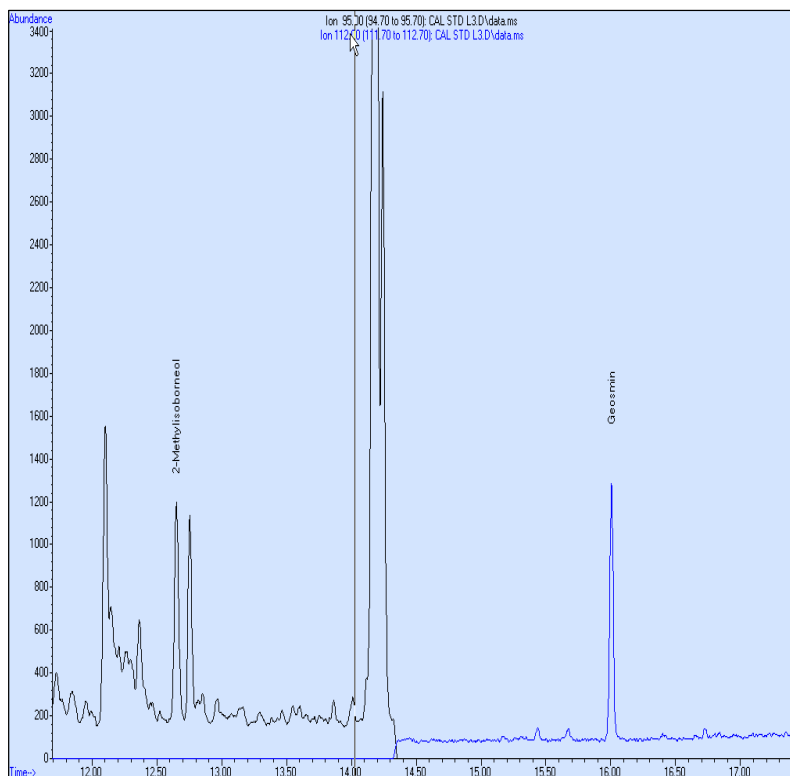


Table 1 – ALS Analytical Services

Analyte	CAS Number	ALS Method Code EP-115	
		Ultra-Trace LOR	
		(µg/L)	(ng/L or ppt)
Geosmin	19700-21-1	0.0010	1.0
MIB (2-methyl-isoborneol)	2371-42-8	0.0010	1.0

General Sampling Requirements

A further advantage of the ALS methodology is that sample collection volume is minimised. Two unpreserved 40ml vials are sufficient for analysis. These vials should be submitted with zero headspace to ensure data quality is not compromised. Under no circumstances should samples be acidified. These un-preserved vials will also facilitate rapid shipment by air to allow timely reporting of results.

ALS Environmental

CLIENT / REFERENCE:

SAMPLED BY:

SAMPLE ID:

DATE / TIME:

Major analytes include: **MIB/Geosmin** ZERO HEADSPACE REQUIRED

This bottle contains no preservatives

For further information please contact the ALS Technical Manager or your local ALS team.

References:

- (1) Geosmin, <http://en.wikipedia.org/wiki/Geosmin>
- (2) Juttner F, Watson F. B (2007), Biochemical and Ecological Control of Geosmin and 2-Methylisoborneol in Source Waters, *Applied and Environmental Microbiology*, 73(14), pp 4935 – 4406

For further information on specialist Services please visit the ALS website: www.alsglobal.com

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