



Trace Organics Innovation to improve safety & reduce costs

SAMPLE NEEDS FOR ULTRA TRACE ORGANICS

ALS has offered ultra-trace organics testing to the Water and Environmental sectors for well over a decade. Common suites tested include Ultra trace OC/OP pesticides, PCBs and PAHs or B(a)P plus a range of Carbamate, Triazine, Urea herbicide, Thiocarbamate and miscellaneous pesticides.

A few years ago ALS would have required 1,000mL for UT PAHs, plus 500ml for UT OC/OP/PCB plus 500mL for Multi-residues. In 2014, small changes were made to move to 500mL bottles. This latest change is a quantum shift in sample requirements following successful R&D and innovation projects.

- From today, a **single 100mL Amber bottle will suffice** for UT OC/OP/PCB plus super UT PAH plus extended EP234 Multiresidues.

LIMITATIONS?

- ALS still require a separate 100mL amber bottle for lab duplicates and matrix spikes (as per current).
- The LORs for four UT OPs tested in method EP130 cannot be quite met in the **new UT suites**. Three LORs go from 0.1 to 0.2µg/L and Parathion-methyl increases to 0.5ug/L, still below ADWG limits. Many LORs however decrease significantly with some as low as 0.005µg/L. The new method offers all 36 OP's in ADWG - an extra 20 vs. ALS method EP130.

APPLICABLE ALS METHODS

EP234 – Multiresidue Screen including OP's from EP130

EP131A/B – Ultra trace OC Pesticides and PCBs

EP132-LL Super UT PAHs or UT PAH EP132

Plus methods listed on page 2

ALS PACKAGE INFORMATION

UTO-9W	22 OCPs & 50 OPPs = 72 analytes
UTO-10W	22 OCPs, 7 PCBs & 50 OPPs = 79 analytes
UTO-11W	22 OCPs, 7 PCBs, 50 OPPs + 105 Triazine & Miscellaneous Pesticides - 184 analytes

MANUAL HANDLING RISKS

ALS performs many UT organics tests annually with projects often involving remote sampling via boat, helicopter or hiking into sites. Many samples are carried from the field in eskies.

Previously ultra-trace OC/OP/PCB, PAH, Triazine, Carbamate and miscellaneous pesticides required at least three 500ml ambers (weight ~814g ea.). This equated to ≥2.4kg per sample. From today, one 100ml amber bottle (weighing ~190g) will suffice cutting weights by 92%, reducing manual handling risk for field staff and benefiting logistics through reducing esky numbers (see above photo showing the old and new options).



ALS has new 'green labelled ambers' for LC/MS tests to assist clients. Given recent developments, the 'orange 100mL amber' can now be used for all UT analyses in suites UTO-9W, 10W & 11W.

WHAT EFFICIENCY AND COST BENEFITS?

The overall benefits to manual handling of the new initiative are fairly clear. With groundwaters, the financial benefits are considerable to the sampling practitioner especially when low flow sampling is used or where there are low recharge wells. Based upon a maximum flow rate of 200mL/minute for low flow sampling, new bottles will reduce sampling time by **seven minutes** per ground water for the full suites. This may mean an extra well sampled in a day. In direct costs, if seven minutes is saved at a charge-out rate of \$90 per hour this can equate to a saving of over \$10 per sample.

COMPLIANCE TESTING BENEFITS?

The new suites UTO-9W, UTO-10W and UTO-11W contain 36 OPs in the ADWG 2014 list. This will benefit where there is a desire to comply with ADWG for all OP pesticides.

Brisbane, Sydney, Melbourne (Springvale), Perth, Newcastle, Roma, Darwin, Adelaide, Townsville, Mackay, Gladstone, Wollongong, Nowra, Mudgee, Chinchilla, Emerald Water Resources Group: Canberra, Bendigo, Geelong, Melbourne (Scoresby), Wangaratta, Traralgon

ULTRA TRACE ORGANICS - WHAT DOES THIS REALLY MEAN?

Laboratories all define Ultra trace Organics differently and no two LORs are the same. The following table summarises the LORs ALS can achieve using the single 100ml bottle. Note that ALS do offer even lower LORs from a 500ml bottle for ultra clean water matrices or where lower LORs are needed – please contact ALS if you need specific lower limits as specialist methods are commonly available lower than this to meet major project needs down to as low as 1ppt or 0.001µg/L.

INCLUSIONS IN THE ALS UTO-9W TO UTO-11W SUITES OR SUPER UT PAHS

The current analytes reported under the full UTO-11W suite or Super ultra-trace PAHs follow. It should be noted that OC and OP pesticides reported under UTO-9W, 10W and 11W are identical.

OP pesticides are shaded yellow or green. Yellow shading indicates the chemical is not listed in ADWG. Green indicates it is listed in ADWG and the LOR can be met. OP Pesticides performed under the method EP130 in ADWG are marked with ‘*’. Additional OP Pesticides reported under the new UTO-9W, -10W & 11W suites that are in ADWG are in green in **bold**.

Summed/Calculated parameter	OP Pesticides, Triazines, Carbamates and miscellaneous pesticides (OPs shaded yellow or those in ADWG (2014) are shaded Green)										Note: All LORs are in µg/L		
OC Pesticides & PCBs	LOR	Compound	LOR	Compound	LOR	Compound	LOR	Compound	LOR	Compound	LOR	Super UT PAHs	LOR
Aldrin	0.01	3-Hydroxy Carbofuran	0.02	Chlorsulfuron	0.2	Fluometuron	0.01	Paclobutrazole	0.05	Tebuconazole	0.01	Naphthalene	0.02
alpha-BHC	0.01	Abamectin	0.1	Coumaphos	0.01	Flusilazole	0.02	*Parathion (20)	0.2	Tebuthiuron	0.02	Acenaphthylene	0.02
beta-BHC	0.01	Acephate (8)	0.5	Cyanazine	0.02	Formothion (50)	20	*Parathion-methyl (0.7)	0.5	Temephos (400)	0.02	Acenaphthene	0.02
delta-BHC	0.01	Alachlor	0.1	Cyproconazole	0.02	Fosetyl Aluminium	10	Pebulate	0.1	Terbacil	0.1	Fluorene	0.02
4,4'-DDD	0.01	Aldicarb	0.05	Cyprodinil	0.01	Haloxypol	0.1	Penconazole	0.01	Terbufos (0.9)	0.01	Phenanthrene	0.02
4,4'-DDE	0.01	Ametryn	0.01	Cyromazine	0.05	Hexaconazole	0.02	Pendimethalin	0.05	Terbutylazine	0.01	Anthracene	0.02
4,4'-DDT	0.01	Aminopyralid	0.1	Demeton-O	0.02	Hexazinone	0.02	Phorate	0.1	Terbutryn	0.01	Fluoranthene	0.02
Sum of DDD + DDE + DDT	0.01	Amitraz	100	Demeton-O & Demeton-S	0.02	Imazapyr	10	Pirimicarb	0.1	Tetrachlorvinphos (100)	0.01	Pyrene	0.02
Dieldrin	0.01	Atrazine	0.01	Demeton-S	0.02	Indoxacarb	0.1	*Pirimiphos-ethyl (0.5)	0.01	Tetraconazole	0.1	Benzo(a)anthracene	0.02
alpha-Endosulfan	0.01	Atrazine-desethyl	0.1	Demeton-S-methyl	0.02	Iodosulfuron methyl	0.1	Pirimiphos-methyl (90)	0.01	Thiamethoxam	0.02	Chrysene	0.02
beta-Endosulfan	0.01	Atrazine-desisopropyl	0.1	*Diazinon (4)	0.01	Irgarol	0.002	Prochloraz	0.1	Thiobencarb	0.01	Benzo(b+j)fluoranthene	0.02
Endosulfan sulfate	0.01	Azinphos-ethyl	0.02	Dichlobenil	0.1	Isoproturon	0.1	Profenofos (0.3)	0.01	Thiodicarb	0.01	Benzo(k)fluoranthene	0.02
Endosulfan (sum)	0.01	*Azinphos-methyl (30)	0.02	*Dichlorvos (5)	0.2	*Malathion (70)	0.02	Thiometon (4)	0.5	Triadimenol	0.1	Benzo(a)pyrene	0.005
Endrin	0.01	Azoxystrobin	0.1	Diclofop-methyl	0.05	Metolachlor	0.01	Propazine	0.01	Toltrazuril	0.5	Indeno(1,2,3-cd)pyrene	0.02
Endrin aldehyde	0.01	Bendiocarb	0.1	Difenoconazole	0.02	Metolachlor-M	0.1	Propachlor	0.1	Triadimefon	0.1	Dibenzo(a,h)anthracene	0.02
Endrin ketone	0.01	Benomyl	0.01	Diffubenzuron	0.1	Metalddehyde	10	Propamocarb	0.1	Triadimenol	0.1	Benzo(g,h,i)perylene	0.02
Heptachlor	0.005	Bensulfuron methyl	0.1	*Dimethoate (7)	0.02	Methidathion (6)	0.1	Propargite	0.1	Triazophos	0.005	Total PAH	0.005
Heptachlor epoxide	0.01	Bensulide	0.1	Diphenamid	0.1	Methiocarb	0.01	Propazine	0.01	Trichlorfon (7)	0.02	Benzo(a)pyrene TEQ (zero)	0.005
Hexachlorobenzene (HCB)	0.01	Boscalid	0.1	Disulfoton (4)	0.05	Methomyl	0.01	Propiconazole	0.05	Trichloronate	0.5		
gamma-BHC	0.01	Bromacil	0.02	Diuron	0.02	Metolachlor	0.01	Propyzamide	0.1	Trifloxystrobin	0.1		
Methoxychlor	0.01	*Bromophos-ethyl (10)	0.1	EPN	0.05	Metribuzin	0.02	Prothiofos	0.1	Trifloxysulfuron-sodium	0.1		
cis-Chlordane	0.01	Butachlor	0.1	EPTC	0.1	Mevinphos (5)	0.02	Pyraclostrobin	0.1	Trifluralin	10		
trans-Chlordane	0.01	Carbaryl	0.01	*Ethion (4)	0.02	Molinate	0.1	Pyrazophos (20)	0.1	Trixapac Ethyl	1		
Total Chlordane (sum)	0.01	Carbendazim	0.1	Ethoprofos (1)	0.01	*Monocrotophos (2)	0.02	Pyrimethanil	0.02	Vemolate	0.1		
Oxychlordane	0.01	*Carbofenthiol (0.5)	0.02	Etridiazole	0.5	Myclobutanil	0.1	Pyriproxyfen	0.1				
Total PCBs	0.1	Carbofuran	0.01	*Fenamiphos (0.5)	0.01	Naftalofos (NA)	1	Pyroxsulam	0.1				
Aroclor 1016	0.1	Carboxin	0.1	Fenarimol	0.02	Napropamide	0.1	Quinclorac	0.1				
Aroclor 1221	0.1	Carfentrazone-ethyl	0.1	Fenchlorphos (Ronnel) (NA)	10	Nitralin	0.1	Rimsulfuron	0.1				
Aroclor 1232	0.1	Chlorantraniliprole	0.1	Fenitrothion (7)	2	Norfurazon	0.1	Siduron	0.1				
Aroclor 1242	0.1	*Chlorfenvinphos (2)	0.02	Fenoxycarb	0.1	Novaluron	0.1	Simazine	0.02				
Aroclor 1248	0.1	Chloroxuron	0.1	Fensulfoton (10)	0.01	Omethoate (1)	0.01	Spirotetramat	0.1				
Aroclor 1254	0.1	*Chlorpyrifos (10)	0.02	*Fenthion (7)	0.05	Oxamyl	0.01	Sulfotep	0.005				
Aroclor 1260	0.1	Chlorpyrifos-methyl	0.1	Flamprop methyl	0.1	Oxyfluorfen	1	Sulprofos (10)	0.05				

WHAT CAN ALS DO TO HELP?

It is recognised that not every project is the same, and that different jurisdictions have varying testing requirements. For further information or a benchmarking of your current sampling bottles and testing compliance to guidelines or license requirements, please contact ALS customer services who will work through to optimise your sampling bottles to save you time, reduce your manual handling risk profile and hopefully assist your field team.

Please note: If in doubt – two 100ml bottles will be more than enough for these tests plus provide options for QC.

Please note that subject to your testing needs, some additional pesticides, herbicides and other specific organics can also be tested from the same 100mL bottle. These include;

- Metsulfuron methyl (Standard level method EP206 to 5µg/L)
- Fosamine (method EP235 to 0.2µg/L)
- Acrylamide (method EP233 to 0.1µg/L)
- Ethanolamines (method EP262 to 1µg/L)
- Select Phthalates etc (e.g. DEHP, DEHA depending on guideline needs)
- Specialist phenols including Bisphenol-A (method EP247 with LORs of 0.01 to 0.1µg/L)

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