



# WA Waste Classification

Analytical Guide 2018 Update



## WA Waste Classification and Definitions 2018 Analytical Guide 2018 Update

Eurofins | mgt offers a complete analytical service to support assessment of materials, for waste or reuse, in accordance with the Landfill Waste Classification and Waste Definitions 1996, as released by the Government of Western Australia (WA) Department of Water and Environmental Regulation (DWER) in April 2018, known as 'WA Waste'.

### Included in this update:

- Classification of per- and poly-fluoroalkyl substances (PFAS) Contaminated Wastes as 'Special Waste'
- Management of Construction and Demolition (C&D) Wastes, including Asbestos Containing Materials (ACM)
- Definitions of Clean Fill and Uncontaminated Fill as applicable to soils and aggregates

Further information about the April 2018 update to WA Waste can be found on the DWER website: <http://dwer.wa.gov.au>

## Types of Waste

Waste Type	Examples of Wastes	Landfill Type
Clean Fill	Raw excavated natural material, not processed or containing any other waste	Class I
Uncontaminated Fill	Wastes meeting the Uncontaminated Fill (UF) criteria per WA Waste Table 6 Type 1 wastes as assessed against CT (Class I) and Clean Fill (CF) Thresholds Neutralised Acid Sulfate Soils (meeting UF assessment criteria)	Class I
Inert Waste	Non-biodegradable non-hazardous waste C&D waste (free of Asbestos and PFAS)	Class I
Putrescible Waste	Readily bio-degradable materials Municipal or Office waste	Class II Class III
Hazardous Waste	Dangerous Goods Medical & Pharmaceutical waste Quarantine Goods	Class IV
Special Waste	Biomedical wastes Asbestos or ACM impacted wastes PFAS impacted wastes	Class IV (or as licenced)
Intractable Waste	Wastes for which Class IV not suitable and no means of destruction Radioactive waste	Class V

## Classification of Waste

Step 1	<p>Ensure an assessment is required</p> <p>Define the waste according to WA Waste Table 2 "Waste types"</p> <p>Consider contaminants of potential concern and any emerging contaminants (e.g. PFAS)</p> <p>If site history unknown, use DWER Contaminated Sites Guideline (Appendix B) to target COPCs from historical site use</p>
Step 2	<p>Assess the waste</p> <p>Collect representative samples in accordance with Section 6 of WA Waste document</p> <p>Determine the total concentration (CT) of target contaminants</p>
Step 3	<p>Compare to CT Criteria</p> <p>Assess analytical results against WA Waste Table 3 "CT values for waste not requiring leach testing" to provisionally classify waste according to highest category for any contaminant reported</p>
Step 4	<p>Determine Leachability</p> <p>If classification not acceptable, determine leachable concentration (ASLP) and concentration limit (CL) of relevant contaminants based on CT results and site history</p>
Step 5	<p>Compare to ASLP &amp; CL Criteria</p> <p>Assess analytical results against WA Waste Table 4 "ASLP and CL values for waste classification" to provisionally classify waste according to highest category for any contaminant reported</p>
Step 6	<p>Test Immobilised Waste against ASLP</p> <p>If classification not acceptable, immobilise and re-assess against WA Waste Table 4 ASLP criteria (not CL)</p> <p>Immobilised or encapsulated wastes may be re-classified one Class lower than previously assessed</p>

## Standard Analytical Approaches

Eurofins | mgt offer the following analytical options, tailored specifically for the requirements of WA Waste.

Being standardised, these suites may offer significant economy over selecting individual analytical tests or suites.

Suite	Typical Use
WA1 – Metals	Basic screen for when metals & metalloids are the only COPC
WA2 – Short	Short metals and hydrocarbons screen for typical contaminated sites
WA3 – Extended	Extended metals, hydrocarbons and pesticides screen
WA4 – Full	Full screen for when a range of unknown contaminants may be present
WA5 – UF	Total screen for the assessment of material as Uncontaminated Fill
PFAS (optional)	28 PFAS to QSM-5.1. Fully DWER and NEMP compliant. Used to accurately determine PFAS levels
ASLP-DI	Water extraction according to AS 4439.3 used to determine leachability of non- & semi-volatile contaminants
ASLP-ZHE	Zero-Headspace extraction according to AS 4439.2 used to determine leachability of volatile contaminants

Parameters	WA1	WA1 ASLP	WA2	WA2 ASLP	WA3	WA3 ASLP	WA4	WA4 ASLP	WA5	WA5 ASLP
pH	✓		✓		✓		✓		✓	
Metals & Metalloids	✓	DI								
Cr(VI)	✓	DI								
Volatile Organics			✓	ZHE	✓	ZHE	✓	ZHE	✓	ZHE
TRH (NEPM)			✓		✓		✓		✓	DI
Total PAH			✓		✓		✓		✓	
TRH (Aii/Aro)					✓		✓			
Total PCB					✓		✓		✓	
OC Pesticides					✓		✓		✓	DI
Inorganics					○		✓	DI	✓	DI
Total Phenols							✓	DI	✓	DI
Total Cresols							✓	DI		DI
Acid Herbicides							✓	DI		
Solvent Screen							✓			
Benzo[a]pyrene (trace)							✓	DI		DI
PAH Priority 16 & TEQ									✓	DI
Nutrients										DI
Asbestos			○		○		✓		✓	
PFAS			○	○	○	○	○	○	○	○

✓ = Included | ○ = Optional

Optional Analyses	PFAS to Freshwater Ecology Levels, including PFOS to 0.0001µg/L
	Total Oxidisable Precursors, TOP Assay, to determine unforeseen PFAS legacy
	Total Organo Fluorine, TOF, to determine anthropogenic fluorine compounds across large programs
	Other Emerging Contaminants: e.g. 1,4-Dioxane, GenX, Microplastics, Nanomaterials
	Gross α & β radioactivity, Naturally Occurring Radioactive Materials (NORM)

Please Note: Assessment of Uncontaminated Fill should be undertaken in accordance with the following sampling specifications:

Sampling	For Aggregates: According to AS 1141, Method 3.1 or 3.2 For Stockpiles: According to ASC-NEPM, Schedule B2, Section 7.5 For Soils: According to IWRG702 (EPA Victoria)	→ minimum 3 samples, up to 1 per 800 tonnes → minimum 3 samples, up to 1 per 25m <sup>3</sup> → minimum 3 samples, up to 1 per 25m <sup>3</sup>
Testing	Undertaken by laboratory holding NATA Accreditation for the testing CoPC determined from site history and list of Potentially contaminating industries (DWER, 2014)	

# Revised Waste Classification

## Class 1 Analytes and Assessment Criteria

Solids Parameters	CT1 mg/kg	CL1 mg/kg	LOR mg/kg
<b>Metals &amp; Metalloids</b>			
Arsenic, As	14	500	2
Beryllium, Be	2	100	2
Cadmium, Cd	0.4	100	0.2
Lead, Pb	2	1500	2
Mercury, Hg	0.2	75	0.1
Molybdenum, Mo	10	1000	5
Nickel, Ni	4	3000	4
Selenium, Se	2	50	2
Silver, Ag	20	180	0.2
Chromium VI	10	500	1
<b>Other Metals</b>			
Al, Ba, B, Co, Cu, Mn, V, Zn	5wt%		5–10
<b>Inorganics</b>			
CN (total)	16	2500	5
CN (amenable)	7	1250	5
Fluoride	300	10000	20
<b>Volatile Organics</b>			
Benzene	0.2	18	0.1
Toluene	160	518	0.1
Ethylbenzene	60	1080	0.1
Xylenes (sum)	120	1800	0.3
Styrene	6	108	0.1
<b>Recoverable Hydrocarbons</b>			
TRH C <sub>6</sub> -C <sub>9</sub>	2800		20
TRH C <sub>10</sub> -C <sub>35</sub> (aliphatic)	28000		100
TRH C <sub>10</sub> -C <sub>35</sub> (aromatic)	450		100
<b>Semi-Volatile Organics</b>			
Benzo[a]Pyrene	-	5	0.5
Total PAH (USEPA, x16)	100		0.5
Total Phenols (non-halogen)	28.8	42500	20
Total Cresols (sum)	400	7200	0.5
Total PCB	50		0.1
<b>Pesticides</b>			
OC Pesticides (ANZECC)	50		0.1
<b>Acid Herbicides</b>			
2,4-D	0.02	360	0.1
<b>Physical Attributes</b>			
pH (pH units)	5.5–8.5		0.1pHu
<b>Physical Contaminants</b>			
Asbestos (AS:4964) <sup>2</sup>	< 0.01 wt%		
<b>PFAS</b>			
PFAS Soil (28 compounds)	-		0.0005
Total Organo Fluorine (TOF)	-		0.05

Leachate Parameters	ASLP <sup>1</sup> µg/L	LOR µg/L
<b>Metals &amp; Metalloids</b>		
Arsenic, As	500	1
Beryllium, Be	100	1
Cadmium, Cd	100	0.2
Lead, Pb	100	1
Mercury, Hg	10	0.1
Molybdenum, Mo	500	5
Nickel, Ni	200	1
Selenium, Se	500	1
Silver, Ag	1000	5
Chromium VI	500	1
<b>Other Metals</b>		
Al, Ba, B, Co, Cu, Mn, V, Zn	5wt%	1–50
<b>Inorganics</b>		
CN (total)	800	5
CN (amenable)	350	5
Fluoride	15000	500
<b>Volatile Organics</b>		
Benzene	10	1
Toluene	8000	1
Ethylbenzene	3000	1
Xylenes (sum)	6000	3
Styrene	300	1
<b>Semi-Volatile Organics</b>		
Benzo[a]Pyrene	0.1	0.1
Total Phenols (non-halogen)	1440	100
Total Cresols (sum)	20000	2
<b>Acid Herbicides</b>		
2,4-D	300	1
<b>PFAS</b>		
PFAS Soil (28 compounds)	-	0.001
PFAS Trace + Ultra-Trace PFOS	-	0.0001
Total Organo Fluorine (TOF)	-	0.1

Please Note:

1. Leaching in accordance with AS 4439 using Reagent Water
2. Asbestos assessment in accordance with DWER Guidelines for C&T Waste Recycling Facilities.

Detailed description in the use and application of the CT and corresponding ASLP and CL threshold criteria can be found in the WA Waste document

Class 1 levels are shown for information purposes and may not reflect site-specific circumstances.

# New Uncontaminated Fill Assessment Criteria

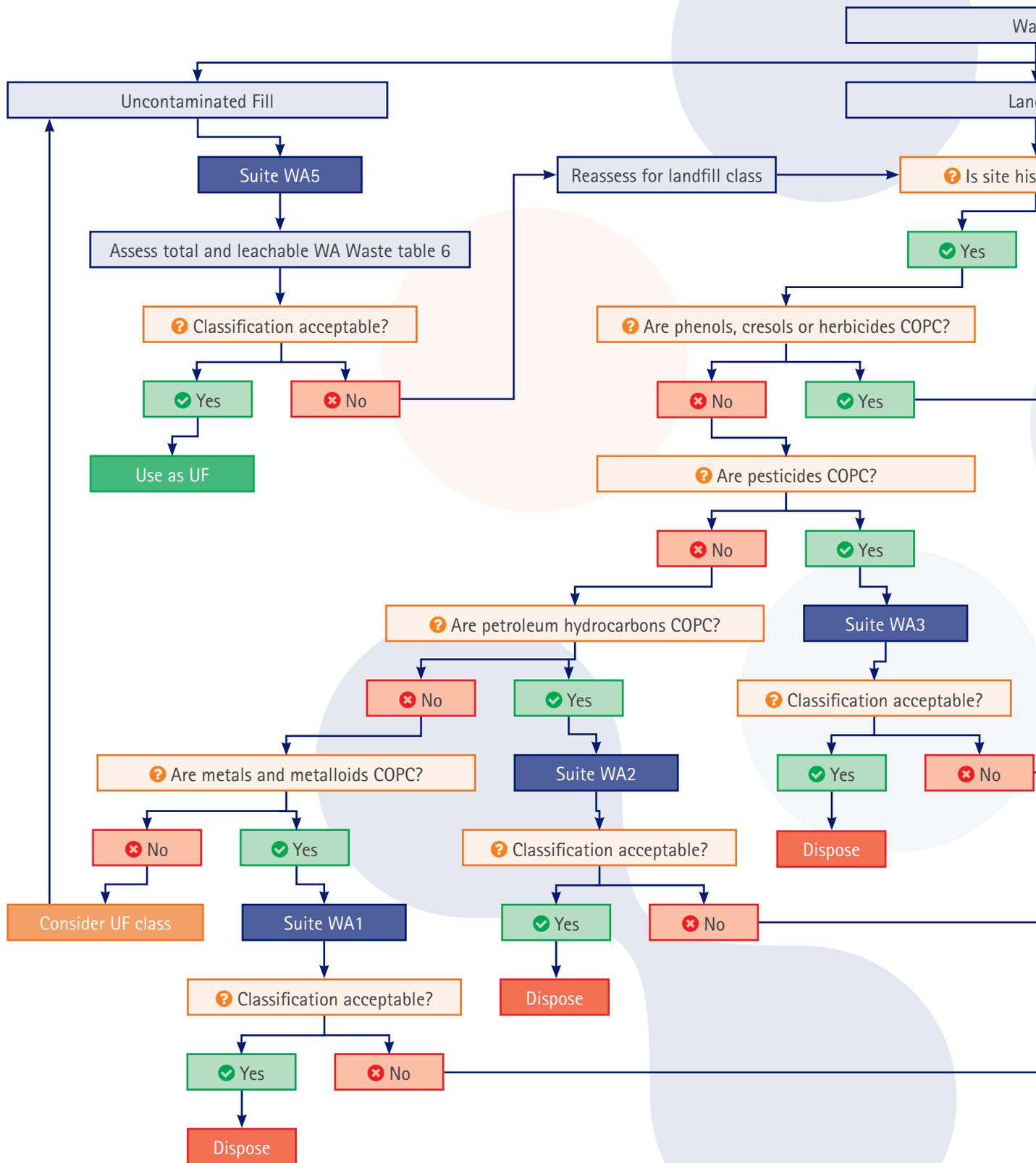
WA5 Parameters	UF Total mg/kg	LOR mg/kg
<b>Metals &amp; Metalloids</b>		
Antimony, Sb	20	10
Arsenic, As	20	2
Barium, Ba	200	10
Beryllium, Be	2	2
Cadmium, Cd	1	0.4
Chromium, Cr	1	1
Chromium VI	1	1
Chromium III (calc.)	30	1
Cobalt, Co	15	5
Copper, Cu	50	5
Lead, Pb	110	5
Manganese, Mn	500	5
Mercury, Hg	0.5	0.1
Molybdenum, Mo	40	5
Nickel, Ni	10	5
Selenium, Se	1	1
Silver, Ag	20	0.2
Thallium, Tl	1	1
Tin, Sn	50	10
Uranium, U	25	10
Vanadium, V	25	10
Zinc, Zn	50	5
<b>Inorganics</b>		
Sulfate, SO <sub>4</sub> <sup>2-</sup>	2500	10
Fluoride, F	400	20
Total Cyanide	50	5
Complexed Cyanide	50	5
Free Cyanide	10	5
<b>Volatile Organics</b>		
Benzene	0.5	0.1
Toluene	10	0.1
Ethyl benzene	2	0.1
Xylenes (sum)	2	0.1
TRH (C6-C10)	45	20
<b>Semi-Volatile Organics</b>		
TRH (>C10-C16)	25	25
TRH (>C16-C34)	300	100
TRH (>C34-C40)	2800	100
Naphthalene	3	0.5
Benzo[a]pyrene	1	0.5
PAHs (TEQ, x8) <sup>3</sup>	3	4
Total PAH (USEPA, x16)	300	8
Phenol	1	0.5
PCBs	1	0.1
<b>Pesticides</b>		
DDT+DDD+DDE (sum)	3	0.1
<b>Physical Attributes</b>		
pH (pH units)	5.5-8.5	0.1 pHu
<b>Physical Contaminants</b>		
Asbestos (WA DoH) <sup>2</sup>	< 0.001 wt%	< 0.001 wt%

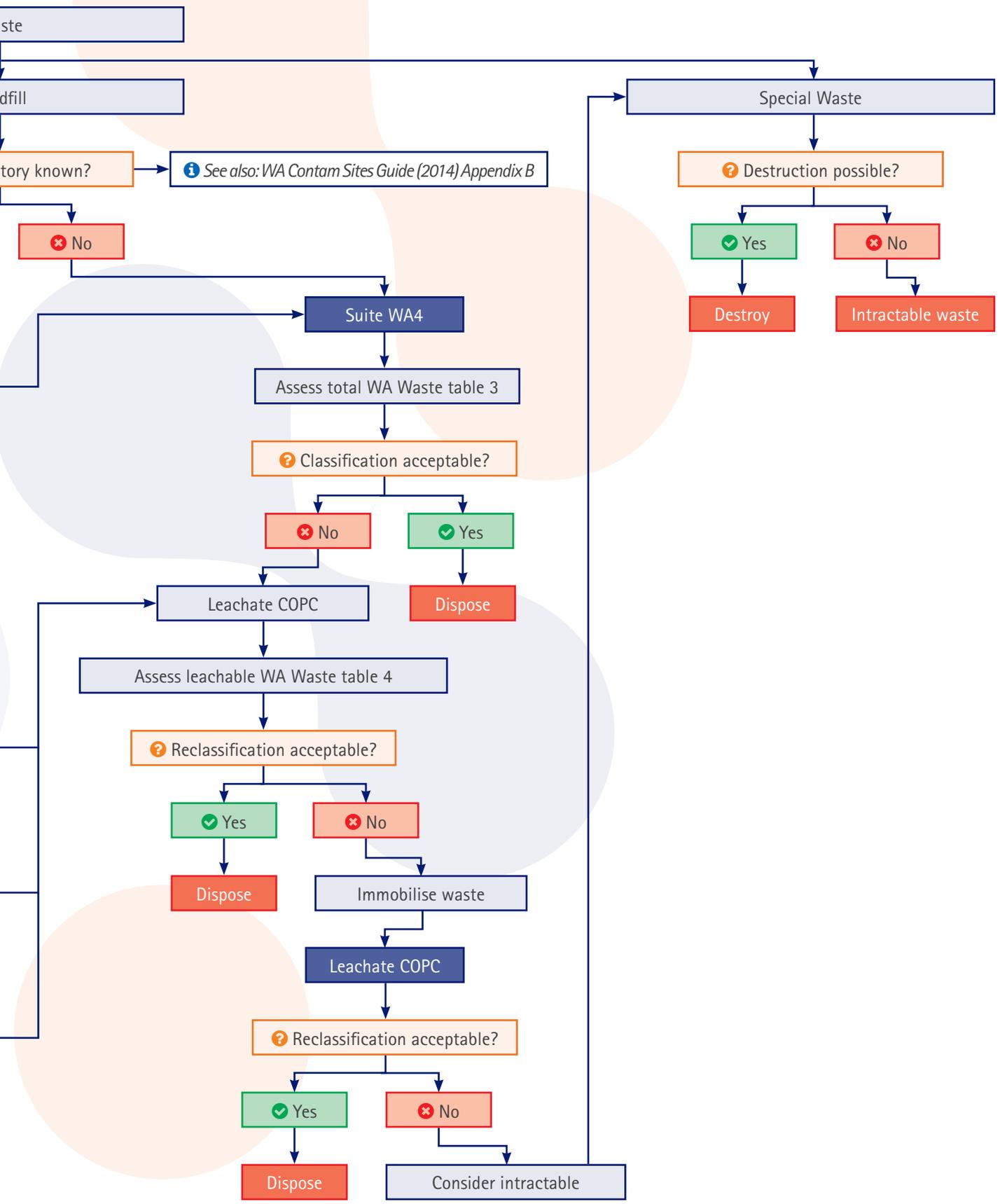
WA5-ASLP Parameters	UF Leach <sup>1</sup> µg/L	LOR µg/L
<b>Metals &amp; Metalloids</b>		
Antimony, Sb	3	1
Arsenic, As	10	1
Cadmium, Cd	0.2	0.2
Chromium, Cr	1	1
Chromium VI	1	1
Chromium III (calc)	10	10
Cobalt, Co	1	1
Copper, Cu	1	1
Lead, Pb	3	1
Manganese, Mn	500	5
Mercury, Hg	0.05	0.05
Molybdenum, Mo	35	5
Nickel, Ni	10	1
Selenium, Se	5	1
Silver, Ag	0.05	0.5
Thallium, Tl	0.8	0.5
Uranium, U	0.5	0.1
Zinc, Zn	10	1
<b>Inorganics</b>		
Fluoride, F	120	100
Total Cyanide	5	5
<b>Nutrients</b>		
Ammonia, NH <sub>3</sub> as N	400	10
Total Nitrogen, TN	2000	200
Total Phosphorus, TP	200	50
<b>Volatile Organics</b>		
Benzene	1	1
Toluene	180	1
Ethyl benzene	5	1
Xylenes (sum)	600	1
<b>Semi-Volatile Organics</b>		
Naphthalene	15	1
Benzo[a]pyrene	0.01	0.01
Phenol	320	10
Cresols (sum)	2	1
<b>Pesticides</b>		
Aldrin	0.001	0.001
Dieldrin	0.01	0.001
DDT	0.006	0.001
DDE	0.03	0.001
Other pesticides	< ADWG <sup>4</sup>	

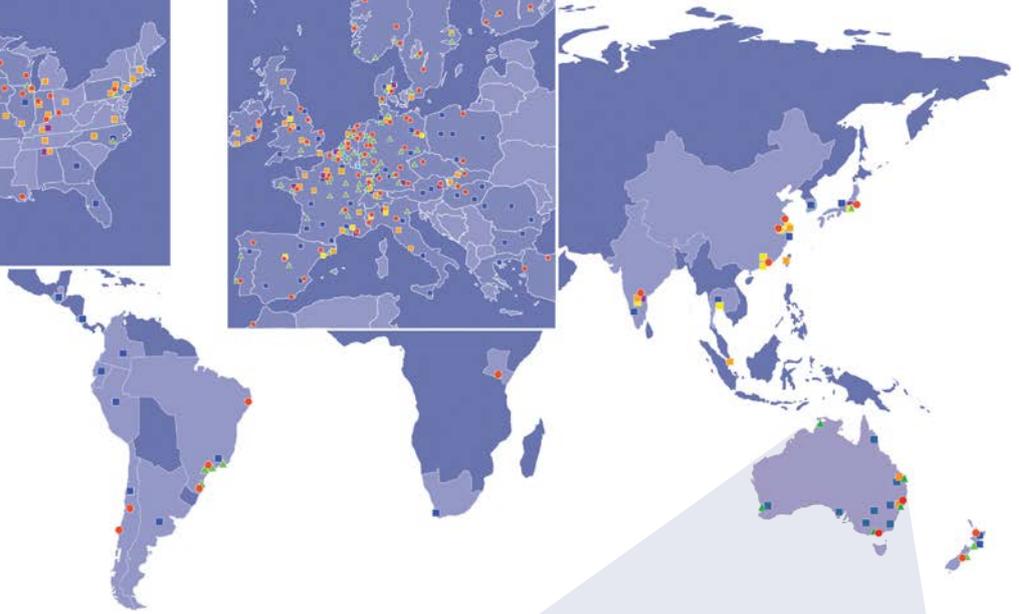
Please Note:

1. Leaching in accordance with AS 4439 using Reagent Water
2. Asbestos assessment in accordance with DWER Guidelines for C&T Waste Recycling Facilities.
3. PAH Toxicity Equivalence Quotient (TEQ) calculated from individual Toxicity Equivalence Factor (TEF) of 8 carcinogenic PAHs
4. Australian Drinking Water Guideline (2011, as current), compounds relevant to site history

# What to do with the waste?







Laboratories and Support Offices

- Food and feed testing
- BioPharma services
- Agrosience services
- Genomic and forensic services
- Consumer product testing
- ▲ Environment testing
- ◆ Corporate offices

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