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MINIMUM REQUIRED PERFORMANCE LEVELS FOR DETECTION OF *PROHIBITED SUBSTANCES*

In order to ensure that all *WADA*-accredited Laboratories can report the presence of *Prohibited Substances*, their *Metabolite(s)* or their *Marker(s)* in a uniform way, a minimum routine detection capability for testing methods has been established. It is recognized that some Laboratories will be able to identify a wider range or lower concentrations of *Prohibited Substances* than other Laboratories. While such individual capabilities are encouraged in order to improve the overall system, it is also recognized that there are Minimum Required Performance Levels (MRPL) at which all Laboratories shall operate.

The MRPL is an analytical parameter of technical performance with which the Laboratories shall comply when testing for the presence of a particular *Prohibited Substance*, its *Metabolite(s)* or *Marker(s)*. The MRPL is not a threshold, nor is it a limit of detection (LOD) or a limit of quantification (LOQ). *Adverse Analytical Findings* may result from concentrations below the MRPL listed in the table.

The following table lists general requirements for detection of concentrations of representative substances in the classes of *Prohibited Substances* and, where applicable, specific exceptions.

Minimum Required Performance Levels

Prohibited Class	Specific Examples / Exceptions	Concentration
Stimulants[a,b]		0.5 µg/mL
	Strychnine	0.2 µg/mL
Narcotics[a]		0.2 µg/mL
	Buprenorphine	10 ng/mL
	Fentanyl (and derivatives)	10 ng/mL
Exogenous Anabolic Agents*[b]		10 ng/mL
	Clenbuterol	2 ng/mL
	Methandienone[c]	2 ng/mL
	Methyltestosterone[d]	2 ng/mL
	Stanozolol[e]	2 ng/mL
Peptide Hormones, Growth Factors and Related Substances** [f]	Aromatase inhibitors, SERMs and other anti-estrogenic substances	50 ng/mL
β_2-agonists		100 ng/mL
β-blockers[a]		0.5 µg/mL
Diuretics[g]		0.25 µg/mL
Glucocorticosteroids[h]		30 ng/mL
Peptide Hormones	hCG	5 mIU/mL

[a] For a Non-Threshold Substance prohibited in-competition only, it is not recommended that Laboratories report below 10% (1/10th) of the MRPL.

[b] For the parent compound or metabolite(s).

[c] 17β-methyl-5β-androst-1-ene-3α,17α-diol.

[d] 17α-methyl-5β-androstane-3α,17β-diol.

[e] 3'-hydroxystanozolol.

[f] Formestane findings less than 100 ng/mL shall be supported by an IRMS analysis.

[g] For thiazides: metabolites and/or degradation compounds.

[h] For glucocorticosteroids, Laboratories are not to report below the MRPL.

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Laboratories shall routinely detect substances at and above the concentrations given in the above table.

Test methods shall also reliably establish the presence of Threshold Substances at concentrations greater than the threshold taking into account measurement uncertainty. The thresholds are listed in the table below.

Thresholds

Compound	Threshold
Carboxy-THC [a]	> 15 ng/mL
Cathine [b]	> 5 µg/mL
Ephedrine	> 10 µg/mL
Epitestosterone*** [c]	> 200 ng/mL
Methylephedrine	> 10 µg/mL
Morphine [d,e]	> 1 µg/mL
19-norandrosterone*** [c]	> 2 ng/mL
Pseudoephedrine	> 150 µg/mL
Salbutamol [d,f]	> 1 µg/mL
T/E ratio	> 4:1***

[a] 11-nor-delta 9-tetrahydrocannabinol-9-carboxylic acid.

[b] Cathine at a urinary concentration greater than the threshold constitutes an *Adverse Analytical Finding* unless it is determined to be the result of the administration of pseudoephedrine.

[c] Threshold adjusted only if specific gravity above 1.020.

[d] The threshold concentration is based on the sum of the glucuronide conjugate (expressed as the free drug) and free drug concentrations.

[e] Morphine at a urinary concentration greater than the threshold constitutes an *Adverse Analytical Finding* unless it is determined to be the result of the administration of a permitted substance such as codeine.

[f] Salbutamol shall only be reported if detected at a concentration greater than the threshold.

* In extremely rare individual cases, boldenone of endogenous origin can be consistently found at very low nanograms per milliliter (ng/mL) levels in urine. When such a very low concentration of boldenone is reported by a Laboratory and the application of any reliable analytical method (e.g. IRMS) has not determined the exogenous origin of the substance, further investigation may be conducted by subsequent test(s).

** Unless the *Athlete* can demonstrate that the concentration was due to a physiological or pathological condition, a *Sample* will be deemed to contain a *Prohibited Substance* (as listed above) where the concentration of the *Prohibited Substance* or its metabolites and/or relevant ratios or markers in the *Athlete*'s *Sample* satisfies positivity criteria established by *WADA* or otherwise so exceeds the range of values normally found in humans that it is unlikely to be consistent with normal endogenous production.

If a Laboratory reports, using a reliable analytical method, that the *Prohibited Substance* is of exogenous origin, the *Sample* will be deemed to contain a *Prohibited Substance* and shall be reported as an *Adverse Analytical Finding*.

*** Where an anabolic androgenic steroid is capable of being produced endogenously, a *Sample* will be deemed to contain such *Prohibited Substance* and an *Adverse Analytical Finding* will be reported where the concentration of such *Prohibited Substance* or its metabolites or markers and/or any other relevant ratio(s) in the *Athlete*'s *Sample* so deviates from the range of values normally found in humans that it is unlikely to be consistent with normal endogenous production. A *Sample* shall not be deemed to contain a *Prohibited Substance* in any such case where an *Athlete* proves that the concentration of the *Prohibited Substance* or its metabolites or markers and/or the relevant ratio(s) in the *Athlete*'s *Sample* is attributable to a physiological or pathological condition.

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In all cases, and at any concentration, the *Athlete*'s *Sample* will be deemed to contain a *Prohibited Substance* and the Laboratory will report an *Adverse Analytical Finding* if, based on any reliable analytical method (e.g. IRMS), the Laboratory can show that the *Prohibited Substance* is of exogenous origin. In such case, no further investigation is necessary.

Where the T/E ratio is greater than 4.0 and an IRMS (or other reliable analytical method) has not revealed evidence of exogenous administration of a *Prohibited Substance*, no further collections or analyses are required. When an IRMS analysis (or other reliable analytical method) has not been performed, and a minimum of 3 previous results are not available, further collections and analyses shall be performed by the relevant anti-doping organization. At any time relevant anti-doping organizations may conduct any additional investigations as they deem appropriate in assessing an atypical sample.