WATERS — Conventional PFAS and trifluoroacetic acid (TFA)

TDE qualification criteria | 10 November 2026 | Environmental validation through monitoring

1. Purpose and approach

This document defines two separate TDE qualification criteria: (A) the sum of conventional PFAS determined in the reference analytical panel; and (B) trifluoroacetic acid (TFA), to be measured separately. Concentrations in water are expressed in ng/L for conventional PFAS and in µg/L for TFA. The TDE values are conventional criteria, not regulatory or toxicological limits.

2. Conventional PFAS — TDE thresholds

Sum of PFAS (ng/L)	TDE assessment
X < 20	TDE — direct acceptance
20 ≤ X ≤ 50	Integrated assessment and comparison with other indicators
X > 50	TDE exclusion

The sum must be calculated using a fixed, explicitly declared panel, excluding TFA. To allow comparison with the regulatory “Sum of PFAS” parameter, the sum of the 20 compounds listed in the EU Directive is proposed; any additional analytes determined must be reported separately. This calculation approach must be stated explicitly in the laboratory test report.

Within the intermediate range, findings from water, sentinel plants, earthworms, mosses where available, and the hydrogeological context are assessed together; TDE status is not granted automatically. Compliance with any applicable legal limits remains a separate and overriding requirement.

3. PFAS analytical panel

The panel includes the 20 PFAS covered by the European “Sum of PFAS” parameter and two additional analytes (PFTeDA and FOSA). The availability of analytical methods and their limits of quantification (LOQs) must be verified for the specific water matrix.

Abbreviation	Substance	Use in protocol
PFBA	Perfluorobutanoic acid	EU Σ20
PFPeA	Perfluoropentanoic acid	EU Σ20
PFHxA	Perfluorohexanoic acid	EU Σ20
PFHpA	Perfluoroheptanoic acid	EU Σ20
PFOA	Perfluorooctanoic acid	EU Σ20
PFNA	Perfluorononanoic acid	EU Σ20
PFDA	Perfluorodecanoic acid	EU Σ20

PFUnDA	Perfluoroundecanoic acid	EU Σ20
PFDoDA	Perfluorododecanoic acid	EU Σ20
PFTrDA	Perfluorotridecanoic acid	EU Σ20
PFTeDA	Perfluorotetradecanoic acid	Additional
PFBS	Perfluorobutanesulfonic acid	EU Σ20
PFPS	Perfluoropentanesulfonic acid	EU Σ20
PFHxS	Perfluorohexanesulfonic acid	EU Σ20
PFHpS	Perfluoroheptanesulfonic acid	EU Σ20
PFOS	Perfluorooctanesulfonic acid	EU Σ20
PFNS	Perfluorononanesulfonic acid	EU Σ20
PFDS	Perfluorodecanesulfonic acid	EU Σ20
PFUnDS	Perfluoroundecanesulfonic acid	EU Σ20
PFDoDS	Perfluorododecanesulfonic acid	EU Σ20
PFTrDS	Perfluorotridecanesulfonic acid	EU Σ20
FOSA	Perfluorooctanesulfonamide	Additional

The panel lists 22 individual compounds (the 20 in the EU group plus PFTeDA and FOSA) and a sum parameter for the four priority PFAS: PFOA, PFOS, PFNA and PFHxS. Compliance with the applicable Italian regulatory value for these four must also be checked separately, without confusing this check with the TDE threshold for the sum of 20.

4. TFA — separate criterion

TFA is an ultrashort-chain PFAS that is highly mobile and is also found in precipitation as a result of atmospheric transport and precursor transformation. TFA must be determined separately and must not be included in the sum defined in Section 2.

Trifluoroacetic acid (µg/L)	TDE assessment
X < 2	TDE — direct acceptance
2 ≤ X ≤ 5	Integrated assessment and comparison with other indicators
X > 5	TDE exclusion

Rationale: NAQUA data show TFA generally below 0.6 µg/L at Alpine and pre-Alpine sites above 1,000 m, whereas concentrations between 1 and 5 µg/L are common in areas with extensive cultivation. Widespread atmospheric deposition means that a low-level detection cannot be interpreted as proof of local use. The proposed thresholds balance selectivity and realism and require field validation.

5. Application and precautions

Results should preferably refer to untreated waters that are hydrogeologically representative of the TDE area: springs, local groundwater and, where necessary, irrigation water actually used. Always specify the sampling point, contributing catchment, date, matrix, analyte list, LOQs and summation method.

For sums, use the calculation approach specified by the laboratory, distinguishing values below the LOQ and declaring the treatment adopted (for example, lower bound). Do not automatically compare sums calculated using different panels. TDE limits do not replace legislation on water intended for human consumption or applicable environmental standards.

6. References

Directive (EU) 2020/2184, Annex I, Part B: “Sum of PFAS” parameter (20 substances). https://eur-lex.europa.eu/eli/dir/2020/2184/oj?locale=it

Italian Legislative Decree No. 18/2023, as amended (Legislative Decree No. 102/2025): parameters for water intended for human consumption, including PFAS and TFA. https://www.normattiva.it/

Swiss Federal Office for the Environment (FOEN), NAQUA programme: PFAS and TFA in Swiss groundwater. https://www.bafu.admin.ch/

Clarification of analytical scope. For comparison with regulatory reference values, calculate the sum of the 20 EU PFAS separately from the two additional analytes PFTeDA and FOSA and from TFA. The summed concentration of the four priority compounds (PFOS, PFOA, PFNA, PFHxS) must always be reported and checked against the applicable Italian parameter, which is distinct from the voluntary TDE threshold for Σ20. The two TDE thresholds (Σ20 in ng/L and TFA in µg/L) must not be added together.