Table 1. A selection of turbidity literature references illustrating the ambiguity associated with the assignment of scattering-regime nomenclature to the actual scattering-angle.

	Scattering-regime and scattering-angle referenced in the text.		
Reference	**Transmitted**	**Back-scattered**	**Forward-scattered**
Agrawal et al. (2008)	*Implied 0°*		<10°
Bilro et al. (2010)	180°		
Campbell et al. (2005)		180°	
Fugate & Friedrichs (2002)		Angle not defined	
Green & Boon (1993)		>150°	
Guillén et al. (2000)		Angle not defined	
Gumprecht & Sliepcevich (1953)	Angle not defined		
Jansson (1992)	*Implied 0°*		12°
Morais et al. (2006)	Angle not defined		
Pavanelli & Bigi (2005)		90°	
Sadar (2004, Fig.4, p.8)	180°		
Sadar (2004, Fig.5, p.9)	*Implied 0°*	140°	
Xu (1997)		Angle not defined	
Yang & Hogg (1979)	Angle not defined		

Table 2. Units of Measurement for Turbidity Sensors, after USGS website (USGS 2013).

Units of Measurement for Turbidity Sensors		
	Wavelength of Light Source	
	White or broadband: peak spectral output of 400-680 nm	**Infrared, monochromatic: typical output in 780-900 nm range**
Single Illumination Beam Light Source		
90° to incident beam; single detector	**Nephelometric Turbidity Unit (NTU)**[a]	**Formazin Nephelometric Unit (FNU)**[b]
90° and other angles; multiple detectors; instrument algorithms use combination of detector readings and ratio techniques	Nephelometric Turbidity Ratio Unit (NTRU)	Formazin Nephelometric Ratio Unit (FNRU)
30°±15°to incident beam (backscatter)	Backscatter Unit (BU)	Formazin Backscatter Unit (FBU)
30°±15° and other angles; multiple detectors; instrument algorithms use combination of detector readings and ratio techniques	Backscatter Ratio Unit (BRU)	Formazin Backscatter Ratio Unit (FBRU)
0° to incident beam (attenuation)	Attenuation Unit (AU)	Formazin Attenuation Unit (FAU)
Multiple Illumination Beam Light Source		
90° and possibly other angles; multiple detectors; instrument algorithms use combination of detector readings	Nephelometric Turbidity Multibeam Unit (NTMU)	Formazin Nephelometric Multibeam Unit (FNMU)

[a] **NTU:** limited to instruments that comply with EPA Method 180.1.

[b] **FNU:** pertains to instruments that comply with ISO 7027, the European drinking-water protocol. This includes many of the most commonly used submersible turbidimeters.

Table 3. Summary of turbidity test methods after Ziegler (2003), where NTU are nephelometric turbidity units, FTU are formazin turbidity units, and FAU are formazin attenuation units.

Characteristic	**USEPA Method180.1 (non-ratio mode)**	**ISO Method 7027 (diffuse radiation)**	**ISO Method 7027 (attenuated radiation)**	**GLI Method 2**
Use of data	Drinking water	Drinking water	Wastewater	Drinking water
Range of method	0-40 NTU (dilution permitted)	0-40 FTU (dilution permitted)	40-4000 FAU	0-40 NTU (dilution permitted)
Light source	Tungsten lamp	Photodiode	Photodiode	Photodiode
Wavelength	400-600 nm	860 nm	860 nm	860 nm
Spectral bandwidth	Not specified	60 nm	60 nm	60 nm
Detector orientation measurement angle	90° ± 30°	90° ± 2.5°	90° ± 2.5°	Two sources, two detectors at 90° ± 2.5°
Aperture angle	Not specified	20°-30°	20°-30°	Unknown
Path length	Less than 0.1 m	Less than 0.1 m	Less than 0.1 m	Less than 0.1 m
Primary standards	Formazin polymer	Formazin polymer	Formazin polymer	Formazin polymer
Secondary standards	Polymer microspheres	Polymer microspheres	Polymer microspheres, cubes, or filaments	Polymer microspheres

Table 4. Stability of formazin standards, after Buzoianu (2000).

Formazin standard concentration	**Stability duration**
> 400 NTU	1 year
20 – 400 NTU	1 month
2 – 20 NTU	12 – 24 hours
< 2 NTU	<= 1 hour
<= 1 NTU	Difficult to prepare accurately