ARIZONA DEPARTMENT OF HEALTH SERVICES

PREPAREDNESS

Turbidity

Nephelometric Method

Fall 2016

AZPDES/APP Permit Field Method Training

ADHS Approved Methods

Turbidity, NTU

- A2 **180.1 (2.0)**
- C **2130B (2011)**

General Items

- Sample hold time is 48 hours
  - If analyze within 15 minutes can be exempt (in-line meters are immediate) and perform testing at plant
  - If do not analyze in-lab samples within 15 minutes must use a licensed lab or become licensed

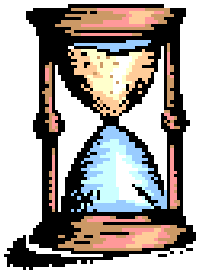

TABLE 2020:II. SUMMARY OF ONGOING QUALITY CONTROL FOR METHODS IN PART 2000

	Section	Calibrate or Standardize	QCS	MB	LFB	Duplicates	LFM
2120B	Color	×	×	–	–	×	–
2120C		×	×	–	–	×	–
2120D		×	×	–	–	×	–
2120E		×	×	–	–	×	–
2120F		×	×	–	–	×	–
2130B	Turbidity	×	×	–	–	–	–
2150B	Odor	–	–	×	–	–	–
2160B	Taste	–	–	×	–	–	–
2170B	Flavor Profile Analysis	–	–	×	–	×	–
2310B	Acidity	×	×	×	×	×	–
2320B	Alkalinity	×	×	×	×	×	–
2340C	Hardness	×	×	×	×	×	–
2350B	Oxidant Demand/ Requirement	–	–	×	–	–	–
2350C		–	–	×	–	–	–
2350D		–	–	×	–	–	–
2350E		–	–	×	–	–	–
2510B	Conductivity	×	×	–	×	×	–
2520B	Salinity	×	×	–	×	×	–

Calibration Requirements

- Both methods require calibration per manufacturer's instructions.
- Continuous turbidity monitors can be calibrated per SM 2130B, 4.d by determining turbidity of the water flowing out of them using a laboratory model nephelometer.

  -grab sample near the in-line probe, comparing the results and adjusting the in-line meter.

6.1 Maintenance Schedule

(Example Cleaning Procedure – 1720E)

Maintenance Task	Frequency
Clean the sensor	Before each calibration and as needed. Depends on sample characteristics.
Calibrate Sensor (as required by regulatory agency)	Per agency-dictated schedule.

Scheduled periodic maintenance requirements of the 1720E are minimal and include calibration and cleaning of the photocell window, bubble trap, and body. Check and clean the bubble trap and turbidimeter body (as described in section 6.4.2) if visual inspection shows that it is necessary. Perform other maintenance on a regular basis; experience will dictate scheduling and may depend on the installation, sample type, and season.

It is very important to maintain the cleanliness of the interior and exterior of the turbidimeter body, head assembly, the integral bubble trap, and the surrounding area. Doing so will ensure accurate, low-level turbidity measurements.

Clean the turbidimeter body before performing any calibration or wet verification (especially when measurements are being made at 1.0 NTU or lower).

Check and/or perform a calibration periodically (as experience dictates) using one of the methods described in section 5.5 on page 16. A calibration history menu option is available under Sensor Setup/Calibrate.

http://www.hach.com/hc/view.file.categories.invoker/FILCAT_MAN_TURBS-PARTICLE-1720_SERIES/NewLinkLabel=1720+Series+Process+Turbidimeter+Manuals/SESSIONID%7CBE1UTXhNREEwTXpZME1UVTBOaVpuZFdWemRFUkZUZz09QTFoYQ==%7C

Calibration Requirements

Laboratory Nephelometers

- Both methods require at least one standard in the range of interest (180.1, 10.1 & 2020B, 2b).
  - Primary Standard – Stabilized formazin or styrene divinylbenzene polymers, beads (AMCO-AEPA-1).
  - Secondary Standard - Commercially prepared, stabilized sealed liquid or gel turbidity standards (Gelex).

(limit range for accuracy)

Routine Analysis of Samples

Laboratory Nephelometers

- Calibration check **(1.0-5.0 NTU)**
  - Instrument Performance Check (IPC) can be a 1° or 2° standard (180.1, 9.3.2 & 2130B, 3b & d).
  - Each day of testing (180.1, 9.3.2 & 2020B, 2b).
  - Within ±10% recovery (180.1, 9.3.2 & 2020B, 2b)
- Calibration Blank: turbidity free (180.1, 9.3.1 & 2020B, 2b).
- QCS: Annual Blind Sample

Types of Calibration Checks

1° - 1.0 NTU or Dilute

2° - 1.0 NTU

TABLE IB
RECLAIMED WATER MONITORING - CLASS A[17]

Sampling Point Number	Sampling Point Identification		Latitude	Longitude
5	Sample point for final effluent and reclaimed water		35° 13' 29.25" N	111° 33' 16.18" W
Parameter	**DL[18]**	**Units**	**Sampling Frequency**	**Reporting Frequency**
E. coli[19]: Single-sample maximum	15	CFU[20]	Daily[21]	Quarterly
E. coli: Four (4) of last seven (7) samples	Non-detect[22]	CFU	Daily Evaluation	Quarterly
Turbidity[23]: Single reading	5.0	NTU[24]	Daily[25]	Quarterly
Turbidity: 24-hour average[26]	2.0	NTU	Daily Calculation	Quarterly

[23]Turbidimeter shall have a signal averaging time not exceeding 120 seconds. Occasional spikes due to back-flushing or instrument malfunction shall not be considered an exceedance. All exceedances must be explained and submitted to the Department with the corresponding quarterly SMRF.

[24]NTU = Nephelometric Turbidity Units

[25]For the single turbidity reading, report the maximum reading during the 24-hour period when the reclaimed water pumps are running.

[26]The 24-hour average is a rolling average when the reclaimed water pumps are running.

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Field Video Demonstration