EPD Air Quality Corner – Data

The Environmental Protection Department, Air Quality section has been collecting samples and data on the mercury levels in our rainwater since September of 2022. This information is being made accessible through the Winnebago Tribe of Nebraska's website at https://winnebagotribe.com/ . From the home page visitors can navigate the pull down boxes, **Services** > **Environmental Protection** > **Air Quality Program,** to find the **Air Quality** page. Here, visitors will find links, helpful tips, and the latest data collected from future air quality monitoring projects. Currently the site sharing the lab results from the Mercury Wet Deposition sampling station. Below is a guide on how to read and understand the data results.

SampleID	SiteID	SampleStart	SampleEnd	SVol	Precip (in)	Type	Hg (ng/L)	Notes	QR	QR Notes
M2203194	NE25	9/27/2022 13:24	10/5/2022 9:40	64.9	0.24	W	10.91	d	B	
M2203242	NE25	10/5/2022 10:08	10/11/2022 9:42	-3.8	0	D		dz	B	
M2203411	NE25	10/11/2022 9:48	10/25/2022 8:52	0.3	0	D		dmh	B	
M2203478	NE25	10/25/2022 8:52	11/1/2022 8:48	101.2	0.32	W	9.83	q	B	
M2203560	NE25	11/1/2022 8:48	11/8/2022 5:31	30.8	0.11	W	8.27	dq	B	
M2203827	NE25	11/8/2022 5:36	11/15/2022 8:37	170	0.56	W	29.67	dhl	C	lab error
M2203739	NE25	11/15/2022 8:37	11/22/2022 8:38	-5	0.01	W		zv	C	Sample/Rain gage

Hg (ng/L)

≥ 18.0	
14.0	
10.0	
6.0	
2.0	
0	

figure 1.

Mercury in nano grams per liter of water.

- **SampleID** – lab sample numbering system
- **SiteID** – name of the site
- **SampleStart** – date and time the sample was deployed.
- **SampleEnd** – date and time the sample was collected.
- **SVol** – the volume of liquid collected in the sample bottle in milliliters.
- **Precip (in)** – total inches of precipitation collected during the sample cycle.
- **Type** – D = Dry, W= Wet.
- **Hg (ng/L)** – mercury level found in the collected volume of the sample bottle.
- **Notes** – Lab notes.
- **QR** – Quality Rating (confidence level of data's accuracy).

The Notes and the Quality Rating (QR) play a major role in the data quality of each sample. The MDN Notes and Quality Rating Codes chart describes the meaning of each Notes code applied to a sample result then applies and QR rating of A, B or C. An A QR means the sample is valid. If it's a **B** QR rating it is Valid but with minor issues but otherwise still accepted. But a QR of C means the sample was invalidated. For example let's look at Sample M2203827. It was given a QR of C. The Notes shows the codes dhl. The MDN Notes chart below describes this as:

D(d) = visible debris was found in the sample. This lowered the QR to **B**.

H(h) = sample handling issue from one or more issues. This also lowered the QR to B.

L(l) = Laboratory error. This brings the QR code to C making the entire sample invalid.

This is why the invalid C samples are marked in red. Samples with a C are ignored when determining the overall average mercury (Hg) levels.

The Hg (ng/L) column are sometimes marked in yellow, orange or nothing, denoting the level of mercury when compared to the meter in figure 1.

There is typically a 6-9 month lag time between lab results to current field samples. The Lab is located in Madison Wisconsin and is part of the University of Wisconsin in connection with the National Atmospheric Deposition Project (NADP). We are part of a nationwide network of monitors. Once a yearly report is made from all the data to determine the concentrations of mercury being observed. This data is also included in the air quality webpage along with maps.

MDN Notes and Quality Rating Codes

	MDN Sample Condition Codes	
Notes	**Description**	**QR Code[1]**
b	Bulk sample (sample exposed the whole time)	C
c	Contaminated sample	C
d	Visible debris in sample	B
e	Extended sampling period (> 360 hours/15 days)	C
f	Field protocol error - Serious problems in field operations that compromise sample integrity OR - Extended field hold time = Sample receipt > 60 days after OFF date	C

h	Sample handling issue
	- Handling contamination in the field
	- Significant leakage upon receipt in the lab OR
	- Extended sampling/field/lab hold times
	   ○ Sampling period > 194 hrs/8 days, 2hrs and ≤ 360 hrs/15days
	   ○ Sample receipt > 16 days and ≤ 60 days after OFF date
	   ○ Lab analysis > 60 days from BrCl preservation
		B

i	Low volume sample (sample volume < 10ml)	B
l	Laboratory error (major handling problems in lab)	C
m	Missing data	B
n	No sample submitted	C
p	Precipitation value unknown (no precipitation data from rain gage or alternate source)	C
q	Minor quality control issue	B
u	Undefined sample (sample exposed for at least 6 hours without precipitation)	C
v	Precipitation amount indicates sufficient sample for analysis, but insufficient sample in bottle. (undercatch; sample volume < 1.5ml or sample volume is < 10% of rain gage precipitation amount)	C
z	Site operation issue (min temp < 32, max temp > 120 deg. F)	B

[1]Quality Rating (QR) Code Definitions:
A – Valid data
B – Valid data with minor issues
C – Invalid data