

Data Validation- Level II - PM_{2.5}

Objective: The 2st level data review process is conducted by section specialist or engineers or at a smaller district, a site operator. The 2nd level data reviewers are responsible for reviewing the work done by the field technician and to ensure that station calibration functions are operating properly.

- 1) Review the December 2013 Hourly BAM data provided from the Sacramento Del Paso Manor (DPM). Identify the data points you would invalidate based on the objective as a level II reviewer.

Provide the date, time, reason, and null code

Date	Time	Reason	Null Code

- 2) Initial the QC Check sheet with a date
- 3) Fill out the Data Validation Form

Answer the following questions:

- 1) What did you check as a second level reviewer?

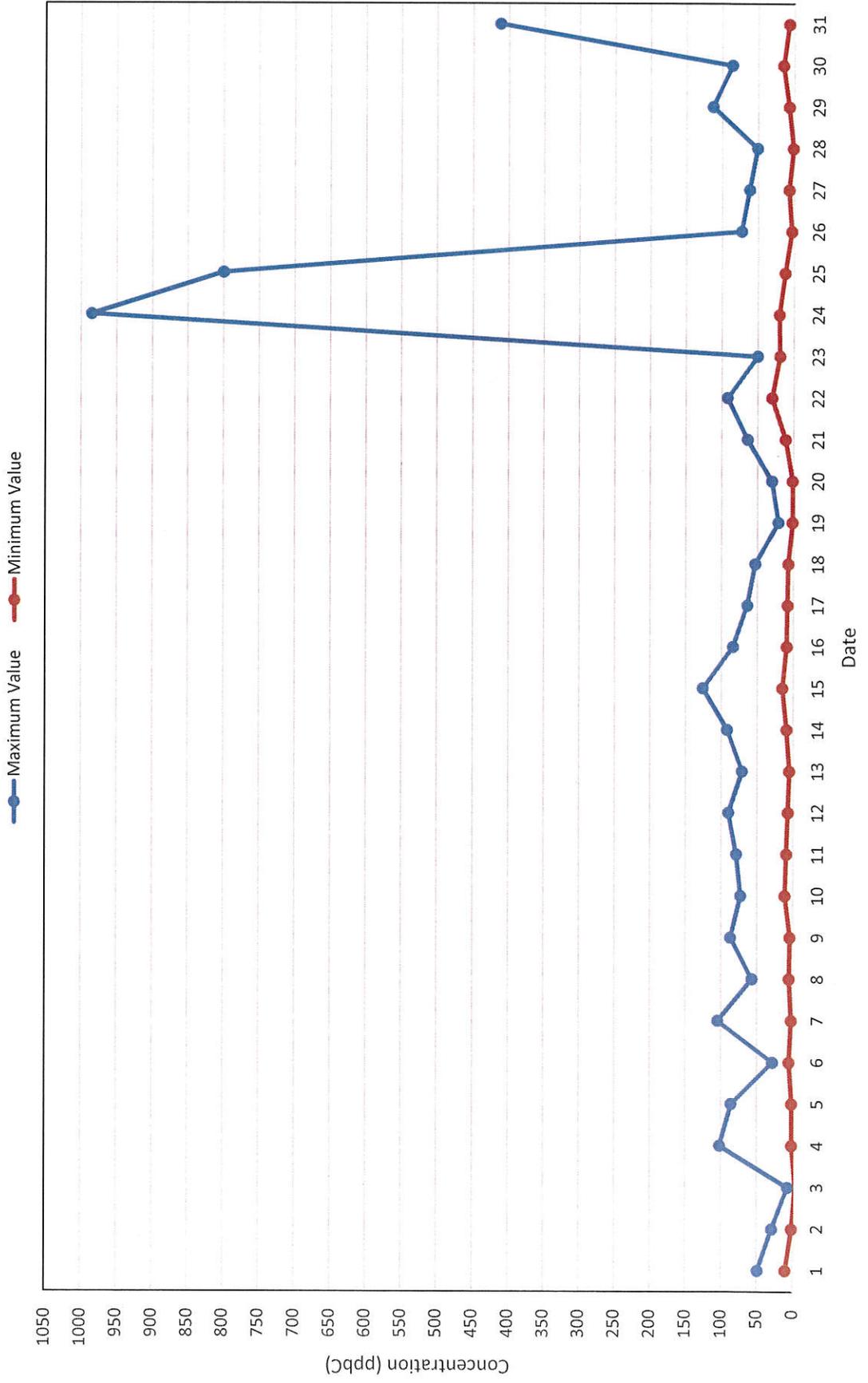
- 2) What are some of the statistics you can use to validate the data?

- 3) What is the main objective of the Level II reviewer in plain language?

- 4) Did you run into any challenges as a level II reviewer?

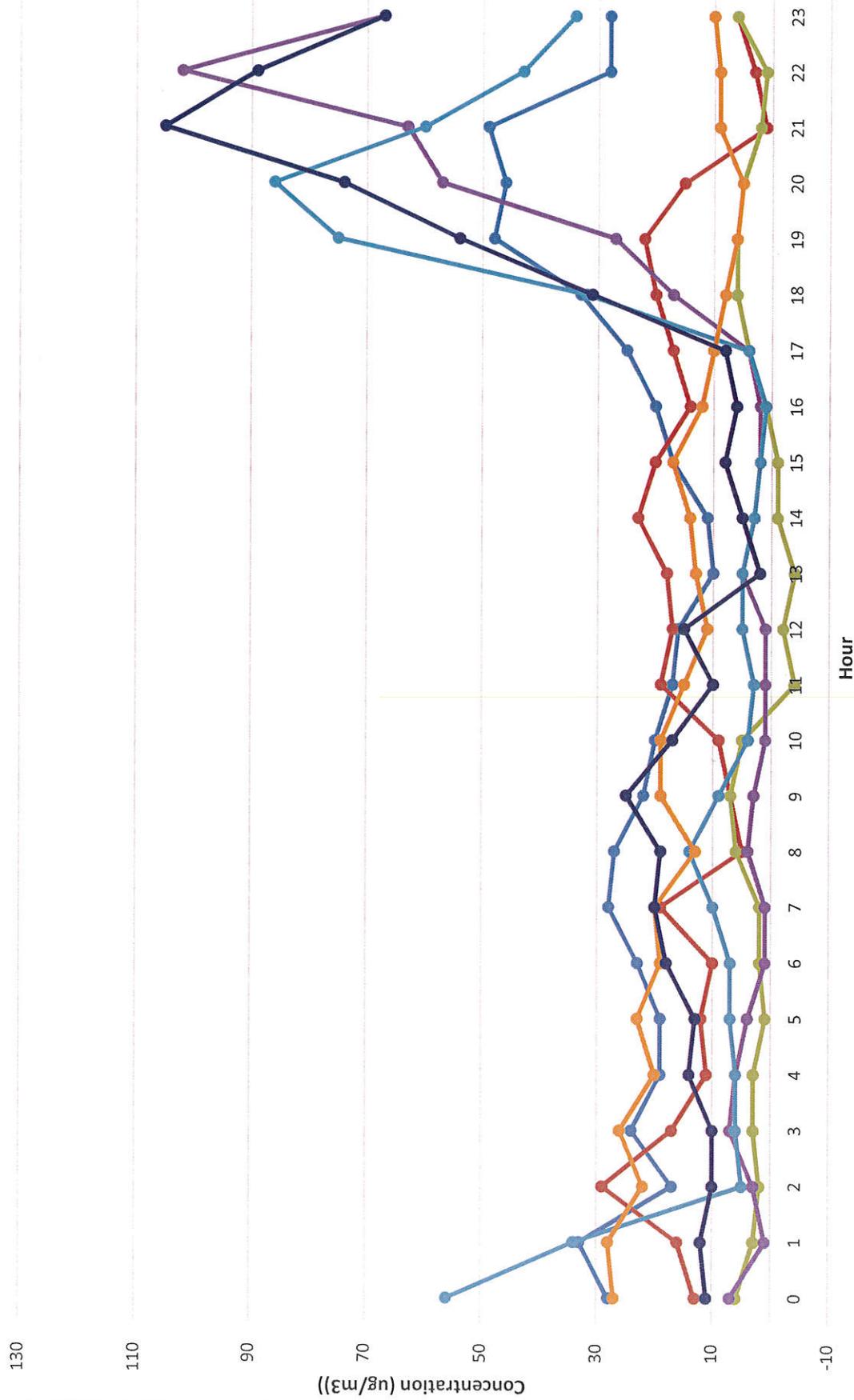
- 5) What was helpful for your validation that the Level I reviewer provided

Del Paso Manor Daily PM_{2.5} Max. Concentrations December 2013

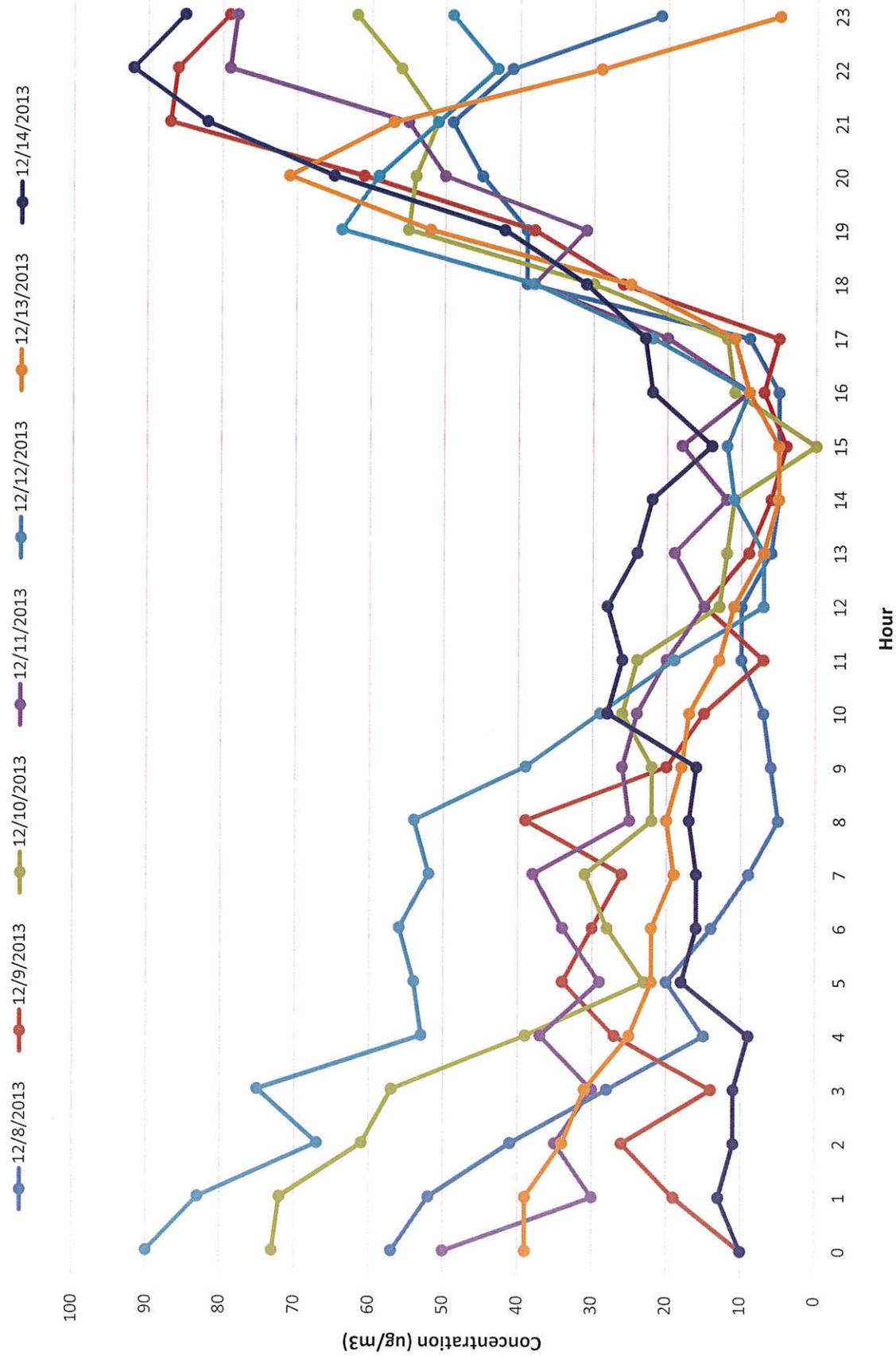


Del Paso Manor PM2.5 Concentrations Time Series December 2013-Week 1

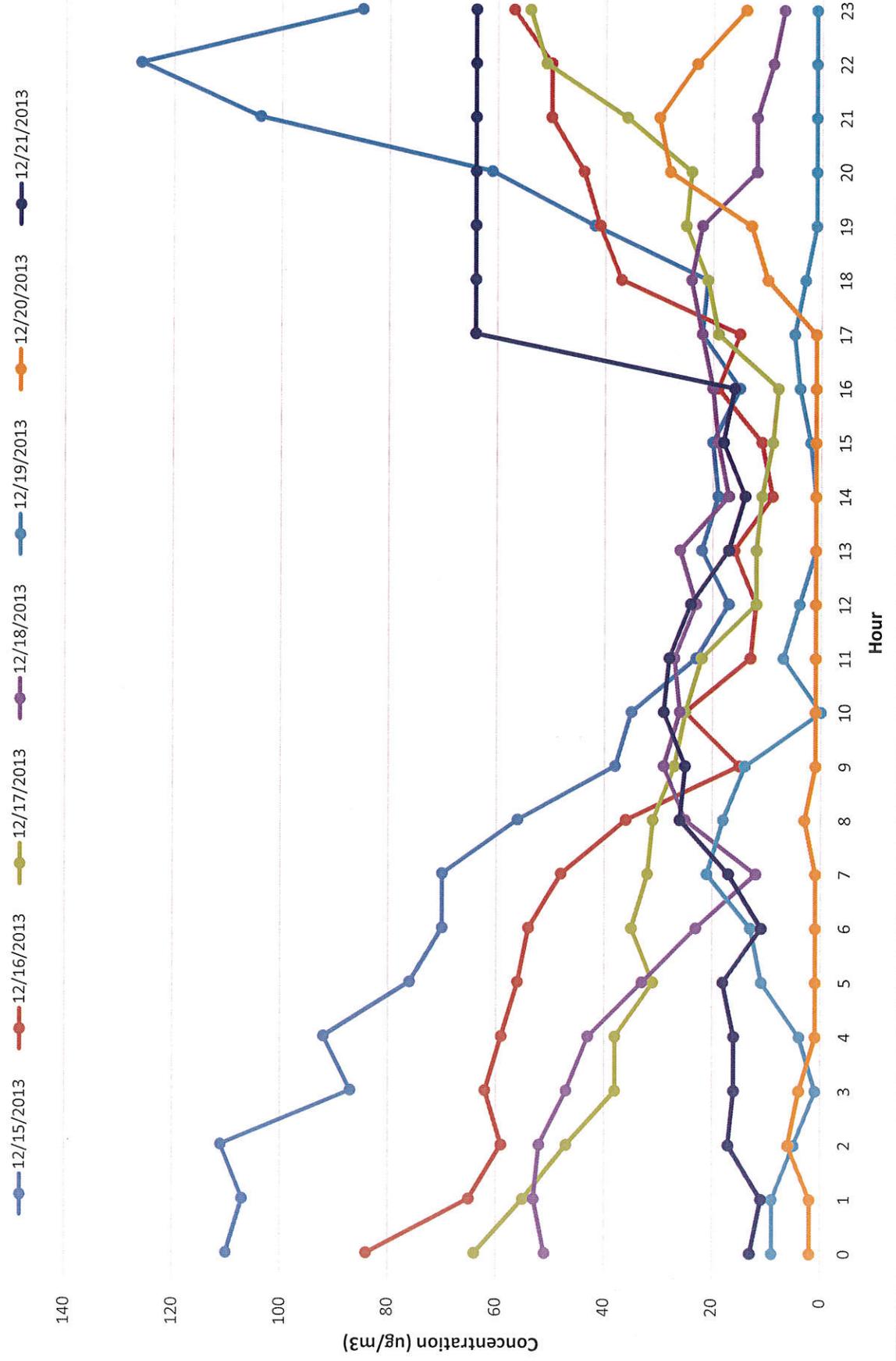
12/1/2013 12/2/2013 12/3/2013 12/4/2013 12/5/2013 12/6/2013 12/7/2013



Del Paso Manor PM2.5 Concentrations Time Series December 2013-Week 2

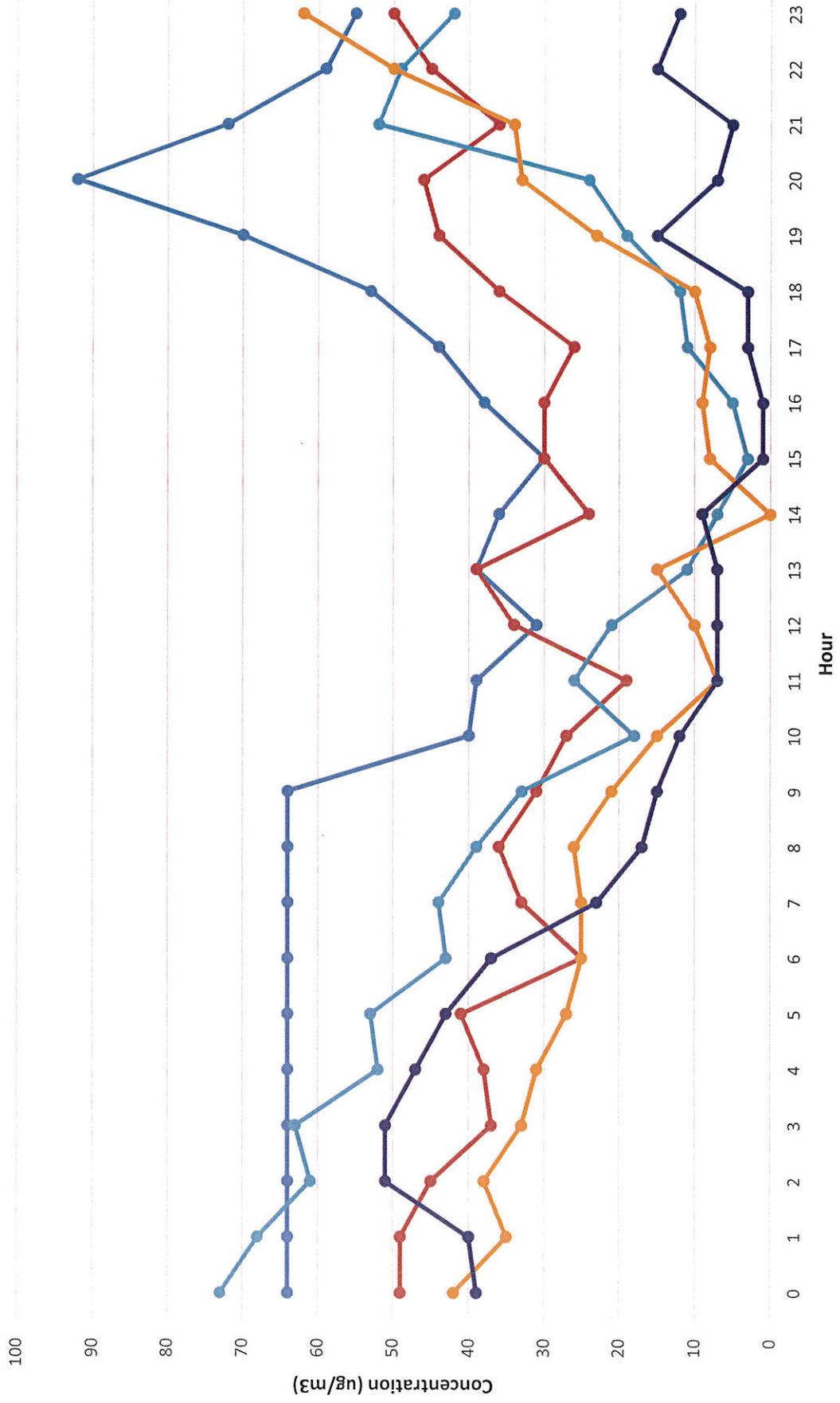


Del Paso Manor PM2.5 Concentrations Time Series December 2013-Week 3



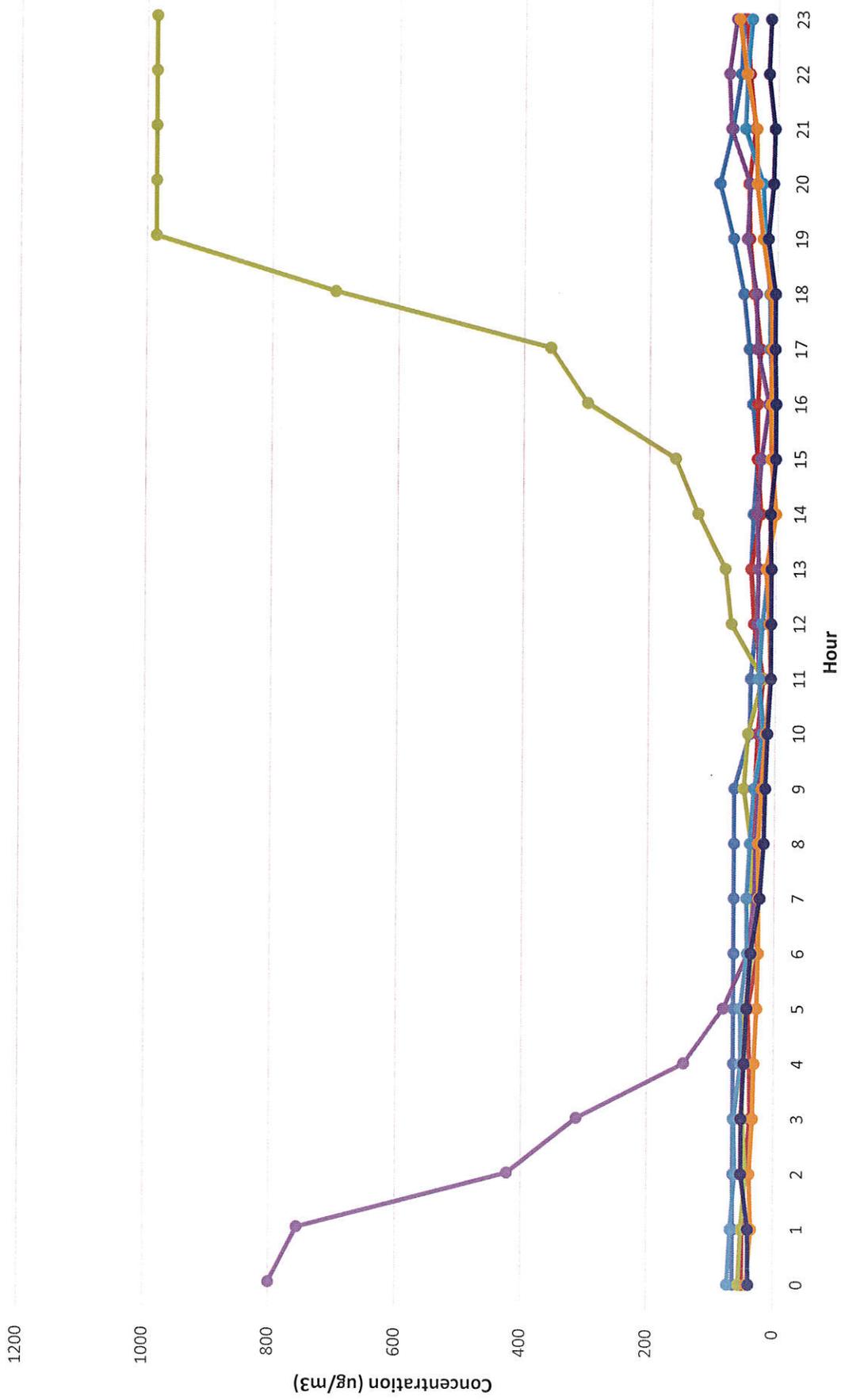
Del Paso Manor PM2.5 Concentrations Time Series December 2013-Week 4 (except Dec24-Dec25)

12/22/2013 12/23/2013 12/26/2013 12/27/2013 12/28/2013



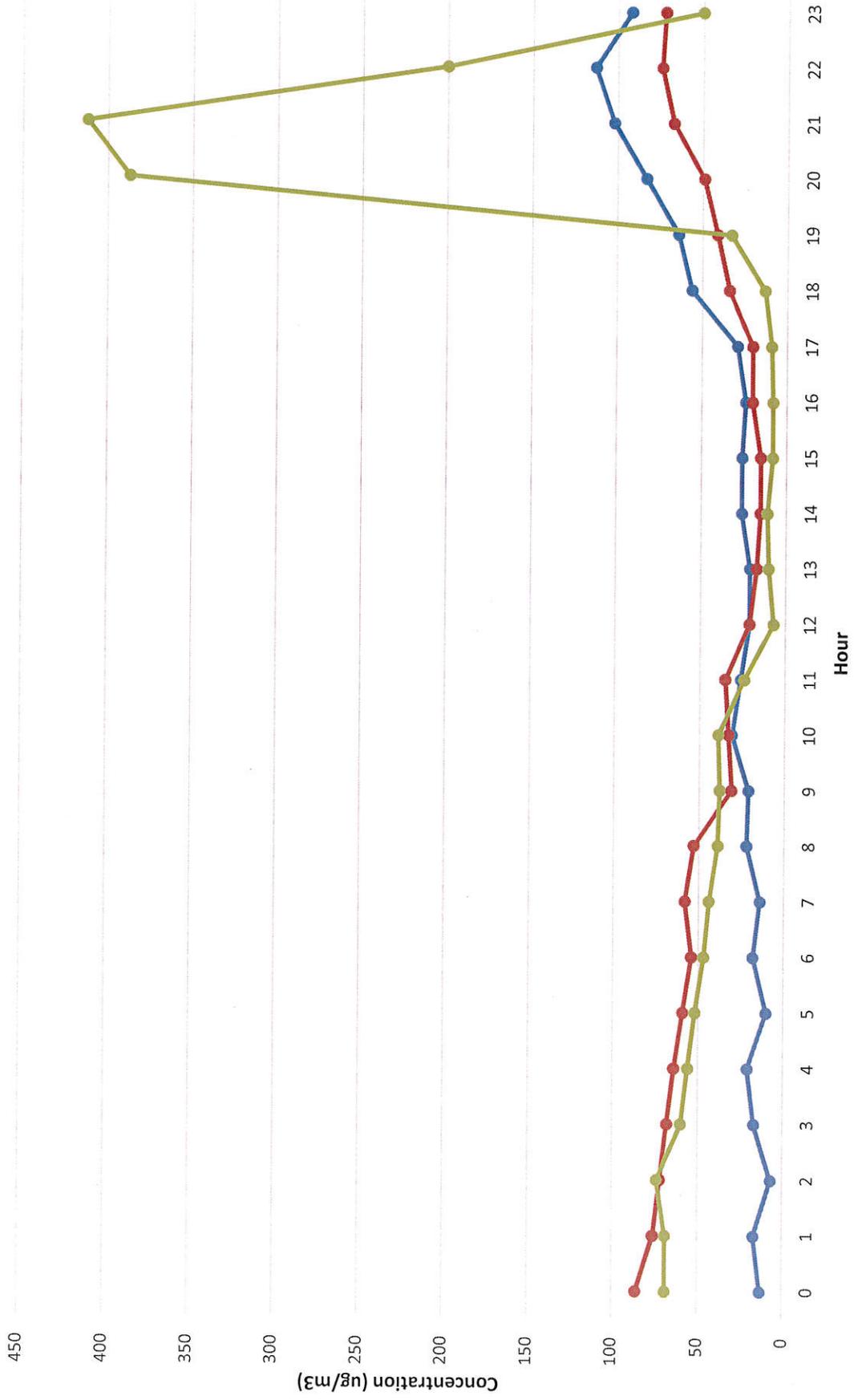
Del Paso Manor PM2.5 Concentrations Time Series December 2013-Week 4

12/22/2013 12/23/2013 12/24/2013 12/25/2013 12/26/2013 12/27/2013 12/28/2013



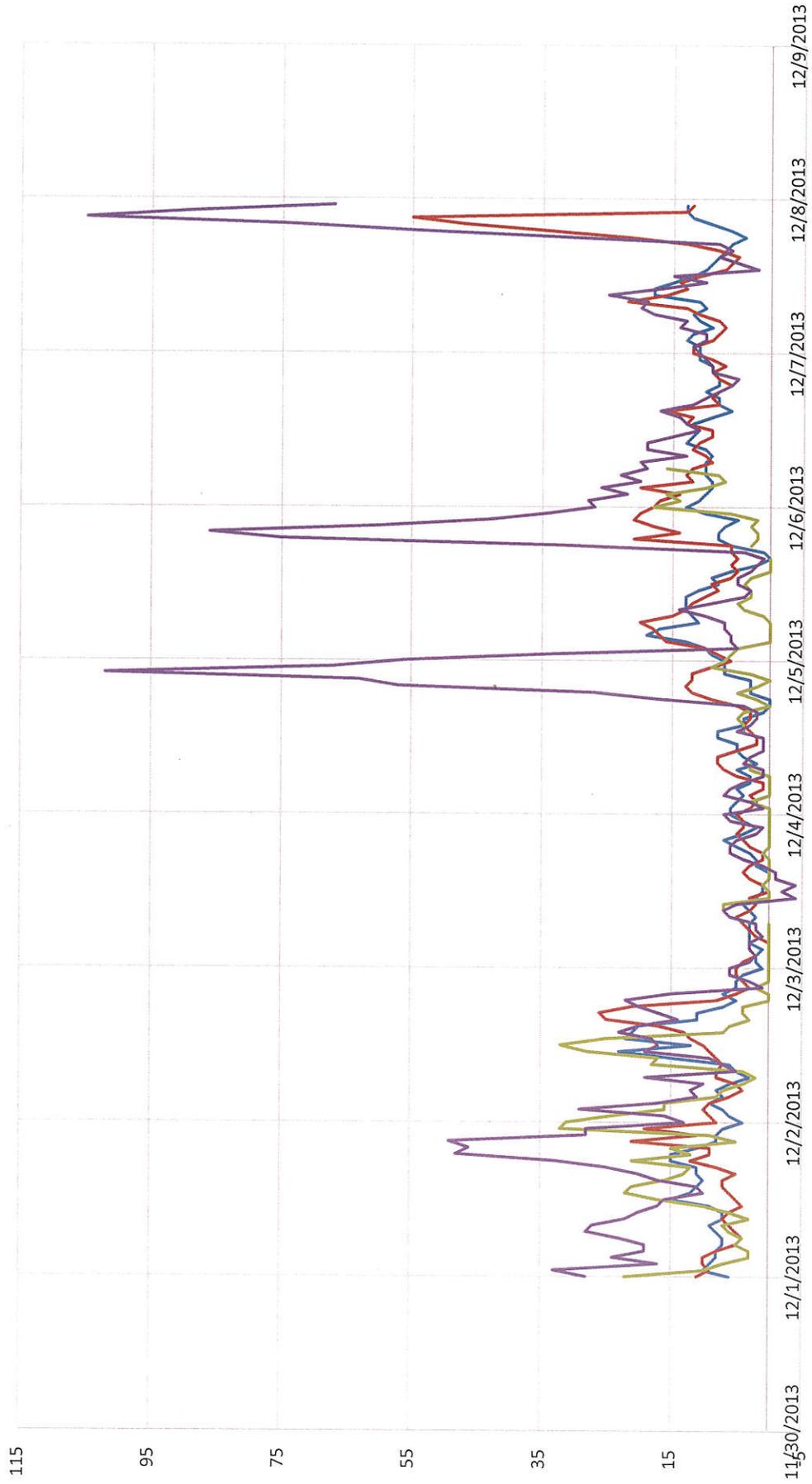
Del Paso Manor PM2.5 Concentrations Time Series December 2013-Week 5

—●— 12/29/2013 —●— 12/30/2013 —●— 12/31/2013

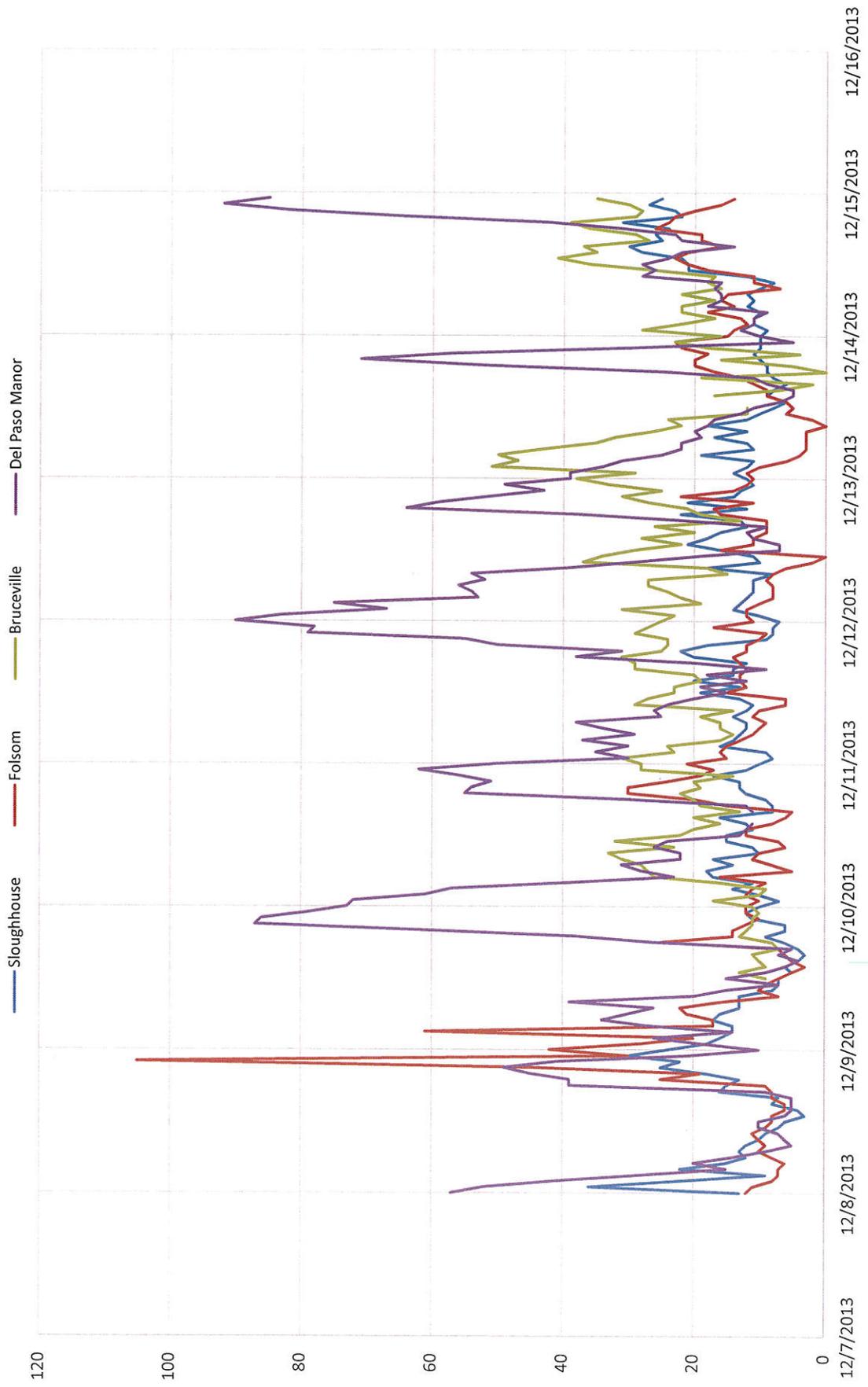


Multi-site Hourly Trends for PM2.5 December 2013 - Week 1

— Sloughhouse — Folsom — Bruceville — Del Paso Manor

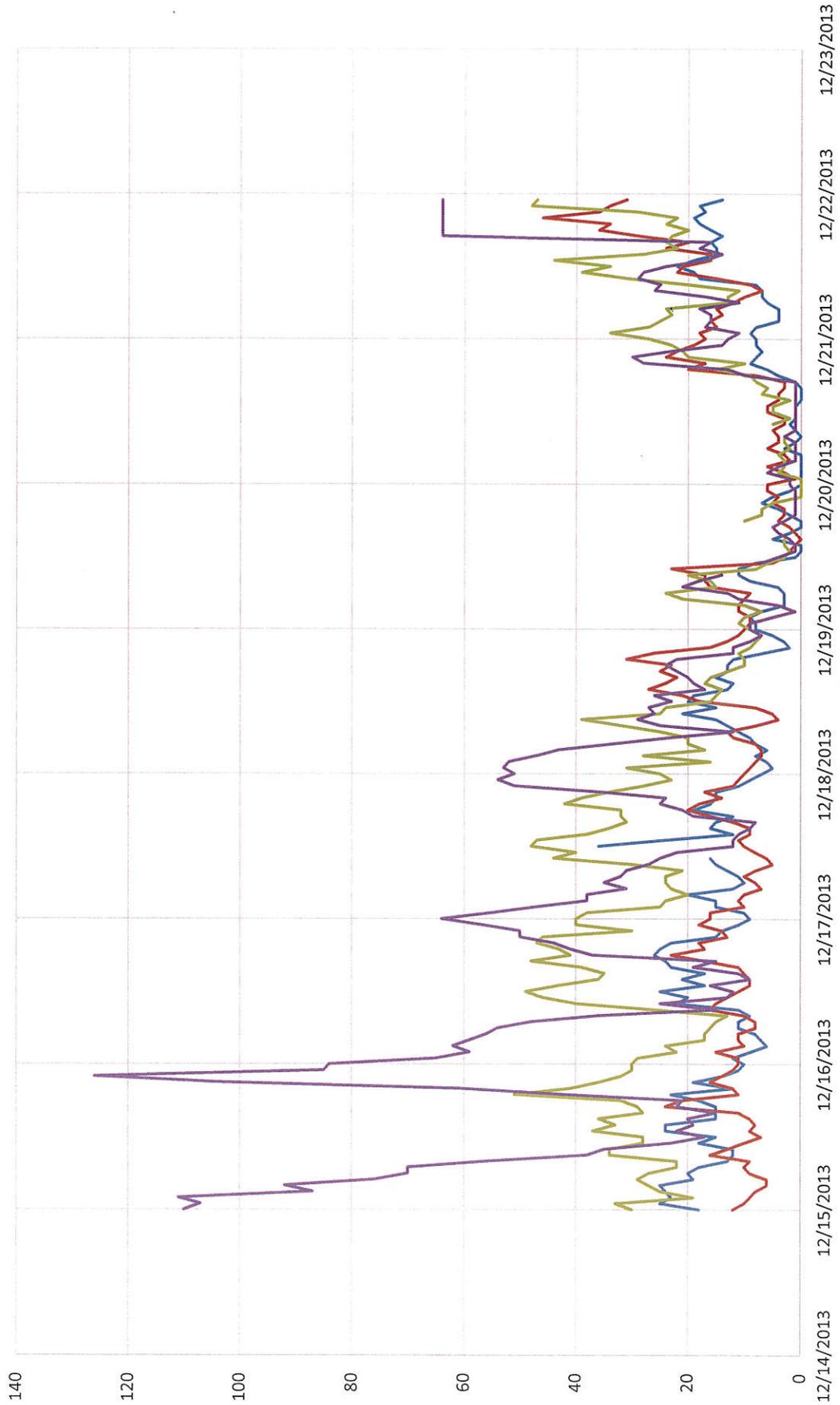


Multi-site Hourly Trends for PM2.5 December 2013 - Week 2



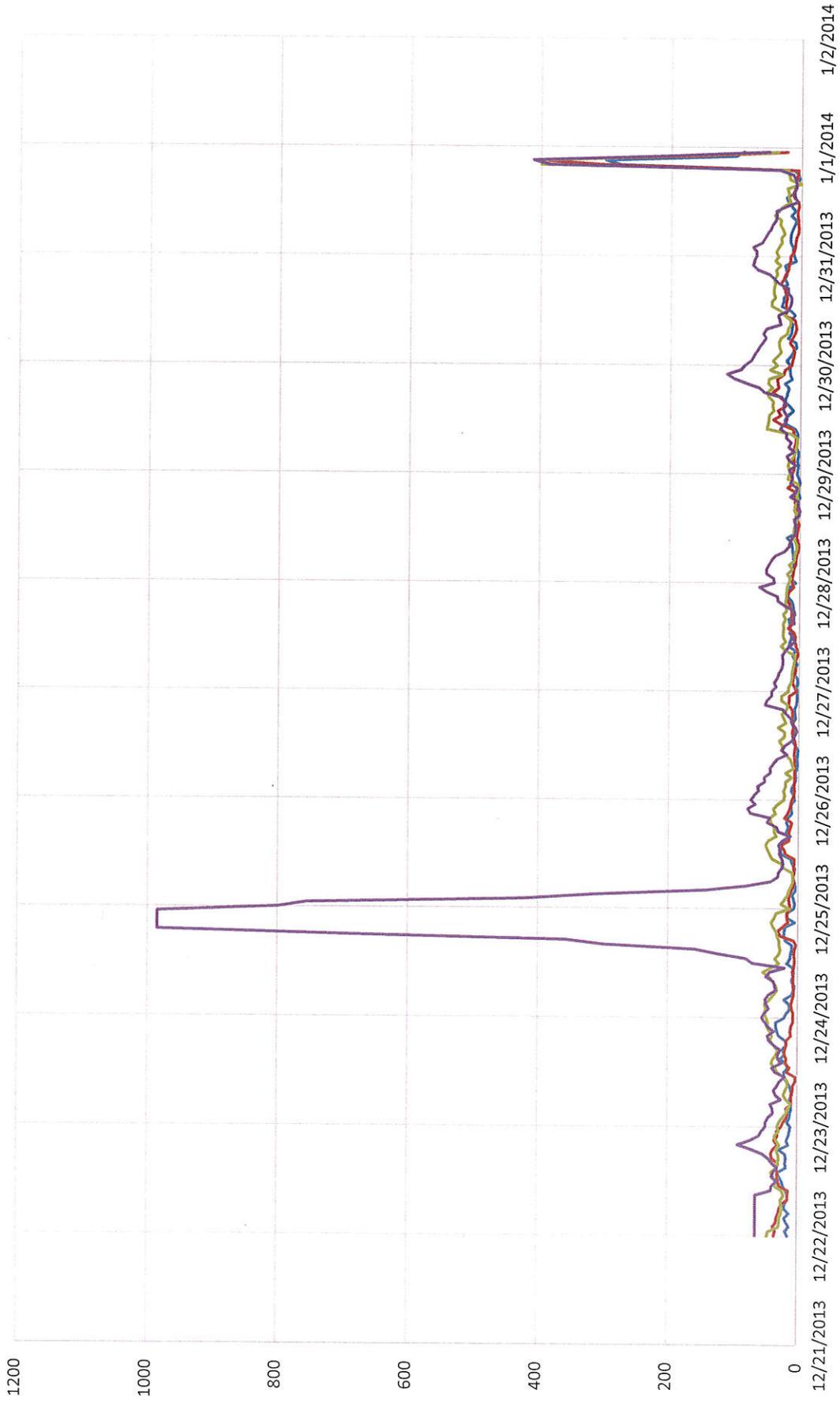
Multi-site Hourly Trends for PM2.5 December 2013 - Week 3

— Sloughhouse — Folsom — Bruceville — Del Paso Manor



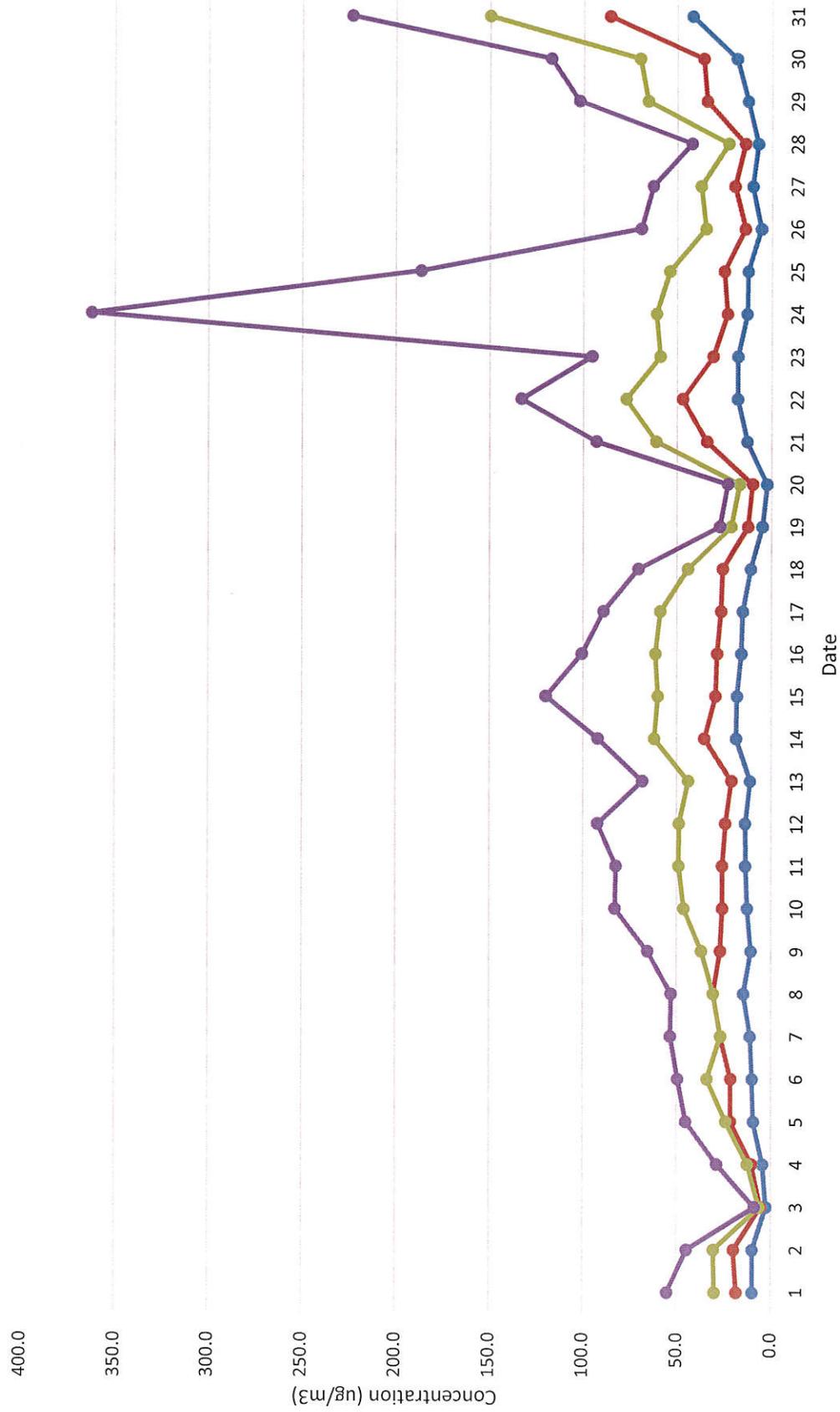
Multi-site Hourly Trends for PM2.5 December 2013 - Week 4&5

— Sloughouse — Folsom — Bruceville — Del Paso Manor



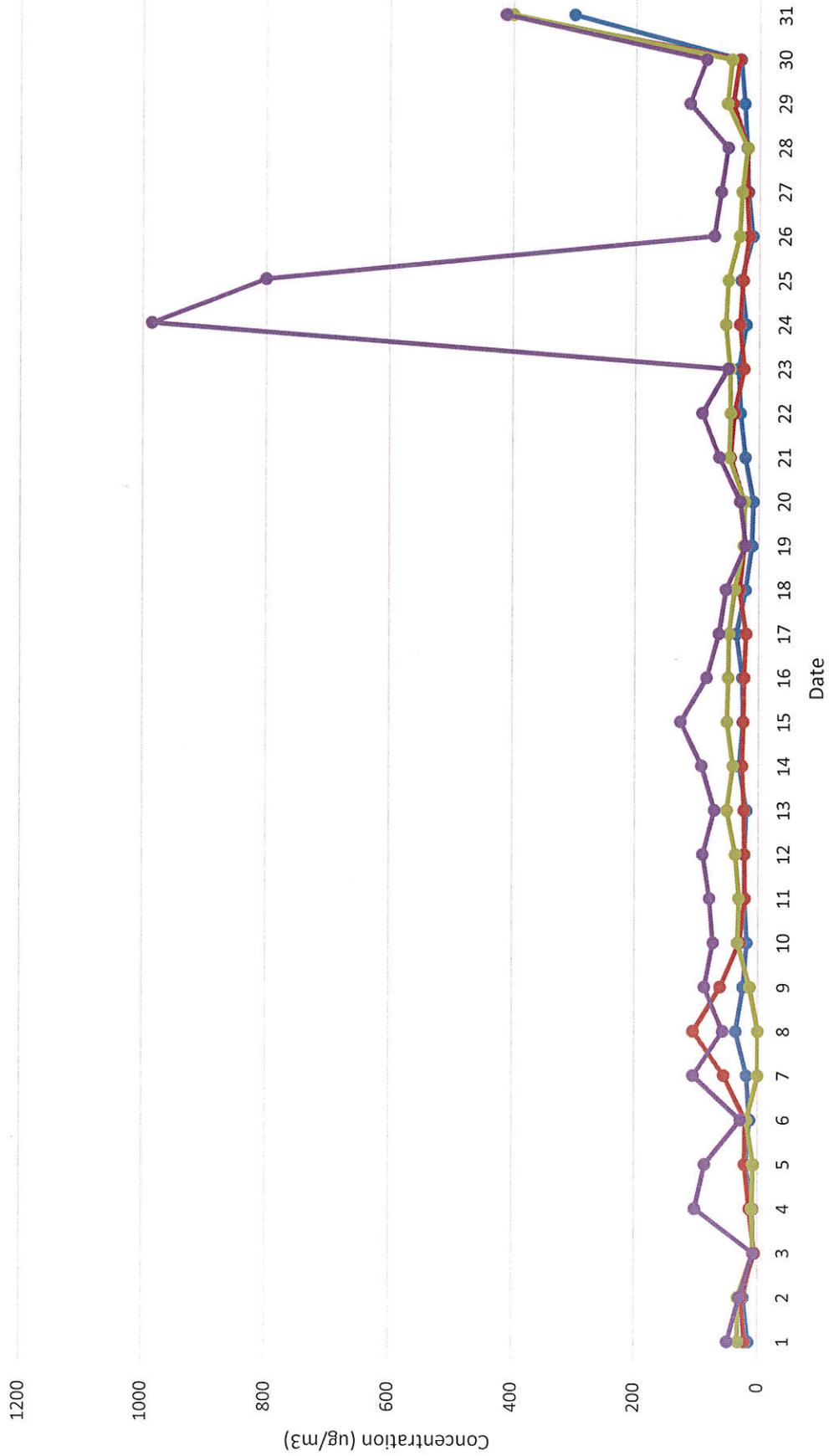
Multi-site Trends PM2.5 Average Daily Concentrations

—●— Sloughouse —●— Folsom —●— Bruceville —●— Del Paso Manor

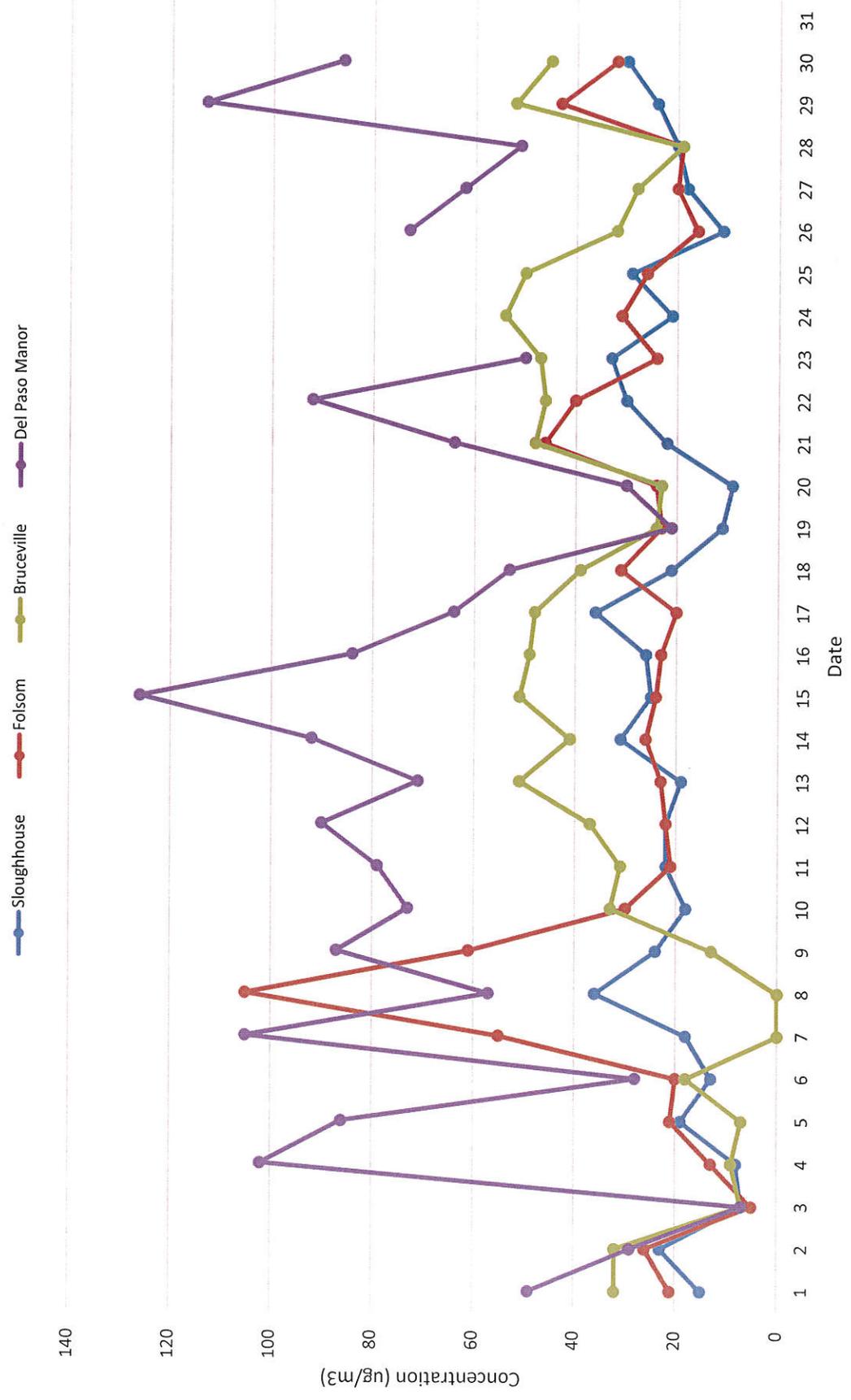


Multi-site Trends PM_{2.5} Daily Max. Concentrations

—●— Sloughouse —●— Folsom —●— Bruceville —●— Del Paso Manor



Multi-site Trends PM2.5 Daily Max. Conc (Except 12/24 & 12/25 at DPM,12/31 at all Sites)



Information from Newspaper/Internet Sources

POSTED: WEDNESDAY DECEMBER 26, 2013 12:00 AM |

Grass fire close to Elementary School at Del Paso Manor on Christmas Eve

Sacramento, California. — A grass fire posed a threat Tuesday afternoon, December 24, 2014 to at least part of the community near Del Paso Manor Elementary school.

Residents of some houses on the western edge of the elementary school were evacuated after the fire, which started in because of possible arson.

“I don't feel like there's any big danger to us here in town, but when you see ashes falling down from the sky on your front porch, it's a little disconcerting,” said a neighbor of the Del Paso community. But for Jacob Joe, the danger was real.

He lives in a trailer house on the property of his mother, Mary Joe, about a quarter of a mile west of the Elementary school. As the fire advanced Tuesday afternoon, Jacob Joe, who was outside his property with a shovel and a hose, said, “It looked like it was going to hit us.”

And it did.

A garage, barn, firewood shed and chicken coop were all lost to the fire, but his mother's home and his trailer were spared.

One resident said that some other homeowners were out watering down their lawns Christmas Eve afternoon in hopes of keeping them from catching fire if the flames continued to advance.

A Sacramento firefighter said the evacuation in the northwest corner of the school began about 2 p.m. At that point, a home was being threatened, he said.

But by Christmas morning, the firefighter said, the fire was 100% contained.

- e3 Membrane OFF Delay. Hysteresis timer, range is 0.000 to 5.000 seconds. Don't change this value unless instructed to do so by Met One.
- e4 Membrane Time Out. The time the unit allows for the membrane assembly to move before generating an error. Range is 10.00 to 20.00 seconds. Don't change this value unless instructed to do so by Met One.

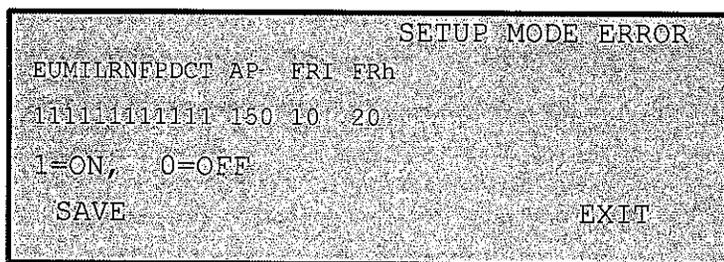
6.5 ERRORS Screen



This screen allows the operator the option of reporting BAM-1020 errors with the analog output signal. This type of error indication is used when the operator is limited to a single voltage channel for particulate information, such as when the BAM is connected to certain types of data loggers. In this case, the BAM sets the analog output to **full scale voltage** (usually 1.000 volts) when an error occurs. At the beginning of the next hour, the errors are reset and the output functions normally unless another error occurs. The operator can select which errors, if any, are reported in this manner, by selecting each error from the list below and enabling or disabling it (**1=ON, 0=OFF**) in the error setup screen.

Regardless if a particular error is enabled for the analog output in this manner or not, it will always be reported in the BAM-1020 digital memory, and may be viewed with the display or by downloading the data through the serial port. Some of these errors such as P, R, N, and E may be set to cause the analog output to go full scale, even though there may be nothing wrong with that hour's data. In this case, the concentration data can still be downloaded from the BAM. Some (but not all) errors such as M and L cause the digital concentration value to be set to full scale too, usually .985mg.

This scheme is used because it is rare for an actual valid concentration reading to measure full-scale. However, concentrations at or near zero can be common, so leaving the data value at 0.000 during an alarm could be mistaken for valid data.



The ERRORS Screen

- E EXTERNAL RESET:** This error indicates that the system clock time was unable to reset when signaled by an external datalogger. If external reset is successful then no error is logged (see Section 8.2). Sometimes called **INTERFACE RESET**.
- U TELEMETRY FAULT:** This error indicates that an external datalogger has sent an error to the BAM-1020 (on the TELEM FAULT input) indicating that it has encountered a problem. Check the datalogger.

- M MAINTENANCE:** This is a user-set data flag which indicates that calibration or testing was performed during the flagged hour. The "M" flag may also be forced ON in the SETUP > INTERFACE menu by setting "Force Maint" to ON, or in the OPERATE > INST screen by pressing the TOGGLE FLG button. M flags cause the digital concentration to read full-scale for that hour.
- I INTERNAL CPU:** This indicates an error in the mass concentration calculation by the central processor. Contact the Service department if these errors begin to occur frequently.
- L POWER FAIL:** This error occurs any time power is cycled or lost, even momentarily. Frequent "L" errors usually indicate poor quality AC power. In some cases these errors can be generated by electrical interference (such as large radio antennas or motors) causing an internal reset in the BAM-1020. There are also a variety of power supply upgrades available for some older BAMs which experience frequent L errors. If a BAM experiences frequent L failures even when connected to a UPS, contact Met One for instructions on possible upgrades. This error also causes the digital concentration value to go full-scale.
- R REFERENCE MEMBRANE:** This error indicates that the reference membrane assembly is not physically extending and retracting properly. The error is generated if photo sensors S2 and S3 never change state despite drive commands to the membrane motor, and a timeout of the membrane motion occurred after 15 seconds.
- N NOZZLE STUCK TIMEOUT (or Delta-T exceeded):** This error indicates that the nozzle motor is not operating. The error is triggered if photo sensors S4 and S5 never change state despite drive commands to nozzle motor, and if the sensors do not see the nozzle motor move within 12 seconds of it being turned on. **NOTE:** The nozzle motor lifts the nozzle, but the nozzle is lowered only by its spring. So it is possible for the nozzle to become stuck in the UP position without generating an error! Proper maintenance and inlet alignment prevents this.

The "N" error is also used to indicate that the Delta-Temperature set-point was exceeded. This occurs if the sample air temperature (measured below the filter tape) is hotter than the ambient air by at least one degree above the set-point value. This is due to the normal heating of the sample air by the smart heater. In this case, the error is used to simply flag the data. Frequent errors may indicate that the set-point is set too low. In most applications Delta-T control is disabled entirely. See the inlet heater settings instructions in this manual.

- F FLOW ERROR:** This error occurs if the average air flow over the sample period was out of the limits set by the **FRI** (low limit) and **FRh** (high limit) values. The error will also be generated if the flow during any part of the sample period goes out of regulation by more than 5% for more than 5 minutes, or by more than 10% for more than 1 minute. In the later case, the sample is stopped as well. Momentary changes in airflow do not usually trigger the error. This error may begin to occur if the vacuum pump is wearing out, if the muffler is clogged, or due to a fault with the flow sensor, flow controller, or air tubing.

The “**F**” error is also used to indicate if the ambient temperature or barometric pressure sensor has failed or is incorrectly connected (only if the BAM is set for ACTUAL flow or concentration reporting). This applies to auto ID sensors BX-592 and BX-596, the internal filter pressure sensor, and CARB style temperature sensors. The sensor is considered failed if any 1 minute average reading of the sensor is at or beyond the min or max measurement range of the particular sensor.

- P PRESSURE DROP EXCESSIVE:** This error indicates that the vacuum beneath the filter tape has exceeded the limit set by the **AP** value. This is almost always caused by high concentrations, or certain types of particulate clogging the filter tape. When this error occurs, the BAM stops the pump to prevent overheating, completes the measurement early, then waits for the top of the next hour. To increase the amount of particulate which can build up on the tape before this occurs, set the **AP** value higher.
- D DEVIANT MEMBRANE DENSITY:** This error indicates that the reference membrane span check measurement (**m**) for that hour was out of agreement with the expected value (**ABS**) by more than $\pm 5\%$. If these errors start to occur regularly, it could indicate that the beta detector is beginning to wear out. It can also be caused by a dirty or damaged membrane, or by a membrane assembly that is not extending or retracting fully. Also sometimes called a **BAM CAL** error.
- C COUNT ERROR:** This error indicates that the beta particle counting system is not operating properly, and is activated if the beta count rate falls below 10,000 per 4 minutes. The beta count rate through clean filter tape is usually more than 800,000 per 4 minutes. This error could occur if the beta detector has failed or if something is blocking the beta particles, such as a stuck membrane assembly or debris.
- T TAPE BREAK:** This error indicates that the filter tape is broken or has run out. The error is triggered if photo sensor S6 is ON continuously, despite drive commands to motors M3-M5. Tape supply motor (M3) and tape take-up motor (M4) time out after 10 seconds. Capstan motor (M5) times out after 6 seconds. This error is also generated if the pinch roller assembly has been left latched in the UP position when a measurement cycle starts. Photo sensor S9 is ON any time the latch is set. The BAM-1020 has no way of unlatching and lowering the pinch rollers. It must be done manually. A tape-break error will cause the measurement cycle will stop, and the BAM to repeat the last good concentration value until the filter tape is fixed or replaced.
- AP** Pressure-drop limit across the filter tape. The default setting is **150** mmHg, and the range is 0-500 mmHg. See the PRESSURE DROP EXCESSIVE error definition above.
- FRI** Flow Rate Lower Limit. The default setting is **10** lpm, and the range is 0-30 lpm. See the FLOW OUT OF LIMITS error definition above.
- FRh** Flow Rate Higher Limit. The default setting is **20** lpm, and the range is 1-38 lpm. See the FLOW OUT OF LIMITS error definition above.



Ms. Gayle Sweigert
California Air Resources Board
1001 I Street
Sacramento, California 95812

Dear Ms. Sweigert:

I have reviewed the appropriate quality control documents used by Sacramento Metropolitan AQMD and attest that the air monitoring data for the time period of _____ for SMAQMD operated sites¹ have been validated in accordance with the criteria established in the ARB procedures for data validation and are acceptable for upload to AQS. This letter does not validate data including those as noted in enclosure A, Data Not Validated (Significant Data Impact). Furthermore, valid data impacted by unusual events are noted with informational only qualifier code and can be found in enclosure B.

If you have any questions regarding the data, please feel free to contact me at (916) 999-9999

Sincerely,

_____, Manager
Air Monitoring

Enclosure:
A. Data Not Validated

cc:

¹ Sacramento-Branch Center, Elk Grove-Bruceville Rd., Sacramento-Del Paso Manor, Sacramento-El Camino Watt, Folsom-Natoma St., Sacramento-Golden Land Ct., North Highlands-Blackfoot Way, Sacramento-Health Dept., Sloughhouse-Sloughhouse Rd.



B. Data with Informational Only Qualifier Code

Site ³	Parameter	P O C	Begin Date and Time	End Date and Time	Number of hours im- pacted	Informational Only Qualifier Code	Comment

³ North Highlands-Blackfoot Way ("0002"), Sacramento-Del Paso Manor ("0006"), Sacramento-El Camino Watt ("0007"), Elk Grove-Bruceville Rd. ("0011"), Folsom-Natoma St. ("0012"), Sacramento-Golden Land Ct. ("0014"), Sacramento-Branch Center ("0284"), Sacramento-Health Dept. ("4001), Sloughhouse-Sloughhouse Rd. ("5003")