

**Harriet Tubman Middle School**  
**Environmental Technical Advisory Committee**

**Meeting Minutes**

**July 31, 2018**

**4:00 – 6:00 pm**

**Attendees**

Director Paul Anthony, Brett Borgeson, Dr. John Burnham, Dr. Raul Cal, Tori Cole (stand in for Mary Peveto), Joe Crelier, Dr. Jae Douglas, Harry Esteve, Daniel Forbes, Dr. Elliott Gall, Dr. Linda George, Claire Hertz, Virginia LaForte, Aurelie Laguerre, Dr. William Lambert, Director Rita Moore, Tom Roick, Director Mike Rosen and Steve Simonson.

**Agenda & Minutes**

**ETAC Objectives**

Dr. Burnham welcomed everyone to the third meeting of the Environmental Technical Advisory Committee (ETAC). He then added that the committee charter had been revised to emphasize that the objective and purpose of the ETAC was to provide guidance and advice to PPS consultants, staff and leadership. The committee has a limited time to meet, so visitor comments and questions have been moved to the end of the meeting. Exceptions will be made for visitor questions that are scientific/technical in nature.

**Building/Construction Status**

Steve Simonson gave several updates on construction:

- 150 workers on location daily
- Since March, 20,000 man hours have been clocked
- Micro piles were installed in late June
- Air handler has been bolted together
- MERV 16 filter is ten feet tall
- Chiller has arrived
- Roof is 90% complete
- Second floor window replacements 80% complete
- Seven foot diameter ductwork is 70% complete

We anticipate that classes will start as scheduled.

## **Implication of Outdoor/Indoor Air Monitoring for Health Risk**

Dr. Lambert gave a presentation entitled "Update on Air Quality Monitoring & Health Risk Assessment". There have been comprehensive upgrades throughout the building that impact the health and safety of the students and staff. In March/April, PSU conducted comprehensive outdoor air monitoring for traffic-related air pollutants. Although not all pollutants are directly regulated (Black Carbon and Ultrafine Particles) measurements of regulated pollutants are above urban background but below federal health standards. Pollutant levels are consistently higher in the morning and correlate with ODOT measures of traffic congestion.

Most volatile organic compounds (VOC) are below Oregon Ambient Benchmark Concentrations (ABCs) with the exception of benzene, naphthalene and acrolein. However, benzene and acrolein are elevated across the city. All metals are at trace levels or below Oregon ABCs. Arsenic levels are elevated across the city due to levels in soil. HVAC system is intended to substantially reduce pollutant exposures indoors. NO<sub>2</sub> is expected to be reduced to 1/50<sup>th</sup> of outdoor levels. PM<sub>2.5</sub> is expected to be reduced to 1/25<sup>th</sup> of outdoor levels. VOCs are expected to be reduced to 1/100<sup>th</sup> of outdoor levels.

Sampling points in the HVAC systems include intake air, immediately downstream of the particulate filters, downstream of the adsorbent carbon fiber and the return air. Comparing the return air with the supply air will give indication of infiltration via cracks, crevices and windows. Sampling will also take place in two west side (I-5) classrooms and two east side (Flint) classrooms and the gymnasium. Outdoor sampling plan includes both sides at corner of building, school grounds and Albina Park, and repeated walking transects for UFP gradients.

The student/staff exposure analysis objectives includes pollutant levels indoors and outdoors by hour and day of week. Time-activity patterns of students will also be observed to identify locations of high exposure. Standard operating procedures will be developed with contractors to provide training to maintenance staff regarding HVAC system design and operation, pressure controls, filtration and exhaust fans.

Estimated timelines are:

- HVAC system operational – August 13<sup>th</sup>
- HVAC system commissioned – August 20<sup>th</sup>
- First day of school – August 27<sup>th</sup>
- Continued monitoring – September and October

Dr. Lambert then provided pictures of various HVAC components including the 10 foot tall carbon fiber bank.

There was a general discussion on future monitoring on the basketball court. This is included in the plans.

Question: Tori Cole – Will there be an effort to estimate students total exposure?

Answer: Dr. Lambert – Dr. Lambert installed a separate presentation to discuss total exposure estimates. It is hypothetically possible to estimate total exposure.

Question: Is it possible to measure total exposure if we did not have the new high tech HVAC.

Answer: Yes

### **Phase II Planning: Indoor/Outdoor Monitoring**

Dr. Gall presented “Evaluation of indoor and outdoor air quality at Tubman Middle School and the design of mitigation measures: Phase II proposed monitoring”. After a brief description of location of the school relative to the I-5 freeway, Dr. Gall discussed the Phase 1 goals” 1) robust measurement of outdoor air quality; 2) enable exposure level health assessment; 3) recommend air quality improvement strategies for indoor and outdoor air.

PSU rapidly deployed monitoring infrastructure beginning in February 2018. A heavy focus was placed on the southwest face of the building. Most monitoring equipment was installed in the greenhouse inlet on the southwest corner of the building along with a weather station on the rooftop. One slide depicted the stack of sophisticated monitoring equipment measuring several different pollutants. A table discussing results presented seven separate traffic-related pollutants. Most were elevated relative to urban background. A separate table was presented for Black Carbon levels comparing the I-5 side of the building to the Flint side. The I-5 side consistently has higher levels the week of 4/6-4/10. The MERV 16 particulate filters and carbon fiber sorbent beds should offer effective reduction in particulate and VOC pollutants, respectively.

Phase II evaluation of treatment efficiency is contingent upon discussions with PPS, the renovation plan and the final renovation implemented. Phase II has four goals.

Question: Virginia LeForte – Do temperature inversions occur in October?

Answer: Yes

Evaluation of HVAC treatment efficiency is goal 1 for Phase II. Sampling will be conducted upstream and downstream of filters and sorbent pre-renovation (beginning August 2018) into occupancy and 6 weeks post occupancy (April 2019). A diagram of the HVAC Air Handling Unit One (AHU-1) was presented showing sampling locations inside the AHU-1.

Phase II, goal 2 is to monitor how outdoor pollutant levels vary in the vicinity of Tubman. NO<sub>x</sub> and UFP particle measurements will be conducted to assess this issue. NO<sub>x</sub> passive sensors will be deployed around Tubman and west across the freeway and ultrafine particle transects will be conducted adjacent to Tubman and the nearby residential community.

Phase II, goal 3 is the determination of the variability of indoor levels. A diagram was presented showing four classrooms and the gymnasium locations where purple air PM monitors and NO<sub>x</sub>

passive sensors will be deployed. This monitors will be located on the west and east sides of the building.

Phase II, goal 4 is to evaluate building airtightness and airflows. Building pressurization tests will be conducted on two I-5 facing classrooms. "Leakage area" will be calculated to estimate building infiltration rate. This air bypasses AHU-1. Indoor-outdoor pressure difference will also be measured when HVAC is operating.

A Phase II Gantt chart was presented of implementation and completion of all four goals in the months of August and September.

### **Wind Tunnel Modeling**

Dr. Cal briefly discussed predominate wind directions followed by a 3D topographic of the site followed by photos of students making the model along with dimensions and photo of wind tunnel. They are close to running first experiments. Four models are planned. Current building and freeway with and without sound wall and current building with and without expanded freeway with and without sound wall.

Comment: Mike Rosen – The Board is particularly interested in experiments involving the current relationship between building and freeway with sound wall.

### **Next Meeting**

The timing for the next meeting was discussed. Final agreement was 9/24/18 @ 3-5 pm. since that timing should provide access to 6 weeks of data.