COVID-19 Workspace Safety Plan – Lab Specific

Use of this template: All light italicized grey font are instructional and must be removed before final copy is approved.

This workspace safety plan will assist Principal Investigators who wish to continue or resume research activities in their lab. This plan will include a review of activities to be undertaken in the lab to ensure effective controls are in place to prevent the spread of COVID-19. Principal Investigators are responsible for ensuring this document reflects current government guidance and notices which can be found, along with information about UBC’s response to the pandemic at https://covid19.ubc.ca/.

This plan must be reviewed by your Local Safety Team, and signed by your Unit Head/Director. Once complete, the plan can be submitted with your online application to return to research.

Resources to Consult
The following guidance documents and resources were used in the development of this plan:

- Preventing Exposure
- Personal Protective Equipment
- Physical Distancing Guidelines
- Reporting COVID-19 Exposure
- Communications Resources
- UBC Research Resumption webpage
- WorksafeBC

Section #1: Lab information

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<tr>
<th>Department</th>
<th>Mechanical Engineering</th>
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<td>Faculty</td>
<td>Applied Science</td>
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<td>Building(s)</td>
<td>CEME</td>
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<tr>
<td>Lab(s)/workspace(s)</td>
<td>UBC PLUME Mobile Air Quality Lab, CEME1053</td>
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Introduction to Your Lab

The iREACH Lab conducts research on the development and application of real-world-based tools to quickly and quantitatively assess the impact of our policy and technology decisions on air pollution and climate outcomes. Our work involves interdisciplinary teams and collaborations with a range of relevant stakeholders, including colleagues in other departments at UBC (e.g., Liu Institute, IRES), non-profits, and regulatory agencies. Currently, our lab has 4 graduate and 2 undergraduate students. iREACH’s main facility is the UBC PLUME mobile laboratory that is currently pending active status, which is why we feel it is critical for our group to receive approval to resume the activities outlined in this safety plan.
## Section #2 - Risk Assessment

**1. Lab/workspace Occupancy (under proposed COVID-19 operations)**
- Provide actual numbers and percentage of previous i.e. 1/3 of ‘normal’ operations
- Outline who remains working remotely and who you’ve requested back to work and why

The following student is the only ones working on the UBC PLUME van:

[Redacted]

is responsible for the operation of the facility and its components and is using it in her MASc project to assess traffic-related air pollution in Vancouver. As part of her work, she will implement the sampling inlet designs created by our co-op student, [Redacted]. We will also need parts for the sampling inlet system to be machined in partnership with the machine shop (by emailing them the designs).

Prof. Zimmerman requested written confirmation from each of her students (via email) that they had read the draft plan as submitted and that they are aware of the risks and comfortable returning. She will review the plan with them again after the plan is approved.

This request represents a substantial, on-going portion Prof. Zimmerman’s research activities (~30%) and is a critical requirement for upcoming projects that have already received funding (see New Frontiers in Research Fund) and to conduct research in partnership with Vancouver Coastal Health on the impacts of traffic-related pollution and wildfire smoke on daycare air quality.

### 2. Hazard Identification

*Describe what hazards exist in your lab/workspace; both research-related (chemicals, heavy machinery) and COVID-19-related (areas that require closer personal interaction, equipment/instruments that cannot maintain social distancing i.e. that require >1 person to operate)*

The following are identified physical and chemical hazards that currently exist in the UBC PLUME Mobile Air Quality Lab and how they will be mitigated:

Compressed N\textsubscript{2}O in the form of a whipped cream cartridge (see photo below). This is fed to the NOx/O3 calibrator we have purchased which converts it to NO/NO\textsubscript{2} and O\textsubscript{3} for use in our calibrations. The outlet concentrations of NO/NO\textsubscript{2}/O\textsubscript{3} gases are 0.5-1 ppm. These concentrations are mitigated through outlet dilution and natural wind ventilation; this final design is pending and will be reviewed and approved by Prof. Steve Rogak and/or Prof. Naomi Zimmerman.
Cartridges will be used one at a time and stored in an upright position. Cartridges will be handled according to the manufacturer’s guide when switching between empty and full.

Since only 1 person is allowed in the lab at a time and will be working with the side door and back door open at all times, there are currently no identified COVID-19-related hazards. The maximum occupancy in the van is 1, but I [insert name] has specific concerns about working alone, she may invite [insert name] (a PhD student in the Zimmerman group who is already in ‘bubble’) to work outside the van on a laptop in a camping-style chair.

3. Employee (HQP, research staff, other) Input/Involvement

Detail how you have involved frontline workers (HQP and research staff) and Joint Occupational Health and Safety Committees (JOHSC) and/or Local Safety Teams (LST) in identifying risks and protocols as part of this plan.

Describe how you will publish your plan (online, hardcopy) and otherwise communicate workplace health measures to employees. Guidelines from SRS are available here: https://srs.ubc.ca/covid-19/health-safety-covid-19/working-safely/

The PI and students worked collaboratively on this document to identify risks associated with the installation and consulted Jen Pelletier (Manager Facilities and Special Projects, Mechanical Engineering department) for the same.

- The approved final plans will be emailed to everyone and posted on the group’s online communication platform, Slack. They will also be posted in our group’s Sync shared online folder.
- A copy of the safety plan will be carried by the students during installation of RAMPs.
- Final plans will be posted to UBC’s COVID-19 Safety Plan website.

Section #3 – Hazard Elimination or Physical Distancing
The following general practices shall be applied for all UBC buildings and workspaces:

- Where possible, workers (HQP, research staff, others) are instructed to work from home.
- Anybody who has travelled internationally, been in contact with a clinically confirmed case of COVID-19 or is experiencing “flu like” symptoms must stay at home.
- All employees are aware that they must maintain a physical distance of at least 2 meters from each other at all times.
- Do not touch your eyes/nose/mouth with unwashed hands.
- When you sneeze or cough, cover your mouth and nose with a disposable tissue or the crease of your elbow, and then wash your hands.
- All employees are aware of proper handwashing and sanitizing procedures for their workspace.
- Supervisors must ensure large events/gatherings (>50 people in a single space) are avoided.
- Supervisors must ensure that all workers have access to dedicated onsite supervision at all times; via their own presence, members of safety committees, campus security or other. When working alone, HQP and staff must be aware of working alone procedures and how these have been adapted for COVID-19.
- All staff wearing non-medical masks are aware of the risks and limitations of the face covering they have chosen to wear or have been provided to protect against the transmission of COVID-19. See SRS website for further information.
- Note transportation/vehicle guidelines if applicable: 1 Person per vehicle, unless the vehicle is large enough to maintain 2m between occupants.

4. Scheduling

For those required or wanting to resume work at UBC, detail how you are rescheduling employees (e.g. shifted start/end times) in order to limit contact intensity at any given time at UBC.

Discuss your working alone procedures and how they will be adapted for this safety plan. Also describe how you will track those entering/leaving work i.e. sign in/sign out process.

- 1 person will be permitted to work inside the UBC PLUME van at a time.
- Gloves and a cloth mask will be provided for anyone working inside who wants to use them. The SRS limitations of non-medical masks communication will be sent to students and posted beside the available masks.
- The side door and back door will remain open at all times work is being performed for maximum ventilation.
- Each person will sign in (Date, Time, Signature) when they begin work and sign out when finished. There will be a check box to indicate the sanitation procedure was done.
- If students encounter any issues while working alone, they are to contact Prof. Steve Rogak or Prof. Naomi Zimmerman (Rogak is contact if Prof. Zimmerman is away)
- We will coordinate with the local safety team and Prof. Rogak to identify a time to access CEME2066 (<30 min) to pick up the NO/NO2/O3 calibrator (had been delivered to Prof. Zimmerman and is currently stored in her office) and to move instruments from CEME1053 to the UBC PLUME van.
5. Occupancy limits, floor space, and traffic flows
APSC recognizes that labs are dynamic environments and it may be challenging to adhere to physical distancing guidelines. Nonetheless, controls must be in place to keep personnel spaced at least 2m apart at all times. Clear communication of this to employees, monitoring of implementation, in addition to physical controls (signage) are needed.

As such: Using floor plans and/or photographs of your lab/workspace:
1) Identify and list the rooms and maximum occupancy for each workspace/area;
2) Illustrate a 2 metre radius circle around stationary workspaces/benches/instruments and common areas or equivalent approach to social distancing; and
3) Illustrate one-way directional traffic flows

- Since UBC PLUME Air Quality Mobile Lab only permits 1 person maximum at a single time, physical distancing signs do not need to be placed inside.
- Physical distancing sign will be taped to the inside passenger window as a reminder to people within close distance to the lab.

Section 4 – Engineering Controls

6. Cleaning and Hygiene
Detail the cleaning and hygiene regimen required to be completed by HQP, research staff and the PIs for common areas/surfaces (Custodial has limitations on cleaning frequency, etc.).

- All PPE and sanitation supplies will be stored inside the UBC PLUME van
- Students will put on gloves immediately upon entering the lab, before signing their name in the logbook
- Students will perform research activities with the side door and back door open at all times
- Once research activities are complete, the student will spray all benchtops, cabinets, handles and knobs inside UBC PLUME with 99% Lysol disinfectant. 1 minute will be allowed between applying the disinfectant and wiping to ensure full sanitation, per manufacturer’s instructions.
- Disinfected areas will be wiped with clean, dry paper towel and disposed of in a clean garbage bag. The outside handles of the van (side door, driver door and passenger door) will also be sanitized follow the same process.
- Gloves and masks will be removed outside the laboratory and discarded in the garbage bag. Hands will be washed with hot, soapy water or disinfected with an alcohol-based hand sanitizer.
- If students have to access CEME1053 to pick up instruments, they will put on a disposable surgical mask or a cloth mask before entering if that is their preference. Any access to CEME1053 (<30 min) will be coordinated with the local safety team
- Since UBC PLUME is a mobile vehicle, it can be considered a closed system. For this reason, we believe the inside has low probability to be contaminated with COVID-19 when the lab is not in use, and that one procedure of sanitation at the end of activities is suitable.

7. Equipment Removal/Sanitation
Detail your appropriate removal of unnecessary tools/equipment/access to areas and/or adequate sanitation for items that must be shared that may elevate risk of transmission, both research-related (i.e. instruments, tools) and general (i.e. coffee makers in break rooms)

- Not applicable

### 8. Safety Infrastructure Requests (Partitions, Plexiglass installation)
Describe any needs for safety infrastructure i.e. physical barriers, plexiglass installation required for your lab/workspace and if possible include them on your photos/room plan.

- Not applicable

### Section 5 – Administrative Controls

#### 9. Communication & Training Strategy for Employees
Describe how you (the PI) have or will communicate the risk of exposure to COVID-19 in the workplace to your HQP/research staff/other employees and the safety controls in place to reduce such risk.

Detail how you will ensure that all employees successfully complete the [Preventing COVID-19 Infection in the Workplace](#) online training and orientation to your specific safety plan

- Outline the expectations for all employees returning to the workplace and describe how an employee would raise concerns
- Clearly indicate that employees with symptoms MUST stay home
- How have you adapted to new risks in terms of training for existing and new staff
- All processes must be documented

The plan has been co-developed by the PI and the graduate students who will execute the research. We are communicating plans via our digital communication platform Slack as well as in our shared filespace.

Research personnel are expected to adhere to the following:

1) Researchers will complete the Preventing COVID-19 Infection in the Workplace online training module within 5 days of it becoming available.
2) Researchers will continue to work from home as much as possible until Provincial Health Authorities provide new guidance.
3) Before beginning work each day, researchers will monitor their health status. Common COVID-19 symptoms are:
   a. Fever
   b. Dry Cough
   c. Tiredness
   d. Loses of sense of smell and/or taste
   e. Sore throat
If researchers experience any of these symptoms, they are encouraged to complete the BC COVID-19 Symptom Self-Assessment Tool and call 8-1-1. They will not be permitted to come to work and must self-isolate.

4) Researchers will adhere to the 1 person limit in the UBC PLUME lab as well as the sanitation procedure required between occupancy

5) Researchers will adhere to any additional posted maximum occupancy limits.

6) Researchers will avoid all up-close social contacts
   a. Communicate digitally using Slack or other messaging systems
   b. Keep minimum 2 m distance from colleagues
   c. Minimize physical interaction (no in-person meetings, seminars, etc.)
   d. Minimize physical social interaction (eat outdoors when possible, and at a safe distance from peers)

7) The use of equipment such as gloves and masks should be a matter of personal choice. Other methods of protection, such as a social distancing, good hygiene practices, and administrative steps (such as, work shift rotations) etc. are preferred. The PI has purchased non-medical, disposable face masks for those who would like to use one and disposable gloves. Per the BC CDC, wearing a mask can help protect others by containing your own droplets from coughing, sneezing, speaking or laughing. The SRS limitations of masks communication will be made known to students, and posted beside the available masks. The usage of masks of any kind does not alleviate the requirement to adhere strictly to social distancing measures put in place by the university.

Researchers who have concerns that the PI has not addressed are advised to raise them with the Mechanical Engineering Local Safety Team or head of department, independently of the PI.

10. Signage
Detail the type of signage you will utilize and how it will be placed (e.g. floor decals denoting one-way walkways and doors, ‘cleanliness state’ of equipment/instruments, hand-washing guidance). See WorksafeBC for signage guidelines and templates.

- **Sanitation Procedure**: Step-by-step guide with details from Section 4.6 Cleaning & Hygiene posted on the inside wall for reference during work inside, and to the inside of the passenger window for reference during work outside. The full sanitation procedure is provided as an attached Appendix
- **Logbook**: A binder of sheets with empty spaces to provide the following information:

<table>
<thead>
<tr>
<th>Date (YYYY/MM/DD)</th>
<th>First Name, Last Name</th>
<th>Time In (24h)</th>
<th>Time Out (24h)</th>
<th>Sanitation Complete</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
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11. Emergency Procedures & Reporting
PIs must ensure that all employees entering the lab should be aware of the Building Emergency Response Plan (BERP) and have access to it. If applicable, detail your strategy to amend your lab’s emergency response plan procedures during COVID-19.


12. Monitoring

Monitoring will be coordinated with the Mechanical Engineering department monitoring plan. In addition regular check-ins with Steven Rogak (Mechanical Engineering) will be used to monitor activities (Prof. Zimmerman is currently travelling due to medical emergency).

Safety concerns can be raised to the PI and/or Prof. Rogak, the Mechanical Engineering Local Safety Team, or the JOHSC.

Section #6 – Personal Protective Equipment (PPE) & Critical Supplies

13. Personal Protective Equipment & Critical Supplies
UBC has a central process for purchasing PPE. Describe what PPE you will require for your lab.

<table>
<thead>
<tr>
<th>#</th>
<th>Type of PPE</th>
<th>Activity and PPE Use Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 box</td>
<td>Nitrile gloves</td>
<td>Protection against contaminated (and contaminating) common surfaces or equipment</td>
</tr>
<tr>
<td>1 box</td>
<td>Surgical disposable masks</td>
<td>Protection against airborne organisms and spreading of germs</td>
</tr>
<tr>
<td>2 boxes</td>
<td>Hand sanitizer</td>
<td>Protection against bacteria when gloves or soap and hot water are not accessible</td>
</tr>
<tr>
<td>3 bottles</td>
<td>Lysol disinfectant wipes</td>
<td>Sanitization of commonly touched surfaces and frequently used equipment</td>
</tr>
<tr>
<td>1 box</td>
<td>Garbage bags</td>
<td>To dispose of soiled PPE</td>
</tr>
<tr>
<td>6 rolls</td>
<td>Paper towel</td>
<td>To wipe down surfaces after disinfectants have been used.</td>
</tr>
</tbody>
</table>

The soiled PPE will be disposed in a clean garbage bag and discarded in the waste bin.

Acknowledgement
I confirm that this Safety Plan has been shared with all workers (HQP, research personnel, etc.) who will be accessing this space both through email and will be made available as a shared document. Workers
can either provide a signature or email confirmation that they have received, read and understood the contents of the plan.

Date  
June 7, 2020

Name (Manager or Supervisor)  
Naomi Zimmerman

Title  
Assistant Professor

Department/School Head/Director Approval

Steve Feng, Department Head  
June 12, 2020

Name, Title  
Date

Signature

×
Appendix
Please attach any maps, pictures, departmental policies or risk assessments applicable UBC Guidance documents, where necessary, and other regulatory requirements referred to in document.

APSC specifically requests photographs of your current lab layout, as well as your proposed usage layout i.e. where HQP will work, what areas will be closed off, where signage will be placed, etc. If floor plans of your lab/shared workspace is available, please append these as well.

Below are photos of the floorplan of UBC PLUME lab. Annotations have been added to indicate where signage will be posted. Please scroll to the bottom of this document to see the signage to be posted.
Signage

Sanitation Procedure:

iREACH: UBC PLUME Sanitation Guide
The following procedure has been approved by the Head of the Mechanical Engineering department

Prepared by M. MacArthur 2020-06-03

1. Put on gloves and open the back door. Wearing an N95 mask is optional but is encouraged.
2. Check the logbook to see if the previous person completed the sanitization procedure and sign your name, the date and time.
3. Go about your research activities as usual while keeping the doors open at all times.
4. When you are ready to exit the lab, apply disinfectant to all benchtops, cabinets, handles and knobs inside UBC PLUME.
5. Allow 1 minute for the disinfectant to set between applying and wiping to ensure full sanitation.
6. Wipe disinfected area with a clean, dry paper towel and dispose of it in a clean garbage bag
7. Disinfect the outside door handles of the van (side door, back door, driver door and passenger door) following the same process as above. before signing out in the logbook. Close each door as you sanitize its handle, leaving the side door for last. Lock the vehicle when you leave
8. Gloves and masks and are to be removed outside the laboratory and discarded in the garbage bag. The garbage bag will be tied shut before disposing in the nearest bin.
9. Hands will be washed with hot, soapy water for 30 seconds or disinfected with an alcohol-based hand sanitizer.

If you have any concerns regarding this safety plan, please don’t hesitate to contact Melanie MacArthur (melanie.macarthur@ubc.ca) or Naomi Zimmerman (nzimmerman@mech.ubc.ca)
COVID-19 Safety Plan Template

Maximum 1 person in this workspace at a time:

![Physical Distancing Sign]

Thank you for your kind attention to this matter.

For more information, please contact: Safety & Risk Services (804-822-2029).

Logbook

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