Attachment B – Invasive Work Exposure Control Using Portable Local Ventilation Systems

<u>Portable Eductor Suction</u> used to capture toxic and flammable gases/vapors at the point of emission, dilute the emissions and discharge them at a remote location to prevent work area exposures to toxic gases/vapors and fire hazard.

A. Portable Eductor Applications: Use in situation where gas/vapor emissions resulting from opening a bleeder or opening a flange could be:

1) Stopped by closing a valve or tightening flange bolts;

2) At IDLH concentrations, greater than 10% of LEL and/or greater than 10 ppm H2S if not captured before being released to a work area;

3) Under pressure or being purged with nitrogen;

4) Accompanied by a volume of liquid hydrocarbon that could prevent the control of emissions by:

- Depositing toxic/flammable liquid on the work area decking;
- Moving the emission source (i.e. liquid hydrocarbon) away from where emissions can be captured by the ventilation system.

Note: If preparing equipment, see PR-11 Safe Equipment Preparation for additional requirements, and note that a variance may be required when used as mitigation.

B. Portable Eductor Safety Procedure Requirements:

1) **<u>Barricade the exhaust point</u>** at a distance to ensure no impact to surrounding work.

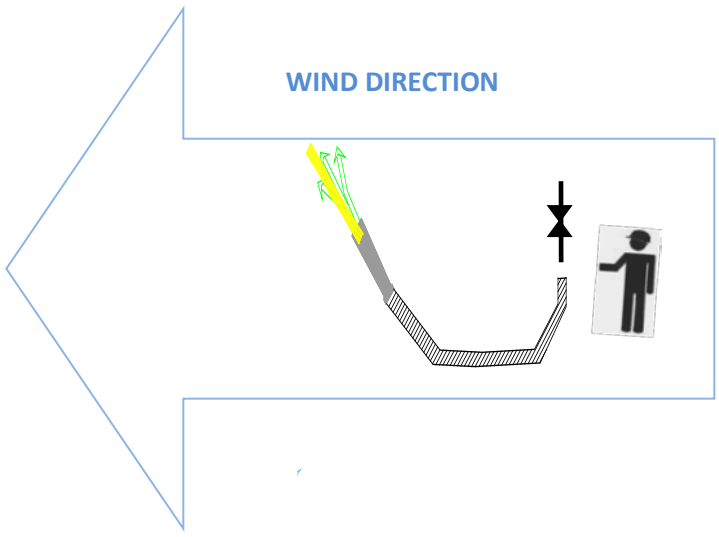
2) **<u>Ground Portable Eductor</u>** with a ground cable before using to capture contaminant emissions to prevent buildup of static electricity that could serve as ignition source.

3) **<u>Position Eductor to discharge at a safe location</u>** at least 6 feet downwind from bleeder/valve or flange to be opened.

4) **<u>Position Eductor suction within 6 inchs below bleeder/valve or flange to ensure</u>** that gas/vapor/liquid emissions are captured before release to the work area.

5) **<u>Check eductor prior to performing invasive work</u>** to verify good air flow.

Note: Rust in air lines or hoses can cause blockage of ports (~ 1/16” diameter) inside the eductor that can significantly reduce the air moving capability.



6) **<u>Work from upwind of the bleeder/valve whenever possible but do not block the wind.</u>**

7) **<u>Consider using Respiratory Protection.</u>** Half-face organic vapor/acid gas/P100 (OV/AG/P100) cartridge respirators and protective clothing. Refer to GBR-HESS-PPE-05.

Note: If any of the procedure requirements above cannot be met, use of an educator to perform the invasive work must be reassessed to determine what additional exposure control measures are warranted.

<u>Portable Eductor Blower</u> is an eductor used to push toxic and flammable gases/vapors away from the work area and significantly dilute concentrations to eliminate the potential for fire hazard exposures in a work area around leaking equipment.

A. Blower Applications: Use in situations where gas/vapor emissions:

1) Greater than 10% of the LEL were detected during testing of the atmosphere within 1 foot of a leaking flange, clamp, etc.

2) The leak that is causing the high LEL cannot be stopped by closing a valve or tightening a flange without entering an area where the LEL is >10%.

B. Blower Safety Procedure Requirements:

1) **<u>Install DANGER Tape/Sign perimeters</u>** at a safe distance around the leaking flange, clamp, etc. to ensure no impact to surrounding work.

2) **<u>Ground Portable Blower</u>** with a ground cable before using to blow air at leak to prevent build-up of static electricity that could serve as ignition source.

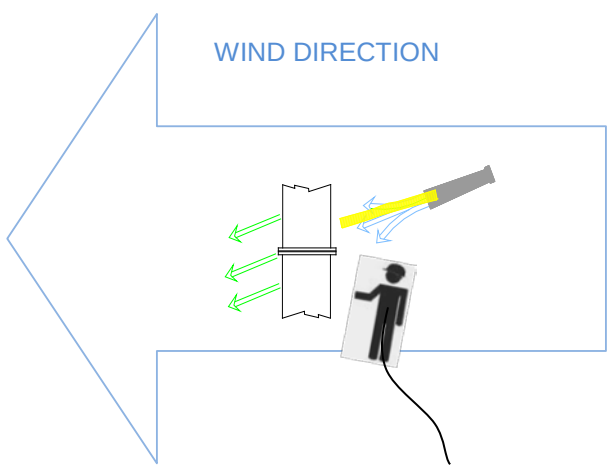
3) **<u>Position Blower discharge within 3 feet of leak</u>** and retest the work area to confirm that the combustible gas/vapor concentration in the area around the leak is less than 10% of the LEL.

4) **<u>Check eductor prior to performing invasive work</u>** to verify good air flow.

5) **<u>Bunker gear or flash suits, supplied air respirators and LEL monitors must be used</u>** by personnel working on the leak.

6) **<u>NO ONE SHOULD WORK FROM A POSITION BETWEEN A BLOWER AND A LEAK</u>**- this can cause emission to be drawn back at the person(s) blocking the air flow.

7) It may be necessary to assign a person to move the blower to control emissions from the leak if personnel working on the leak might move to positions that could block air flow from the eductor.



Note: If any of the procedure requirements above cannot be met, use of an educator to perform the invasive work must be reassessed to determine what additional exposure control measures are warranted.