User Guide for DICE HRA Screenings
Using our District's DICE Screening Tool

1) Before getting started, make sure you have the following information:
   - Engine size
   - Engine location
   - Dimensions and locations of nearby buildings
   - PM emission factor
   - Maximum annual usage for maintenance & testing

2) Open Google Earth and locate the engine:
   - Draw a circle with a radius of 3 km centered on the diesel engine. Determine if the area within the circle is primarily urban or rural.
     - o Industrial, commercial, dense single/multi-family, and multi-family two-story land use types are considered to be urban.
     - o Large estates, residences with large grass lawns, parks, golf courses, agricultural areas, undeveloped land, and water surfaces are considered to be rural.
   - Determine if the engine is closer to Santa Barbara or Santa Maria.
   - Use Google Earth's ruler tool to determine the distance to the nearest resident and to the nearest worker[1].
     - o The resident should be located at the nearest point of the closest house, apartment building, college/boarding school dorm, K-12 school, daycare or care facility, or hospital.
     - o The worker should be located at the nearest point of the closest commercial building or outdoor area where a worker could be located on a daily basis (i.e., an agricultural field, golf course, park, etc.).

3) How to use the DICE Screening Tool:
   - Open the spreadsheet, located here: https://www.ourair.org/wp-content/uploads/DICE-Screening-Tool.xlsx. The purple boxes in the "UI" (User Interface) tab are the only cells that must be edited to perform the DICE HRA screening. All other cells in all tabs are locked and contain data that was used to create the spreadsheet tool; they should *not* be edited.

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[1] Typically this refers to the nearest offsite worker. However, this could be an onsite receptor where a person works if they are not employed by or monetarily tied to the facility being evaluated (e.g. agricultural workers on a field within an oil lease, employees of restaurants located on a military base, etc.). See Section 3.8.7 of the District's Form-15i for additional information: https://www.ourair.org/wp-content/uploads/apcd-15i.pdf.

Santa Barbara County Air Pollution Control District
DICE Screening Tool — August 2018

Engine Data User Inputs

Dispersion

- ◉ Urban
- ○ Rural

Meteolorogical Data Set

- ◉ Santa Maria Airport
- ○ Santa Barbara Airport

Building Downwash

- ◉ Include Building Downwash
- ○ No Building Downwash

Engine Size

500 bhp

Distance from Source to

Nearest Resident:

200 meters

Nearest Worker:

100 meters

Diesel PM Emission Factor

0.15 g/bhp-hr

Permitted Hours

50 hr/yr

DICE Screening Health Risk Outputs		SBCAPCD Board-Approved Significance Thresholds
Cancer Risk at the MEIR:	5.9 / million	≥10.0 / million
Chronic HI at the MEIW:	<0.1	>1.0

HI stands for "hazard index."
MEIR stands for "maximally exposed individual resident."
MEIW stands for "maximally exposed individual worker."

- Enter the engine data into the appropriate purple cells:
  - Select urban or rural dispersion based on your determination from Google Earth.
  - Select the meteorological data set based on your determination from Google Earth.
  - Building downwash effects should be included if there is a sufficiently large building near the engine. *If you are unsure, include building downwash.* Building downwash effects can be excluded only if the following is true:

$$D \geq 5L$$

where: $D = shortest\ distance\ from\ the\ exhaust\ stack\ to\ the\ building$

$L = lesser\ of\ the\ following\ two\ values$:
$building\ height\ and\ projected\ building\ width\ (PBW)$

$PBW = maximum\ cross-sectional\ length\ of\ the\ building;$
$for\ rectangular\ buildings,\ PBW = \sqrt{(length^2 + width^2)}$

  - Enter the size of the engine in units of brake horsepower.
  - Enter the distance from the engine to the nearest resident and to the nearest worker in meters.
  - The diesel PM emission factor is equal to the PM emission factor for the engine.
  - Enter the maximum annual permitted usage of the engine, *for non-emergency purposes only*. This value is usually 50 hours per year for new engines in Santa Barbara County.

4) How to interpret the results:
   - Our District's Board-approved significance thresholds for cancer risk and chronic non-cancer risk are shown in green.
   - The resulting screening health risk values will be shown in blue.
   - If the screening health risk values are below the significance thresholds, the engine has passed the HRA screening.
   - If any of the values are above the significance thresholds, contact the District.