



# Geographic Information Systems (GIS)

Environmental Impact Analysis

Name: \_\_\_\_\_

Section: \_\_\_\_\_

Score: \_\_\_\_/5

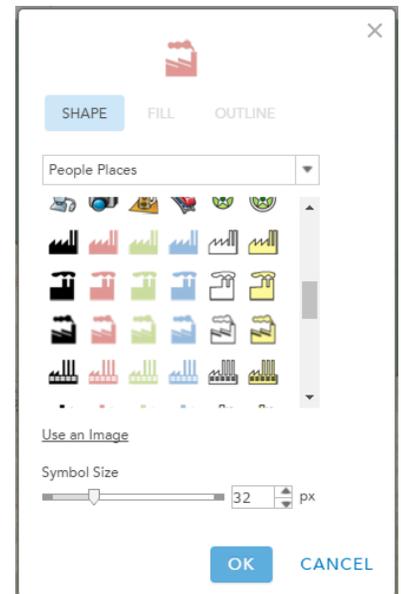
Directions: Read the scenario and then follow the directions to make a map showing the disaster area of a chemical spill in West Virginia. When finished prepare a report that summarizes your findings.

## Scenario:

The date is January 9<sup>th</sup>, 2014 and it has just been discovered that there has been a MCHM chemical spill at Freedom Industries into the Elk River near Charleston, West Virginia. The facility is located at 1015 Barlow Drive, Charleston, West Virginia (38°22'7.98"N 81°36'23.82"W) and the Environmental Protection Agency (EPA) needs to know how this will impact the area and how many people could potentially be affected. The EPA needs to know as soon as possible since any humans that come into contact with the chemicals will get sick. The impacted area needs to immediately switch to using bottled water for bathing, drinking, and other daily uses. The EPA estimates that it will need about \$1,000,000 to clean up the spill, and \$500 per person in the impacted area in order to provide them with water until the spill can be cleaned up.

## Step 1: Preparing your Map

1. Sign in to ArcGIS and open a new map
2. As you are working with an environmental issue change the **basemap** to the **USA Topo Maps**
3. Add a map note at the point of the origin of the chemical spill and label it as "Freedom Industries"
4. Edit the symbol of the map so that it is represented as a red factory



## Step 2: Perform a Downstream Analysis

1. Select the **Analysis** option on the top bar to open up the **Perform Analysis** side menu
2. Left-click on the **Find Locations** drop down menu and then select the **Trace Downstream** option
3. Make sure that Freedom Industries is being used as your starting location
4. Do not split the trace but estimates are that after 115 miles the chemicals will be diluted enough to be diluted enough to not impact humans
5. Check the credits (should be less than 1) and then Run the Analysis

## Step 3: Figuring the Impacted Area

1. The line that appears is the amount of water that will be impacted by the Chemical spill
2. Add a Map Note titled "Disaster Area" and create an area on the map around the impacted Area
3. Once the layer is created go back to the Analysis top bar and in the **Perform Analysis** side menu select that you would like to Enrich Layer.
4. In the **Enrich Layer** menu select that you would like to enrich the Disaster Area and then left-click on the **SELECT VARIABLES** option
5. In the Data Browser search in Population for the **2015 Total Population** statistics. Select **Apply** and run a quick check on credits (should be under 1) and then Run the Analysis. The enriched layer will now tell you how many people live in the area.

