Preliminaries

1. In c:\arcnlet, create new subfolder called workshop
2. Open ArcMap (Look for it in the start menu-> programs)
3. Create a new empty map
4. Add data
    1. Add file **c:\arcnlet\lakeshore_example\PotentialSepticTankLocations.shp**
    2. All data in **c:\arcnlet\lakeshore_example\OriginalData**
5. Change the data frame coordinate system to UTM Zone 17N
6. Save the map to **c:\arcnlet\workshop\workshop.mxd**

Clipping the Data

1. Create clipping region
   a) Open the Create Feature Class tool from the toolbox
   b) Enter **c:\arcnlet\workshop** for the Feature Class Location
   c) Name it **clip**
   d) For coordinate system, select UTM Zone 17N
   e) Leave everything else as default
2. From the editor toolbar, select Editor->Start Editing (if the toolbar is not visible add it)
   1. From the box that appears, select **c:\arcnlet\workshop**
   2. Create a new polygon
   3. Exit the editing session and save when prompted.

Clipping the Data

3. Open the Extract by Mask tool from the toolbox (you can also use the Clip tool if you want)
   a) Input: **lakeshore.img**
   b) Mask: **clip**
   c) Output: **c:\arcnlet\workshop\lakeshore.img** (make sure to add the .img extension)
   d) Click the Environments button
      i. Select General Settings
      ii. Set the output coordinate system to Same as Display. The box below should read NAD_1983_UTM_Zone_17N

Clipping the Data

4. Open the Clip (analysis) tool to clip the water bodies
   a) Input: **NHDFlowline_DEP_NHD**
   b) Clip Features: **clip**
   c) Output: **C:\arcnlet\workshop\NHDFlowline_DEP_NHD_clip**
   d) Click the Environments button
      i. Select General Settings
      ii. Set the output coordinate system to Same as Display. The box below should read NAD_1983_UTM_Zone_17N
5. Repeat previous step for **NHDArea_DEP_NHD**. Save as **C:\arcnlet\workshop\NHDArea_DEP_NHD_clip**
6. Save the map.

Merge Line Features With Water Bodies

1. Create a buffer around the flow line
   a) Open the Buffer tool
   b) Input: **NHDFlowline_DEP_NHD_clip**
   c) Output: **c:\arcnlet\workshop\NHDFlowline_DEP_NHD_clip_5m.shp**
   d) Linear Unit: 5 meters
   e) Leave everything else as default

Merge Line Features With Water Bodies

1. Open the Merge tool
   a) Add the two input datasets: **NHDFlowline_DEP_NHD_clip_5m** and **NHDArea_DEP_NHD_clip**
   b) Output: **c:\arcnlet\workshop\waterbodies.shp**
3. (OPTIONAL) Delete any parts of the buffered flow lines that overlap the main water bodies
4. Save the map

Hydraulic Conductivity & Porosity

This example will use a homogeneous hydraulic conductivity and porosity

1. Open Raster Calculator from the Spatial Analyst toolbar (enable it if it is not present)
   a) Double click the lakeshore entry
   b) Enter the expression [lakeshore] * 0 + 2.113
   c) Right click on the resulting Calculating and select Make Permanent
   d) Save it in **c:\arcnlet\workshop\hydr_cond.img** (be sure to select the ERDAS IMAGINE format)
   e) Add the layer manually to the map
2. Repeat the process to create the porosity raster (use 0.25 instead of 2.113.) Save as **porosity.img** and add it to the map.

Add a Value for C0

1. Add field to specify C0 (initial concentration) for each septic tank
   a) Open the Add Field tool
   b) Select the PotentialSepticTankLoctions table
   c) Enter N0_conc as the field name
   d) Select FLOAT as the field type

   Note for this particular data set, the N0_Conc field is already present so you will get an error if you try to add it again.

2. To change the value of the N0_Conc field
   a) Right click on the PotentialSepticTankLoctions layer and open the attribute table
   b) Right click on the column name and open field calculator
   c) Enter the desired value and click OK
3. To change each value individually, it must be done within an edit session.