NaviKnow

Dispersion Modeling Training Series

Dispersion Modeling Audits: Representation Consistency

### Procedure for Processing AERMOD Input Files for Data Validation

I. **Download Tools**
   a. Download zip file with NKInputToCSV.zip and NKModelingAudit_DB.accdb.
   b. Extract NKInputToCSV.zip to any directory use choose. The tool to process is NKInputToCSV.exe.

II. **Processing AERMOD Modeling System input files**
   a. Though it is not necessary, it is recommended you copy ALL AERMOD, AERMAP, BPIPPRM input files to a single directory.
   b. Launch NKInputToCSV by double clicking on NKInputToCSV.exe.
   c. Locate the **Select** button on the upper right-hand corner of the interface. Click the **Select** button to navigate to the directory where the model input files are located.
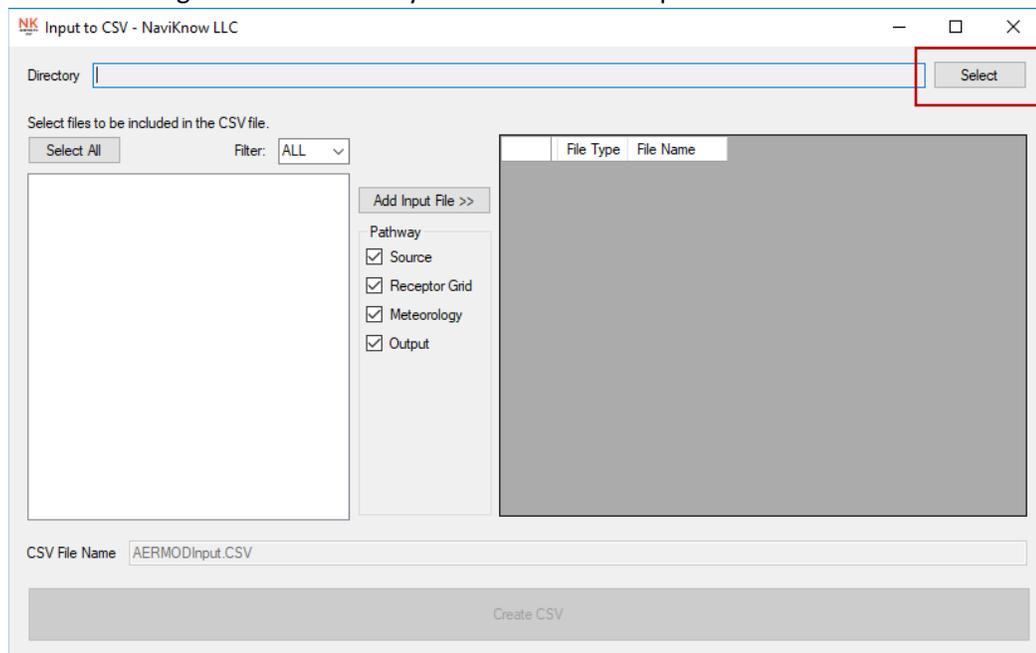
   d. Select the files to process by clicking on the file names listed in the list box on the left side of the interface. Alternatively, clicking the **Select All** button will select all the files in the directory. Select files are highlighted in blue.
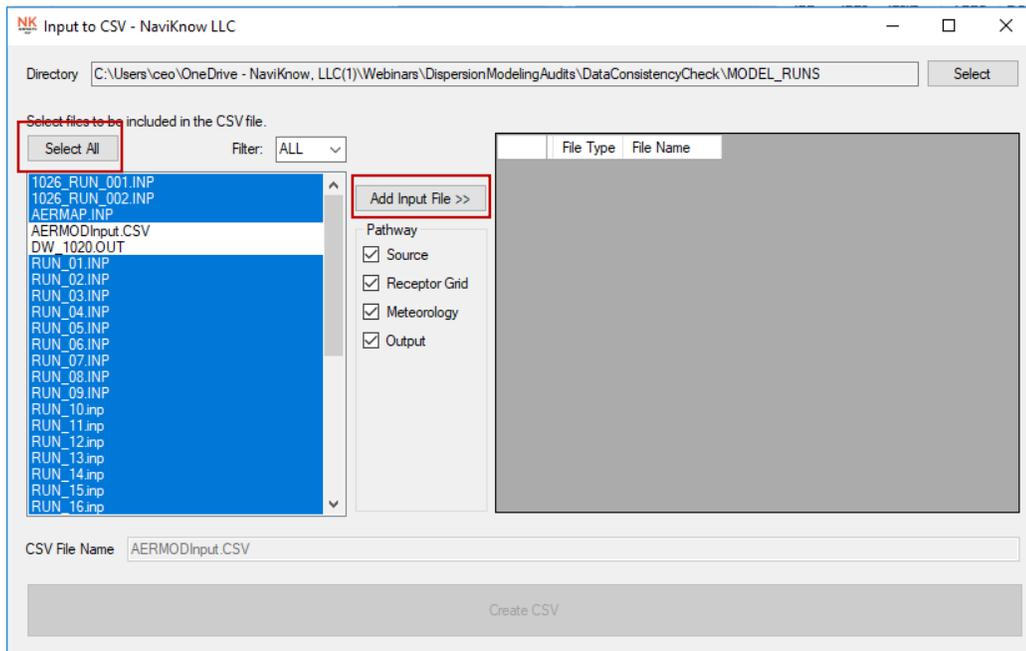
e. Click on the **Add Input File** button to fill in the listing on the right-hand side of the interface of files to be processed.

f. When files are listed, the **Create CSV** button will become active. Once all the files to be processed have been selected and listed on the right-hand side of the interface, click on the **Create CSV** button to process the selected input files. The data is stored in the file AERMODInput.CSV.
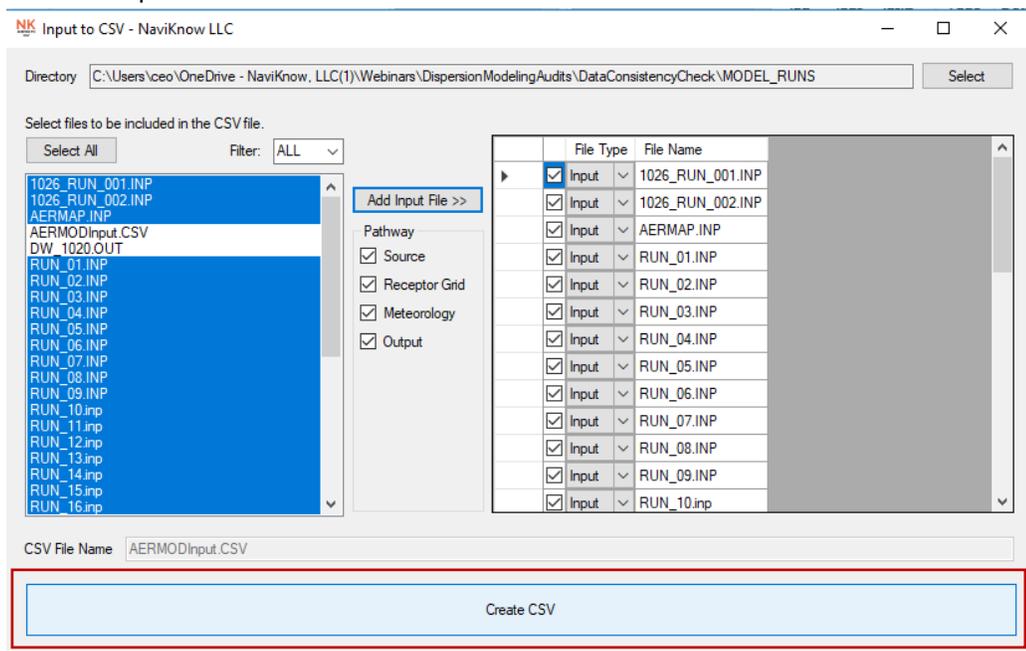
III. **Importing Processed File Data to Modeling Audit Database**

a. Locate and open NKModelingAudit_DB.accdb, the Modeling Audit database file.

b. From the menu items, select **External Data | New Data Source | From File | Text File**. Then locate the file created by NKInputToCSV (AERMODInput.CSV), then select the file. Make sure the **Import the source data into a new table in the current database** is checked then click on OK.
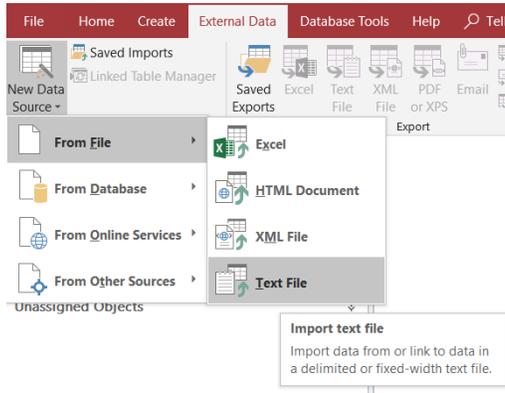
c. In the dialog box, make sure **Delimited** is checked, then click **Next**.

d. In the dialog box, make sure **Comma** and **First Row Contains Field Names** are both checked. Set the Text Qualifier to double quotes, ("), then click Next.

e. Locate the **Advanced…** button on the lower left-hand side of the dialog box. Click on the **Advanced…** button. In the dialog that opens locate then click on the **Specs…** button. Another small dialog opens. Select **AERMODInput Import Specification**, then click **Open**. The smaller dialog will close. Then click OK.

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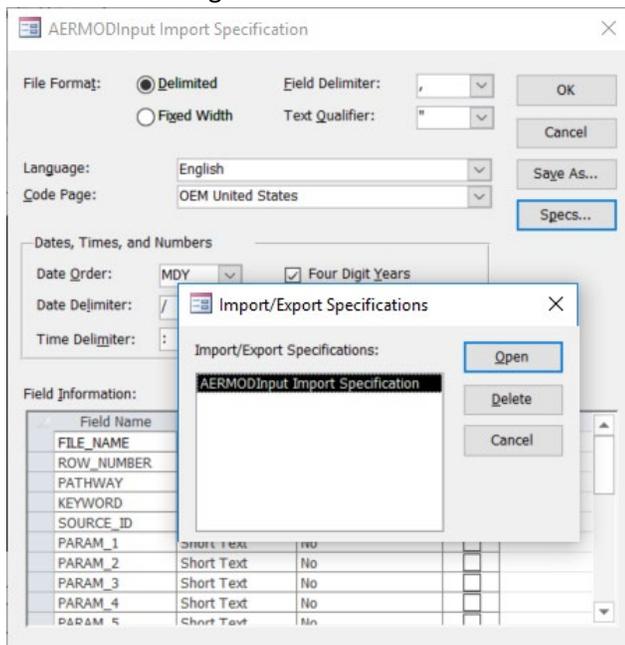
f. In the next dialog box, make sure **Let Access add primary key** is checked, then click on **Next**.
g. In the next dialog box, make sure the Import to Table entry is set to AERMODInput. Then click on Finished.
h. At this point, the data in the file created by NKInputToCSV is imported to the data table **AERMODInput**. When the import is complete, the table **AERMODInput** should appear under **Unassigned Objects** group in the Access Table of Contents on the left-hand side of the Access interface.
i. The next step is to insert the data from the staging table (**AERMODInput**) to the working table **tblAllAermodInput**. To insert the data, double click on the query qryInsertAllAermodInput. A dialog box will appear informing you **You are about to run an append query that will modify data in your table**. Click Yes. The query will run. This could take a few seconds. A second dialog will appear informing you **You are about to append XXX row(s)**. Click Yes.

The queries to execute to perform the input data consistency audit are located in four groups, **Audit Source Locations**, **Audit Source Parameters**, **Audit Source Emissions**, and **Reports**.

IV. **Performing Data Consistency Audit** -
   a. **Audit Source Locations** - There are two queries to validate all source locations are consistency represented in all input files, qrySourceXY_Duplicates and qrySourceXYZ_Duplicates. Double click to execute each query. If no records are returned, all the locations are consistently represented. If there are nonmatching values, all records for that source with the associated input file name will be returned. There are two separate queries because AERMAP input with only have X and Y values and no Z value.
   b. **Audit Source Parameters** – There are three queries to validate all source parameters represented in all input files, qrySourceParams_Duplicates, qryAreaParam_ValidRange, and qryPointParam_ValidRange. The query qrySourceParams_Duplicates checks for duplicate source parameter values. If no records are returned, all source parameter values are consistently represented. If there are nonmatching values, all records for that source with the associated input file name will be returned.

   The other queries check for valid ranges of source parameter values by source type. Each source type has a separate query. If no records are returned, then all values are within valid ranges. If records are returned, the source will all parameter values are returned indicating that the values should be more closely scrutinized.
   c. **Audit Source Emissions** – There are three queries to validate all source emission rates represented in all input files, qrySourceEmiss_Duplicates, qrySourceEmiss_DuplicatesByAirContaminant, and qrySourceEmiss_DuplicatesByStandard. Before you can use these queries, two data tables, tblFiles and tblEPN_Source, must be populated with project specific values. There are two queries to assist in populating these two tables, qryInsertToFiles to insert the file names into tblFiles and qryInsertToEPN_Source to insert Source_IDs into tblEPN_Sources.

The three queries checking for duplicate representations, return no records when all source emission rate values are consistently represented. If there are nonmatching values, all records for that source with the associated input file name will be returned.

V. **Reports**

There are five queries that can be used to summarize the data represented in the modeling project.

a. To return all source locations (X, Y, Z) and source type of each source, double click on **qrySourceLocations**.

b. To return all emission rates modeled in English units (pounds per hour and tons per year), double click on **qrySourceEmissionsModeled**.

c. To return all source parameters in SI and English units, double click on **qryPointParameters**, **qryAreaParameters**, and **qryVolumeParameters** for point, area, and volume sources, respectively.