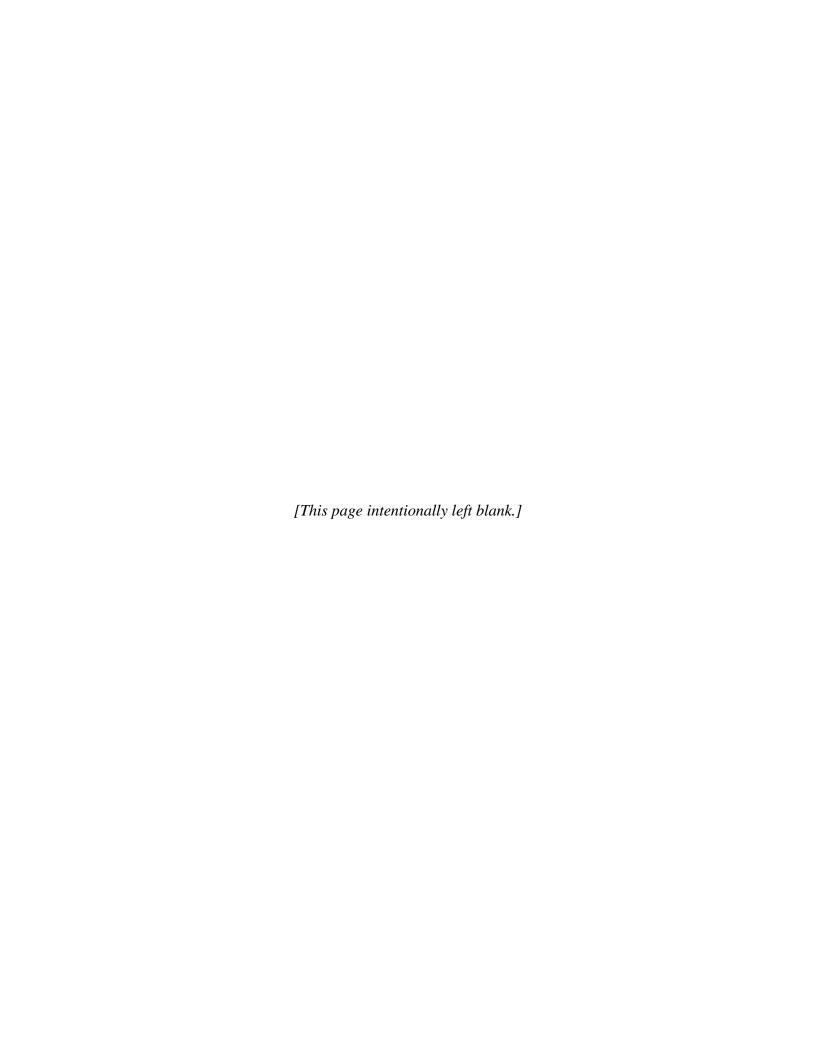# APPENDIX C

Nonroad Sources

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Nonroad Sources

All methodologies described below are taken directly from the November 2013 United States Environmental Protection Agency (EPA) document, "2011 National Emissions Inventory," Version 1 Technical Support Document, which can be found at:

http://www.epa.gov/ttn/chief/net/2011nei/2011_neiv1_tsd_draft.pdf.

Starting with 2008, nonroad consists of nonroad engines and equipment. Aircraft engine emissions occurring during Landing and Takeoff operations and the Ground Support Equipment and Auxiliary Power Units associated with the aircraft are included in the point data category at individual airports. Emissions from locomotives that occur at rail yards are also included in the point data category. In-flight aircraft emissions, locomotive emissions outside of the rail yards, and commercial marine vessel emissions (both underway and port emissions) are included in the nonpoint data category.

The data files used for this document were obtained as a download from the EIS gateway. The SMOKE files from the gateway were imported into the EMF system in order to apply the necessary data filters and summer day averages.

Nonroad Equipment – Diesel, Gasoline and Other

Although "nonroad" is used to refer to all transportation sources that are not on-highway, these EIS sectors and this section address nonroad equipment other than locomotives, aircraft, or commercial marine vehicles.

Sector Description

The U.S. Environmental Protection Agency's (EPA) NONROAD model (http://www.epa.gov/otaq/nonrdmdl.htm) was used to estimate emissions from all other nonroad source categories. These categories include nonroad engines and equipment, such as: lawn and garden equipment, construction equipment, engines used in recreational activities, portable industrial, commercial, and agricultural engines.

The National Mobile Inventory Model (NMIM) (http://www.epa.gov/otaq/nmim.htm) was EPA's consolidated mobile emissions estimation system that allowed EPA to produce nonroad mobile emissions in a consistent and automated way for the entire country for the year 2011. EPA encouraged agencies to submit NMIM inputs to the EIS for the 2011 NEI for inclusion in the National County Database (NCD). The NCD contains all the county-specific information needed to run NONROAD. Although NMIM was designed to also estimate onroad emissions, it is no longer used and EPA now uses the MOVES model. Eventually MOVES will be revised to also estimate nonroad emissions and NMIM will be retired.

NMIM estimates monthly emissions for total hydrocarbons (THC) used to determine VOC, NO_X, and CO, as well as calculating monthly fuel consumption. All of the input and activity data required to run NMIM are contained within the NCD, which is distributed with the model.

EPA-Developed NMIM-Based Nonroad Emissions Data

EPA uses the activity data within NMIM as a basis for air quality modeling, rule development, international reporting, air quality trends analysis, and other activities. To that end, a single NCD for the 2011 NEI was developed to represent, as accurately as possible, the activity data upon which the 2011 NEI emissions are based. This newly developed NCD, named NCD20130531_nei2011v1, was created using the approach discussed in the following sections. Like the emissions, the updates to the NCD were determined using a hierarchy decision model, where defaults were replaced with S/L-supplied data. The exception to the hierarchy decision model is that EPA-supplied fuel and meteorological data were used for all 2011 NMIM modeling runs, as explained below. A copy of NCD20130531_nei2011v1 which includes all the state-supplied updates, as well as EPA's fuel and meteorological data is named NCD20130531 and is provided in the same zip file as the NCD used for the NEI. The zip file name is 2011nei_supdata_nonroad.zip, and it can be accessed at:

ftp://ftp.epa.gov/EmisInventory/2011v1/doc

The development of the NCD used for the 2011 NEI is explained in the following sections.

4.5.4.1 Default NCD

The default 2011 NCD, NCD20130531_nei2011 is available at: ftp://ftp.epa.gov/EmisInventory/2011v1/doc, in the zip file "2011nei_supdata_nonroad.zip" and is based upon NCD20101201a.[1] EPA updated fuel and meteorological data for inclusion in the new 2011 NCD.

Summary of Quality Assurance Methods

After the NMIM completed its execution, the resulting output databases were checked to ensure that no error messages were created during the runs for each geographical area. Furthermore, the NMIM generates the same number of output records for each RunID-FIPSCountyID-FIPSStateID-Year-Month combination. Therefore, each of the output tables was checked to ensure the number of records for this combination of fields summed to the correct record count. As expected, zero error messages were recorded by NMIM and every county produced the same number of output records.

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[1] NCD20101201a is the NCD that is included in the current download of NMIM.