

## User instructions for LEADPOST (Version 11237) program

LEADPOST is a FORTRAN program designed to read monthly concentration output from AERMOD or an alternative model and calculate rolling 3-month averages by receptor and source group. The program will calculate the maximum rolling 3-month average concentration for each receptor and overall maximum concentration (across all receptors and source groups).

References for dispersion modeling guidance can be found in the lead modeling Q & A sheet. (<http://www.epa.gov/ttn/amtic/files/ambient/pb/ModelingQA.pdf>) and EPA's Support Center for Regulatory Atmospheric Modeling (SCRAM) (<http://www.epa.gov/scram001>). A list of preferred dispersion models can be found at [http://www.epa.gov/scram001/dispersion\\_prefrec.htm](http://www.epa.gov/scram001/dispersion_prefrec.htm) and a list of alternative models can be found at [http://www.epa.gov/scram001/dispersion\\_alt.htm](http://www.epa.gov/scram001/dispersion_alt.htm).

### 1. Inputs

LEADPOST reads two file types: 1) AERMOD POSTFILES with a monthly averaging period or 2) user-created simple text files. The user chooses which type to use, but all files must be of the same type. When choosing either option, multiple files can be read. These could be separate files by source group and year, all source groups in one file for each year, etc. However, all the receptors must be the same and in the same order for each month and source group. The filenames are read from a file called inputfiles.txt, a text file listing the concentration files.

#### 1.1 AERMOD POSTFILES

When using AERMOD POSTFILES, LEADPOST will check the header lines (lines with '\*' as the first character on the line) to check for the number of receptors and source group identifiers. LEADPOST will also derive the format of the concentration records and account for the presence of deposition output (dry, wet, and/or total deposition) when reading the files (Figure 1). Deposition output is not retained by the program.

When creating the list of source groups, LEADPOST will check for the existence of source group "ALL", the source group used in AERMOD to automatically calculate the total contribution of all sources to a receptor concentration (see AERMOD User's Guide, Section 3.3.11). If LEADPOST does not find the group "ALL", the user will be notified and prompted for a source group that represents the total contribution from all sources. The entered group name will be compared against the list of source groups from the AERMOD POSTFILES and if it is not in the list, the user is notified that the concentrations for the entered group will be calculated. If the entered group is to be calculated, LEADPOST assumes the individual source groups are mutually exclusive, i.e. an emission source is assigned to only one source group only.

LEADPOST assumes that concentrations are in micrograms per cubic meter. If concentrations are in units other than micrograms per cubic meter, concentration results from LEADPOST should be converted to micrograms per cubic meter to compare against the lead NAAQS standard. LEADPOST will also check the averaging period in the POSTFILE. If it is not monthly (averaging period MONTH), the program will notify the user and stop processing.

* AERMOD (07026): RDU 2003 STANDARD ASOS URBAN									
* MODELING OPTIONS USED:									
* CONC									
* ELEV									
* POST/PLOT FILE OF CONCURRENT MONTH VALUES FOR SOURCE GROUP: STACK1 ← Source group									
* FOR A TOTAL OF 1692 RECEPTORS. ← Number of receptors									
* FORMAT: (3 (1X,F13.5), 3 (1X,F8.2), 2X,A6,2X,A8,2X,I8.8,2X,A8) ← Format									
* X Y AVERAGE CONC ZELEV ZHILL ZFLAG AVE GRP DATE NET ID									
* DRYDPL WETDPL									
34.72964	196.96155	0.04133	32.20	127.00	0.00	MONTH	STACK1	99013124	POL1
43.41204	246.20193	0.03038	67.20	127.00	0.00	MONTH	STACK1	99013124	POL1
52.09445	295.44232	0.02346	72.50	127.00	0.00	MONTH	STACK1	99013124	POL1
60.77686	344.68271	0.02382	94.50	127.00	0.00	MONTH	STACK1	99013124	POL1
69.45927	393.92310	0.01341	103.30	105.80	0.00	MONTH	STACK1	99013124	POL1
78.14168	443.16348	0.00973	105.50	105.50	0.00	MONTH	STACK1	99013124	POL1
86.82409	492.40387	0.00724	107.00	113.70	0.00	MONTH	STACK1	99013124	POL1
95.50650	541.64429	0.00533	109.80	112.90	0.00	MONTH	STACK1	99013124	POL1
104.18890	590.88464	0.00754	104.00	125.90	0.00	MONTH	STACK1	99013124	POL1
112.87132	640.12506	0.00771	102.40	125.30	0.00	MONTH	STACK1	99013124	POL1
121.55373	689.36542	0.00741	101.50	101.50	0.00	MONTH	STACK1	99013124	POL1
130.23613	738.60583	0.00651	102.10	102.10	0.00	MONTH	STACK1	99013124	POL1
138.91855	787.84619	0.00622	101.20	101.20	0.00	MONTH	STACK1	99013124	POL1
147.60095	837.08661	0.00617	99.00	99.00	0.00	MONTH	STACK1	99013124	POL1
156.28336	886.32697	0.00570	98.30	98.30	0.00	MONTH	STACK1	99013124	POL1
164.96577	935.56738	0.00531	96.50	96.50	0.00	MONTH	STACK1	99013124	POL1
173.64818	984.80774	0.00490	95.10	95.10	0.00	MONTH	STACK1	99013124	POL1
191.01300	1083.28857	0.00392	91.50	91.50	0.00	MONTH	STACK1	99013124	POL1
208.37781	1181.76929	0.00323	88.70	91.20	0.00	MONTH	STACK1	99013124	POL1
225.74263	1280.25012	0.00269	85.20	90.70	0.00	MONTH	STACK1	99013124	POL1
243.10745	1378.73083	0.00230	80.50	87.30	0.00	MONTH	STACK1	99013124	POL1
260.47226	1477.21167	0.00205	78.80	80.20	0.00	MONTH	STACK1	99013124	POL1
277.83710	1575.69238	0.00184	76.50	77.90	0.00	MONTH	STACK1	99013124	POL1
295.20190	1674.17322	0.00168	77.60	77.60	0.00	MONTH	STACK1	99013124	POL1
312.56671	1772.65393	0.00150	69.40	77.60	0.00	MONTH	STACK1	99013124	POL1

Figure 1. Example AERMOD POSTFILE with source group, receptor number, and format lines denoted.

## 1.2 USER-CREATED FILES

LEADPOST can also read user-created simple text files with variables in the order, units, and type (integer, real, character) shown in Table 1 and a sample format is shown in Figure 2.

Table 1. Variables contained in user-created concentration text files.

Order	Variable	Units	Type
1	Receptor x-coordinate	meters	Real
2	Receptor y-coordinate	meters	Real
3	Monthly concentration	( $\mu\text{g}/\text{m}^3$ ) <sup>1</sup>	Real
4	Receptor terrain elevation	meters	Real
5	Receptor hill-height scale	meters	Real
6	Receptor height above ground	meters	Real
7	Source group		Character (maximum 8 in length)
8	2-digit year		Integer
9	Month		Integer

1. If concentrations are in units other than micrograms per cubic meter, results from LEADPOST should be converted to micrograms per cubic meter to compare against the lead NAAQS standard.

```
-4000 -0.00015 0.00029 126.8 126.8 0 STACK1 99 1  
-3939.23096 -694.59283 0.00044 126.8 126.8 0 STACK1 99 1  
-3939.23096 694.59259 0.00051 126.8 126.8 0 STACK1 99 1  
-3900 -0.00014 0.0003 126.8 126.8 0 STACK1 99 1  
-3840.75024 -677.22803 0.00046 126.8 126.8 0 STACK1 99 1  
-3840.75024 677.22772 0.00054 126.8 126.8 0 STACK1 99 1
```

**Figure 2. Sample format of user-created concentration text file.**

Like the POSTFILES, there can be several user-created files, but each file must contain all the receptors and in the same order for each month and source group. Within each user-created file the records should be sorted by: year, month, group, x-coordinate, and y-coordinate. The variables do not need to follow a specific format, but must be separated by at least one space in order to be read into the program correctly.

As with the POSTFILE option, the presence of source group “ALL” will be determined and if not detected, the user will be prompted for the name of the total concentration source group. If it is not detected in the list of the sources, the group’s concentration will be calculated.

Examples of use of user-created text files may be include scenarios when the receptor network for a modeling study is divided into several subsets, to decrease runtime, and must be recombined so that all receptors are in one dataset. User-created text files may also be utilized if the initial model results are not monthly and must be averaged to create monthly averages.

## 2. Running LEADPOST

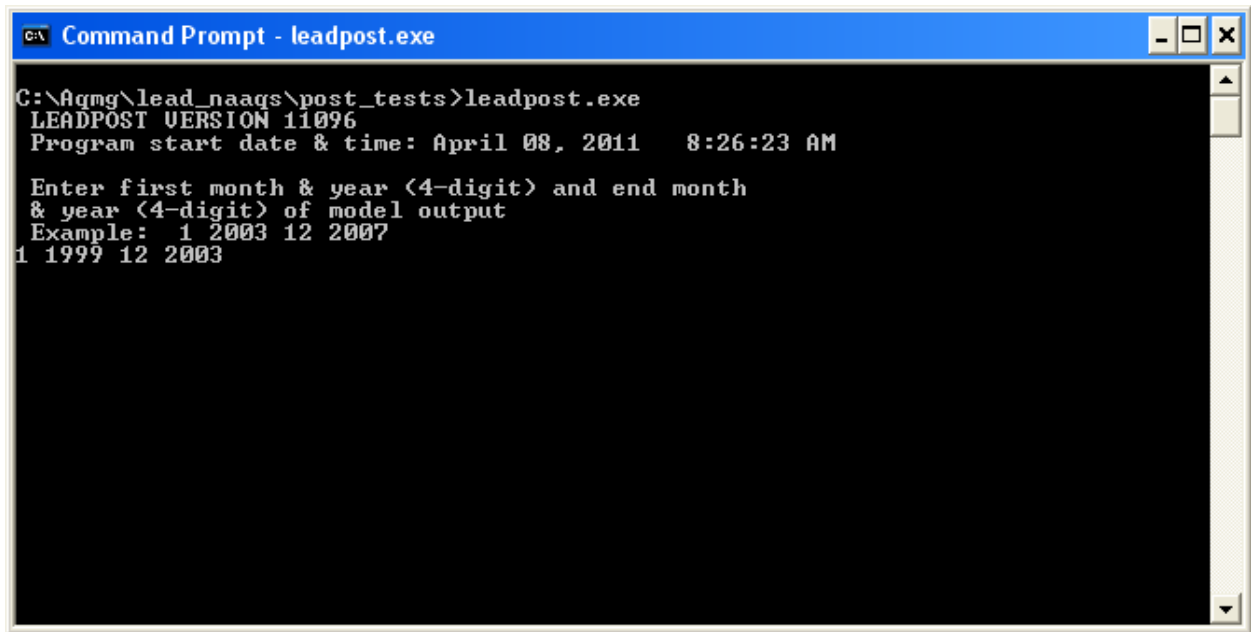
The following example show the steps in running LEADPOST as well as the outputs from LEADPOST for seven hypothetical source groups for 1,692 receptors in a polar grid for a period from 1999 to 2003. In this example, the total concentration from all sources at each receptor has been calculated by AERMOD as source group ALL.

1. List input concentration files in the files inputfiles.txt (Figure 3). Full pathnames or pathnames relative to the working directory can be used if output is not in the same directory as the working directory. If the filename or path contains spaces, the entire pathname must be enclosed in quotations. The file inputfiles.txt must be in the current working directory. If running LEADPOST on a PC, the filename inputfiles.txt and the files listed in inputfiles.txt are not case sensitive. If running LEADPOST on a Linux computer, inputfiles.txt must be lowercase and the filenames listed in inputfiles.txt are case sensitive.

```
"example case\STACK1.PST"  
"example case\STACK2.PST"  
"example case\STACK3.PST"  
"example case\STACK4.PST"  
"example case\STACK5.PST"  
"example case\STACK6.PST"  
"example case\STACK7.PST"  
"example case\ALL.PST"
```

**Figure 3. List of input concentration files in inputfiles.txt**

2. Double click on the LEADPOST executable (leadpost.exe) or in a DOS window, change directory to the directory containing the executable and inputfiles.txt and type leadpost.exe at the prompt.
3. The user will be prompted for the start month, start year, end month, and end year. The dates should cover the entire modeled period, in this case January 1999 through December 2003 (Figure 4). Years are entered as four digit years.

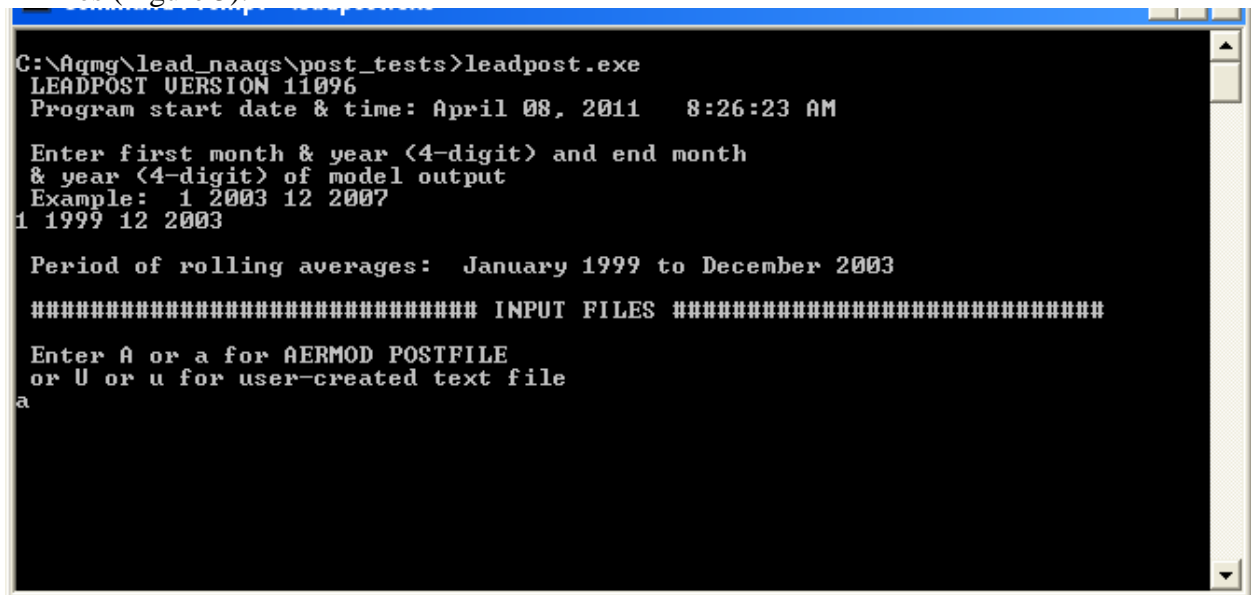


```
C:\Agmg\lead_naags\post_tests>leadpost.exe
LEADPOST VERSION 11096
Program start date & time: April 08, 2011 8:26:23 AM

Enter first month & year <4-digit> and end month
& year <4-digit> of model output
Example: 1 2003 12 2007
1 1999 12 2003
```

Figure 4. Start and end dates prompt for LEADPOST.

4. LEADPOST will list the period of rolling averages and the user will be prompted for the file type. Enter “A” or “a” for AERMOD POSTFILES or “U” or “u” for user-created text files (Figure 5).



```
C:\Agmg\lead_naags\post_tests>leadpost.exe
LEADPOST VERSION 11096
Program start date & time: April 08, 2011 8:26:23 AM

Enter first month & year <4-digit> and end month
& year <4-digit> of model output
Example: 1 2003 12 2007
1 1999 12 2003

Period of rolling averages: January 1999 to December 2003

##### INPUT FILES #####

Enter A or a for AERMOD POSTFILE
or U or u for user-created text file
a
```

Figure 5. File type prompt in LEADPOST.

5. Once processing begins, LEADPOST lists the names of the input files and checks for duplicate filenames. If duplicate names are found, the user is notified and the program is stopped so the user can correct the file listings in inputfiles.txt, otherwise processing continues (Figure 6).
6. After checking the input files, LEADPOST reads the header lines of the input files to get source group information and receptor number. After creating the array of unique source

groups, LEADPOST searches for the source group “ALL” in the concentration files. If “ALL” is found, the user will be notified that “ALL” has been found and will be assumed to be the total concentration group. Otherwise, LEADPOST will prompt the user for the total source group name, check for its existence, and notify the user if it exists or will be calculated. LEADPOST will also report the number of receptors found in the model output. The source groups are listed with the total concentration group listed last and denoted with a “\*”. The user is then given two options: 1) to proceed, or 2) stop program and check inputs. Option 2 should be chosen if the number of source groups or source group identifiers do not match what was intended to be input or the number of receptors does not match the model runs. Otherwise, if everything is correct, option 1 should be chosen (Figure 6). If the number of receptors does not match among the concentration input files, LEADPOST will automatically stop and inform the user.

```
Command Prompt - leadpost_09041.exe

Enter first month & year (4-digit) and end month
& year (4-digit) of model output
Example: 1 2003 12 2007
1 1999 12 2003

Period of rolling averages: January 1999 to December 2003

##### INPUT FILES #####

Enter A or a for AERMOD POSTFILE
or U or u for user-created text file
a

Input concentration file type: AERMOD POSTFILE

8 input concentration files:

example case\STACK1.PST
example case\STACK2.PST
example case\STACK3.PST
example case\STACK4.PST
example case\STACK5.PST
example case\STACK6.PST
example case\STACK7.PST
example case\ALL.PST

Checking for duplicate filenames

No duplicate filenames found

#####

##### SOURCE GROUPS #####

Source group ALL has been found in group array
It will be assumed this the group that represents
contributions from all sources

8 groups will be processed
Groups are:
STACK1
STACK2
STACK3
STACK4
STACK5
STACK6
STACK7
* ALL

* denotes total group

The number of receptors is: 1692

Verify source groups and receptors and enter one of
the following options:

1) Proceed with calculations
2) Stop program and check input concentration files
```

Figure 6. Input concentration files listing, source group listings and number of receptors as reported by LEADPOST.

During execution, LEADPOST writes information to a file called lead.log. Much of this information is written to the screen as well.

Following the source group summary, LEADPOST writes the input filenames to the log file and screen as they are read by the program (Figure 7).

```

##### INPUT CONCENTRATIONS #####

Reading concentration file: STACK1.PST
Checking for deposition output

Reading concentration file: STACK2.PST
Checking for deposition output

Reading concentration file: STACK3.PST
Checking for deposition output

Reading concentration file: STACK4.PST
Checking for deposition output

Reading concentration file: STACK5.PST
Checking for deposition output

Reading concentration file: STACK6.PST
Checking for deposition output

Reading concentration file: STACK7.PST
Checking for deposition output

Reading concentration file: ALL.PST
Checking for deposition output

All concentrations read

#####

```

**Figure 7. Message to lead.log telling user that input concentration files are being read.**

After reading the input concentrations, LEADPOST will then check to see if any group/month combinations are missing. If a group/month combination is missing, LEADPOST will write the group and month to the screen and prompt the user to either:

1. set missing concentrations to zero (or recalculate the total concentration if it is one of the missing groups)
2. Stop program to check the input files.

If no group/month combination is missing, no message or prompts are sent to the screen.

During rolling average calculations, the user is informed when each month has been calculated for all receptors. Note that for this case, the first month calculated is March as this is the first month with 2 months preceding it in the model output (Figure 8).



```
##### CALCULATIONS #####
Calculating 3-month rolling averages for:      1692 receptors

Calculating 3-month average for: March 1999
Calculating 3-month average for: April 1999
Calculating 3-month average for: May 1999
Calculating 3-month average for: June 1999
Calculating 3-month average for: July 1999
Calculating 3-month average for: August 1999
Calculating 3-month average for: September 1999
Calculating 3-month average for: October 1999
Calculating 3-month average for: November 1999
Calculating 3-month average for: December 1999
.
.
.
Calculating 3-month average for: September 2003
Calculating 3-month average for: October 2003
Calculating 3-month average for: November 2003
Calculating 3-month average for: December 2003

#####
```

**Figure 8. Messages to lead.log listing months processed during averaging.**

7. Once processing is complete LEADPOST writes a summary of the highest overall maximum 3-month rolling average concentration to the screen and a summary file called lead.out (Figure 9). Shown are the month and year, receptor coordinates, receptor elevation, receptor hill height scale, and receptor flagpole height of the maximum rolling average. Also shown, in descending order by concentration, are the rolling averages for the individual source groups at the same receptor and same month. If only one source group is being processed, there will be no individual group contributions shown. Also listed are the summary text files: a text file containing the rolling 3-month averages for all receptors and source groups for each month and a text file of maximum 3-month concentrations by receptor. Since the lead standard is based on concentrations in micrograms per cubic meter, the concentrations should be converted to micrograms per cubic meter to compare against the NAAQS standard.

```

C:\ Command Prompt
Calculating 3-month average for: November 2001
Calculating 3-month average for: December 2001
Calculating 3-month average for: January 2002
Calculating 3-month average for: February 2002
Calculating 3-month average for: March 2002
Calculating 3-month average for: April 2002
Calculating 3-month average for: May 2002
Calculating 3-month average for: June 2002
Calculating 3-month average for: July 2002
Calculating 3-month average for: August 2002
Calculating 3-month average for: September 2002
Calculating 3-month average for: October 2002
Calculating 3-month average for: November 2002
Calculating 3-month average for: December 2002
Calculating 3-month average for: January 2003
Calculating 3-month average for: February 2003
Calculating 3-month average for: March 2003
Calculating 3-month average for: April 2003
Calculating 3-month average for: May 2003
Calculating 3-month average for: June 2003
Calculating 3-month average for: July 2003
Calculating 3-month average for: August 2003
Calculating 3-month average for: September 2003
Calculating 3-month average for: October 2003
Calculating 3-month average for: November 2003
Calculating 3-month average for: December 2003

##### SUMMARY #####

Overall maximum 3-month averaged concentration
With individual source contributions

Month      Year      X          Y          Elev      Hill ht      Flagpole
August     2003      153.20889  128.55753  24.20     127.00       0.00

Group      Concentration
ALL        0.980523E+01
STACK7     0.353372E+01
STACK6     0.264937E+01
STACK5     0.176624E+01
STACK4     0.105999E+01
STACK3     0.353740E+00
STACK2     0.265307E+00
STACK1     0.176867E+00

Rolling 3-month average concentrations by receptor are in:
01_1999_12_2003_3_month_concs.txt

Maximum 3-month average concentrations by receptor are in:
01_1999_12_2003_3_month_max_concs_rec.txt

End calculations

#####

Program end date & time: August 25, 2011  8:11:53 AM
C:\leadpost\version_11237>

```

Figure 9. Summary of overall maximum 3-month concentration.

Rolling 3-month average concentrations by receptor, group, and month are output to a text file named in the summary section. The format of the file and variables are shown in Figure 10. The maximum 3-month concentrations for each receptor are output to a text file also named in the summary section. Its format is similar to the monthly file and is shown in Figure 11. Unless one source group is being processed, the maximum concentrations will always be associated with the total concentration group.

X-coordinate	Y-coordinate	Receptor elevation	Hill height scale	Flagpole height	Average 3-month rolling conc.	Source group	Month year
34.72964	196.96155	32.20	127.00	0.00	0.341300E-01	STACK1	March 1999
34.72964	196.96155	32.20	127.00	0.00	0.511967E-01	STACK2	March 1999
34.72964	196.96155	32.20	127.00	0.00	0.682667E-01	STACK3	March 1999
34.72964	196.96155	32.20	127.00	0.00	0.204557E+00	STACK4	March 1999
34.72964	196.96155	32.20	127.00	0.00	0.340850E+00	STACK5	March 1999
34.72964	196.96155	32.20	127.00	0.00	0.511277E+00	STACK6	March 1999
34.72964	196.96155	32.20	127.00	0.00	0.681933E+00	STACK7	March 1999
34.72964	196.96155	32.20	127.00	0.00	0.189221E+01	ALL	March 1999
43.41204	246.20193	67.20	127.00	0.00	0.246700E-01	STACK1	March 1999
43.41204	246.20193	67.20	127.00	0.00	0.370067E-01	STACK2	March 1999
43.41204	246.20193	67.20	127.00	0.00	0.493467E-01	STACK3	March 1999
43.41204	246.20193	67.20	127.00	0.00	0.147860E+00	STACK4	March 1999
43.41204	246.20193	67.20	127.00	0.00	0.246373E+00	STACK5	March 1999
43.41204	246.20193	67.20	127.00	0.00	0.369560E+00	STACK6	March 1999
43.41204	246.20193	67.20	127.00	0.00	0.492917E+00	STACK7	March 1999
43.41204	246.20193	67.20	127.00	0.00	0.136773E+01	ALL	March 1999
52.09445	295.44232	72.50	127.00	0.00	0.188300E-01	STACK1	March 1999
52.09445	295.44232	72.50	127.00	0.00	0.282467E-01	STACK2	March 1999
52.09445	295.44232	72.50	127.00	0.00	0.376600E-01	STACK3	March 1999
52.09445	295.44232	72.50	127.00	0.00	0.112847E+00	STACK4	March 1999
52.09445	295.44232	72.50	127.00	0.00	0.188037E+00	STACK5	March 1999
52.09445	295.44232	72.50	127.00	0.00	0.282050E+00	STACK6	March 1999
52.09445	295.44232	72.50	127.00	0.00	0.376200E+00	STACK7	March 1999
52.09445	295.44232	72.50	127.00	0.00	0.104386E+01	ALL	March 1999
60.77686	344.68271	94.50	127.00	0.00	0.189600E-01	STACK1	March 1999
60.77686	344.68271	94.50	127.00	0.00	0.284400E-01	STACK2	March 1999
60.77686	344.68271	94.50	127.00	0.00	0.379200E-01	STACK3	March 1999
60.77686	344.68271	94.50	127.00	0.00	0.113633E+00	STACK4	March 1999
60.77686	344.68271	94.50	127.00	0.00	0.189347E+00	STACK5	March 1999
60.77686	344.68271	94.50	127.00	0.00	0.284020E+00	STACK6	March 1999
60.77686	344.68271	94.50	127.00	0.00	0.378827E+00	STACK7	March 1999
60.77686	344.68271	94.50	127.00	0.00	0.105116E+01	ALL	March 1999
69.45927	393.92310	103.30	105.80	0.00	0.105000E-01	STACK1	March 1999

Figure 10. Format of summary file of rolling 3-month average concentrations by receptor.

X-coordinate	Y-coordinate	Receptor elevation	Hill height scale	Flagpole height	Maximum 3-month rolling conc.	Source group	Month year
34.72964	196.96155	32.20	127.00	0.00	0.261865E+01	ALL	August 2000
43.41204	246.20193	67.20	127.00	0.00	0.189163E+01	ALL	August 2000
52.09445	295.44232	72.50	127.00	0.00	0.144484E+01	ALL	August 2000
60.77686	344.68271	94.50	127.00	0.00	0.145847E+01	ALL	August 2000
69.45927	393.92310	103.30	105.80	0.00	0.856943E+00	ALL	August 2000
78.14168	443.16348	105.50	105.50	0.00	0.624467E+00	ALL	August 2000
86.82409	492.40387	107.00	113.70	0.00	0.469997E+00	ALL	August 2000
95.50650	541.64429	109.80	112.90	0.00	0.344147E+00	ALL	August 2000
104.18890	590.88464	104.00	125.90	0.00	0.472410E+00	ALL	August 2000
112.87132	640.12506	102.40	125.30	0.00	0.471023E+00	ALL	August 2000
121.55373	689.36542	101.50	101.50	0.00	0.445173E+00	ALL	August 2000
130.23613	738.60583	102.10	102.10	0.00	0.391160E+00	ALL	August 2000
138.91855	787.84619	101.20	101.20	0.00	0.368877E+00	ALL	August 2000
147.60095	837.08661	99.00	99.00	0.00	0.367077E+00	ALL	April 2001
156.28336	886.32697	98.30	98.30	0.00	0.338937E+00	ALL	April 2001
164.96577	935.56738	96.50	96.50	0.00	0.315797E+00	ALL	April 2001
173.64818	984.80774	95.10	95.10	0.00	0.290893E+00	ALL	April 2001
191.01300	1083.28857	91.50	91.50	0.00	0.231833E+00	ALL	April 2001
208.37781	1181.76929	88.70	91.20	0.00	0.189487E+00	ALL	April 2001
225.74263	1280.25012	85.20	90.70	0.00	0.157177E+00	ALL	April 2001
243.10745	1378.73083	80.50	87.30	0.00	0.133797E+00	ALL	April 2001
260.47226	1477.21167	78.80	80.20	0.00	0.119033E+00	ALL	April 2001
277.83710	1575.69238	76.50	77.90	0.00	0.106543E+00	ALL	April 2001
295.20190	1674.17322	77.60	77.60	0.00	0.973200E-01	ALL	April 2001
312.56671	1772.65393	69.40	77.60	0.00	0.869700E-01	ALL	April 2001
329.93155	1871.13477	69.10	74.10	0.00	0.797300E-01	ALL	April 2001
347.29636	1969.61548	74.60	74.60	0.00	0.744767E-01	ALL	April 2001
364.66116	2068.09619	76.00	76.00	0.00	0.694367E-01	ALL	April 2001
382.02600	2166.57715	74.50	74.50	0.00	0.641100E-01	ALL	April 2001
399.39081	2265.05786	76.50	76.50	0.00	0.604867E-01	ALL	April 2001
416.75562	2363.53857	71.70	84.90	0.00	0.553300E-01	ALL	April 2001
434.12045	2462.01929	73.10	73.10	0.00	0.521767E-01	ALL	April 2001
451.48526	2560.50024	77.90	77.90	0.00	0.506733E-01	ALL	April 2001

Figure 11. Format of summary file of maximum 3-month concentration by receptor.

### 3. WARNINGS AND ERRORS

LEADPOST will automatically stop processing for the following reasons:

- The file inputfiles.txt does not exist or is not in working folder or directory.
- An input concentration file (POSTFILE or user-created file) is not in the location as specified by inputfiles.txt or does not exist. The user should check the location of the file or files and the location specified in inputfiles.txt
- Two or more input concentration files have the same filename. Check the filenames in inputfiles.txt or rename files
- The file does not fit the format as specified by the user, i.e. the user specifies AERMOD POSTFILE but the input concentration file is not an AERMOD POSTFILE, or the user specifies user-created file but the file is an AERMOD POSTFILE.
- If the number of receptors differ for each file for AERMOD POSTFILES. If the number of receptors differs for several group/date combinations for user-created files, LEADPOST will also stop.
- When reading the AERMOD POSTFILES, LEADPOST will stop if the averaging period in the POSTFILE is not monthly. The user is informed of the period found. For user-created files, it is assumed the averages are monthly.

There are two places in the program that processing can be stopped by the user:

- Once LEADPOST creates the source group array and determines the number of receptors in the model output, the source groups and receptor number are displayed (Figure 6) for user verification. If the user sees that a source group is missing or the number of receptors is incorrect, processing can be stopped. Once stopping the program, the user may want to check the inputfiles.txt file and concentration input files.
- When allocating the monthly concentration array, LEADPOST initializes all the elements of the array to -1.0. After reading the input concentration files and assigning the concentrations to the arrays, LEADPOST checks for any remaining negative concentrations. If any are found, LEADPOST will display the source group/month combinations that are still negative. The user has the option to either set those concentrations to zero or stop processing the program. If one of the missing groups is the total group (when the total group is already present in model output), the user has the option to calculate the total group from the other source groups. Situations that may cause a concentration to remain negative may include:
  - The input concentration file was omitted from inputfiles.txt. In this case, the user may want to stop processing and check inputfiles.txt
  - A particular source group may be composed of sources that are not active during the entire model period and the user did not model the source group for the entire modeling period. In this case, the user may want to verify that in fact this is the case, and allow the program to set concentrations to zero and/or calculate the total group concentrations.

There is a special message that can be displayed by LEADPOST. When processing user-created concentration files, LEADPOST may find a source group that is not present in the source group

array but is found later in processing. This can occur because LEADPOST uses the first month of the averaging period, the last month of the averaging period, and the first month in each input concentration file when looking for source groups. A source group may not be found for one of the three times if it has accidentally been omitted from the concentration input files, one of its concentration file was not listed in inputfiles.txt, or the sources comprising the source group were not operating for one of the three times and was not modeled. If a source group is found that is not in the original source group list, the program will not use concentrations from that source group and the user is warned that a new source group has been found.

#### **4. References**

U.S. EPA, 2004a. User's Guide for the AMS/EPA Regulatory Model – AERMOD. EPA-454/B-03-001. U.S. Environmental Protection Agency, Research Triangle Park, NC.

U.S. EPA, 2006. Addendum: User's Guide for the AMS/EPA Regulatory Model - AERMOD EPA-454/B-03-001. U.S. Environmental Protection Agency, Research Triangle Park, NC.