Knox County Air Quality Management
Site Criteria Waiver Request
Parton Place Lead Monitoring Site

KNOX COUNTY
TENNESSEE
HEALTH DEPARTMENT

Prepared by:
Amber Talgo
Air Quality
1/24/2022

Narrative:

Knox County Air Quality Management (KCAQM) currently operates a source-oriented lead monitor at the northeast fence line of the CMC Steel Plant. Knox County Air Quality Management, as required by 40 CFR Part 58 Appendix D, sought a new location for the source-oriented lead monitor to site the monitor in the area of the maximum lead concentration. KCAQM, using modeling data dated May 6, 2019, ranked potential sites from 1-20 where 1 was the modeled site of maximum lead concentration (Attachment 1). The current fence line monitor located at 1526 New York Avenue, was ranked 20th. Knox County Air Quality Management approached property owners based on the list of potential sites, on the southeast side of the CMC Steel Plant along Tennessee Avenue, to find a suitable location. Most of the potential sites are owned by CMC Steel or the Tennessee Federation of Garden Clubs Inc. CMC Steel declined KCAQM's request to site a monitor on their property in a meeting on May 7, 2019. The Chairperson for the Tennessee Federation of Garden Clubs, Marta Frink, also declined KCAQM's request via phone in June 2019. Two potential sites ranked 17 & 19 were privately owned property. KCAQM sent certified letters seeking permission to site a lead monitor on the property of ranked sites 17 & 19 but did not receive a reply. The following table lists receptor site rank, property, and the reason the monitor could not be sited on the property.

Receptor Site Rank(s)	Property	Reason Monitor not sited	Type of Ownership
1,6,7,9,11,12,13 and 18	1943 Tennessee Ave (Fence line and locations on source property)	Denied access by property owner	Private Business
2,3,5 and 8	1919 Tennessee Ave	Denied access by property owner	Private Business
4,14,15 and 16	1536 New York Ave (fence line)	Denied access by property owner	Private Business
10	1916 and 1924 Tennessee Ave	Could not obtain permission from property owner	Private Business
17	1900, 1930 and 1934 Tennessee Ave	Could not obtain permission from property owner	Private residence
19	1734,1738,1742 and 1746 Tennesse Ave.	Could not obtain permission from property owner	Private Residence

KCDAQM also sent letters to 5 other privately owned properties that were in the area of ranked sites 10, 17 & 19 that were suggested by EPA. The only response was from the property located at 1904 Tennessee Avenue. This property is between ranked site 17 &10 and adjacent to ranked site 3. This property was donated to Knox County for use as an air monitoring site for lead and officially acquired on May 10, 2021.

The new site, Parton Place, was approved by EPA in a letter to KCAQM dated August 26, 2021. The site will be classified as a special purpose monitor (SPM) to establish if it or the Ameristeel monitoring site is the site of maximum Pb concentration. Knox County Air Quality will then request that only the site of maximum Pb concentration be operated as the required source-oriented monitor. Knox County Air Quality will gather a minimum of 12 months of 3-month rolling averages (15 months of data) and then conduct an analysis to compare the data from the new monitoring site with the Ameristeel (47-093-0023) monitoring site (current source-oriented monitor) to determine the maximum concentration site. This data analysis will be presented along with a request to establish the primary SLAMS monitor at the maximum concentration site and decommission the other site in a subsequent Annual Monitoring Plan, expected in July of 2023.

Waiver Request:

Knox County Air Quality Management would like to request a waiver from the United States Environmental Protection Agency (USEPA) for the siting requirement in 40 CFR Part 58 Appendix E that states that a monitor, "[s]hould be greater than 20 meters from the dripline of tree(s) and must be 10 meters from the dripline when the tree(s) act as an obstruction" for the Parton Place lead site (47-093-0024-01).

The property was so severely overgrown when acquired that a proper site assessment could not be done. The property was surveyed and cleared in September 2021 and the site build was completed November 3, 2021. KCAQM was able to do a site assessment (Attachment 2) and found that due to the size constraints of the property, 25 feet wide by 144 feet long, that all siting criteria could not be meet. A walnut tree east of the site has a dripline that is 5 meters from the monitor. (Attachment 3) 40 CFR Part 58 Appendix E section 10 states, in pertinent part, "*The EPA will consider a written request from the State agency to waive one or more siting criteria for some monitoring sites providing that the State can adequately demonstrate the need (purpose) for monitoring or establishing a monitoring site at that location."* See below for the required criteria contained in 40 CFR Part 58 Appendix E Section 10.1 for a waiver to be granted for a new site and Knox County Air Quality's responses:

40 CFR Part 58 Appendix E Section 10.1 Criteria

10.1.1 The site can be demonstrated to be as representative of the monitoring area as it would be if the siting criteria were being met.

- Lead (Pb) is an elemental heavy metal that can be released directly into the air as suspended particles during manufacturing processes. As a heavy metal, it settles quickly out of the air into soil or dust. The aerodynamics of this settling increases the priority in microscale source-oriented monitoring at a site in direct line with the source. Attachment 2 of this document shows two photos facing from the site to the North and West (toward the source) that show an unobstructed direct line of site.
- The modeling results found in Attachment 1 of this document support the demonstration that the unobstructed area between the proposed monitoring site and the facility is the area of concern for the highest concentration and, as such, this site would be as representative of the monitoring area as it would be if siting criteria were met.
- The tree dripline in question is not located between the source and the monitor.

10.1.2 The monitor or probe cannot reasonably be located so as to meet the siting criteria

- KCAQM did a thorough search for a site on the southeast side of the CMC Steel Plant. The only site that could be obtained was the site at 1904 Tennessee Avenue.
- The tree is located on adjourning property and, therefore, Knox County Air Quality cannot remove it. The tree has been trimmed to the property line
- The property east of the site is overgrown and covered in large trees. The platform placement on the property was to maximize the unrestricted airflow of the monitor, and avoid tree driplines
- The small width of the property, 7.62 meters, limits KCAQM's ability to site the monitor 10 meters from the tree dripline

Attachment 1

Model Report – CMC Steel USA, LLC Fence Line Pb Monitor Modeling

Model Report – CMC Steel USA, LLC Fence Line Pb Monitor Modeling
1919 Tennessee Avenue, Knoxville, TN 37921
May 6, 2019

1.0 Summary

As required by 40 CFR Part 58 Appendix D, the Knox County Department of Air Quality Management (KCDAQM) is required to site a lead (Pb) monitor, taking into account logistics and the potential for population exposure, where the Pb concentration from all sources combined is expected to be at its maximum. The KCDAQM performed an air dispersion modeling analysis to determine the locations of maximum Pb concentrations. The air dispersion modeling analysis was conducted following the guidance obtained from the Environmental Protection Agency (EPA) and contained in the EPA Guideline on Air Quality Models.

2.0 Model Inputs

2.1 Model of Choice/Version

The AERMOD model, version 18081, was used for the air dispersion modeling analysis.

2.2 Description of the Site

The base elevation of the plant is 960 feet (292.6 meters) and was used throughout the modeling. During the modeling review for the Prevention of Significant Deterioration (PSD) Air Permit Application submitted on November 22, 2004, the applicant had used the land use methodology known as the Auer Technique to determine the area was Urban. Therefore, the Urban dispersion coefficient was selected in AERMOD. See Figure 1 below for a scaled facility drawing showing the proximity of the fence line and buildings.

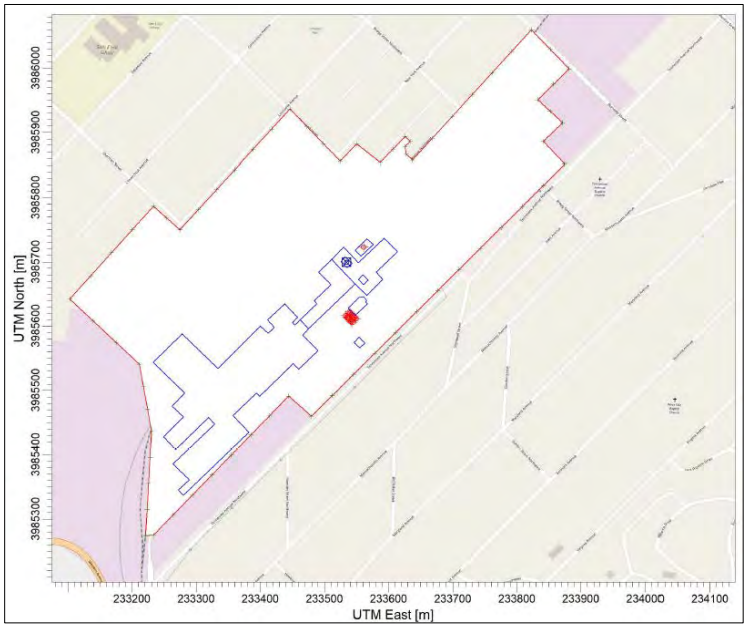


Figure 1: Scaled Facility Drawing

2.3 Emission Sources

The emission of Pb was modeled for three emission sources at the facility. They are baghouse 2, baghouse 4, and the meltshop building louver. All other sources of Pb emissions were considered negligible.

The stacks of baghouses 2 and 4 were inputted into AERMOD as point sources (1 stack for baghouse 4 and 14 stacks for baghouse 2). During the modeling review for the Prevention of Significant Deterioration (PSD) Air Permit

Application submitted on November 22, 2004, the applicant listed the baghouses stack heights and stack diameters. Baghouses 2 and 4 average Pb emissions, temperature, and volumetric flow rate data from stack tests conducted in 2012 and 2015 were used for the emission rate, gas exit temperature, and gas exit flow rate. Since baghouse 2 has 14 stacks and one is always in cleaning mode (i.e., not in operation), one of baghouse 2's stacks (stack 14) emission rate or gas exit flow rate was set to zero with the average Pb emissions and volumetric flow rate, from the stack tests, allocated evenly to the remaining 13 stacks. Lastly, the coordinates of the emissions sources were updated.

The meltshop building louver was inputted into AERMOD as a volume source. The center and half the height of the penthouse were used for the coordinates and release height of the volume source, respectively. The average Pb emission data from the Meltshop Building Louver Study (industrial hygiene/ambient methodology) conducted in 2013 was used for the emission rate.

See Attachment 1 for the AERMOD parameters for baghouse 2, baghouse 4, and the meltshop building louver.

2.4 Downwash Effects

The EPA downwash program called BPIPPRM, dated 04-27-04, was used to calculate the downwash parameters for input to AERMOD. During the modeling review for the Prevention of Significant Deterioration (PSD) Air Permit Application submitted on November 22, 2004, the applicant had determined the building heights. KCDAQM staff updated the building coordinates due to additions to the buildings. See Attachment 2 for the updated building coordinates and heights that were used for input to BPIPPRM.

2.5 Receptors and Complex Terrain

A dense receptor grid was used with 50 meter spacing at the fence line and a Cartesian grid with 50 meter spacing beyond the fence line out to 500 meters. Terrain elevations for all the receptors were imported from AERMAP, version 18081, input data processor using the United States Geological Survey (USGS) 1-degree Digital Elevation Model (DEM) files.

Some of the receptors are located at terrain heights that are greater than the top of the stacks. This terrain is called complex terrain. However, these receptors are not located in areas where the concentrations are highest (i.e., not around the facility boundary). Therefore, no further analysis is required.

2.6 Meteorological Data

The meteorological data input to the AERMOD model consists of the five years of National Weather Service (NWS) data, for years 2014, 2015, 2016, 2017, and 2018. The surface station data is from the Knoxville/McGhee Tyson Airport station (Station No. 13891) and the upper air data is from the Nashville/Metro Airport station (Station No. 13897). The surface station data were processed with the upper air sounding data using AERMET, version 18081, to create the meteorological files for input to AERMOD. Meteorological data for the five years were used for the air dispersion modeling analysis.

3.0 Model Results

The predicted highest 3-month Pb concentrations in Figure 2 show maximum impact areas along the southern and northeastern fence lines of the facility. An analysis of the predicted highest 3-month Pb concentration as well as a ranking system for the monthly and 3-month maximum receptor concentration were utilized according to EPA guidance (see Attachment 3 for e-mail dated 10/9/2018).

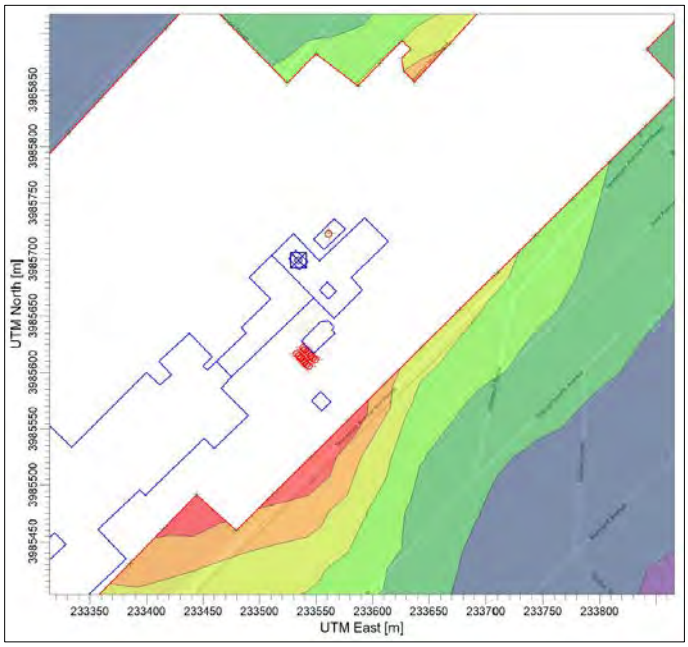


Figure 2: Highest 3-Month Concentrations

The ranking system combined the ranks of each receptor according to the number of months that the receptor had the highest predicted Pb concentration, the number of 3-month periods that receptor had the highest predicted Pb concentration, and each receptor's overall highest 3-month predicted concentration was used to rank proposed sites to locate the Pb monitor. The resulting receptor ranking confirmed that the areas along the southern and northeastern fence lines are the most probable locations for capturing the maximum Pb concentrations at a monitor. Figure 3 shows the location of the top 20 ranked receptors.

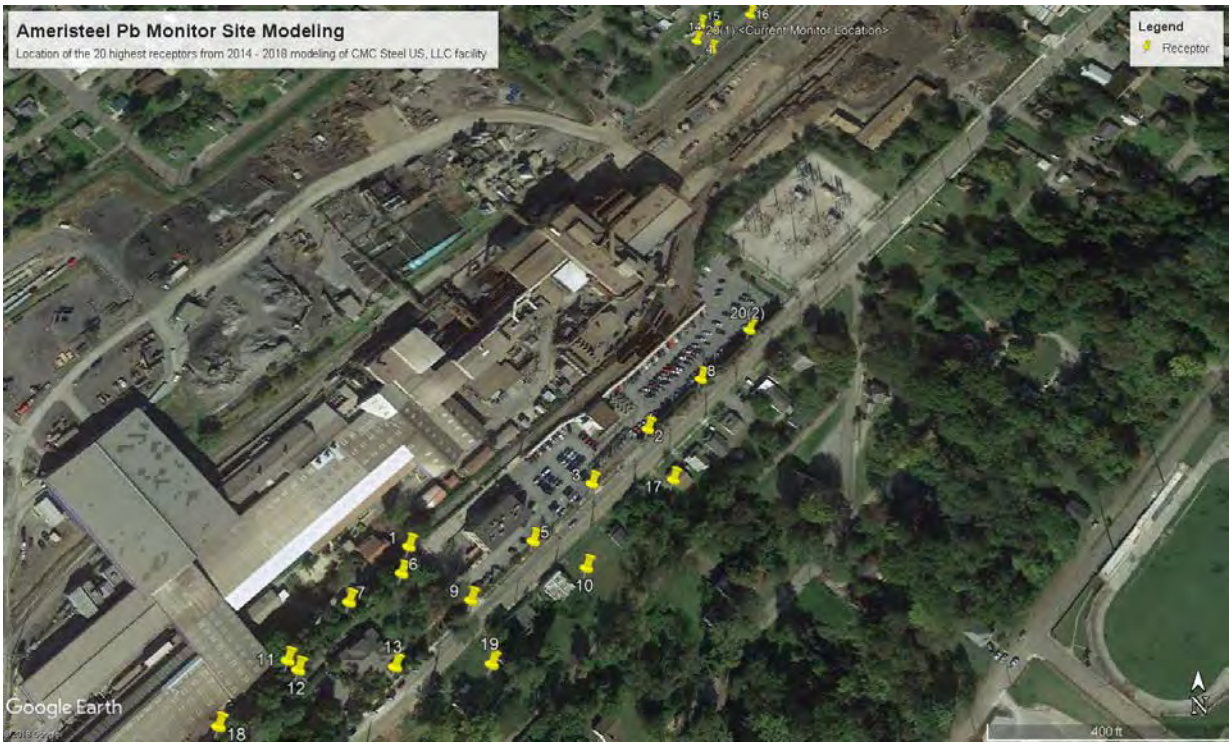


Figure 3: 20 Highest 3-Month Pb Concentration Receptor Sites

Attachment 1

AERMOD parameters for baghouse 2, baghouse 4, and the meltshop building louver

Table 1: AERMOD parameters for baghouse 2, baghouse 4, and the meltshop building louver

	Parameters	Units	Description
	Type		POINT, AREA, AREA_CIRC, AREA_POLY, VOLUME, OPEN_PIT, LINE, LINE_VOLUME, LINE_AREA, BUOYLINE
	ID		Source ID up to 12 characters
	Desc		Optional description
	SourceID_Prefix		Text prefix up to 4 characters long for generated LINE_VOLUME and LINE_AREA sources
	Base_Elev	[m]	Source base elevation above mean sea level
	Height	[m]	Release height above ground
	Diam	[m]	Inner stack diameter (POINT) or circular area radius (AREA_CIRC)
	Exit_Vel	[m/s]	Exit velocity (POINT only)
	Exit_Temp	[K]	Exit temperature (POINT only)
	Release Type		VERTICAL, HORIZONTAL, CAPPED (POINT only) - HORIZONTAL and CAPPED are non-default beta options
	SigmaY	[m]	Initial sigma Y (VOLUME only)
	SigmaZ	[m]	Initial sigma Z (AREA, AREA_CIRC, AREA_POLY, VOLUME, LINE, and LINE_AREA only; optional for AREA, AREA_CIRC, AREA_POLY, and LINE)
	Length_X	[m]	X side length (AREA, VOLUME, OPEN PIT, and LINE_AREA only; optional for VOLUME, will be used to calculate SigmaY)
	Emission_Rate	[g/s or g/s/m2]	Emission rate (g/s for POINT, VOLUME, and LINE_VOLUME; g/s/m2 for AREA, AREA_CIRC, AREA_POLY, OPENPIT, LINE, and LINE_AREA)
	X1	[m]	X coordinate of source location [m]
	Y1	[m]	Y coordinate of source location [m]

Type	ID	Desc	Base_Elev	Height	Diam	Exit_Vel	Exit_Temp	Release_Type	SigmaY	SigmaZ	Length_X	Emission_Rate	X1	Y1
			[m]	[m]	[m]	[m/s]	[K]		[m]	[m]	[m]		[m]	[m]
POINT	BH4	Baghouse 4 Monovent	292.6	27.13	7.17	3.81107515	378.7055556	CAPPED				0.004535924	233561.00	3985723.00
POINT	BH2_1	Baghouse 2 Stack 1	292.6	11.58	0.97	8.742206798	326.4833333	HORIZONTAL				0.000340194	233543.60	3985605.60
POINT	BH2_2	Baghouse 2 Stack 2	292.6	11.58	0.97	8.742206798	326.4833333	HORIZONTAL				0.000340194	233541.80	3985607.40
POINT	BH2_3	Baghouse 2 Stack 3	292.6	11.58	0.97	8.742206798	326.4833333	HORIZONTAL				0.000340194	233540.00	3985609.40
POINT	BH2_4	Baghouse 2 Stack 4	292.6	11.58	0.97	8.742206798	326.4833333	HORIZONTAL				0.000340194	233538.30	3985611.20
POINT	BH2_5	Baghouse 2 Stack 5	292.6	11.58	0.97	8.742206798	326.4833333	HORIZONTAL				0.000340194	233536.80	3985612.90
POINT	BH2_6	Baghouse 2 Stack 6	292.6	11.58	0.97	8.742206798	326.4833333	HORIZONTAL				0.000340194	233535.00	3985614.70
POINT	BH2_7	Baghouse 2 Stack 7	292.6	11.58	0.97	8.742206798	326.4833333	HORIZONTAL				0.000340194	233533.20	3985616.70
POINT	BH2_8	Baghouse 2 Stack 8	292.6	11.58	0.97	8.742206798	326.4833333	HORIZONTAL				0.000340194	233538.80	3985622.30
POINT	BH2_9	Baghouse 2 Stack 9	292.6	11.58	0.97	8.742206798	326.4833333	HORIZONTAL				0.000340194	233540.30	3985620.50
POINT	BH2_10	Baghouse 2 Stack 10	292.6	11.58	0.97	8.742206798	326.4833333	HORIZONTAL				0.000340194	233542.30	3985618.70
POINT	BH2_11	Baghouse 2 Stack 11	292.6	11.58	0.97	8.742206798	326.4833333	HORIZONTAL				0.000340194	233543.80	3985617.00
POINT	BH2_12	Baghouse 2 Stack 12	292.6	11.58	0.97	8.742206798	326.4833333	HORIZONTAL				0.000340194	233545.60	3985614.90
POINT	BH2_13	Baghouse 2 Stack 13	292.6	11.58	0.97	8.742206798	326.4833333	HORIZONTAL				0.000340194	233547.40	3985613.20
POINT	BH2_14	Baghouse 2 Stack 14	292.6	11.58	0.97	0	326.4833333	HORIZONTAL				0	233549.10	3985611.40
VOLUM	MSLOUV	Meltshop Louvers	292.6	32.13					3.18977	16.0906	13.716	0.013859767	233534.40	3985699.50

Attachment 2

Building coordinates and heights

Table 2: Baghouse 4 and Rolling Mill/Fab Shop Building Data

Parameters	Units	Description
ID_Building =	-	Name up to 8 characters with no spaces or "-"
Description =	-	Optional (up to 250 characters)
Base_Elevation =	[m]	Building base elevation above mean sea level
Tier_Height =	[m]	Tier height above ground / height of tank
Num_Coords =	integer	Number of coordinate pairs (X,Y) for the building corners to follow
X =	[m]	X coordinate for corner
Y =	[m]	Y coordinate for corner

ID_Building	Description	Base_Elevation	Tier_Height	Num_Coords	X1	Y1
		[m]	[m]		[m]	[m]
BH4_BLD	Baghouse 4	292.61	27.13	4	233566	3985736
					233576	3985727
					233557	3985709
					233548	3985718
RM/FS_BLD	Rolling Mill/Fab Shop	292.61	14.48	32	233280	3985337
					233272	3985345
					233289	3985361
					233264	3985386
					233329	3985448
					233319	3985458
					233268	3985408
					233249	3985428
					233280	3985459
					233262	3985476
					233282	3985496
					233233	3985544
					233278	3985588
					233334	3985534
					233400	3985600
					233412	3985589
					233422	3985598
					233411	3985610
					233438	3985635
					233458	3985614
					233450	3985606
					233454	3985602
					233462	3985610
					233475	3985596
					233466	3985586
					233490	3985562
					233460	3985533
					233451	3985542
					233399	3985491
					233394	3985496
					233357	3985461
					233382	3985435

Table 3: Caster, Meltshop (including penthouses), Baghouse 2 Control, and Parking Lot Buildings Data

Parameters	Units	Description
ID_Building =	-	Name up to 8 characters with no spaces or "-"
Description =	-	Optional (up to 250 characters)
Base_Elevation =	[m]	Building base elevation above mean sea level
Tier_Height =	[m]	Tier height above ground / height of tank
Num_Coords =	integer	Number of coordinate pairs (X,Y) for the building corners to follow
X =	[m]	X coordinate for corner
Y =	[m]	Y coordinate for corner

ID_Building	Description	Base_Elevation	Tier_Height	Num_Coords	X1	Y1
		[m]	[m]		[m]	[m]
CSTR_BLD	Caster	292.61	17.53	8	233462	3985610
					233488	3985635
					233484	3985640
					233510	3985665
					233491	3985684
					233511	3985704
					233548	3985666
					233475	3985596
MS_BLD	Melt Shop	292.61	29.66	9	233511	3985704
					233530	3985723
					233553	3985699
					233593	3985737
					233614	3985716
					233581	3985684
					233591	3985673
					233566	3985648
					233548	3985666
MSPNT1_BLD	Penthouse 1	292.61	34.59	4	233535	3985691
					233526	3985701
					233532	3985708
					233543	3985698
MSPNT2_BLD	Penthouse 2	292.61	34.59	4	233561	3985665
					233553	3985673
					233560	3985680
					233568	3985672
BH2_BLD	Baghouse 2 Control Building	292.61	11.58	7	233548	3985617
					233537	3985628
					233554	3985645
					233561	3985646
					233566	3985640
					233564	3985638
					233567	3985635
BUILDING	Parking Lot Building	304.66	8.86	4	233546	3985575
					233554	3985583
					233563	3985574
					233555	3985566

Attachment 3

Ranking of receptor guidance provided by EPA

From: Walther, Katherine
To: Brian Rivera
Cc: Howard, Chris
Subject: Knox County Pb Modeling
Date: Tuesday, October 09, 2018 3:50:35 PM
Attachments: GerdauExample_KW_Oct2018.xlsx

Hi Brian,

I hope you are doing well! I wanted to let you know that we talked with James Thurman from OAQPS to get his thoughts on how to do the ranking analysis for potential placement of a lead monitor. Would you be available sometime this week to have a call to discuss James' proposed methodology? Additionally, Chris wanted to discuss the model inputs for the volume source (MSLOUV), specifically, the initial vertical dimension (sz) of 0.83 meters.

Below is an outline of James' suggestions for the ranking analysis.

Run AERMOD with monthly output and run LEADPOST to get the rolling 3-month averages at each receptor as well as the maximum rolling 3-month average at each receptor. Then do the following:

1. Using the maximum rolling 3-month output from LEADPOST, rank the receptors from highest to lowest design value. Give each receptor a score based on its rank. The highest receptor would have rank of 1. This is analogous to the design value ranking in the SO2 guidance.
2. For the monthly output from AERMOD, determine the highest receptor for each month in the modeled period. Total up the number of times each receptor is the highest across the modeled months. For example, a receptor may be the highest for 6 monthly averages across the modeled period, another receptor could be highest 4 times in the modeled period, etc. After getting how many times each receptor is the highest for each month, rank the receptors by the number times each is the highest, ranking from the highest number of months to the lowest number of months. Give each receptor a score, with rank 1 being the receptor having the most number of months where it's the highest across all the receptors. This is analogous to the MAXDAILY analysis in the SO2 guidance.
3. Since the design value is a rolling 3-month average, perform a similar analysis as step 2, except do it on the rolling 3-month averages output from LEADPOST. Get a ranking similar to step 2.
4. For each receptor, add up the scores from the 3 steps. The lowest score a receptor could have is 3. That would be a receptor that has the highest design value (DV), has the most occurrences of monthly max, and most occurrences of rolling 3-month average max.

I used the initial Pb modeling that you submitted to run through these steps. I have attached that spreadsheet for your reference as an example.

The first sheet, "monthlysorted" lists the AERMOD monthly concentrations sorted by descending concentration for each month with the rank (MONTHRANK). The sheet "monthly_stats" lists the number of times a receptor has an occurrence of a particular monthrank. For example, the first receptor listed has 21 months where it is the highest

receptor for the month. The second receptor listed has the highest monthly concentration 16 times. The highlighted receptors are the ones which are the highest receptor at least one time.

The third sheet, "3monthconc" is similar to "monthlysorted" except it is the rankings for the 3-month rolling averages output by LEADPOST. The "3monthconc" sheet has all of the source groups and the "3monthconcALLOnlySrcGrp" has just the "All" source group. The sheet "rolling3monthstats" is similar to "monthlystats" except it is for the rolling 3-month averages. Here there are 4 receptors that were highest for at least one 3-month period.

The sheet "maxconcreceptor" contains the maximum 3-month rolling averages output by LEADPOST, basically the design value. These are sorted by descending concentrations.

The last sheet ("scores") is the score for the receptors where all three datasets: monthlystats, rolling3monthstats, and the sorted design values are merged and scores calculated. I've highlighted six receptors with the lowest scores that had monthcount and count values > 0.

Please let me know if you have any questions regarding the steps outlined in this email. Additionally, at your earliest convenience, please let me know your upcoming availability so we can schedule a call to discuss this. I wanted to provide the steps ahead of time so that you had time to look through the example and see what questions you might have.

Thanks!

Sincerely,
Katie

Katie Walther
U.S. Environmental Protection Agency, Region 4
Air, Pesticides & Toxics Management Division
Air Data & Analysis Section
PH: (404) 562-9110

Attachment 2

Siting Evaluation Form

KNOX COUNTY TENNESSEE HEALTH DEPARTMENT

Siting Evaluation Form

Site Name: Parton Place

AQSNo: 47-093-0024

Coordinate 35° 58' 39 N", 83° 57' 14"W

Date: Oct 19,2021

Site Address: 1907 Tennessee Ave, 37921

Inspected by: R. Larocque and A. Talgo

Pollutant	Scale	Probe Height [1]	Flow (hi or Low)	Separation from samplers [1]	Pass/Fail	Distance to Road [1]	Pass/Fail
Lead	Micro	2.1M	Hi	n/a	n/a	5.8M	Pass

				Tree	
Obstruction type [2]	Obst. Height [1]	Obst. Distance [1,2]	Pass/Fail	Dripline [1]	Pass/ Fail
House	3.1M	4.3 M	Pass		
Tree	unknown			4.5-5M	

[1] All Measurements in meters

[2] Including vertical and horizontal separation from walls &/or parapets if applicable

Collocated Samplers must be within 4 m of each other and at least 2 m apart for hi vol, at least 1 m for low volume

Obstruction Distance must be ≥ 2* (Obst height - probe height)

Tree Dripline must be >10 m away, prefer >20m

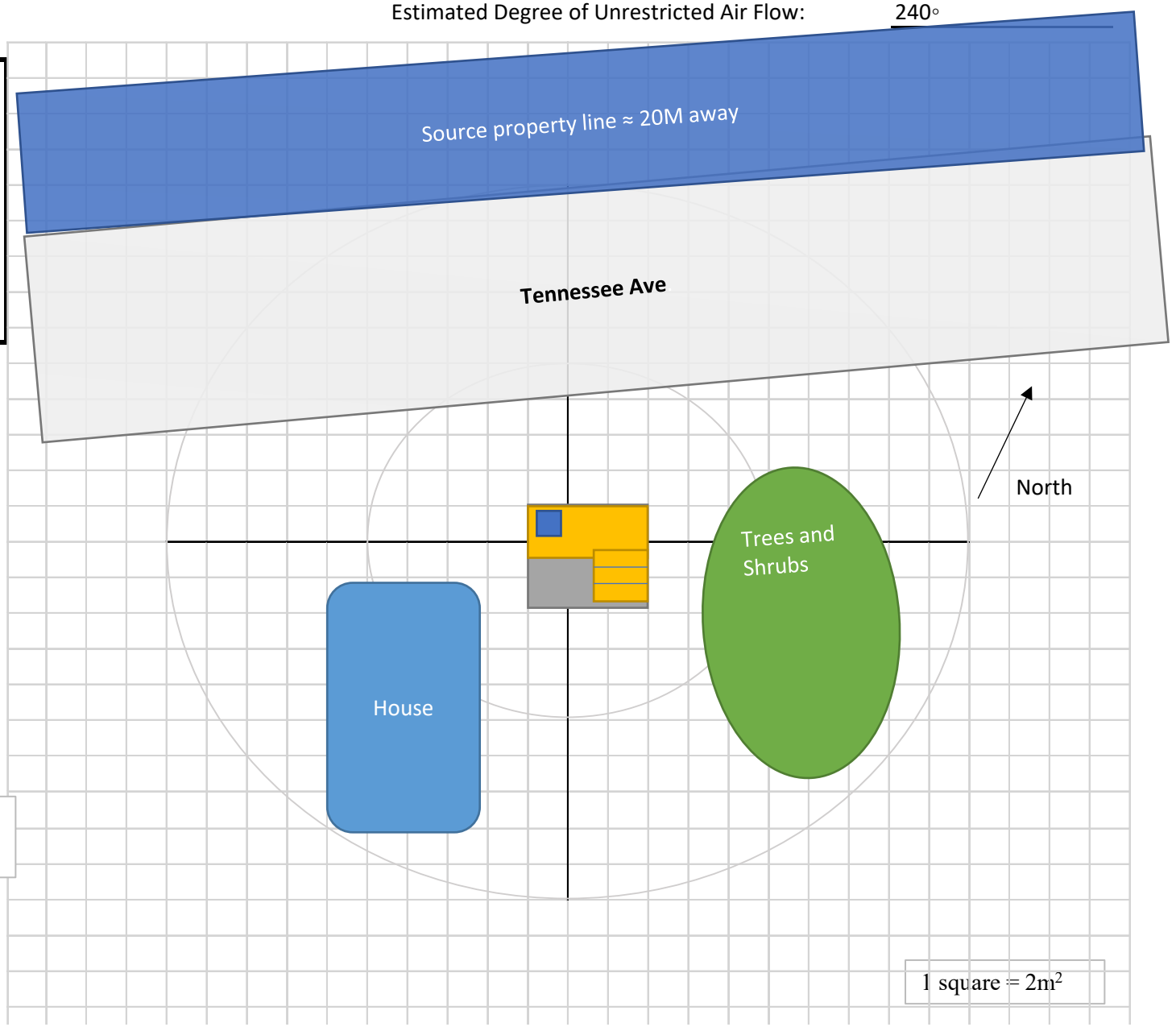
Horizontal and vertical disance on rooftop 1m for $O_{3/}$ gases - 2m for all others

Unrestricted air flow must be ≥ 270 °

Site Drawing

Estimated Degree of Unrestricted Air Flow: 240◦

Indicate:
North
Shelter
Probe Postions
Nearby trees
Roadways
Buildings
Other Obstuctions
Source if Appicable

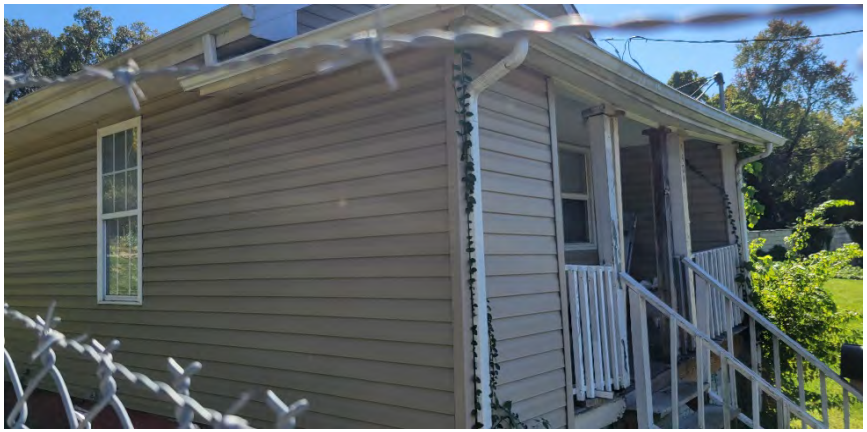


Primary Wind Direction : 220° SSW

Photos facing out from monitor to cardinal direction

North

South



East

West

KNOX COUNTY TENNESSEE HEALTH DEPARTMENT

Siting Evaluation Form

Photos from cardinal direction facing in towards monitor

North

South

East

West

Attachment 3

Photo of Drip Line

Dripline