

# **Impact Analysis of Pennsylvania RACT II Rule on Downwind Monitor Ozone Concentrations**

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Alpine Geophysics, LLC was tasked by the Midwest Ozone Group to utilize EPA's modeling platform from the Cross State Air Pollution Rule (CSAPR) and to conduct an independent assessment of the implementation of RACT II on electric generating utilities (EGUs) in the Commonwealth of Pennsylvania and their impact on ozone concentrations at downwind monitors.

As discussed in other documentation<sup>1</sup>, we performed nationwide, state, source category-level ozone source apportionment modeling using the CAMx OSAT technique to quantify the contribution of 2017 base case NOx and VOC emissions from major source categories in each region to projected 2017 ozone concentrations at ozone monitoring sites based on EPA's Cross State Air Pollution Rule (CSAPR) 2017 base case scenario as obtained from EPA.

Using the results of this documented OSAT modeling and impact factor method described therein, we have investigated the impact of Pennsylvania RACT II on electric generating utilities (EGUs) in the Commonwealth of Pennsylvania and their impact on ozone concentrations at downwind monitors.

## **Pennsylvania RACT II**

The final Pennsylvania RACT II requirements<sup>2</sup> will apply to major NOx or VOC emitting facilities that were in existence on or before July 20, 2012 and will affect emissions units at such facilities for which no RACT requirement has been established. The applicability threshold for the RACT II rule is 50 and 100 tpy for NOx and VOC, respectively, including the five-county Philadelphia region (i.e., Bucks, Chester, Delaware, Montgomery, and Philadelphia counties).

The RACT II rule differs significantly from the original Pennsylvania RACT rule as it specifies presumptive RACT limits and defines specific numeric RACT limits and work practice standards for certain combustion units (i.e., boilers) and combustion sources (e.g., engines, combustion turbines, cement kilns, etc.) versus the case-by-case approach of the original rule. Facilities will also have the option to prepare and submit case-by-case RACT analyses for affected emissions units that cannot meet specific numeric standards under the rule.

Where applicable, facilities may also propose facility-wide or systems-wide RACT averaging plans for approval by the Pennsylvania Department of Environmental Protection. Case-by-case analyses will be required for emissions units with potential NOx or VOC emissions that are greater than 5 and 2.7 tpy, respectively, at affected facilities and that are not subject to a presumptive or numeric RACT standard. Compliance demonstrations under RACT II will be generally required within one year of rule promulgation and calls for emission reductions to take effect in January 2017.

From data provided by Olympus Power<sup>3</sup>, it has been estimated that EGU NOx emissions from EGUs in 2017 will be 27,010 tons as compared with EPA IPM 5.14 data and predicted ozone season EGU NOx emissions of 52,173 tons<sup>4</sup>(Table B-2, Policy Analysis TSD).

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<sup>1</sup> "Independent, Sector-Specific Source Apportionment Modeling of the 2017 Cross State Air Pollution Rule Modeling Platform," Alpine Geophysics, LLC, January 2016.

<sup>2</sup> 25 PA. Code §§129.91-129.95

<sup>3</sup> <http://www.midwestozonegroup.com/files/PARACTNOx.pdf>

<sup>4</sup> [http://www.epa.gov/sites/production/files/2015-11/documents/ozone\\_transport\\_policy\\_analysis\\_tsd.pdf](http://www.epa.gov/sites/production/files/2015-11/documents/ozone_transport_policy_analysis_tsd.pdf)

## Additional Analysis

As noted in our OSAT modeling document, time and resource limitations (in particular the amount of time needed to set up, run the CAMx model, and analyze the results for even a single model run) constrained by the significantly short comment period of the rule, precluded the use of full air quality modeling for use in establishing relationships between emission reductions and ozone concentration changes. Because we needed to evaluate emission reductions under a different NOx scenario, it was not possible to use CAMx air quality modeling to evaluate more than the base case relationship.

It is recognized that NOx emission changes and ozone concentration responses are not necessarily linear. However, comparable to assumptions made by EPA<sup>5</sup> regarding the relative NOx emission changes and associated ozone concentration deltas are small (tenths of ppb), and the emissions being considered are relatively small compared with the total emissions in the area, we assume a closely linear proportion. This assumption infers that each ton of NOx emitted from Pennsylvania EGUs has an associated ozone concentration impact on a downwind monitor. We note, as does EPA, that directly scaling our results could possibly overestimate the air quality impacts of emission reductions calculated with this method.

The first step in our analysis was to develop 2017 ozone season EGU emissions from Pennsylvania (and the rest of the modeling domain) to ozone concentrations generated with the source-specific OSAT runs described earlier in this document. This calculation is designed to establish NOx emissions to ozone concentration ratios that will be used in later steps of the analysis.

Using EPA published ozone season EGU NOx emissions totals for the various pollution control cost thresholds for “all units” (Table B-2, Policy Analysis TSD), we generated ratios of Pennsylvania EGU contribution to ozone concentrations at each monitor to the 2017 base case modeled emissions (5.14 base case) used in the air quality modeling of our analysis. From this value (“impact factor”), we used the linear relationship assumption to determine associated levels of ozone concentration change associated with the other pollution control scenarios generated by EPA. Table 3 provides an example calculation.

**Table 3.** Example calculation of impact factor using ozone season NOx emissions and OSAT source apportionment results for Fairfield, Connecticut monitor 90010017.

PA 2017 OS EGU NOx (tons) – IPM 5.14 Base Case	52,173
PA EGU 2017 Contribution (ppb)	1.67
ppb contributed/ton PA EGU NOx (ppb/ton)	3.20E-05

It was determined that seasonal emissions were an adequate surrogate for the ratio development as the relative response factors and source apportionment results generated in the proposed rule were derived from ozone season air quality concentrations generated with CAMx and OSAT.

To this impact factor (in units of ppb/ton), we applied the difference in seasonal NOx emissions for Pennsylvania EGU NOx emissions associated with RACT II and the 5.14 base case. Using this emissions change, we calculated a resulting ozone concentration delta to determine the effectiveness of

<sup>5</sup> [http://www.epa.gov/sites/production/files/2015-11/documents/ozone\\_transport\\_policy\\_analysis\\_tsd.pdf](http://www.epa.gov/sites/production/files/2015-11/documents/ozone_transport_policy_analysis_tsd.pdf)

controlling NOx emissions from EGU sources in the State. An example of the calculations conducted for the RACT II scenario is provided in Table 4.

**Table 4.** Example calculation of ozone concentration change for Fairfield, Connecticut monitor 90010017 resulting from various EPA EGU scenarios.

Scenario	Resulting tons	Reduction (ppb)
IPM 5.14 Emissions	52,173	---
PA RACT II (EGUs)	27,010	0.81

For each monitor that the reductions associated with RACT II showed noticeable impact, we have calculated the monitor-level average and maximum design values, as well as the Pennsylvania state total and EGU-only contributions (in ppb) to that design value. Calculations and results for these monitors can be found at the end of this document.

To summarize those results, we have prepared Tables 5 and 6 that show the summary design values, by monitor, for the average and maximum projections, respectively.

**Table 5.** Average design value change and Pennsylvania state total and EGU contribution concentrations (ppb) for selected monitors.

Monitor	Location	Avg Monitor DV (ppb)		Pennsylvania 2017 Contribution to Monitor Ozone Design Value (ppb)			
		IPM 5.14	PA RACT II	IPM 5.14 Base Case		PA RACT II	
				State Total	EGU Total	State Total	EGU Total
90010017	Fairfield, Connecticut	75.8	75.0	7.96	1.62	7.18	0.84
90013007	Fairfield, Connecticut	77.1	76.1	9.07	2.12	8.04	1.10
90019003	Fairfield, Connecticut	78.0	77.0	9.16	2.02	8.19	1.04
90099002	New Haven, Connecticut	77.2	76.5	7.74	1.38	7.07	0.71
240053001	Baltimore, Maryland	73.2	72.2	6.76	2.10	5.74	1.09
240251001	Harford, Maryland	81.3	80.1	7.60	2.53	6.38	1.31
340071001	Camden, New Jersey	74.2	72.7	13.24	3.12	11.74	1.61
340150002	Gloucester, New Jersey	75.1	73.6	14.20	3.13	12.69	1.62
340230011	Middlesex, New Jersey	73.0	71.8	11.52	2.41	10.36	1.25
340290006	Ocean, New Jersey	73.9	72.8	11.45	2.31	10.34	1.20
360810124	Queens, New York	75.7	74.9	8.07	1.63	7.28	0.84
360850067	Richmond, New York	76.3	75.0	12.51	2.75	11.18	1.42
361030002	Suffolk, New York	79.2	78.2	10.11	1.98	9.15	1.02
390610006	Hamilton, Ohio	76.3	76.2	0.76	0.22	0.65	0.12
420031005	Allegheny, Pennsylvania	75.3	73.0	20.91	4.77	18.61	2.47
421010024	Philadelphia, Pennsylvania	75.1	73.2	18.71	3.90	16.83	2.02

**Table 6. Maximum design value change and Pennsylvania state total and EGU contribution concentrations (ppb) for selected monitors.**

Monitor	Location	Max Monitor DV (ppb)		Pennsylvania 2017 Contribution to Monitor Ozone Design Value (ppb)			
		IPM 5.14	PA RACT II	IPM 5.14 Base Case		PA RACT II	
				State Total	EGU Total	State Total	EGU Total
90010017	Fairfield, Connecticut	78.4	77.6	8.23	1.67	7.42	0.87
90013007	Fairfield, Connecticut	81.4	80.3	9.57	2.24	8.49	1.16
90019003	Fairfield, Connecticut	81.1	80.1	9.53	2.10	8.52	1.09
90099002	New Haven, Connecticut	80.2	79.5	8.04	1.43	7.35	0.74
240053001	Baltimore, Maryland	76.2	75.1	7.04	2.19	5.98	1.13
240251001	Harford, Maryland	84.0	82.7	7.85	2.61	6.59	1.35
340071001	Camden, New Jersey	78.1	76.5	13.94	3.28	12.35	1.70
340150002	Gloucester, New Jersey	77.5	75.9	14.66	3.23	13.10	1.67
340230011	Middlesex, New Jersey	76.3	75.1	12.04	2.52	10.82	1.30
340290006	Ocean, New Jersey	76.6	75.4	11.87	2.40	10.71	1.24
360810124	Queens, New York	77.6	76.8	8.27	1.67	7.47	0.86
360850067	Richmond, New York	77.8	76.4	12.75	2.80	11.40	1.45
361030002	Suffolk, New York	80.8	79.8	10.31	2.02	9.34	1.05
390610006	Hamilton, Ohio	79.1	79.0	0.79	0.23	0.67	0.12
420031005	Allegheny, Pennsylvania	76.5	74.2	21.24	4.84	18.90	2.51
421010024	Philadelphia, Pennsylvania	78.4	76.4	19.53	4.07	17.57	2.11

As can be seen in these tables and in Figure 1, we note that ozone concentration improvements ranging from 0.1 to 2.3 ppb are seen at monitors as the result of EGU NOx controls planned to be implemented under RACT II in Pennsylvania. It is recognized that with this partial application of the rule, using the average base case design values, the Richmond, NY monitor demonstrates attainment with the 2008 NAAQS. When applying reductions to the maximum design values, three monitors downwind of Pennsylvania, located in Baltimore, MD and Gloucester, Middlesex, and Ocean, NJ, show attainment with the 2008 NAAQS.

It should also be noted that many of these monitors are already currently observed to be demonstrating attainment with the 2008 ozone NAAQS<sup>6</sup>.

In conclusion, while the impacts of Pennsylvania’s RACT II controls on NOx emissions from EGU sources fall short of exclusively bringing downwind monitors into modeled attainment, the reductions associated with this partial implementation of the rule show impact and resultant ozone concentration decreases of up to 1.5 ppb in downwind states.

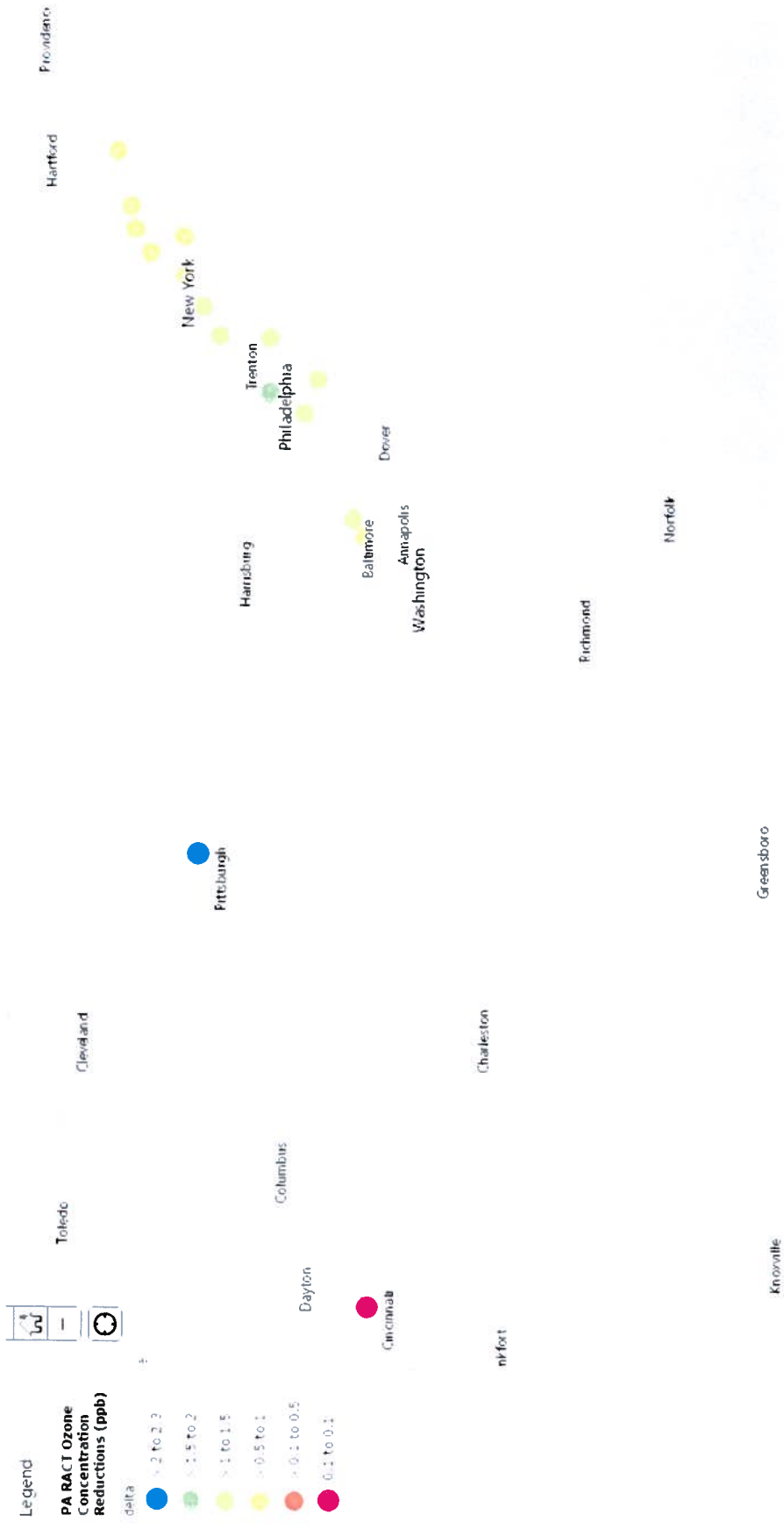
We recognize that this is not even the full impact of NOx controls associated with the Pennsylvania RACT II rule (there are other non-EGU categories affected with additional NOx and VOC reductions) and that there are additional, northeastern state programs yet to be accounted for in the base case modeling of the proposed CSAPR rule. These programs include OTC model rules on industrial, area, and mobile

<sup>6</sup>

[http://www.midwestozonegroup.com/files/Current\\_Ozone\\_Design\\_Values\\_and\\_Widespread\\_Attainment\\_of\\_the\\_2008\\_8-hr\\_Ozone\\_NAAQS2.pdf](http://www.midwestozonegroup.com/files/Current_Ozone_Design_Values_and_Widespread_Attainment_of_the_2008_8-hr_Ozone_NAAQS2.pdf)

source NOx and VOC, RACT in Connecticut, controls applied to high energy demand day (HEDD) sources, EGU and mobile source initiatives in Maryland, as well as other state and local initiatives to be in place prior to the 2017 calendar year.

Only after a complete air quality simulation considering emission levels reflective of all planned controls in the impacted areas and upwind states can EPA consider nonattainment and significant contribution modeling appropriate for developing a rule.



**Figure 1. Relative impact on monitor level average 2017 base case ozone concentrations (ppb) resulting from Pennsylvania RACT II EGU NOx controls.**

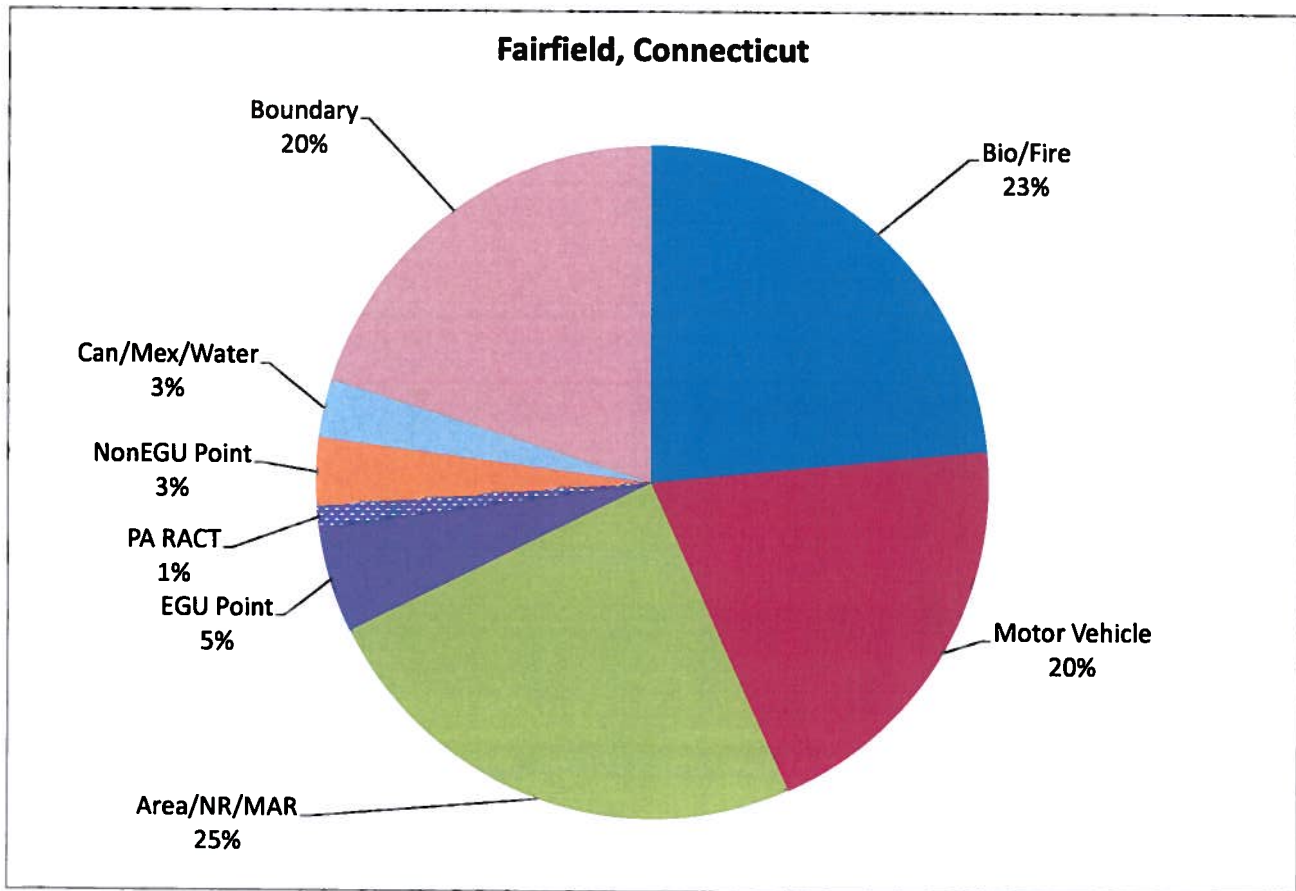
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 90010017 Fairfield, Connecticut

Scenario Avg 2017 DV

Base Case 5.14	75.8
PA RACT II	75.0

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	9.97	1,587	0.02	1.11E-05	1,587	0.00	9.97
DE	0.51	388	0.05	1.36E-04	388	0.00	0.51
MD	2.27	5,107	0.19	3.78E-05	5,107	0.00	2.27
NJ	12.26	4,617	0.43	9.32E-05	4,617	0.00	12.26
NY	9.77	9,123	0.33	3.66E-05	9,123	0.00	9.77
PA	7.96	52,173	1.62	3.10E-05	27,010	-0.78	7.18
VA/DC	2.47	11,254	0.17	1.48E-05	11,254	0.00	2.47
NorthEast	0.14	4,272	0.00	0.00E+00	4,272	0.00	0.14
IL	0.99	15,810	0.19	1.22E-05	15,810	0.00	0.99
IN	0.98	43,910	0.25	5.80E-06	43,910	0.00	0.98
MI	0.99	32,421	0.20	6.23E-06	32,421	0.00	0.99
OH	1.95	29,693	0.27	9.17E-06	29,693	0.00	1.95
WI	0.37	8,801	0.03	2.99E-06	8,801	0.00	0.37
WV	0.60	25,606	0.12	4.80E-06	25,606	0.00	0.60
KY	0.58	38,993	0.11	2.93E-06	38,993	0.00	0.58
NC	0.60	22,048	0.10	4.38E-06	22,048	0.00	0.60
TN	0.27	6,382	0.02	2.75E-06	6,382	0.00	0.27
SOUTH	0.83	84,284	0.07	8.34E-07	84,284	0.00	0.83
AR	0.24	11,890	0.03	2.22E-06	11,890	0.00	0.24
MO	0.42	20,632	0.04	2.13E-06	20,632	0.00	0.42
OK	0.42	24,335	0.05	2.17E-06	24,335	0.00	0.42
TX	0.67	66,651	0.06	9.22E-07	66,651	0.00	0.67
WEST	2.47	182,298	0.24	1.30E-06	182,298	0.00	2.47





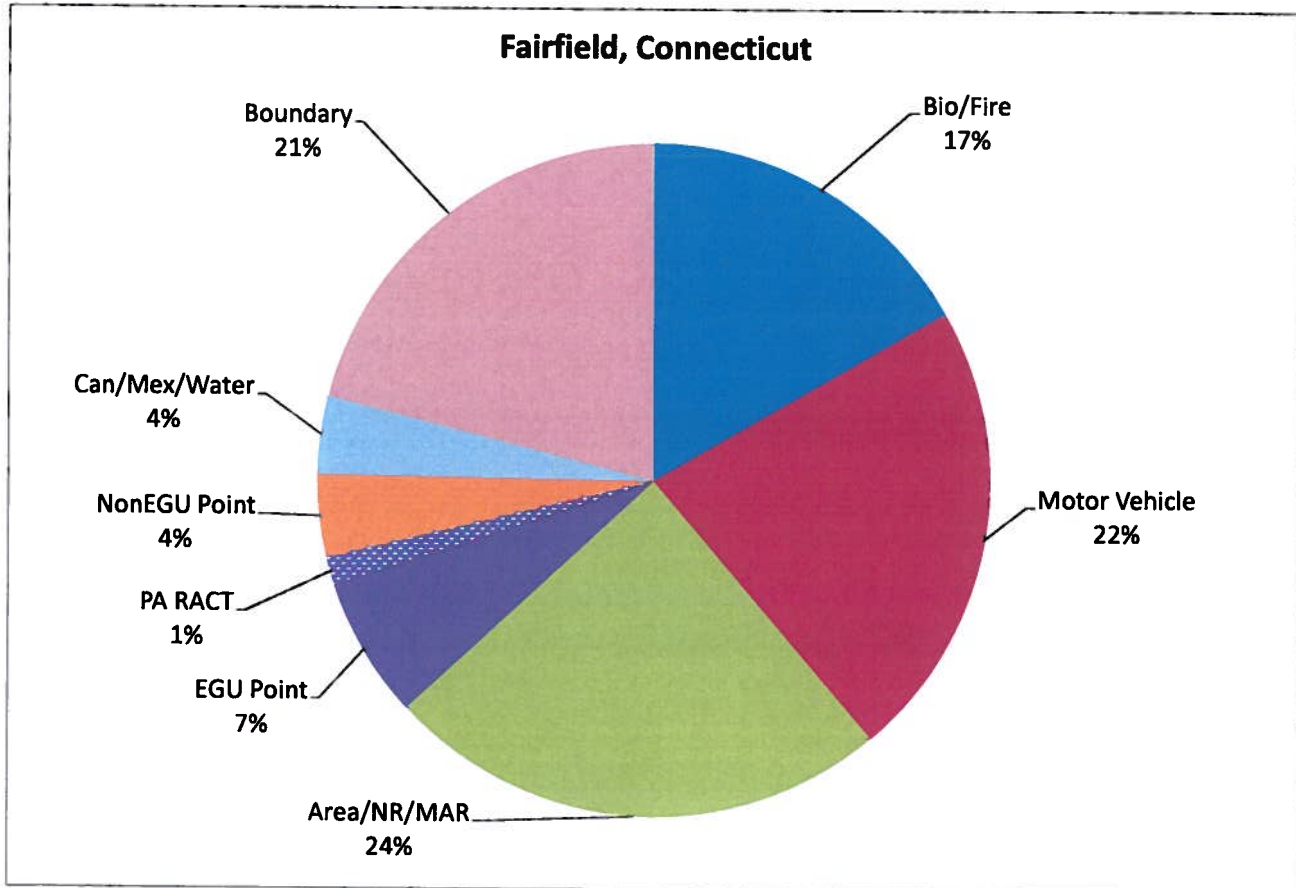
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 90013007 Fairfield, Connecticut

Scenario Avg 2017 DV

Base Case 5.14	77.1
PA RACT II	76.1

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	5.91	1,587	0.12	7.29E-05	1,587	0.00	5.91
DE	0.74	388	0.07	1.83E-04	388	0.00	0.74
MD	3.13	5,107	0.32	6.27E-05	5,107	0.00	3.13
NJ	11.15	4,617	0.63	1.37E-04	4,617	0.00	11.15
NY	11.33	9,123	0.83	9.07E-05	9,123	0.00	11.33
PA	9.07	52,173	2.12	4.06E-05	27,010	-1.02	8.04
VA/DC	2.90	11,254	0.23	2.06E-05	11,254	0.00	2.90
NorthEast	0.10	4,272	0.00	0.00E+00	4,272	0.00	0.10
IL	1.01	15,810	0.22	1.41E-05	15,810	0.00	1.01
IN	1.13	43,910	0.30	6.89E-06	43,910	0.00	1.13
MI	0.85	32,421	0.16	4.94E-06	32,421	0.00	0.85
OH	1.93	29,693	0.30	1.02E-05	29,693	0.00	1.93
WI	0.22	8,801	0.02	2.02E-06	8,801	0.00	0.22
WV	0.61	25,606	0.13	5.21E-06	25,606	0.00	0.61
KY	0.72	38,993	0.14	3.65E-06	38,993	0.00	0.72
NC	0.92	22,048	0.15	6.86E-06	22,048	0.00	0.92
TN	0.47	6,382	0.04	5.58E-06	6,382	0.00	0.47
SOUTH	1.25	84,284	0.11	1.27E-06	84,284	0.00	1.25
AR	0.37	11,890	0.04	2.99E-06	11,890	0.00	0.37
MO	0.38	20,632	0.04	1.72E-06	20,632	0.00	0.38
OK	0.39	24,335	0.04	1.83E-06	24,335	0.00	0.39
TX	0.69	66,651	0.06	9.34E-07	66,651	0.00	0.69
WEST	1.90	182,298	0.17	9.27E-07	182,298	0.00	1.90



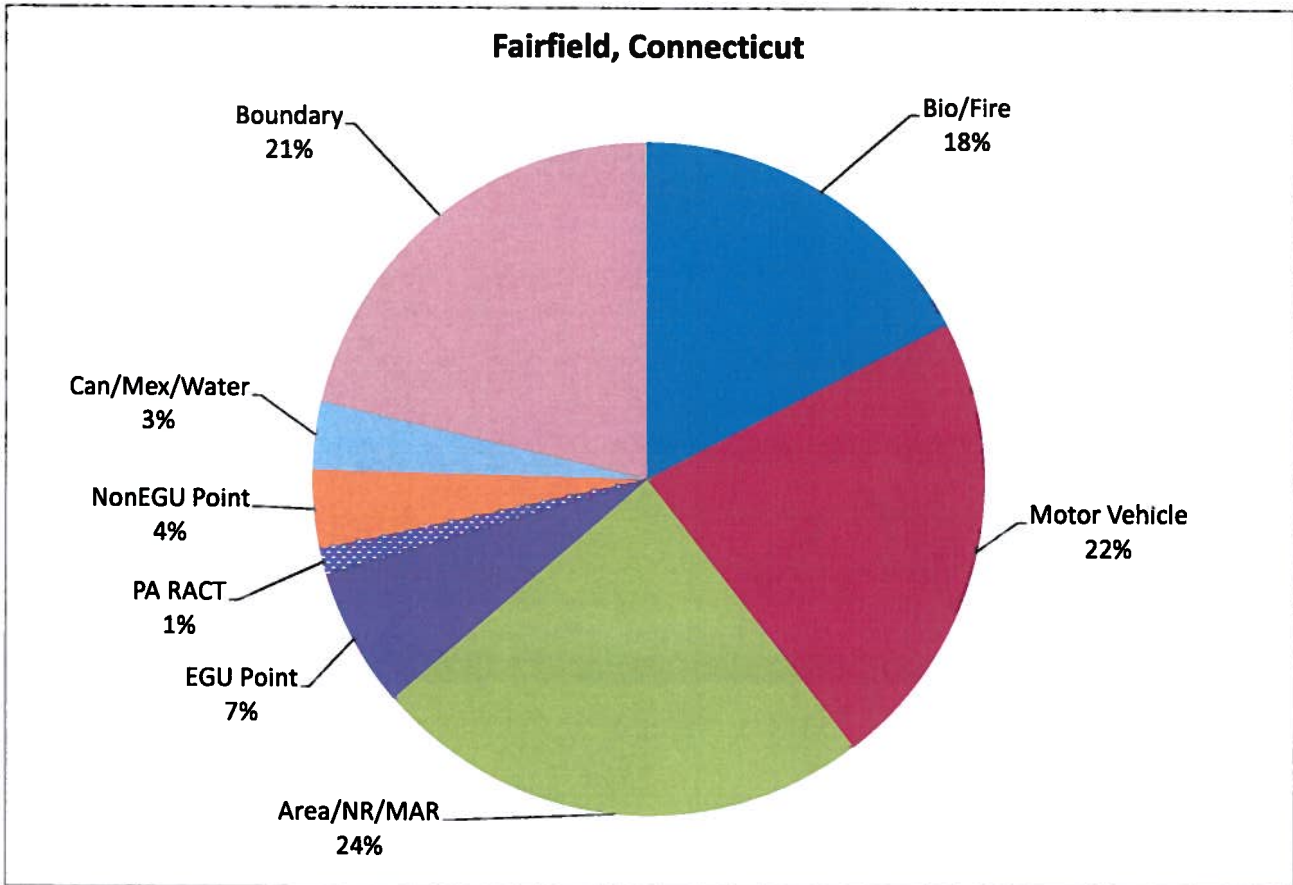
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 90019003 Fairfield, Connecticut

Scenario Avg 2017 DV

Base Case 5.14	78.0
PA RACT II	77.0

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	5.82	1,587	0.08	5.15E-05	1,587	0.00	5.82
DE	0.69	388	0.07	1.87E-04	388	0.00	0.69
MD	2.85	5,107	0.28	5.51E-05	5,107	0.00	2.85
NJ	12.30	4,617	0.62	1.34E-04	4,617	0.00	12.30
NY	10.50	9,123	0.81	8.86E-05	9,123	0.00	10.50
PA	9.16	52,173	2.02	3.86E-05	27,010	-0.97	8.19
VA/DC	2.74	11,254	0.21	1.86E-05	11,254	0.00	2.74
NorthEast	0.11	4,272	0.00	0.00E+00	4,272	0.00	0.11
IL	1.19	15,810	0.25	1.55E-05	15,810	0.00	1.19
IN	1.23	43,910	0.34	7.65E-06	43,910	0.00	1.23
MI	0.88	32,421	0.18	5.60E-06	32,421	0.00	0.88
OH	2.17	29,693	0.33	1.10E-05	29,693	0.00	2.17
WI	0.25	8,801	0.02	2.06E-06	8,801	0.00	0.25
WV	0.66	25,606	0.15	5.67E-06	25,606	0.00	0.66
KY	0.76	38,993	0.15	3.73E-06	38,993	0.00	0.76
NC	0.83	22,048	0.14	6.18E-06	22,048	0.00	0.83
TN	0.42	6,382	0.03	4.27E-06	6,382	0.00	0.42
SOUTH	1.24	84,284	0.10	1.19E-06	84,284	0.00	1.24
AR	0.33	11,890	0.03	2.29E-06	11,890	0.00	0.33
MO	0.44	20,632	0.05	2.20E-06	20,632	0.00	0.44
OK	0.46	24,335	0.05	2.24E-06	24,335	0.00	0.46
TX	0.77	66,651	0.07	1.09E-06	66,651	0.00	0.77
WEST	2.24	182,298	0.22	1.20E-06	182,298	0.00	2.24



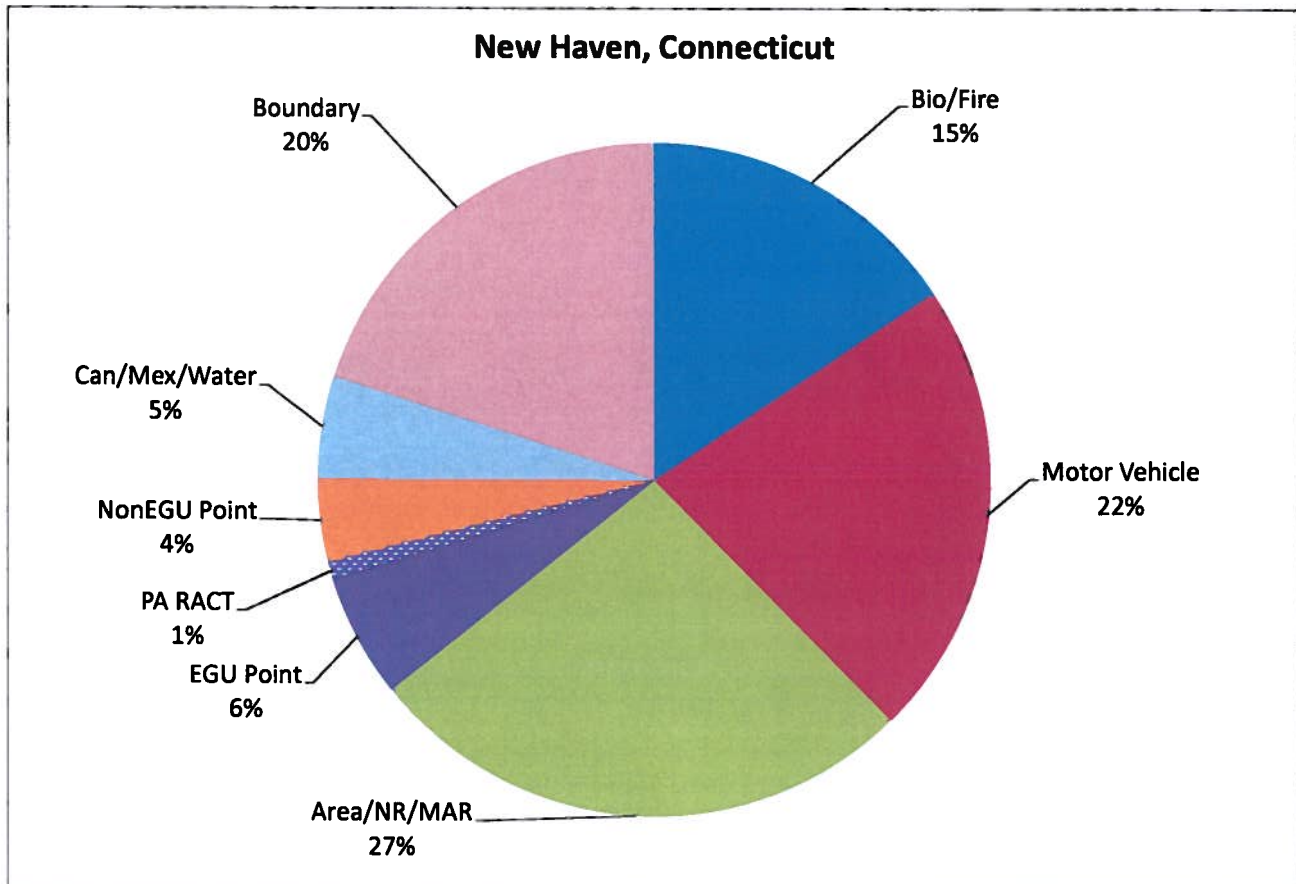
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 90099002 New Haven, Connecticut

Scenario Avg 2017 DV

Base Case 5.14	77.2
PA RACT II	76.5

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	8.33	1,587	0.14	8.76E-05	1,587	0.00	8.33
DE	0.72	388	0.06	1.67E-04	388	0.00	0.72
MD	2.17	5,107	0.19	3.63E-05	5,107	0.00	2.17
NJ	8.29	4,617	0.47	1.02E-04	4,617	0.00	8.29
NY	12.83	9,123	0.69	7.52E-05	9,123	0.00	12.83
PA	7.74	52,173	1.38	2.65E-05	27,010	-0.67	7.07
VA/DC	1.80	11,254	0.12	1.07E-05	11,254	0.00	1.80
NorthEast	0.23	4,272	0.00	0.00E+00	4,272	0.00	0.23
IL	1.39	15,810	0.29	1.82E-05	15,810	0.00	1.39
IN	1.27	43,910	0.33	7.60E-06	43,910	0.00	1.27
MI	0.97	32,421	0.24	7.43E-06	32,421	0.00	0.97
OH	2.40	29,693	0.30	9.99E-06	29,693	0.00	2.40
WI	0.30	8,801	0.03	3.16E-06	8,801	0.00	0.30
WV	0.56	25,606	0.10	3.98E-06	25,606	0.00	0.56
KY	0.77	38,993	0.15	3.80E-06	38,993	0.00	0.77
NC	0.65	22,048	0.10	4.62E-06	22,048	0.00	0.65
TN	0.31	6,382	0.02	2.90E-06	6,382	0.00	0.31
SOUTH	0.82	84,284	0.07	8.80E-07	84,284	0.00	0.82
AR	0.30	11,890	0.03	2.34E-06	11,890	0.00	0.30
MO	0.57	20,632	0.06	2.70E-06	20,632	0.00	0.57
OK	0.60	24,335	0.08	3.43E-06	24,335	0.00	0.60
TX	0.93	66,651	0.09	1.39E-06	66,651	0.00	0.93
WEST	2.74	182,298	0.28	1.53E-06	182,298	0.00	2.74



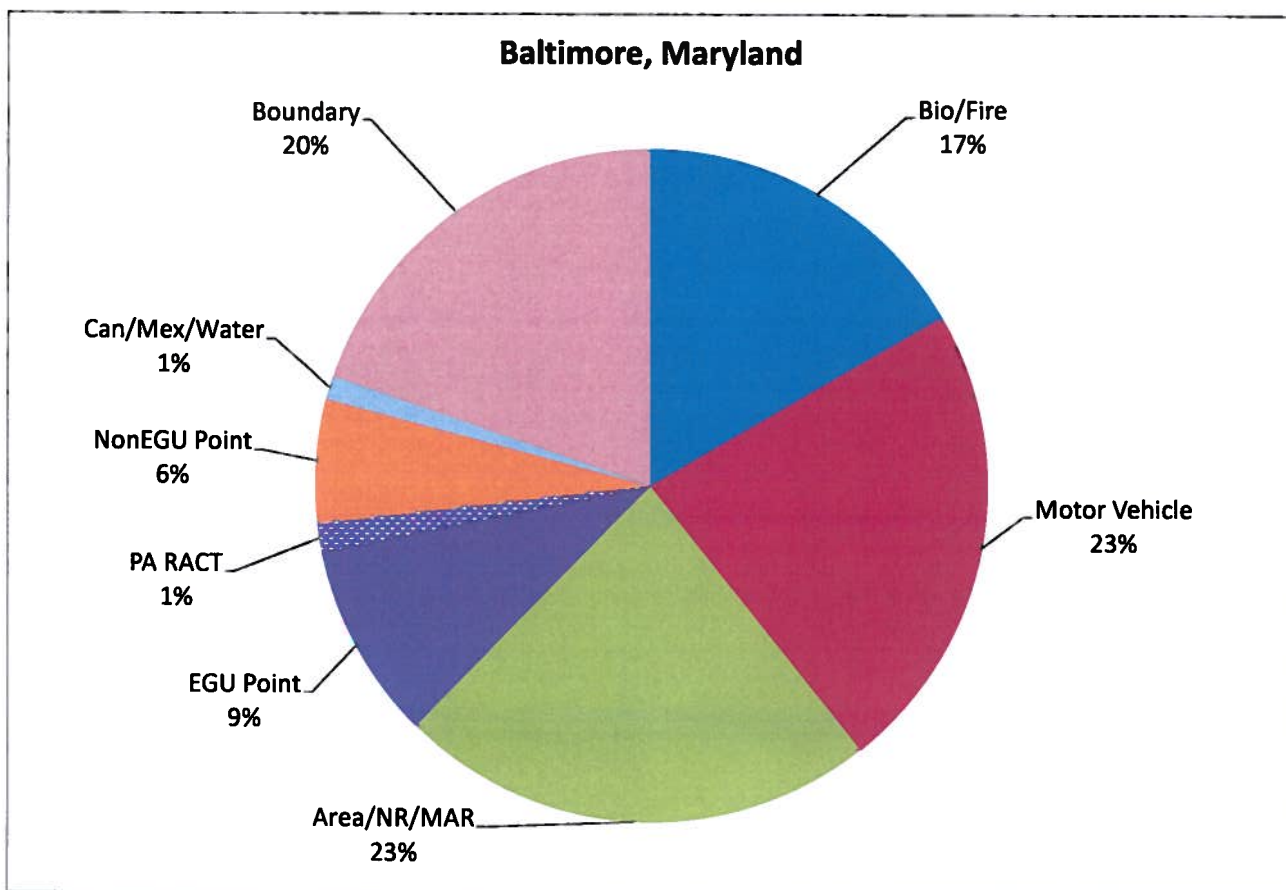
### Impact Factor Calculation for Pennsylvania RACT II

Monitor 240053001 Baltimore, Maryland

Scenario Avg 2017 DV

Base Case 5.14	73.2
PA RACT II	72.2

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.01	1,587	0.00	0.00E+00	1,587	0.00	0.01
DE	0.21	388	0.04	9.19E-05	388	0.00	0.21
MD	22.08	5,107	1.60	3.14E-04	5,107	0.00	22.08
NJ	0.44	4,617	0.05	1.16E-05	4,617	0.00	0.44
NY	0.34	9,123	0.01	9.77E-07	9,123	0.00	0.34
PA	6.76	52,173	2.10	4.03E-05	27,010	-1.01	5.74
VA/DC	5.33	11,254	0.26	2.30E-05	11,254	0.00	5.33
NorthEast	0.01	4,272	0.00	0.00E+00	4,272	0.00	0.01
IL	1.32	15,810	0.31	1.97E-05	15,810	0.00	1.32
IN	2.29	43,910	0.63	1.44E-05	43,910	0.00	2.29
MI	1.12	32,421	0.23	7.15E-06	32,421	0.00	1.12
OH	4.51	29,693	0.71	2.40E-05	29,693	0.00	4.51
WI	0.30	8,801	0.03	3.04E-06	8,801	0.00	0.30
WV	1.85	25,606	0.51	1.98E-05	25,606	0.00	1.85
KY	2.03	38,993	0.45	1.14E-05	38,993	0.00	2.03
NC	0.97	22,048	0.16	7.28E-06	22,048	0.00	0.97
TN	0.59	6,382	0.05	8.38E-06	6,382	0.00	0.59
SOUTH	1.34	84,284	0.12	1.48E-06	84,284	0.00	1.34
AR	0.37	11,890	0.04	3.00E-06	11,890	0.00	0.37
MO	0.74	20,632	0.07	3.46E-06	20,632	0.00	0.74
OK	0.64	24,335	0.08	3.30E-06	24,335	0.00	0.64
TX	1.13	66,651	0.12	1.74E-06	66,651	0.00	1.13
WEST	3.11	182,298	0.32	1.76E-06	182,298	0.00	3.11



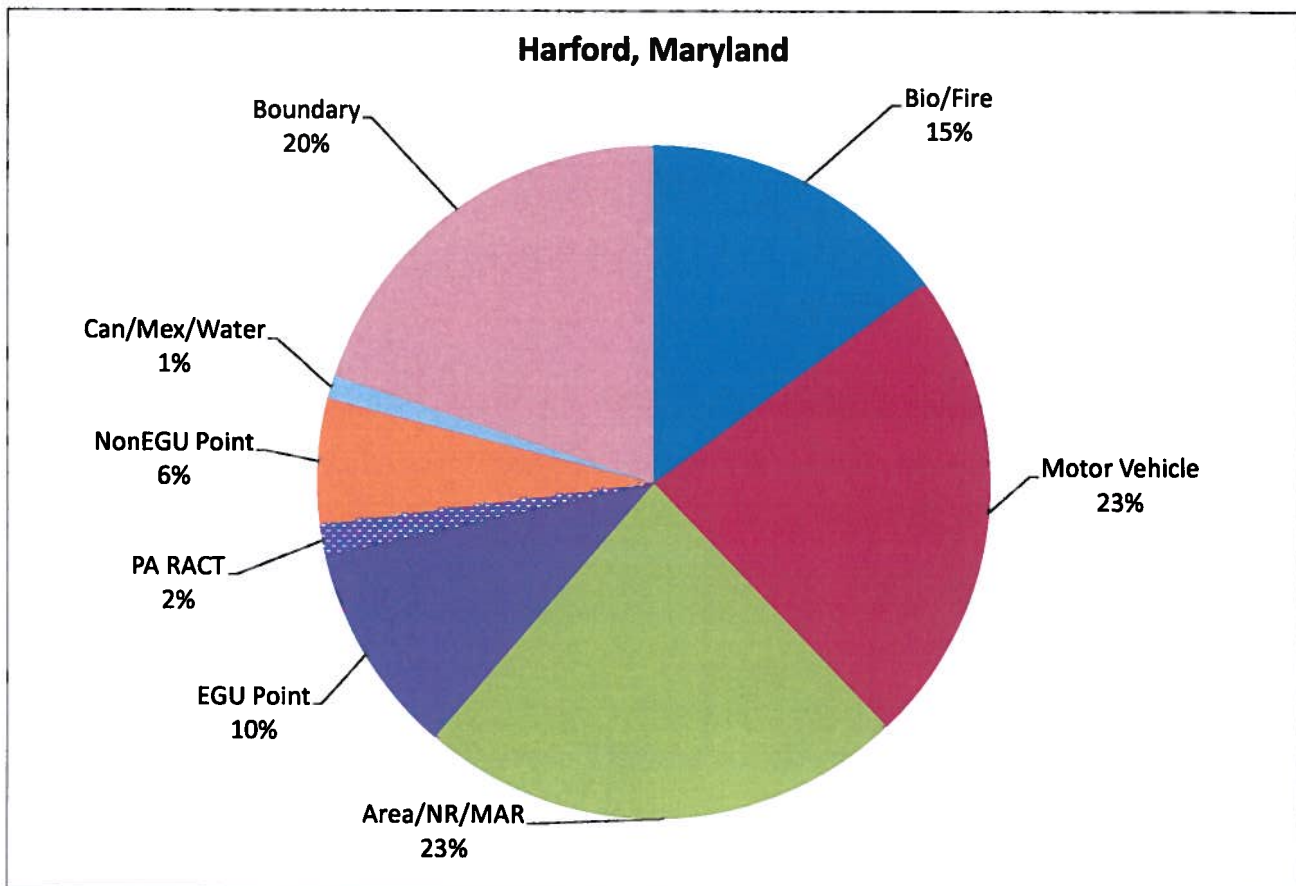
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 240251001 Harford, Maryland

Scenario Avg 2017 DV

Base Case 5.14	81.3
PA RACT II	80.1

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.01	1,587	0.00	0.00E+00	1,587	0.00	0.01
DE	0.15	388	0.02	5.13E-05	388	0.00	0.15
MD	23.82	5,107	2.10	4.12E-04	5,107	0.00	23.82
NJ	0.34	4,617	0.04	8.63E-06	4,617	0.00	0.34
NY	0.31	9,123	0.01	1.09E-06	9,123	0.00	0.31
PA	7.60	52,173	2.53	4.85E-05	27,010	-1.22	6.38
VA/DC	6.66	11,254	0.38	3.36E-05	11,254	0.00	6.66
NorthEast	0.00	4,272	0.00	0.00E+00	4,272	0.00	0.00
IL	1.41	15,810	0.35	2.21E-05	15,810	0.00	1.41
IN	2.55	43,910	0.71	1.61E-05	43,910	0.00	2.55
MI	1.22	32,421	0.25	7.68E-06	32,421	0.00	1.22
OH	4.97	29,693	0.84	2.82E-05	29,693	0.00	4.97
WI	0.34	8,801	0.03	3.40E-06	8,801	0.00	0.34
WV	2.12	25,606	0.60	2.33E-05	25,606	0.00	2.12
KY	2.38	38,993	0.53	1.35E-05	38,993	0.00	2.38
NC	0.74	22,048	0.15	6.78E-06	22,048	0.00	0.74
TN	0.69	6,382	0.06	9.36E-06	6,382	0.00	0.69
SOUTH	1.70	84,284	0.16	1.89E-06	84,284	0.00	1.70
AR	0.38	11,890	0.04	3.35E-06	11,890	0.00	0.38
MO	0.81	20,632	0.08	3.86E-06	20,632	0.00	0.81
OK	0.70	24,335	0.09	3.68E-06	24,335	0.00	0.70
TX	1.28	66,651	0.13	1.94E-06	66,651	0.00	1.28
WEST	3.60	182,298	0.38	2.08E-06	182,298	0.00	3.60





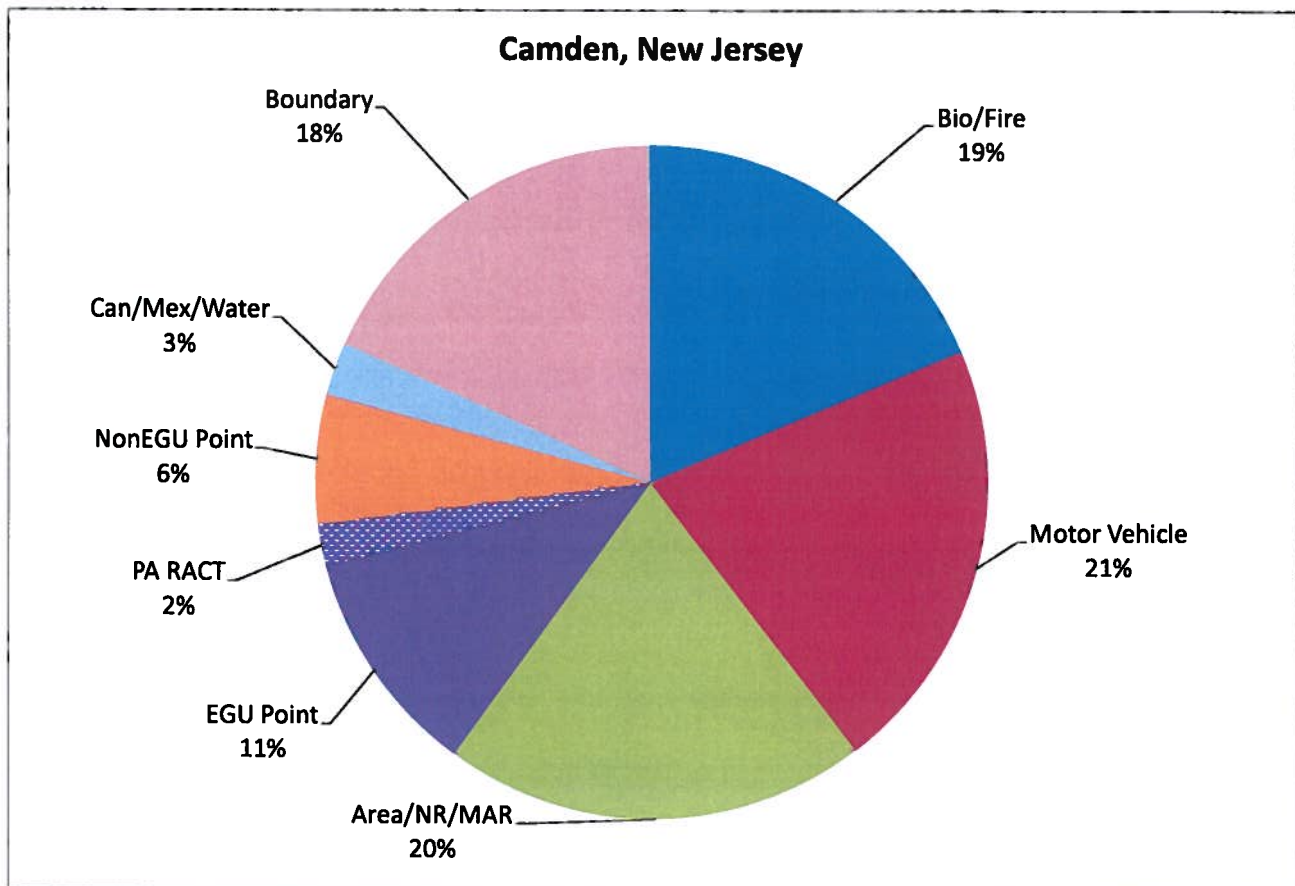
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 340071001 Camden, New Jersey

Scenario Avg 2017 DV

Base Case 5.14	74.2
PA RACT II	72.7

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.05	1,587	0.00	0.00E+00	1,587	0.00	0.05
DE	4.15	388	1.01	2.61E-03	388	0.00	4.15
MD	1.40	5,107	0.08	1.61E-05	5,107	0.00	1.40
NJ	11.22	4,617	1.52	3.30E-04	4,617	0.00	11.22
NY	1.40	9,123	0.12	1.30E-05	9,123	0.00	1.40
PA	13.24	52,173	3.12	5.98E-05	27,010	-1.50	11.74
VA/DC	0.94	11,254	0.05	4.05E-06	11,254	0.00	0.94
NorthEast	0.00	4,272	0.00	0.00E+00	4,272	0.00	0.00
IL	2.32	15,810	0.44	2.77E-05	15,810	0.00	2.32
IN	2.22	43,910	0.52	1.18E-05	43,910	0.00	2.22
MI	1.94	32,421	0.39	1.21E-05	32,421	0.00	1.94
OH	5.05	29,693	0.65	2.18E-05	29,693	0.00	5.05
WI	0.69	8,801	0.05	6.22E-06	8,801	0.00	0.69
WV	0.95	25,606	0.23	8.90E-06	25,606	0.00	0.95
KY	1.26	38,993	0.27	7.02E-06	38,993	0.00	1.26
NC	0.18	22,048	0.04	1.65E-06	22,048	0.00	0.18
TN	0.22	6,382	0.02	2.86E-06	6,382	0.00	0.22
SOUTH	1.60	84,284	0.13	1.51E-06	84,284	0.00	1.60
AR	0.68	11,890	0.05	4.60E-06	11,890	0.00	0.68
MO	1.07	20,632	0.10	4.86E-06	20,632	0.00	1.07
OK	1.09	24,335	0.14	5.62E-06	24,335	0.00	1.09
TX	1.95	66,651	0.20	3.01E-06	66,651	0.00	1.95
WEST	4.61	182,298	0.47	2.55E-06	182,298	0.00	4.61



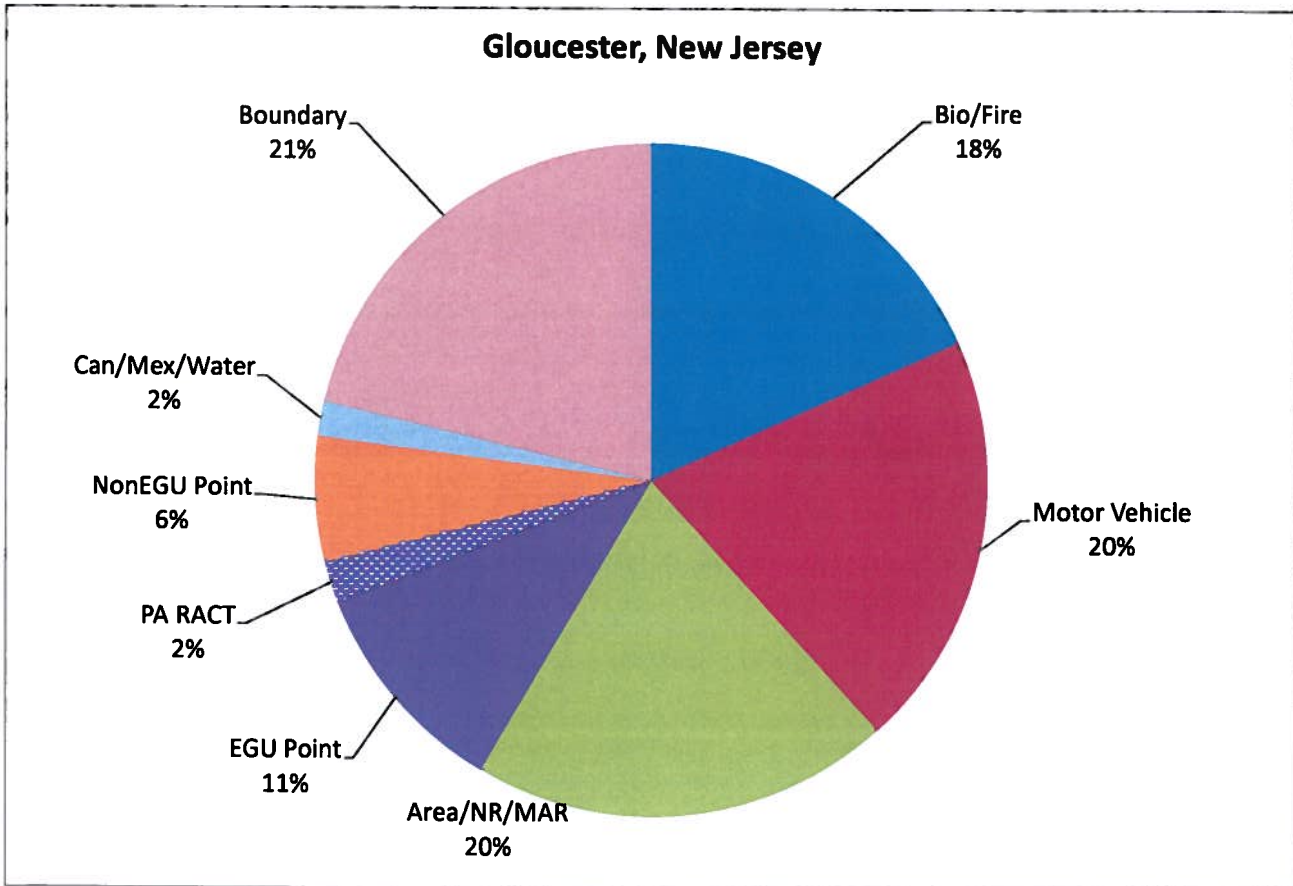
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 340150002 Gloucester, New Jersey

Scenario Avg 2017 DV

Base Case 5.14	75.1
PA RACT II	73.6

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.11	1,587	0.00	0.00E+00	1,587	0.00	0.11
DE	5.09	388	1.05	2.72E-03	388	0.00	5.09
MD	6.54	5,107	0.80	1.58E-04	5,107	0.00	6.54
NJ	3.61	4,617	0.45	9.75E-05	4,617	0.00	3.61
NY	0.98	9,123	0.03	3.15E-06	9,123	0.00	0.98
PA	14.20	52,173	3.13	6.00E-05	27,010	-1.51	12.69
VA/DC	3.52	11,254	0.29	2.55E-05	11,254	0.00	3.52
NorthEast	0.14	4,272	0.00	0.00E+00	4,272	0.00	0.14
IL	1.56	15,810	0.30	1.88E-05	15,810	0.00	1.56
IN	1.66	43,910	0.49	1.11E-05	43,910	0.00	1.66
MI	1.29	32,421	0.29	8.86E-06	32,421	0.00	1.29
OH	5.33	29,693	0.79	2.65E-05	29,693	0.00	5.33
WI	0.59	8,801	0.04	4.35E-06	8,801	0.00	0.59
WV	1.89	25,606	0.53	2.06E-05	25,606	0.00	1.89
KY	1.99	38,993	0.37	9.58E-06	38,993	0.00	1.99
NC	0.36	22,048	0.08	3.48E-06	22,048	0.00	0.36
TN	0.44	6,382	0.05	7.50E-06	6,382	0.00	0.44
SOUTH	1.72	84,284	0.16	1.93E-06	84,284	0.00	1.72
AR	0.25	11,890	0.03	2.42E-06	11,890	0.00	0.25
MO	0.76	20,632	0.07	3.25E-06	20,632	0.00	0.76
OK	0.52	24,335	0.07	2.76E-06	24,335	0.00	0.52
TX	1.44	66,651	0.12	1.87E-06	66,651	0.00	1.44
WEST	3.28	182,298	0.31	1.68E-06	182,298	0.00	3.28



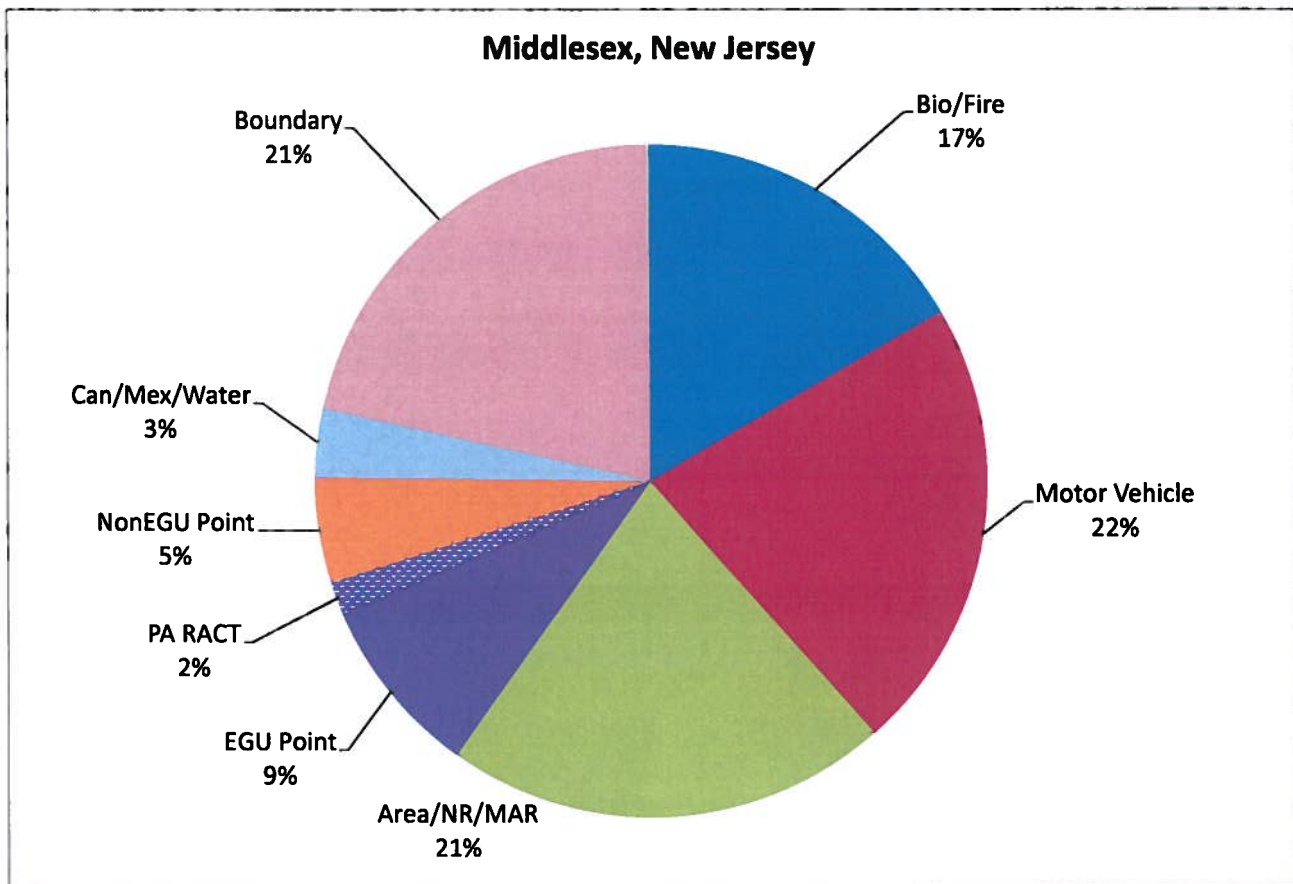
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 340230011 Middlesex, New Jersey

Scenario Avg 2017 DV

Base Case 5.14	73.0
PA RACT II	71.8

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.54	1,587	0.01	5.75E-06	1,587	0.00	0.54
DE	1.36	388	0.27	7.05E-04	388	0.00	1.36
MD	2.99	5,107	0.33	6.43E-05	5,107	0.00	2.99
NJ	13.10	4,617	0.98	2.11E-04	4,617	0.00	13.10
NY	3.16	9,123	0.15	1.60E-05	9,123	0.00	3.16
PA	11.52	52,173	2.41	4.61E-05	27,010	-1.16	10.36
VA/DC	2.46	11,254	0.22	1.94E-05	11,254	0.00	2.46
NorthEast	0.86	4,272	0.01	2.13E-06	4,272	0.00	0.86
IL	1.23	15,810	0.26	1.67E-05	15,810	0.00	1.23
IN	1.29	43,910	0.47	1.08E-05	43,910	0.00	1.29
MI	0.85	32,421	0.14	4.22E-06	32,421	0.00	0.85
OH	2.95	29,693	0.64	2.15E-05	29,693	0.00	2.95
WI	0.46	8,801	0.04	4.14E-06	8,801	0.00	0.46
WV	1.47	25,606	0.39	1.53E-05	25,606	0.00	1.47
KY	1.50	38,993	0.29	7.48E-06	38,993	0.00	1.50
NC	0.71	22,048	0.13	5.79E-06	22,048	0.00	0.71
TN	0.57	6,382	0.05	8.57E-06	6,382	0.00	0.57
SOUTH	1.52	84,284	0.14	1.62E-06	84,284	0.00	1.52
AR	0.26	11,890	0.03	2.30E-06	11,890	0.00	0.26
MO	0.57	20,632	0.05	2.65E-06	20,632	0.00	0.57
OK	0.56	24,335	0.06	2.62E-06	24,335	0.00	0.56
TX	1.11	66,651	0.10	1.51E-06	66,651	0.00	1.11
WEST	3.03	182,298	0.29	1.60E-06	182,298	0.00	3.03





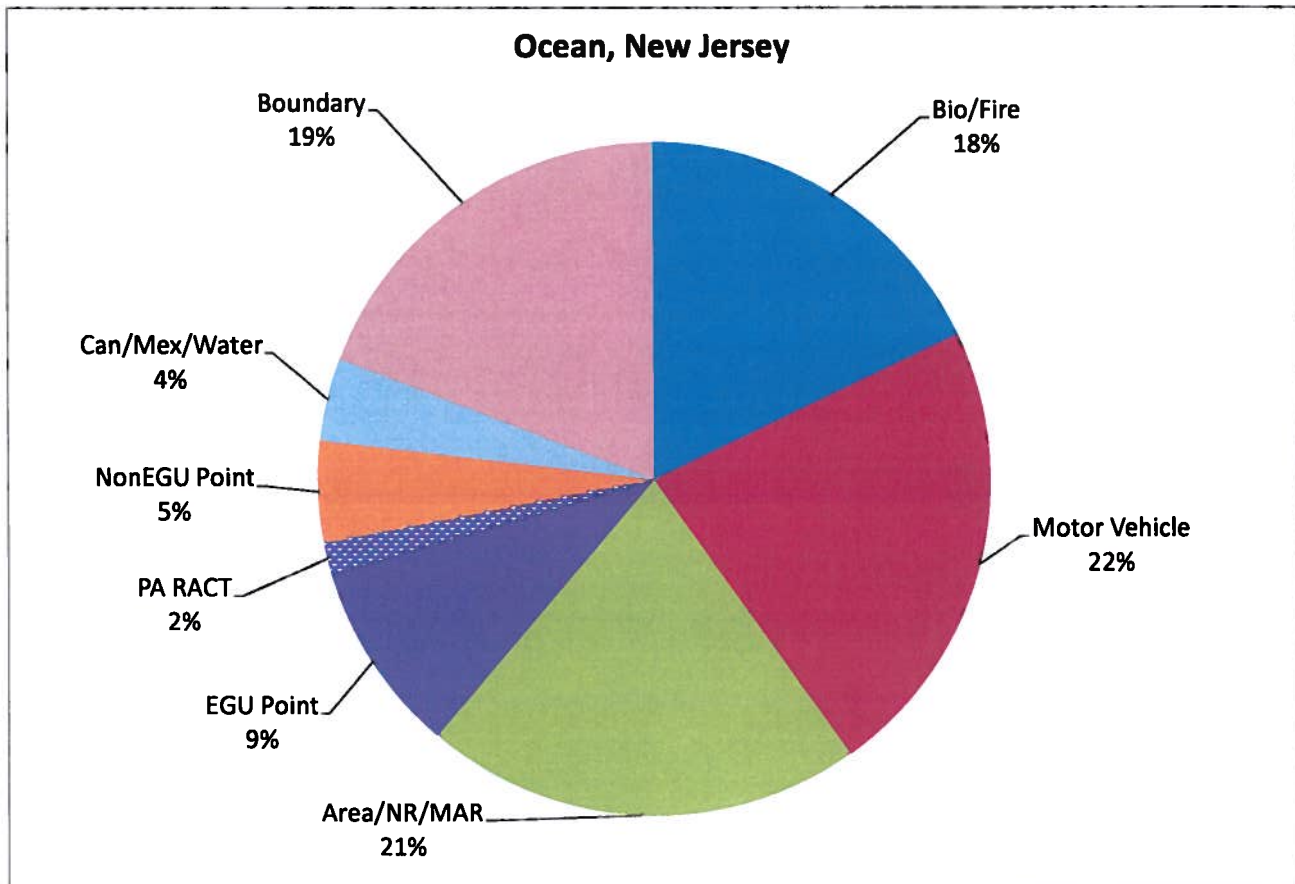
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 340290006 Ocean, New Jersey

Scenario Avg 2017 DV

Base Case 5.14	73.9
PA RACT II	72.8

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.45	1,587	0.01	5.76E-06	1,587	0.00	0.45
DE	1.27	388	0.25	6.36E-04	388	0.00	1.27
MD	1.67	5,107	0.15	2.86E-05	5,107	0.00	1.67
NJ	13.44	4,617	1.61	3.48E-04	4,617	0.00	13.44
NY	3.55	9,123	0.20	2.20E-05	9,123	0.00	3.55
PA	11.45	52,173	2.31	4.43E-05	27,010	-1.12	10.34
VA/DC	1.18	11,254	0.06	5.68E-06	11,254	0.00	1.18
NorthEast	0.56	4,272	0.01	2.14E-06	4,272	0.00	0.56
IL	1.60	15,810	0.32	2.02E-05	15,810	0.00	1.60
IN	1.79	43,910	0.58	1.33E-05	43,910	0.00	1.79
MI	1.58	32,421	0.27	8.46E-06	32,421	0.00	1.58
OH	3.33	29,693	0.54	1.82E-05	29,693	0.00	3.33
WI	0.68	8,801	0.05	6.23E-06	8,801	0.00	0.68
WV	1.05	25,606	0.22	8.57E-06	25,606	0.00	1.05
KY	1.68	38,993	0.33	8.44E-06	38,993	0.00	1.68
NC	0.51	22,048	0.07	3.32E-06	22,048	0.00	0.51
TN	0.69	6,382	0.05	8.59E-06	6,382	0.00	0.69
SOUTH	1.76	84,284	0.15	1.73E-06	84,284	0.00	1.76
AR	0.55	11,890	0.05	3.84E-06	11,890	0.00	0.55
MO	0.83	20,632	0.08	3.99E-06	20,632	0.00	0.83
OK	0.87	24,335	0.10	4.13E-06	24,335	0.00	0.87
TX	1.72	66,651	0.16	2.33E-06	66,651	0.00	1.72
WEST	3.82	182,298	0.37	2.01E-06	182,298	0.00	3.82

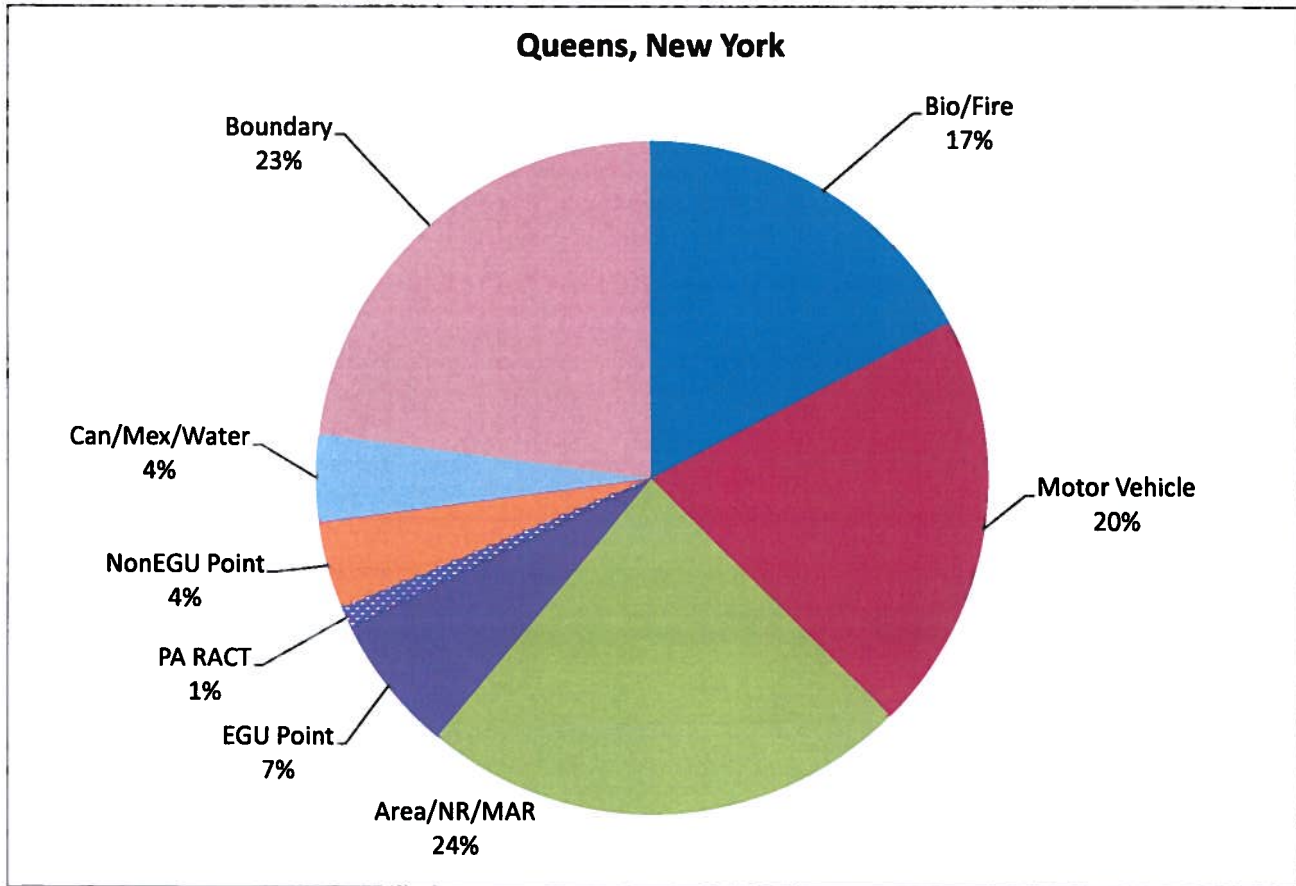


**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 360810124 Queens, New York

Scenario	Avg 2017 DV
Base Case 5.14	75.7
PA RACT II	74.9

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	1.04	1,587	0.00	0.00E+00	1,587	0.00	1.04
DE	1.12	388	0.17	4.41E-04	388	0.00	1.12
MD	2.89	5,107	0.32	6.34E-05	5,107	0.00	2.89
NJ	14.85	4,617	0.90	1.96E-04	4,617	0.00	14.85
NY	7.11	9,123	0.21	2.29E-05	9,123	0.00	7.11
PA	8.07	52,173	1.63	3.12E-05	27,010	-0.78	7.28
VA/DC	3.12	11,254	0.26	2.28E-05	11,254	0.00	3.12
NorthEast	0.10	4,272	0.00	0.00E+00	4,272	0.00	0.10
IL	1.29	15,810	0.21	1.32E-05	15,810	0.00	1.29
IN	1.03	43,910	0.22	4.98E-06	43,910	0.00	1.03
MI	2.10	32,421	0.43	1.32E-05	32,421	0.00	2.10
OH	2.51	29,693	0.29	9.61E-06	29,693	0.00	2.51
WI	0.57	8,801	0.05	5.41E-06	8,801	0.00	0.57
WV	0.69	25,606	0.19	7.43E-06	25,606	0.00	0.69
KY	0.54	38,993	0.11	2.93E-06	38,993	0.00	0.54
NC	0.83	22,048	0.14	6.47E-06	22,048	0.00	0.83
TN	0.16	6,382	0.02	2.98E-06	6,382	0.00	0.16
SOUTH	0.97	84,284	0.09	1.02E-06	84,284	0.00	0.97
AR	0.22	11,890	0.02	1.60E-06	11,890	0.00	0.22
MO	0.55	20,632	0.06	2.77E-06	20,632	0.00	0.55
OK	0.54	24,335	0.07	2.74E-06	24,335	0.00	0.54
TX	0.87	66,651	0.09	1.28E-06	66,651	0.00	0.87
WEST	3.28	182,298	0.32	1.77E-06	182,298	0.00	3.28



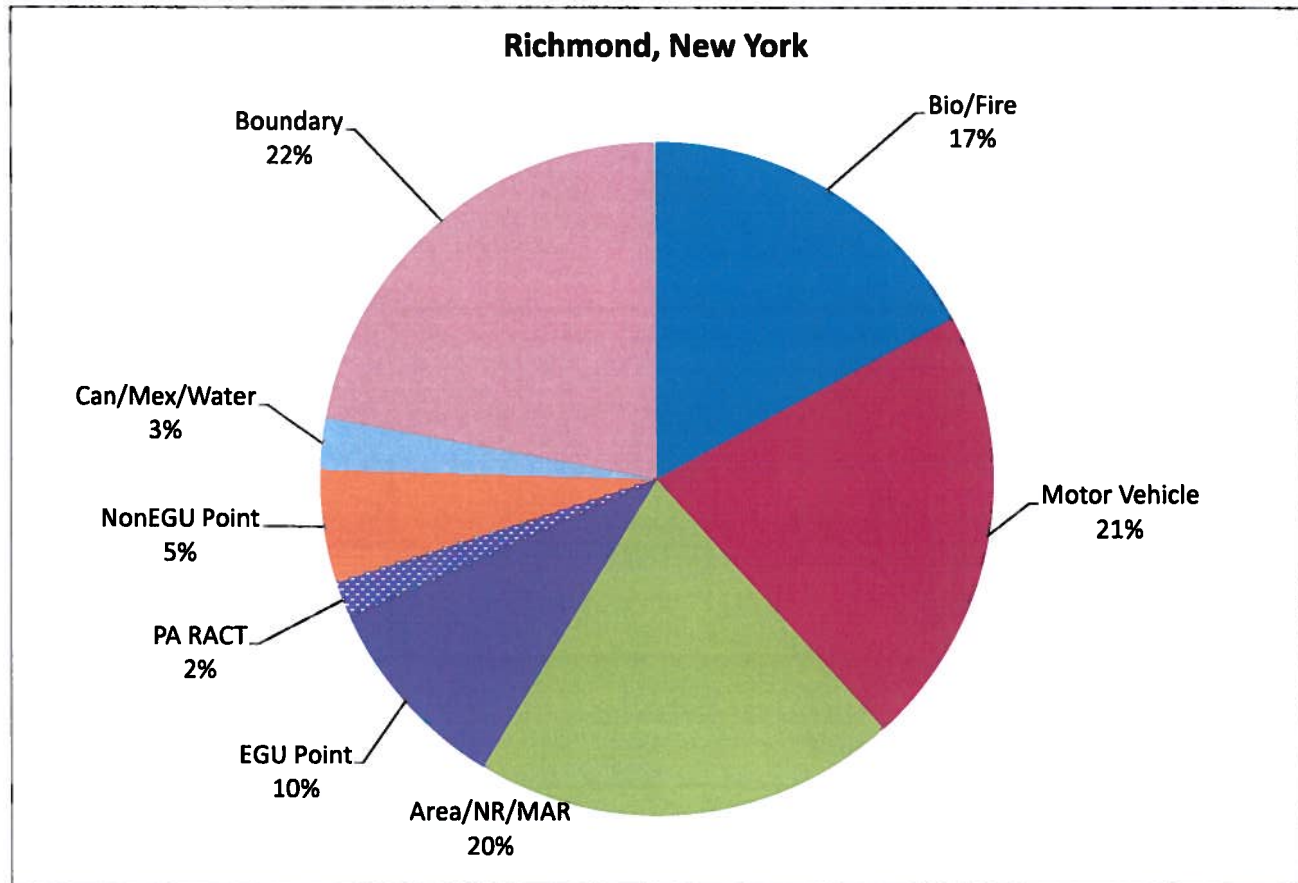
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 360850067 Richmond, New York

Scenario Avg 2017 DV

Base Case 5.14	76.3
PA RACT II	75.0

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		State Total (ppb)
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	
CT	0.28	1,587	0.00	0.00E+00	1,587	0.00	0.28
DE	1.45	388	0.27	6.89E-04	388	0.00	1.45
MD	3.47	5,107	0.38	7.48E-05	5,107	0.00	3.47
NJ	14.67	4,617	1.63	3.54E-04	4,617	0.00	14.67
NY	1.66	9,123	0.08	8.37E-06	9,123	0.00	1.66
PA	12.51	52,173	2.75	5.27E-05	27,010	-1.33	11.18
VA/DC	3.57	11,254	0.31	2.71E-05	11,254	0.00	3.57
NorthEast	0.09	4,272	0.00	0.00E+00	4,272	0.00	0.09
IL	1.32	15,810	0.27	1.69E-05	15,810	0.00	1.32
IN	1.41	43,910	0.48	1.09E-05	43,910	0.00	1.41
MI	1.08	32,421	0.20	6.18E-06	32,421	0.00	1.08
OH	3.22	29,693	0.64	2.15E-05	29,693	0.00	3.22
WI	0.32	8,801	0.03	3.25E-06	8,801	0.00	0.32
WV	1.43	25,606	0.37	1.45E-05	25,606	0.00	1.43
KY	1.44	38,993	0.28	7.10E-06	38,993	0.00	1.44
NC	0.90	22,048	0.16	7.36E-06	22,048	0.00	0.90
TN	0.60	6,382	0.06	8.97E-06	6,382	0.00	0.60
SOUTH	1.67	84,284	0.15	1.81E-06	84,284	0.00	1.67
AR	0.29	11,890	0.03	2.41E-06	11,890	0.00	0.29
MO	0.63	20,632	0.07	3.24E-06	20,632	0.00	0.63
OK	0.63	24,335	0.08	3.14E-06	24,335	0.00	0.63
TX	1.10	66,651	0.11	1.58E-06	66,651	0.00	1.10
WEST	3.15	182,298	0.32	1.73E-06	182,298	0.00	3.15



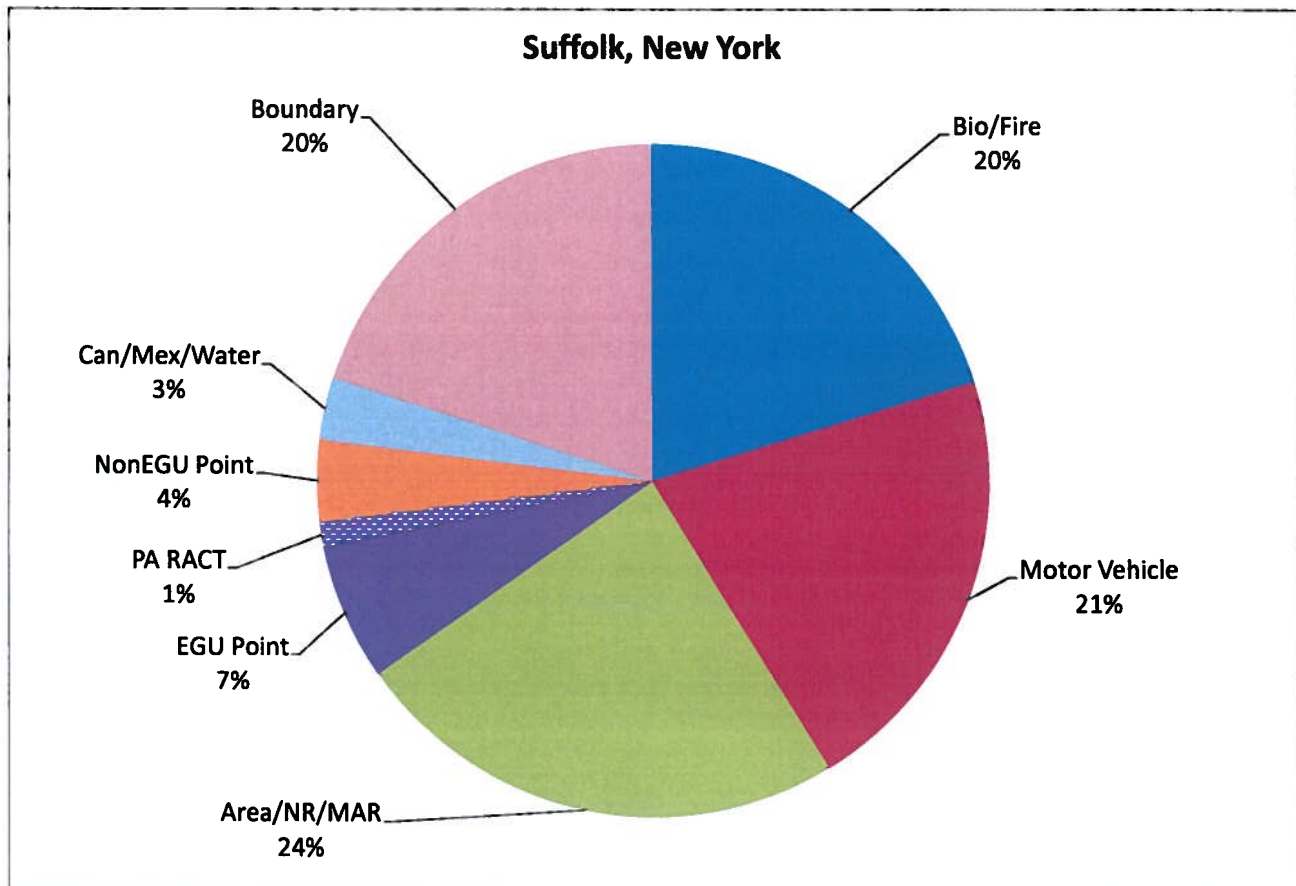
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 361030002 Suffolk, New York

Scenario Avg 2017 DV

Base Case 5.14	79.2
PA RACT II	78.2

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		State Total (ppb)
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	
CT	1.24	1,587	0.01	5.94E-06	1,587	0.00	1.24
DE	0.55	388	0.05	1.21E-04	388	0.00	0.55
MD	1.88	5,107	0.16	3.14E-05	5,107	0.00	1.88
NJ	15.25	4,617	0.60	1.31E-04	4,617	0.00	15.25
NY	9.82	9,123	0.39	4.24E-05	9,123	0.00	9.82
PA	10.11	52,173	1.98	3.79E-05	27,010	-0.95	9.15
VA/DC	2.05	11,254	0.12	1.09E-05	11,254	0.00	2.05
NorthEast	0.03	4,272	0.00	0.00E+00	4,272	0.00	0.03
IL	1.61	15,810	0.32	2.03E-05	15,810	0.00	1.61
IN	1.75	43,910	0.51	1.16E-05	43,910	0.00	1.75
MI	1.33	32,421	0.29	9.01E-06	32,421	0.00	1.33
OH	3.16	29,693	0.42	1.43E-05	29,693	0.00	3.16
WI	0.30	8,801	0.03	3.21E-06	8,801	0.00	0.30
WV	0.81	25,606	0.13	5.15E-06	25,606	0.00	0.81
KY	1.24	38,993	0.22	5.56E-06	38,993	0.00	1.24
NC	0.54	22,048	0.07	2.99E-06	22,048	0.00	0.54
TN	0.64	6,382	0.05	7.39E-06	6,382	0.00	0.64
SOUTH	1.49	84,284	0.12	1.45E-06	84,284	0.00	1.49
AR	0.41	11,890	0.04	3.17E-06	11,890	0.00	0.41
MO	0.73	20,632	0.07	3.20E-06	20,632	0.00	0.73
OK	0.75	24,335	0.09	3.87E-06	24,335	0.00	0.75
TX	1.15	66,651	0.11	1.70E-06	66,651	0.00	1.15
WEST	3.50	182,298	0.35	1.91E-06	182,298	0.00	3.50



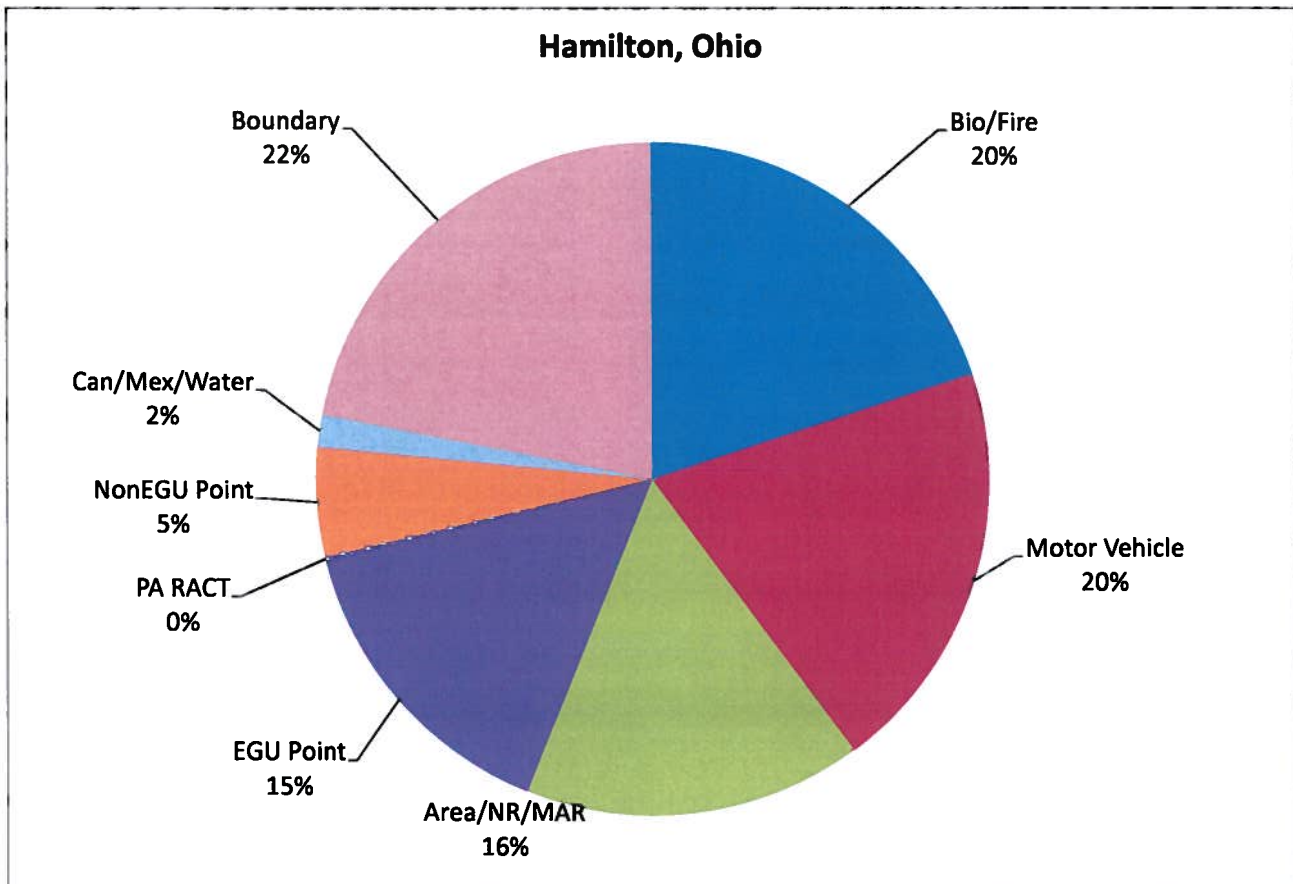
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 390610006 Hamilton, Ohio

Scenario Avg 2017 DV

Base Case 5.14	76.3
PA RACT II	76.2

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		State Total (ppb)
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	
CT	0.00	1,587	0.00	0.00E+00	1,587	0.00	0.00
DE	0.00	388	0.00	0.00E+00	388	0.00	0.00
MD	0.00	5,107	0.00	0.00E+00	5,107	0.00	0.00
NJ	0.00	4,617	0.00	0.00E+00	4,617	0.00	0.00
NY	0.29	9,123	0.02	2.13E-06	9,123	0.00	0.29
PA	0.76	52,173	0.22	4.29E-06	27,010	-0.11	0.65
VA/DC	0.21	11,254	0.01	8.64E-07	11,254	0.00	0.21
NorthEast	0.00	4,272	0.00	0.00E+00	4,272	0.00	0.00
IL	2.23	15,810	0.63	4.00E-05	15,810	0.00	2.23
IN	13.17	43,910	5.87	1.34E-04	43,910	0.00	13.17
MI	1.11	32,421	0.13	3.90E-06	32,421	0.00	1.11
OH	10.32	29,693	0.75	2.52E-05	29,693	0.00	10.32
WI	0.62	8,801	0.04	4.42E-06	8,801	0.00	0.62
WV	1.69	25,606	0.21	8.36E-06	25,606	0.00	1.69
KY	12.57	38,993	2.25	5.76E-05	38,993	0.00	12.57
NC	0.15	22,048	0.02	8.82E-07	22,048	0.00	0.15
TN	2.16	6,382	0.16	2.44E-05	6,382	0.00	2.16
SOUTH	2.54	84,284	0.19	2.31E-06	84,284	0.00	2.54
AR	1.48	11,890	0.14	1.15E-05	11,890	0.00	1.48
MO	1.01	20,632	0.09	4.24E-06	20,632	0.00	1.01
OK	1.18	24,335	0.18	7.60E-06	24,335	0.00	1.18
TX	2.55	66,651	0.31	4.67E-06	66,651	0.00	2.55
WEST	3.86	182,298	0.34	1.87E-06	182,298	0.00	3.86





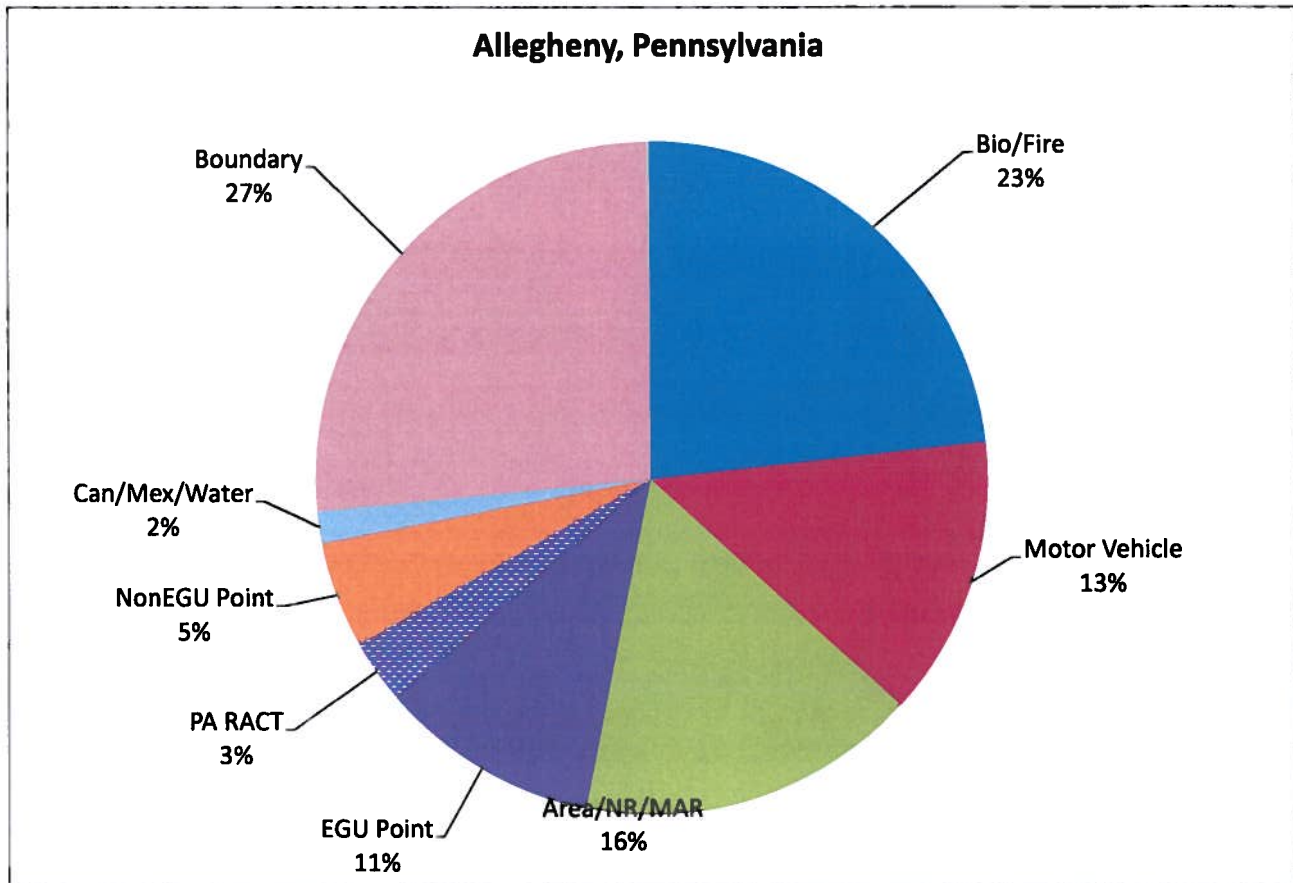
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 420031005 Allegheny, Pennsylvania

Scenario Avg 2017 DV

Base Case 5.14	75.3
PA RACT II	73.0

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.00	1,587	0.00	0.00E+00	1,587	0.00	0.00
DE	0.00	388	0.00	0.00E+00	388	0.00	0.00
MD	0.07	5,107	0.00	0.00E+00	5,107	0.00	0.07
NJ	0.00	4,617	0.00	0.00E+00	4,617	0.00	0.00
NY	0.30	9,123	0.01	1.02E-06	9,123	0.00	0.30
PA	20.91	52,173	4.77	9.14E-05	27,010	-2.30	18.61
VA/DC	0.16	11,254	0.01	8.24E-07	11,254	0.00	0.16
NorthEast	0.00	4,272	0.00	0.00E+00	4,272	0.00	0.00
IL	2.36	15,810	0.44	2.76E-05	15,810	0.00	2.36
IN	2.39	43,910	0.70	1.58E-05	43,910	0.00	2.39
MI	2.11	32,421	0.41	1.26E-05	32,421	0.00	2.11
OH	9.99	29,693	2.60	8.75E-05	29,693	0.00	9.99
WI	0.43	8,801	0.04	4.22E-06	8,801	0.00	0.43
WV	2.04	25,606	0.14	5.43E-06	25,606	0.00	2.04
KY	2.11	38,993	0.29	7.37E-06	38,993	0.00	2.11
NC	0.15	22,048	0.02	8.41E-07	22,048	0.00	0.15
TN	0.85	6,382	0.06	8.72E-06	6,382	0.00	0.85
SOUTH	1.51	84,284	0.09	1.10E-06	84,284	0.00	1.51
AR	0.55	11,890	0.05	3.90E-06	11,890	0.00	0.55
MO	0.91	20,632	0.07	3.60E-06	20,632	0.00	0.91
OK	0.81	24,335	0.10	4.19E-06	24,335	0.00	0.81
TX	1.31	66,651	0.13	1.95E-06	66,651	0.00	1.31
WEST	4.80	182,298	0.38	2.09E-06	182,298	0.00	4.80



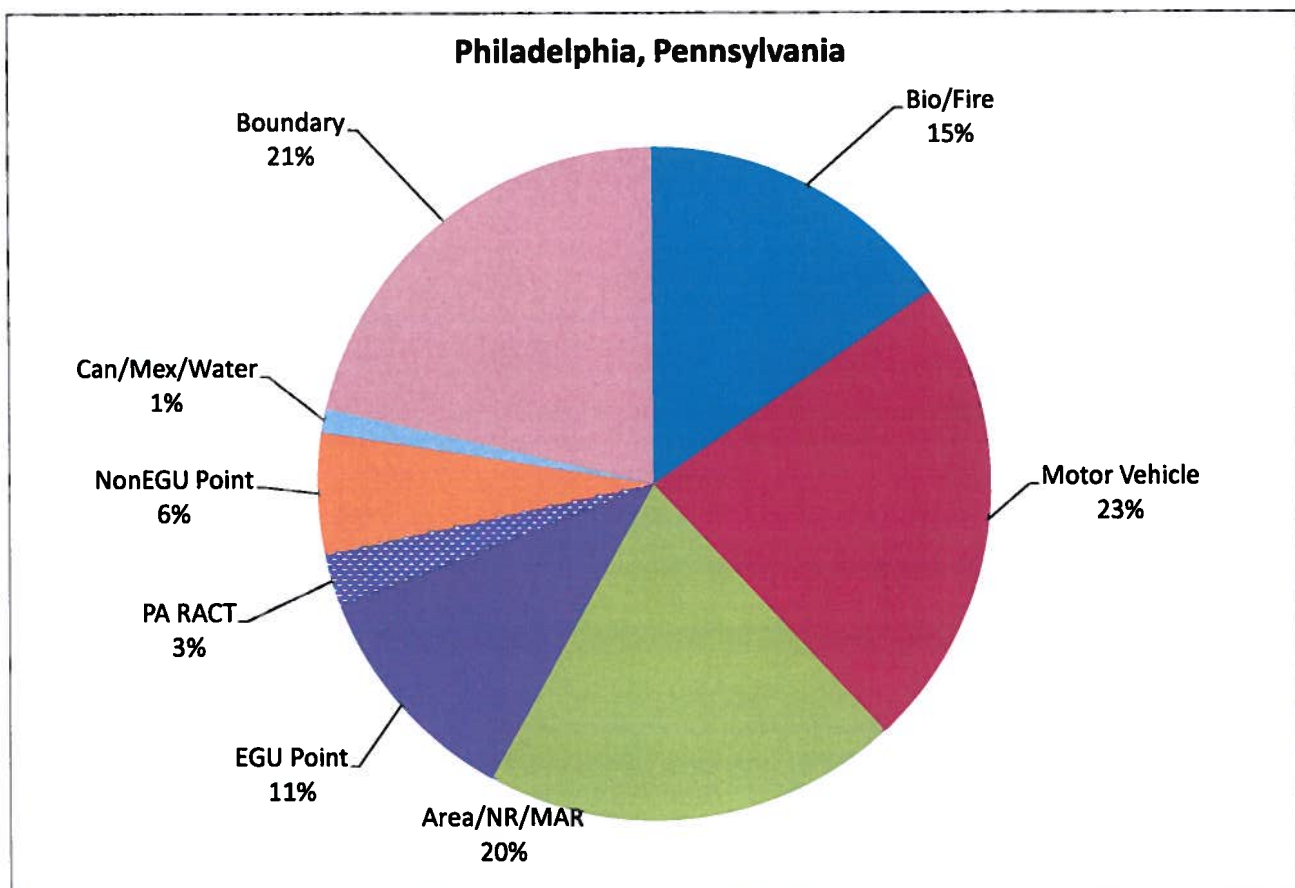
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 421010024 Philadelphia, Pennsylvania

Scenario Avg 2017 DV

Base Case 5.14	75.1
PA RACT II	73.2

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.04	1,587	0.00	0.00E+00	1,587	0.00	0.04
DE	2.06	388	0.42	1.09E-03	388	0.00	2.06
MD	5.13	5,107	0.58	1.13E-04	5,107	0.00	5.13
NJ	3.27	4,617	0.26	5.73E-05	4,617	0.00	3.27
NY	0.16	9,123	0.01	1.03E-06	9,123	0.00	0.16
PA	18.71	52,173	3.90	7.47E-05	27,010	-1.88	16.83
VA/DC	3.06	11,254	0.26	2.35E-05	11,254	0.00	3.06
NorthEast	0.04	4,272	0.00	0.00E+00	4,272	0.00	0.04
IL	1.59	15,810	0.41	2.57E-05	15,810	0.00	1.59
IN	2.62	43,910	0.93	2.13E-05	43,910	0.00	2.62
MI	0.45	32,421	0.11	3.49E-06	32,421	0.00	0.45
OH	5.01	29,693	0.98	3.31E-05	29,693	0.00	5.01
WI	0.23	8,801	0.02	2.15E-06	8,801	0.00	0.23
WV	2.26	25,606	0.59	2.29E-05	25,606	0.00	2.26
KY	2.95	38,993	0.59	1.50E-05	38,993	0.00	2.95
NC	0.67	22,048	0.12	5.57E-06	22,048	0.00	0.67
TN	0.90	6,382	0.08	1.33E-05	6,382	0.00	0.90
SOUTH	2.22	84,284	0.21	2.46E-06	84,284	0.00	2.22
AR	0.39	11,890	0.05	3.97E-06	11,890	0.00	0.39
MO	0.93	20,632	0.08	4.12E-06	20,632	0.00	0.93
OK	0.72	24,335	0.09	3.88E-06	24,335	0.00	0.72
TX	1.51	66,651	0.14	2.12E-06	66,651	0.00	1.51
WEST	3.02	182,298	0.30	1.66E-06	182,298	0.00	3.02



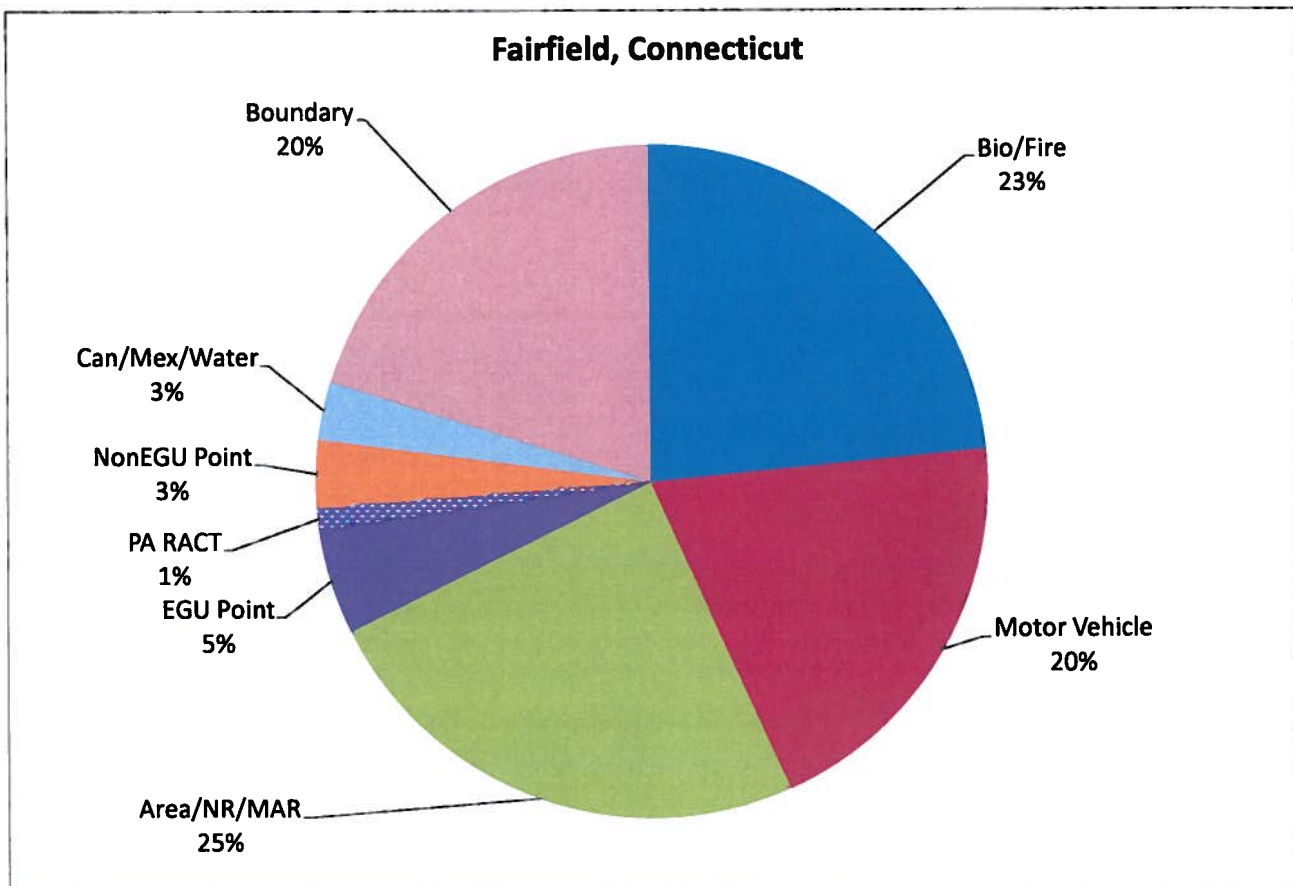
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 90010017 Fairfield, Connecticut

Scenario Max 2017 DV

Base Case 5.14	78.4
PA RACT II	77.6

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	10.31	1,587	0.02	1.14E-05	1,587	0.00	10.31
DE	0.53	388	0.05	1.40E-04	388	0.00	0.53
MD	2.35	5,107	0.20	3.91E-05	5,107	0.00	2.35
NJ	12.68	4,617	0.45	9.64E-05	4,617	0.00	12.68
NY	10.10	9,123	0.35	3.78E-05	9,123	0.00	10.10
PA	8.23	52,173	1.67	3.20E-05	27,010	-0.81	7.42
VA/DC	2.55	11,254	0.17	1.53E-05	11,254	0.00	2.55
NorthEast	0.15	4,272	0.00	0.00E+00	4,272	0.00	0.15
IL	1.03	15,810	0.20	1.26E-05	15,810	0.00	1.03
IN	1.02	43,910	0.26	6.00E-06	43,910	0.00	1.02
MI	1.03	32,421	0.21	6.44E-06	32,421	0.00	1.03
OH	2.02	29,693	0.28	9.48E-06	29,693	0.00	2.02
WI	0.38	8,801	0.03	3.10E-06	8,801	0.00	0.38
WV	0.62	25,606	0.13	4.97E-06	25,606	0.00	0.62
KY	0.60	38,993	0.12	3.03E-06	38,993	0.00	0.60
NC	0.62	22,048	0.10	4.53E-06	22,048	0.00	0.62
TN	0.28	6,382	0.02	2.85E-06	6,382	0.00	0.28
SOUTH	0.85	84,284	0.07	8.62E-07	84,284	0.00	0.85
AR	0.25	11,890	0.03	2.29E-06	11,890	0.00	0.25
MO	0.44	20,632	0.05	2.20E-06	20,632	0.00	0.44
OK	0.44	24,335	0.05	2.24E-06	24,335	0.00	0.44
TX	0.69	66,651	0.06	9.54E-07	66,651	0.00	0.69
WEST	2.55	182,298	0.25	1.35E-06	182,298	0.00	2.55





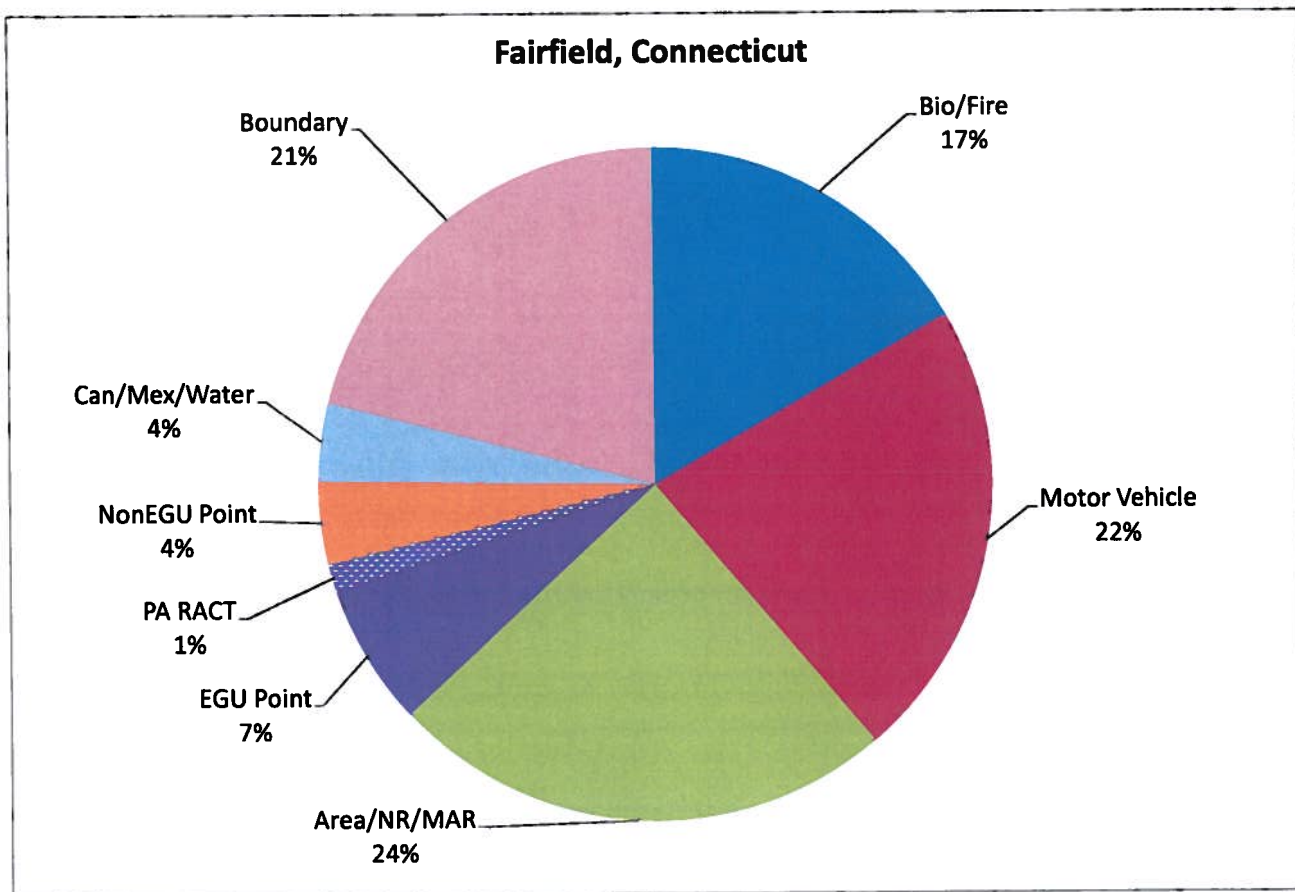
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 90013007 Fairfield, Connecticut

Scenario Max 2017 DV

Base Case 5.14	81.4
PA RACT II	80.3

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	6.24	1,587	0.12	7.69E-05	1,587	0.00	6.24
DE	0.78	388	0.08	1.94E-04	388	0.00	0.78
MD	3.31	5,107	0.34	6.62E-05	5,107	0.00	3.31
NJ	11.77	4,617	0.67	1.44E-04	4,617	0.00	11.77
NY	11.97	9,123	0.87	9.58E-05	9,123	0.00	11.97
PA	9.57	52,173	2.24	4.28E-05	27,010	-1.08	8.49
VA/DC	3.06	11,254	0.24	2.17E-05	11,254	0.00	3.06
NorthEast	0.10	4,272	0.00	0.00E+00	4,272	0.00	0.10
IL	1.07	15,810	0.23	1.49E-05	15,810	0.00	1.07
IN	1.19	43,910	0.32	7.27E-06	43,910	0.00	1.19
MI	0.89	32,421	0.17	5.21E-06	32,421	0.00	0.89
OH	2.04	29,693	0.32	1.08E-05	29,693	0.00	2.04
WI	0.23	8,801	0.02	2.13E-06	8,801	0.00	0.23
WV	0.65	25,606	0.14	5.50E-06	25,606	0.00	0.65
KY	0.76	38,993	0.15	3.85E-06	38,993	0.00	0.76
NC	0.97	22,048	0.16	7.24E-06	22,048	0.00	0.97
TN	0.50	6,382	0.04	5.89E-06	6,382	0.00	0.50
SOUTH	1.32	84,284	0.11	1.34E-06	84,284	0.00	1.32
AR	0.39	11,890	0.04	3.16E-06	11,890	0.00	0.39
MO	0.40	20,632	0.04	1.82E-06	20,632	0.00	0.40
OK	0.41	24,335	0.05	1.93E-06	24,335	0.00	0.41
TX	0.72	66,651	0.07	9.87E-07	66,651	0.00	0.72
WEST	2.00	182,298	0.18	9.79E-07	182,298	0.00	2.00



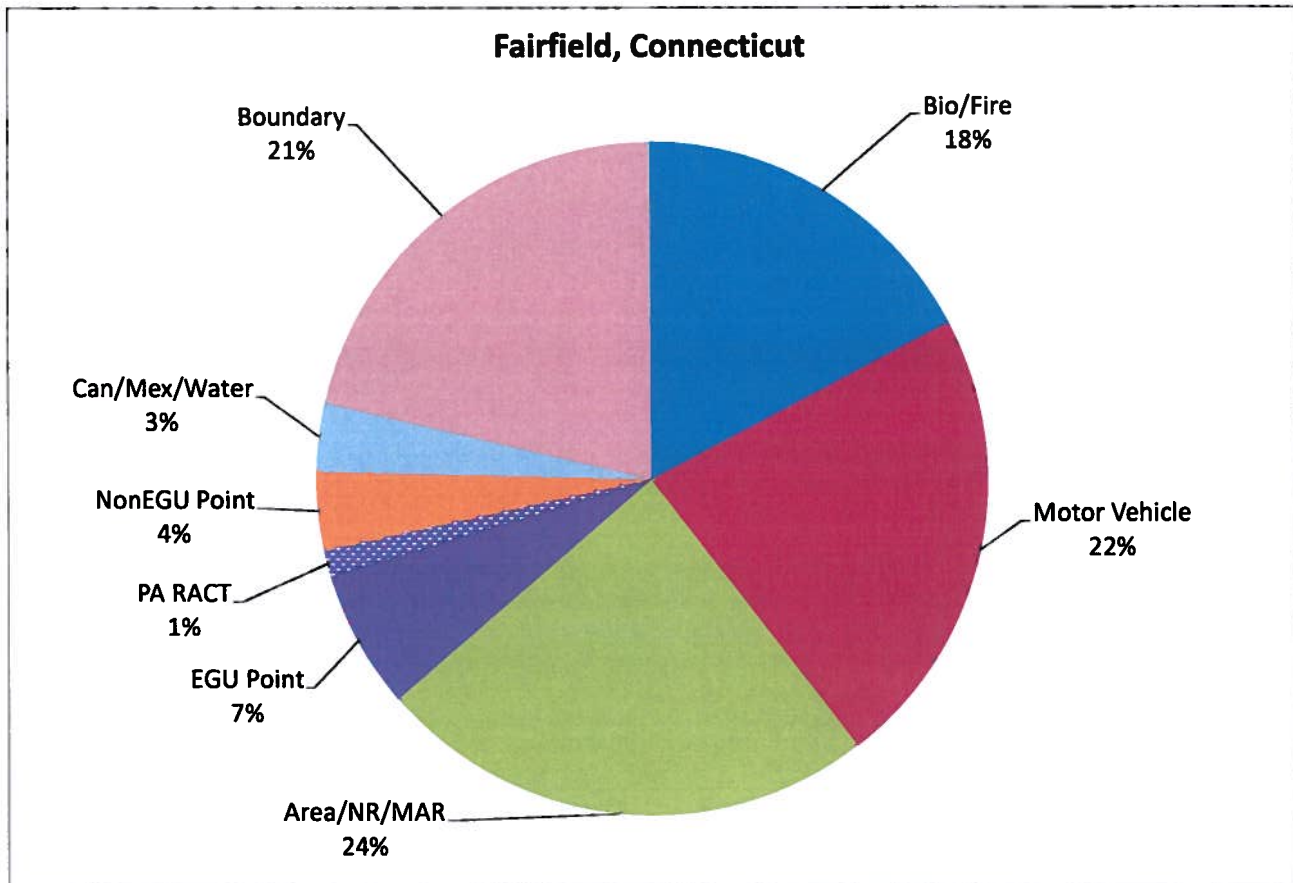
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 90019003 Fairfield, Connecticut

Scenario Max 2017 DV

Base Case 5.14	81.1
PA RACT II	80.1

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	6.05	1,587	0.08	5.35E-05	1,587	0.00	6.05
DE	0.72	388	0.08	1.95E-04	388	0.00	0.72
MD	2.96	5,107	0.29	5.73E-05	5,107	0.00	2.96
NJ	12.79	4,617	0.64	1.39E-04	4,617	0.00	12.79
NY	10.91	9,123	0.84	9.21E-05	9,123	0.00	10.91
PA	9.53	52,173	2.10	4.02E-05	27,010	-1.01	8.52
VA/DC	2.85	11,254	0.22	1.93E-05	11,254	0.00	2.85
NorthEast	0.11	4,272	0.00	0.00E+00	4,272	0.00	0.11
IL	1.24	15,810	0.25	1.61E-05	15,810	0.00	1.24
IN	1.28	43,910	0.35	7.96E-06	43,910	0.00	1.28
MI	0.92	32,421	0.19	5.82E-06	32,421	0.00	0.92
OH	2.26	29,693	0.34	1.14E-05	29,693	0.00	2.26
WI	0.25	8,801	0.02	2.15E-06	8,801	0.00	0.25
WV	0.69	25,606	0.15	5.90E-06	25,606	0.00	0.69
KY	0.79	38,993	0.15	3.87E-06	38,993	0.00	0.79
NC	0.86	22,048	0.14	6.42E-06	22,048	0.00	0.86
TN	0.43	6,382	0.03	4.44E-06	6,382	0.00	0.43
SOUTH	1.29	84,284	0.10	1.23E-06	84,284	0.00	1.29
AR	0.34	11,890	0.03	2.38E-06	11,890	0.00	0.34
MO	0.46	20,632	0.05	2.29E-06	20,632	0.00	0.46
OK	0.48	24,335	0.06	2.33E-06	24,335	0.00	0.48
TX	0.80	66,651	0.08	1.13E-06	66,651	0.00	0.80
WEST	2.33	182,298	0.23	1.24E-06	182,298	0.00	2.33



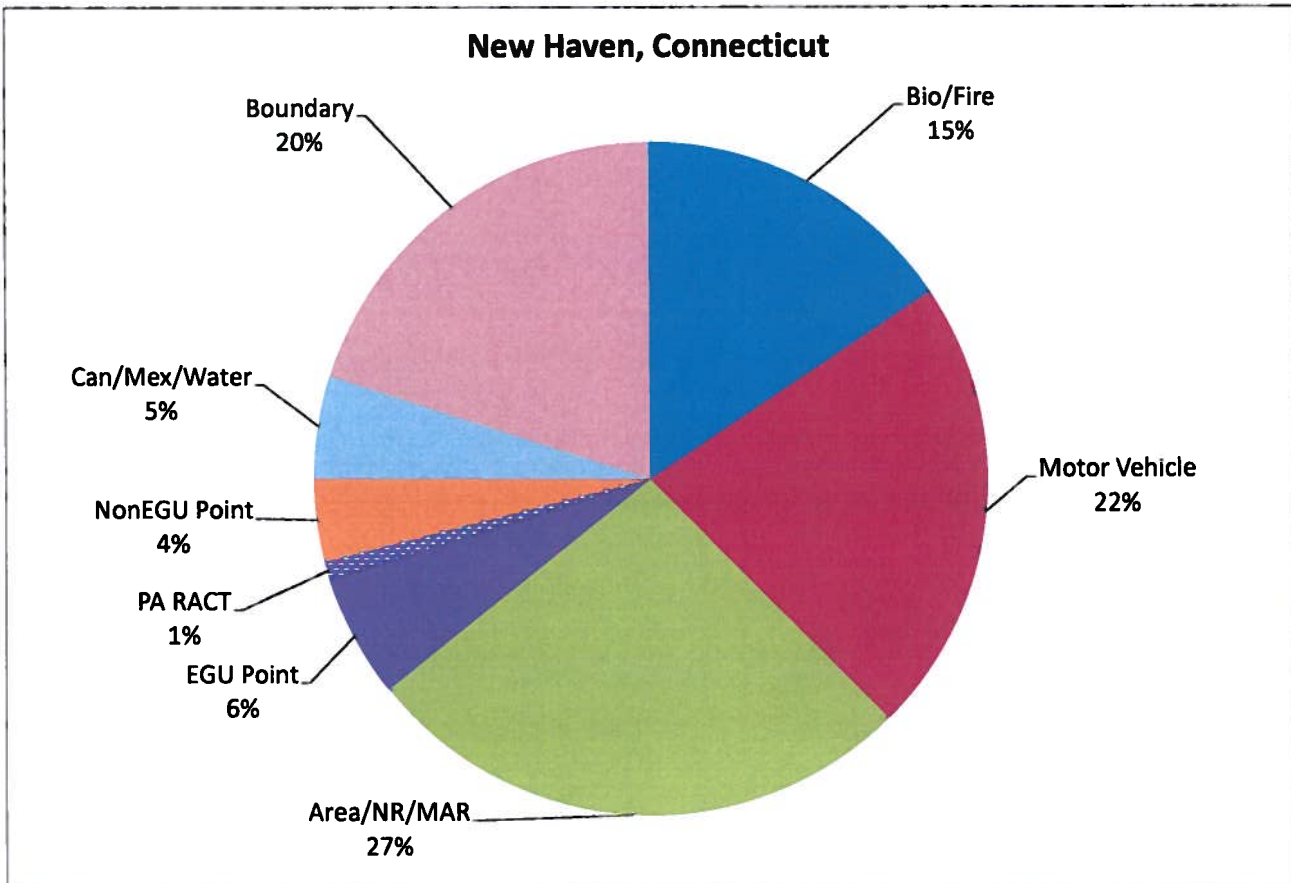
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 90099002 New Haven, Connecticut

Scenario Max 2017 DV

Base Case 5.14	80.2
PA RACT II	79.5

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	8.66	1,587	0.14	9.10E-05	1,587	0.00	8.66
DE	0.75	388	0.07	1.74E-04	388	0.00	0.75
MD	2.25	5,107	0.19	3.77E-05	5,107	0.00	2.25
NJ	8.62	4,617	0.49	1.06E-04	4,617	0.00	8.62
NY	13.32	9,123	0.71	7.81E-05	9,123	0.00	13.32
PA	8.04	52,173	1.43	2.75E-05	27,010	-0.69	7.35
VA/DC	1.87	11,254	0.13	1.11E-05	11,254	0.00	1.87
NorthEast	0.24	4,272	0.00	0.00E+00	4,272	0.00	0.24
IL	1.44	15,810	0.30	1.89E-05	15,810	0.00	1.44
IN	1.32	43,910	0.35	7.89E-06	43,910	0.00	1.32
MI	1.01	32,421	0.25	7.72E-06	32,421	0.00	1.01
OH	2.49	29,693	0.31	1.04E-05	29,693	0.00	2.49
WI	0.31	8,801	0.03	3.28E-06	8,801	0.00	0.31
WV	0.58	25,606	0.11	4.14E-06	25,606	0.00	0.58
KY	0.80	38,993	0.15	3.95E-06	38,993	0.00	0.80
NC	0.67	22,048	0.11	4.80E-06	22,048	0.00	0.67
TN	0.32	6,382	0.02	3.02E-06	6,382	0.00	0.32
SOUTH	0.85	84,284	0.08	9.14E-07	84,284	0.00	0.85
AR	0.31	11,890	0.03	2.43E-06	11,890	0.00	0.31
MO	0.59	20,632	0.06	2.80E-06	20,632	0.00	0.59
OK	0.63	24,335	0.09	3.56E-06	24,335	0.00	0.63
TX	0.96	66,651	0.10	1.44E-06	66,651	0.00	0.96
WEST	2.85	182,298	0.29	1.58E-06	182,298	0.00	2.85



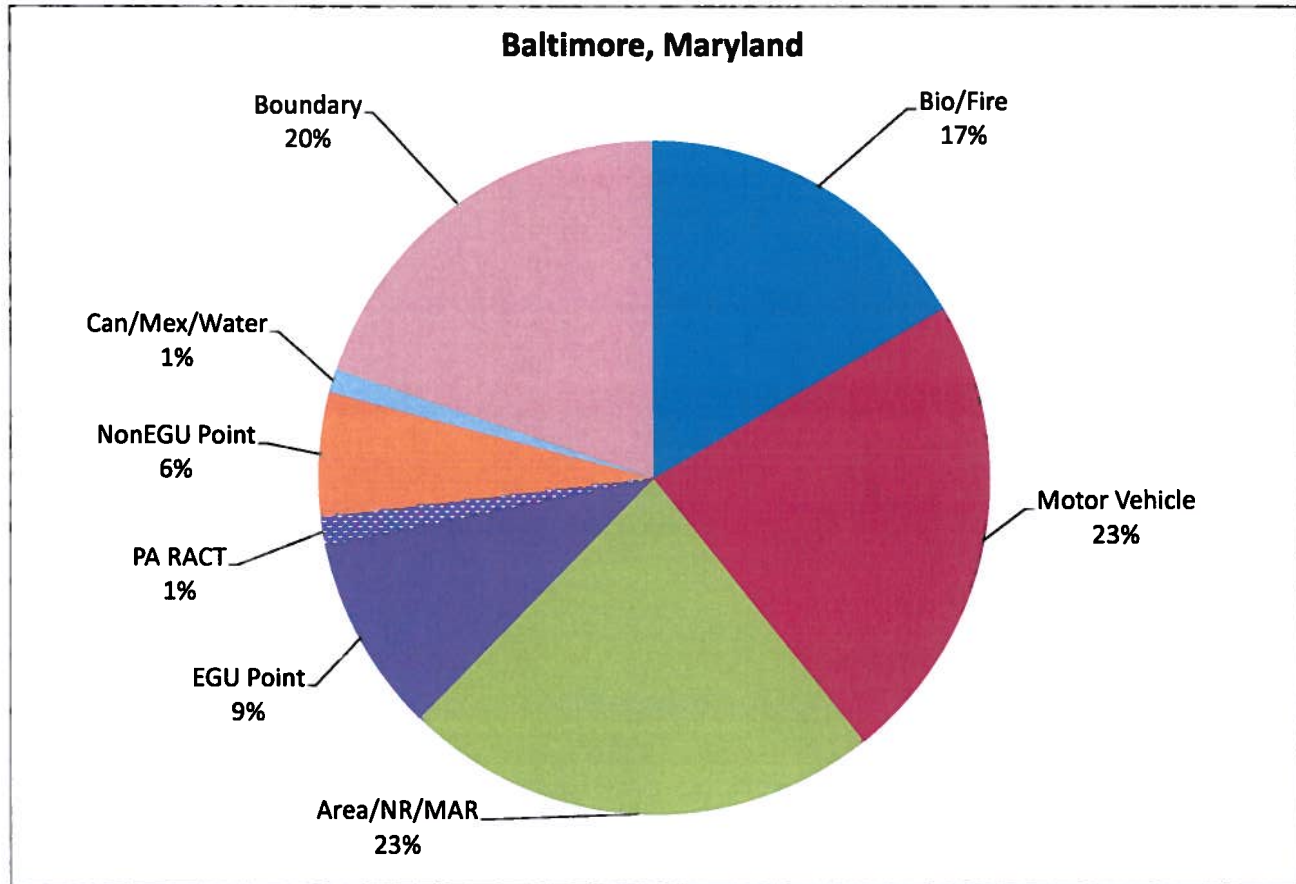
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 240053001 Baltimore, Maryland

Scenario Max 2017 DV

Base Case 5.14	76.2
PA RACT II	75.1

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.01	1,587	0.00	0.00E+00	1,587	0.00	0.01
DE	0.21	388	0.04	9.57E-05	388	0.00	0.21
MD	22.98	5,107	1.67	3.27E-04	5,107	0.00	22.98
NJ	0.45	4,617	0.06	1.21E-05	4,617	0.00	0.45
NY	0.35	9,123	0.01	1.02E-06	9,123	0.00	0.35
PA	7.04	52,173	2.19	4.20E-05	27,010	-1.06	5.98
VADC	5.55	11,254	0.27	2.39E-05	11,254	0.00	5.55
NorthEast	0.01	4,272	0.00	0.00E+00	4,272	0.00	0.01
IL	1.37	15,810	0.32	2.05E-05	15,810	0.00	1.37
IN	2.39	43,910	0.66	1.50E-05	43,910	0.00	2.39
MI	1.17	32,421	0.24	7.44E-06	32,421	0.00	1.17
OH	4.70	29,693	0.74	2.50E-05	29,693	0.00	4.70
WI	0.32	8,801	0.03	3.16E-06	8,801	0.00	0.32
WV	1.93	25,606	0.53	2.07E-05	25,606	0.00	1.93
KY	2.12	38,993	0.46	1.19E-05	38,993	0.00	2.12
NC	1.01	22,048	0.17	7.58E-06	22,048	0.00	1.01
TN	0.61	6,382	0.06	8.73E-06	6,382	0.00	0.61
SOUTH	1.39	84,284	0.13	1.54E-06	84,284	0.00	1.39
AR	0.38	11,890	0.04	3.12E-06	11,890	0.00	0.38
MO	0.77	20,632	0.07	3.60E-06	20,632	0.00	0.77
OK	0.67	24,335	0.08	3.43E-06	24,335	0.00	0.67
TX	1.18	66,651	0.12	1.81E-06	66,651	0.00	1.18
WEST	3.24	182,298	0.33	1.83E-06	182,298	0.00	3.24



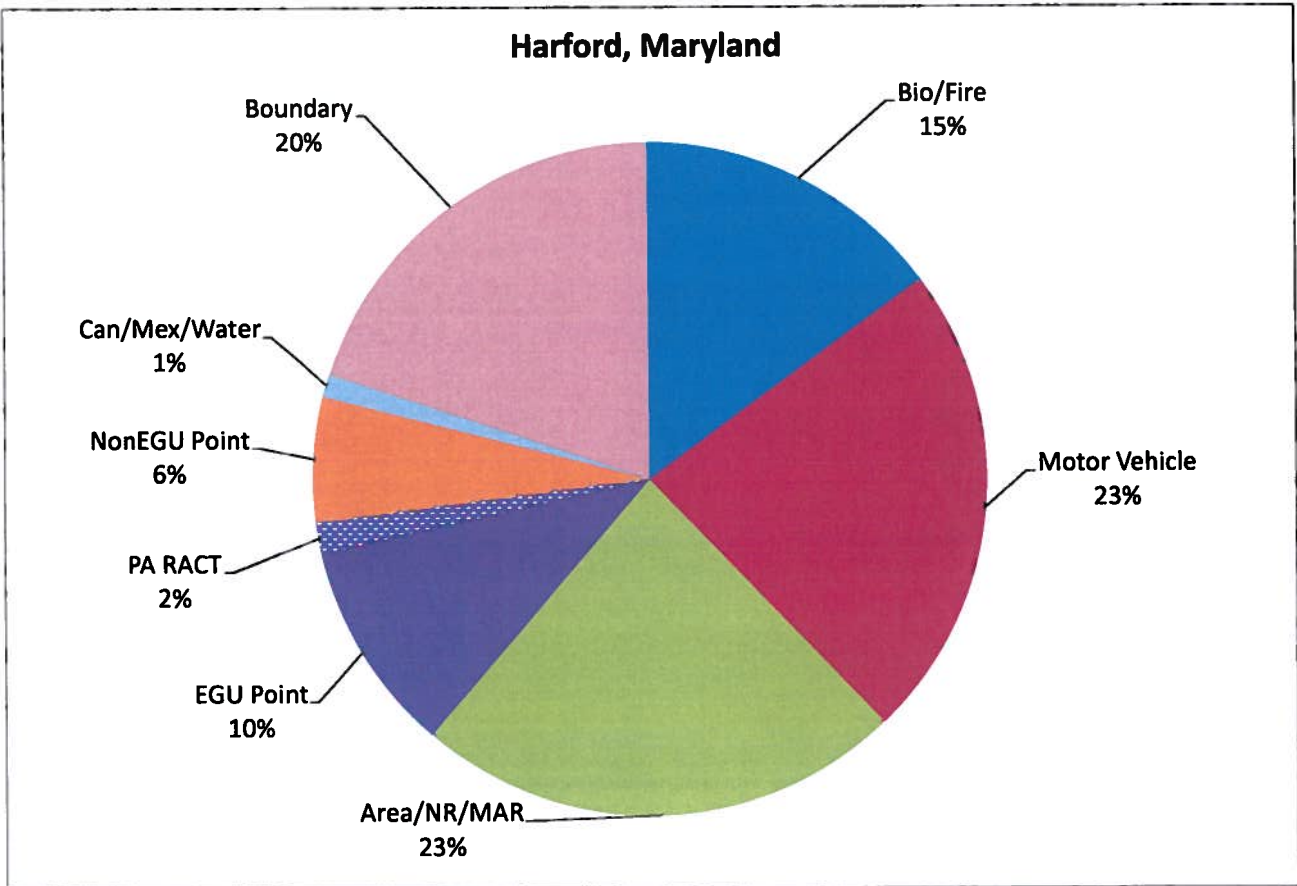
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 240251001 Harford, Maryland

Scenario Max 2017 DV

Base Case 5.14	84.0
PA RACT II	82.7

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.01	1,587	0.00	0.00E+00	1,587	0.00	0.01
DE	0.15	388	0.02	5.30E-05	388	0.00	0.15
MD	24.61	5,107	2.17	4.25E-04	5,107	0.00	24.61
NJ	0.35	4,617	0.04	8.92E-06	4,617	0.00	0.35
NY	0.32	9,123	0.01	1.13E-06	9,123	0.00	0.32
PA	7.85	52,173	2.61	5.01E-05	27,010	-1.26	6.59
VA/DC	6.89	11,254	0.39	3.48E-05	11,254	0.00	6.89
NorthEast	0.00	4,272	0.00	0.00E+00	4,272	0.00	0.00
IL	1.46	15,810	0.36	2.28E-05	15,810	0.00	1.46
IN	2.63	43,910	0.73	1.66E-05	43,910	0.00	2.63
MI	1.26	32,421	0.26	7.94E-06	32,421	0.00	1.26
OH	5.14	29,693	0.86	2.91E-05	29,693	0.00	5.14
WI	0.35	8,801	0.03	3.51E-06	8,801	0.00	0.35
WV	2.19	25,606	0.62	2.41E-05	25,606	0.00	2.19
KY	2.46	38,993	0.55	1.40E-05	38,993	0.00	2.46
NC	0.76	22,048	0.15	7.00E-06	22,048	0.00	0.76
TN	0.71	6,382	0.06	9.68E-06	6,382	0.00	0.71
SOUTH	1.76	84,284	0.16	1.95E-06	84,284	0.00	1.76
AR	0.39	11,890	0.04	3.46E-06	11,890	0.00	0.39
MO	0.83	20,632	0.08	3.99E-06	20,632	0.00	0.83
OK	0.72	24,335	0.09	3.81E-06	24,335	0.00	0.72
TX	1.33	66,651	0.13	2.01E-06	66,651	0.00	1.33
WEST	3.72	182,298	0.39	2.15E-06	182,298	0.00	3.72





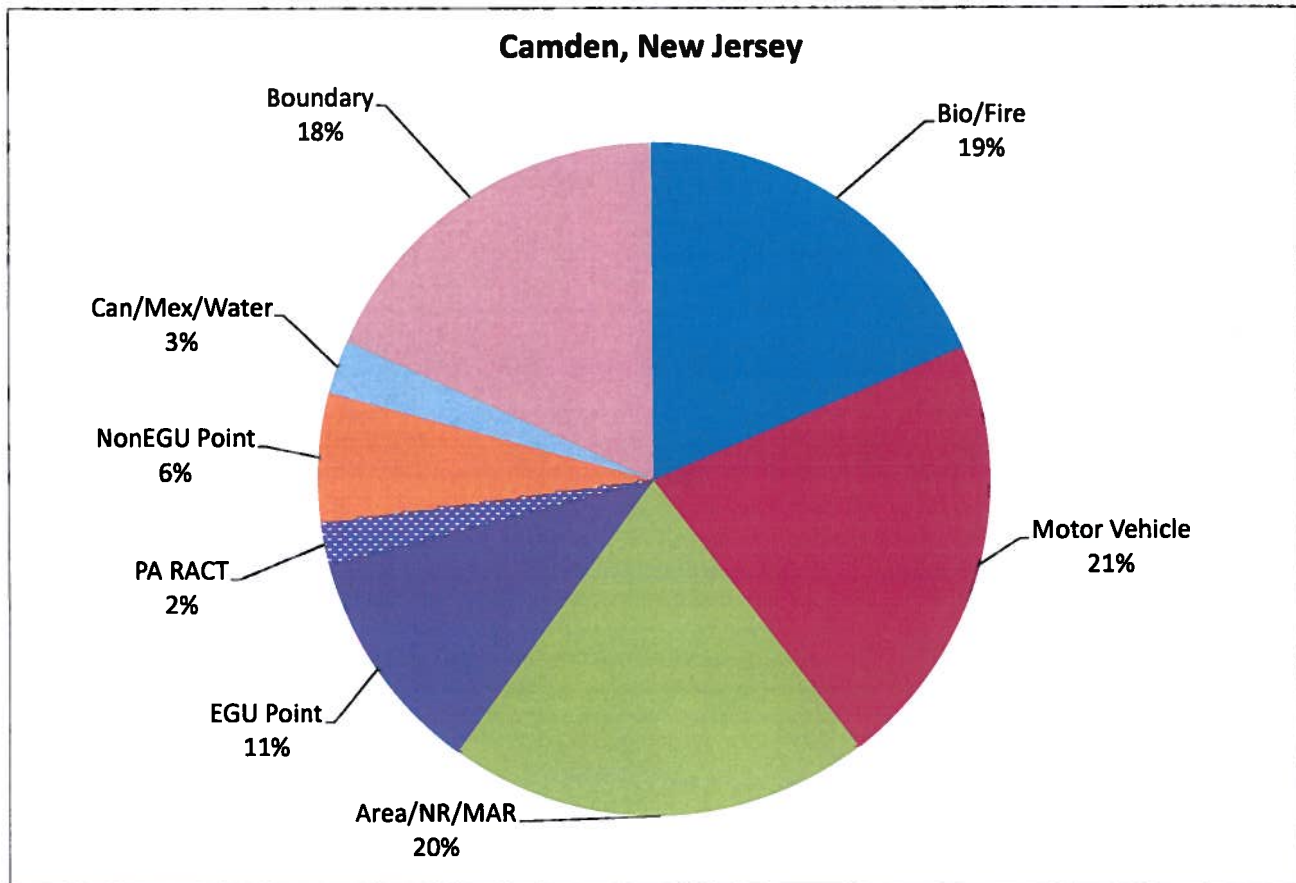
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 340071001 Camden, New Jersey

Scenario Max 2017 DV

Base Case 5.14	78.1
PA RACT II	76.5

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.05	1,587	0.00	0.00E+00	1,587	0.00	0.05
DE	4.37	388	1.07	2.75E-03	388	0.00	4.37
MD	1.48	5,107	0.09	1.69E-05	5,107	0.00	1.48
NJ	11.81	4,617	1.60	3.47E-04	4,617	0.00	11.81
NY	1.47	9,123	0.12	1.37E-05	9,123	0.00	1.47
PA	13.94	52,173	3.28	6.29E-05	27,010	-1.58	12.35
VA/DC	0.99	11,254	0.05	4.26E-06	11,254	0.00	0.99
NorthEast	0.00	4,272	0.00	0.00E+00	4,272	0.00	0.00
IL	2.44	15,810	0.46	2.91E-05	15,810	0.00	2.44
IN	2.33	43,910	0.55	1.25E-05	43,910	0.00	2.33
MI	2.04	32,421	0.41	1.27E-05	32,421	0.00	2.04
OH	5.32	29,693	0.68	2.30E-05	29,693	0.00	5.32
WI	0.73	8,801	0.06	6.54E-06	8,801	0.00	0.73
WV	1.00	25,606	0.24	9.37E-06	25,606	0.00	1.00
KY	1.32	38,993	0.29	7.38E-06	38,993	0.00	1.32
NC	0.19	22,048	0.04	1.74E-06	22,048	0.00	0.19
TN	0.23	6,382	0.02	3.01E-06	6,382	0.00	0.23
SOUTH	1.68	84,284	0.13	1.59E-06	84,284	0.00	1.68
AR	0.72	11,890	0.06	4.84E-06	11,890	0.00	0.72
MO	1.12	20,632	0.11	5.12E-06	20,632	0.00	1.12
OK	1.15	24,335	0.14	5.92E-06	24,335	0.00	1.15
TX	2.05	66,651	0.21	3.17E-06	66,651	0.00	2.05
WEST	4.85	182,298	0.49	2.69E-06	182,298	0.00	4.85



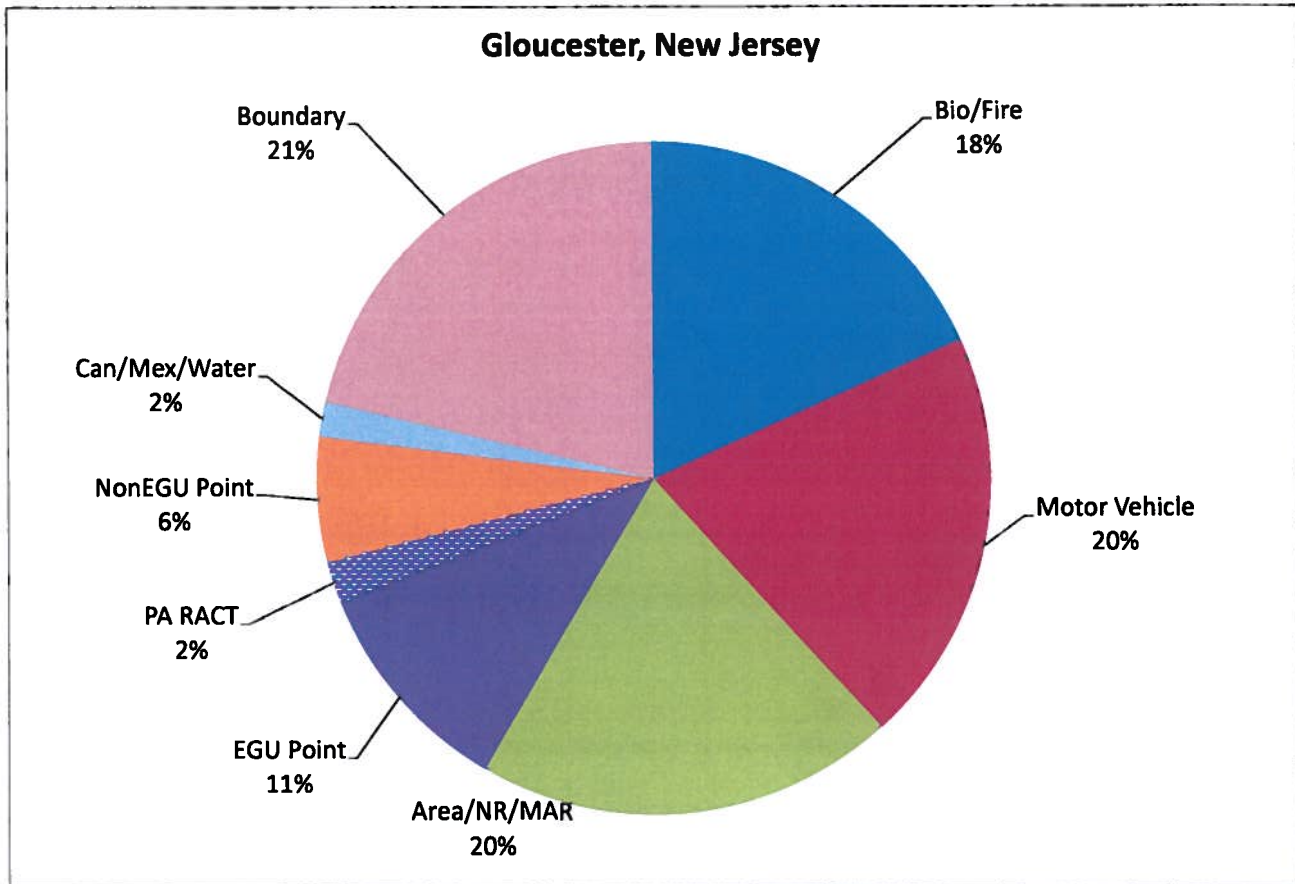
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 340150002 Gloucester, New Jersey

Scenario Max 2017 DV

Base Case 5.14	77.5
PA RACT II	75.9

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.12	1,587	0.00	0.00E+00	1,587	0.00	0.12
DE	5.25	388	1.09	2.80E-03	388	0.00	5.25
MD	6.75	5,107	0.83	1.63E-04	5,107	0.00	6.75
NJ	3.73	4,617	0.46	1.01E-04	4,617	0.00	3.73
NY	1.01	9,123	0.03	3.25E-06	9,123	0.00	1.01
PA	14.66	52,173	3.23	6.19E-05	27,010	-1.56	13.10
VA/DC	3.64	11,254	0.30	2.63E-05	11,254	0.00	3.64
NorthEast	0.15	4,272	0.00	0.00E+00	4,272	0.00	0.15
IL	1.61	15,810	0.31	1.94E-05	15,810	0.00	1.61
IN	1.71	43,910	0.50	1.15E-05	43,910	0.00	1.71
MI	1.33	32,421	0.30	9.15E-06	32,421	0.00	1.33
OH	5.51	29,693	0.81	2.73E-05	29,693	0.00	5.51
WI	0.61	8,801	0.04	4.49E-06	8,801	0.00	0.61
WV	1.95	25,606	0.54	2.12E-05	25,606	0.00	1.95
KY	2.06	38,993	0.39	9.89E-06	38,993	0.00	2.06
NC	0.38	22,048	0.08	3.59E-06	22,048	0.00	0.38
TN	0.45	6,382	0.05	7.74E-06	6,382	0.00	0.45
SOUTH	1.78	84,284	0.17	1.99E-06	84,284	0.00	1.78
AR	0.26	11,890	0.03	2.49E-06	11,890	0.00	0.26
MO	0.78	20,632	0.07	3.35E-06	20,632	0.00	0.78
OK	0.53	24,335	0.07	2.84E-06	24,335	0.00	0.53
TX	1.48	66,651	0.13	1.93E-06	66,651	0.00	1.48
WEST	3.38	182,298	0.32	1.73E-06	182,298	0.00	3.38



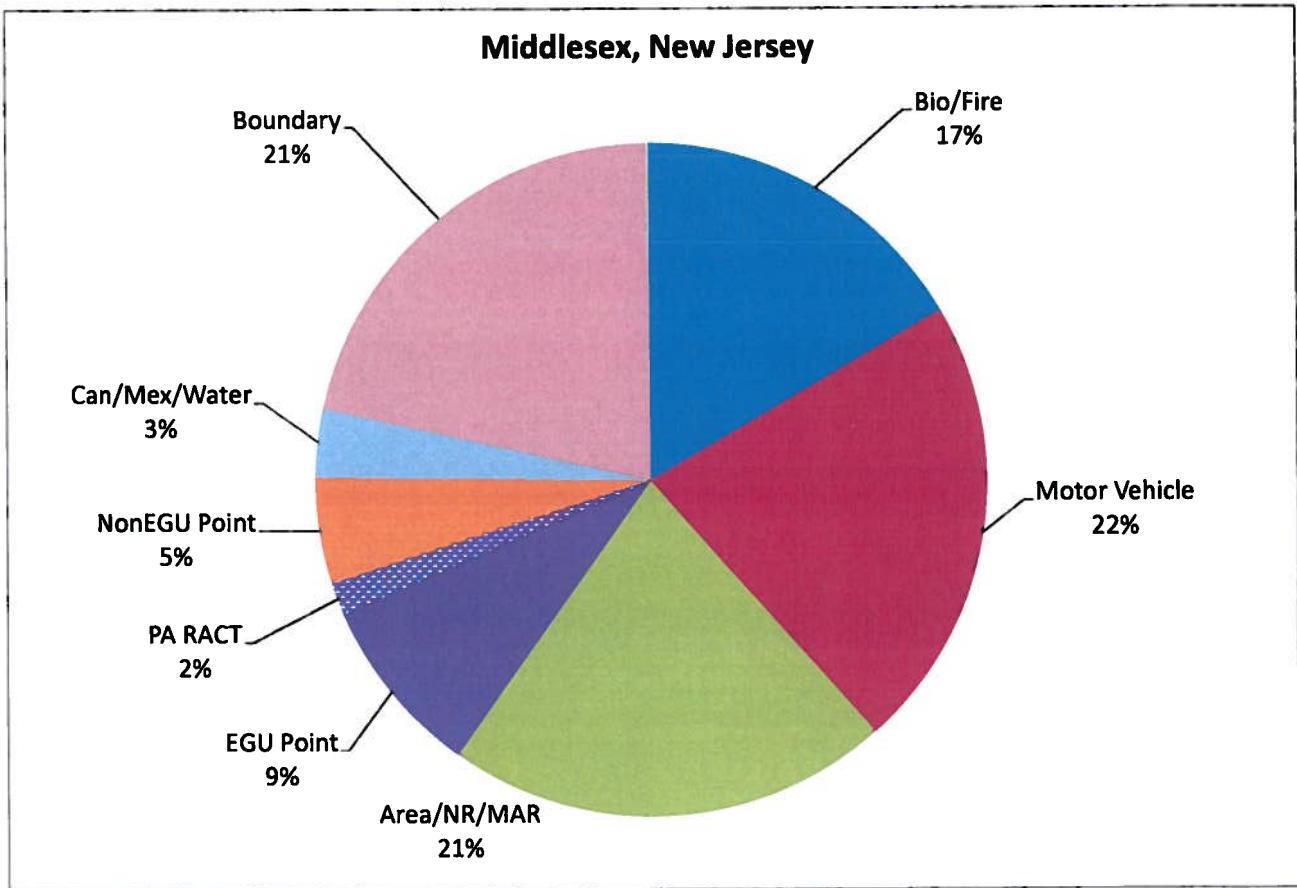
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 340230011 Middlesex, New Jersey

Scenario Max 2017 DV

Base Case 5.14	76.3
PA RACT II	75.1

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.56	1,587	0.01	6.01E-06	1,587	0.00	0.56
DE	1.42	388	0.29	7.37E-04	388	0.00	1.42
MD	3.13	5,107	0.34	6.72E-05	5,107	0.00	3.13
NJ	13.69	4,617	1.02	2.21E-04	4,617	0.00	13.69
NY	3.30	9,123	0.15	1.67E-05	9,123	0.00	3.30
PA	12.04	52,173	2.52	4.82E-05	27,010	-1.21	10.82
VA/DC	2.57	11,254	0.23	2.03E-05	11,254	0.00	2.57
NorthEast	0.90	4,272	0.01	2.23E-06	4,272	0.00	0.90
IL	1.29	15,810	0.28	1.75E-05	15,810	0.00	1.29
IN	1.35	43,910	0.50	1.13E-05	43,910	0.00	1.35
MI	0.89	32,421	0.14	4.41E-06	32,421	0.00	0.89
OH	3.08	29,693	0.67	2.25E-05	29,693	0.00	3.08
WI	0.48	8,801	0.04	4.33E-06	8,801	0.00	0.48
WV	1.53	25,606	0.41	1.60E-05	25,606	0.00	1.53
KY	1.56	38,993	0.31	7.82E-06	38,993	0.00	1.56
NC	0.74	22,048	0.13	6.05E-06	22,048	0.00	0.74
TN	0.60	6,382	0.06	8.96E-06	6,382	0.00	0.60
SOUTH	1.59	84,284	0.14	1.70E-06	84,284	0.00	1.59
AR	0.28	11,890	0.03	2.40E-06	11,890	0.00	0.28
MO	0.59	20,632	0.06	2.77E-06	20,632	0.00	0.59
OK	0.58	24,335	0.07	2.74E-06	24,335	0.00	0.58
TX	1.16	66,651	0.10	1.57E-06	66,651	0.00	1.16
WEST	3.16	182,298	0.31	1.67E-06	182,298	0.00	3.16





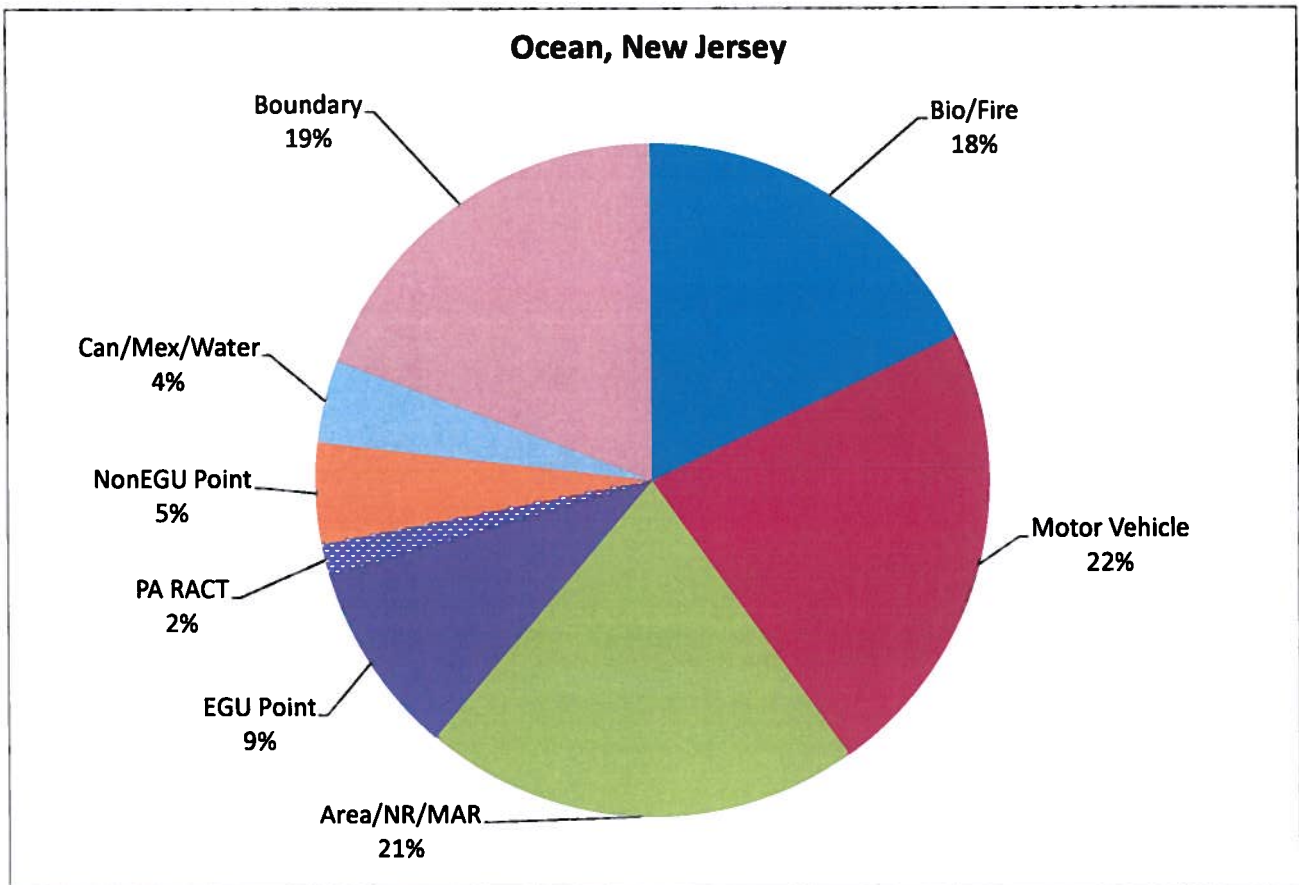
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 340290006 Ocean, New Jersey

Scenario Max 2017 DV

Base Case 5.14	76.6
PA RACT II	75.4

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.46	1,587	0.01	5.97E-06	1,587	0.00	0.46
DE	1.32	388	0.26	6.59E-04	388	0.00	1.32
MD	1.73	5,107	0.15	2.97E-05	5,107	0.00	1.73
NJ	13.94	4,617	1.67	3.61E-04	4,617	0.00	13.94
NY	3.68	9,123	0.21	2.28E-05	9,123	0.00	3.68
PA	11.87	52,173	2.40	4.59E-05	27,010	-1.16	10.71
VA/DC	1.22	11,254	0.07	5.89E-06	11,254	0.00	1.22
NorthEast	0.58	4,272	0.01	2.22E-06	4,272	0.00	0.58
IL	1.66	15,810	0.33	2.10E-05	15,810	0.00	1.66
IN	1.86	43,910	0.61	1.38E-05	43,910	0.00	1.86
MI	1.64	32,421	0.28	8.77E-06	32,421	0.00	1.64
OH	3.45	29,693	0.56	1.88E-05	29,693	0.00	3.45
WI	0.70	8,801	0.06	6.46E-06	8,801	0.00	0.70
WV	1.09	25,606	0.23	8.88E-06	25,606	0.00	1.09
KY	1.74	38,993	0.34	8.75E-06	38,993	0.00	1.74
NC	0.53	22,048	0.08	3.44E-06	22,048	0.00	0.53
TN	0.71	6,382	0.06	8.91E-06	6,382	0.00	0.71
SOUTH	1.83	84,284	0.15	1.80E-06	84,284	0.00	1.83
AR	0.57	11,890	0.05	3.98E-06	11,890	0.00	0.57
MO	0.86	20,632	0.09	4.13E-06	20,632	0.00	0.86
OK	0.90	24,335	0.10	4.28E-06	24,335	0.00	0.90
TX	1.78	66,651	0.16	2.42E-06	66,651	0.00	1.78
WEST	3.96	182,298	0.38	2.08E-06	182,298	0.00	3.96



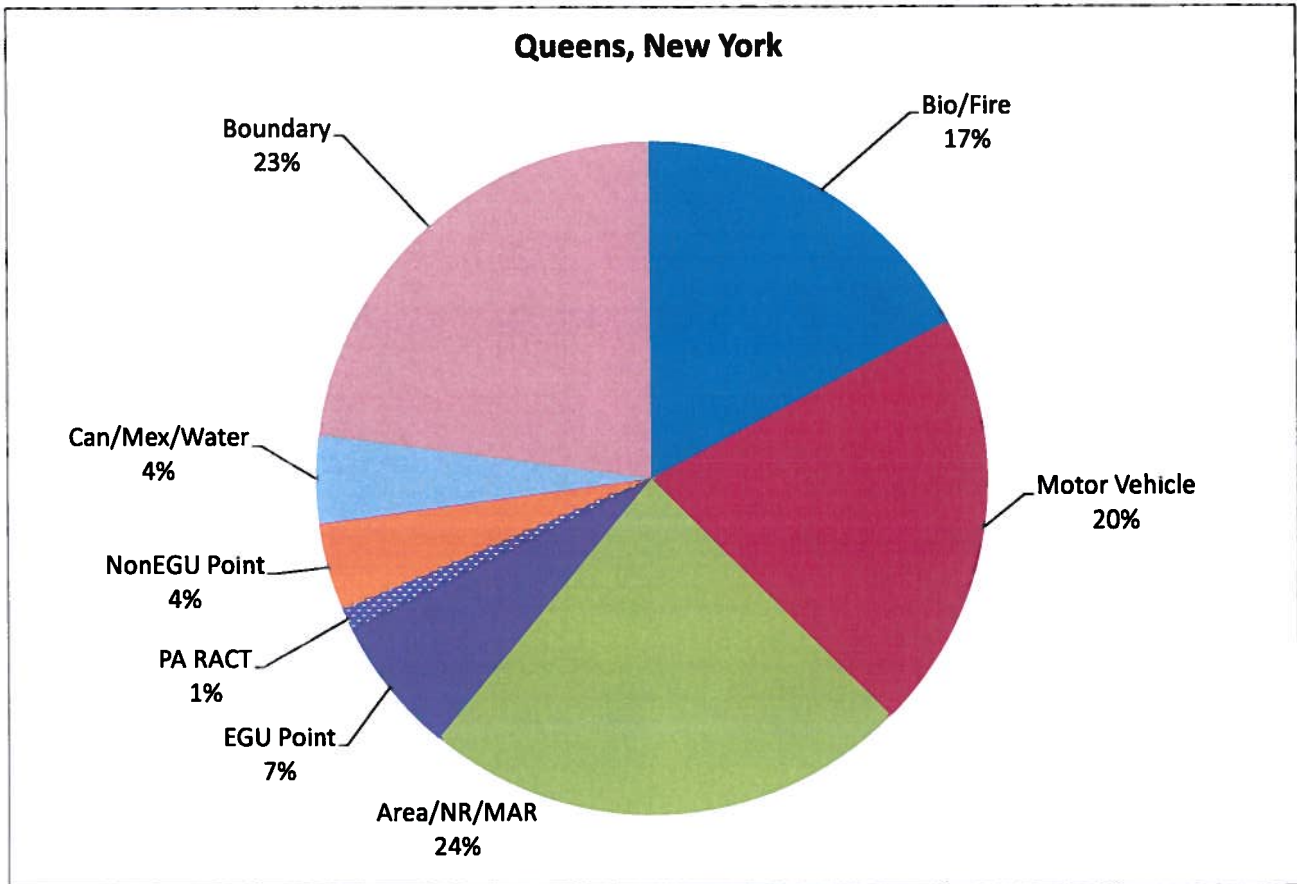
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 360810124 Queens, New York

Scenario Max 2017 DV

Base Case 5.14	77.6
PA RACT II	76.8

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	1.06	1,587	0.00	0.00E+00	1,587	0.00	1.06
DE	1.15	388	0.18	4.53E-04	388	0.00	1.15
MD	2.97	5,107	0.33	6.49E-05	5,107	0.00	2.97
NJ	15.22	4,617	0.93	2.01E-04	4,617	0.00	15.22
NY	7.29	9,123	0.21	2.35E-05	9,123	0.00	7.29
PA	8.27	52,173	1.67	3.20E-05	27,010	-0.80	7.47
VA/DC	3.20	11,254	0.26	2.34E-05	11,254	0.00	3.20
NorthEast	0.10	4,272	0.00	0.00E+00	4,272	0.00	0.10
IL	1.33	15,810	0.21	1.36E-05	15,810	0.00	1.33
IN	1.05	43,910	0.22	5.11E-06	43,910	0.00	1.05
MI	2.16	32,421	0.44	1.35E-05	32,421	0.00	2.16
OH	2.58	29,693	0.29	9.86E-06	29,693	0.00	2.58
WI	0.59	8,801	0.05	5.54E-06	8,801	0.00	0.59
WV	0.70	25,606	0.20	7.62E-06	25,606	0.00	0.70
KY	0.56	38,993	0.12	3.00E-06	38,993	0.00	0.56
NC	0.85	22,048	0.15	6.64E-06	22,048	0.00	0.85
TN	0.17	6,382	0.02	3.06E-06	6,382	0.00	0.17
SOUTH	0.99	84,284	0.09	1.04E-06	84,284	0.00	0.99
AR	0.22	11,890	0.02	1.64E-06	11,890	0.00	0.22
MO	0.57	20,632	0.06	2.84E-06	20,632	0.00	0.57
OK	0.56	24,335	0.07	2.81E-06	24,335	0.00	0.56
TX	0.89	66,651	0.09	1.32E-06	66,651	0.00	0.89
WEST	3.37	182,298	0.33	1.82E-06	182,298	0.00	3.37



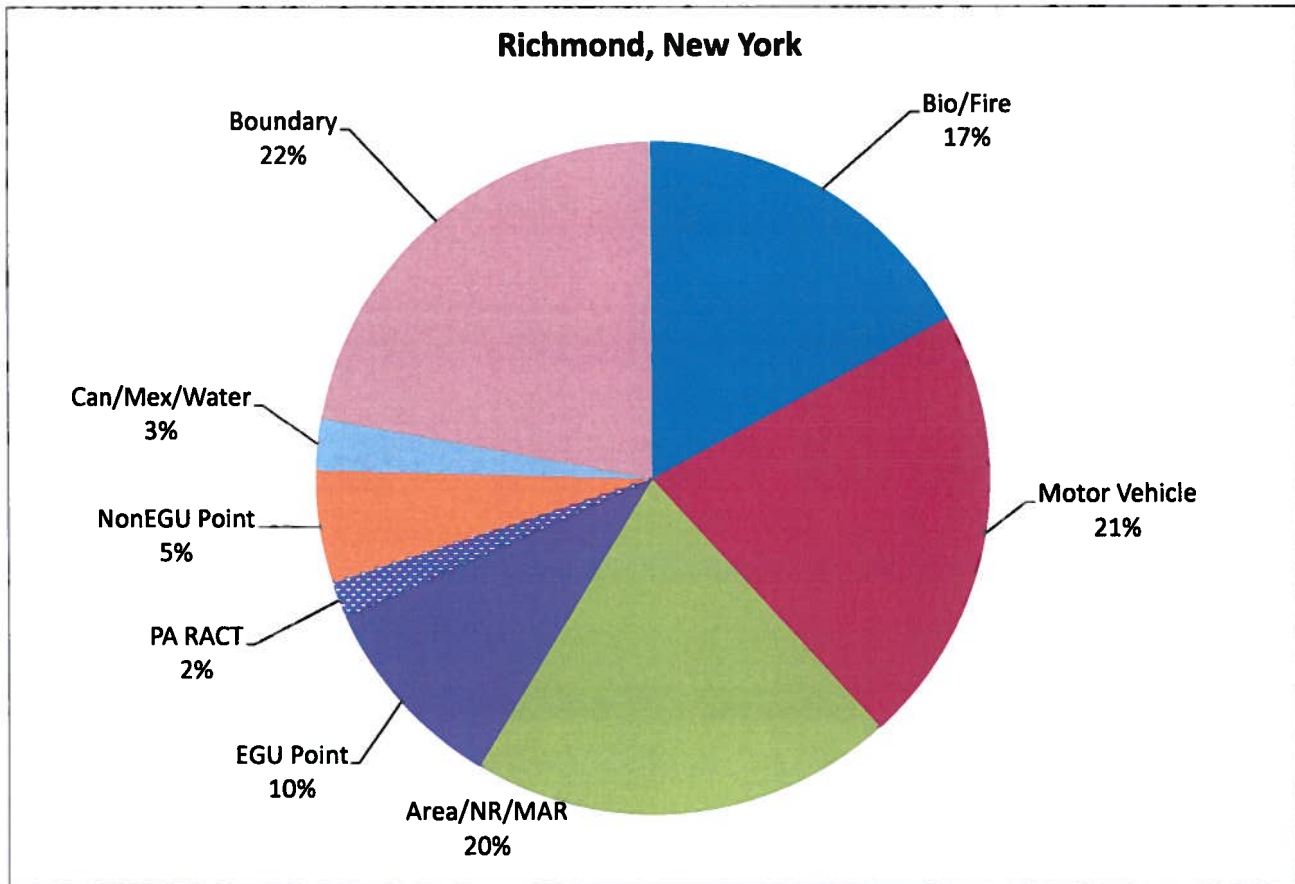
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 360850067 Richmond, New York

Scenario Max 2017 DV

Base Case 5.14	77.8
PA RACT II	76.4

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.28	1,587	0.00	0.00E+00	1,587	0.00	0.28
DE	1.48	388	0.27	7.02E-04	388	0.00	1.48
MD	3.54	5,107	0.39	7.62E-05	5,107	0.00	3.54
NJ	14.96	4,617	1.66	3.61E-04	4,617	0.00	14.96
NY	1.69	9,123	0.08	8.54E-06	9,123	0.00	1.69
PA	12.75	52,173	2.80	5.37E-05	27,010	-1.35	11.40
VA/DC	3.64	11,254	0.31	2.77E-05	11,254	0.00	3.64
NorthEast	0.09	4,272	0.00	0.00E+00	4,272	0.00	0.09
IL	1.34	15,810	0.27	1.72E-05	15,810	0.00	1.34
IN	1.44	43,910	0.49	1.11E-05	43,910	0.00	1.44
MI	1.10	32,421	0.20	6.30E-06	32,421	0.00	1.10
OH	3.28	29,693	0.65	2.20E-05	29,693	0.00	3.28
WI	0.33	8,801	0.03	3.32E-06	8,801	0.00	0.33
WV	1.46	25,606	0.38	1.48E-05	25,606	0.00	1.46
KY	1.47	38,993	0.28	7.24E-06	38,993	0.00	1.47
NC	0.91	22,048	0.17	7.50E-06	22,048	0.00	0.91
TN	0.61	6,382	0.06	9.15E-06	6,382	0.00	0.61
SOUTH	1.70	84,284	0.16	1.85E-06	84,284	0.00	1.70
AR	0.29	11,890	0.03	2.46E-06	11,890	0.00	0.29
MO	0.64	20,632	0.07	3.30E-06	20,632	0.00	0.64
OK	0.64	24,335	0.08	3.20E-06	24,335	0.00	0.64
TX	1.12	66,651	0.11	1.61E-06	66,651	0.00	1.12
WEST	3.21	182,298	0.32	1.76E-06	182,298	0.00	3.21



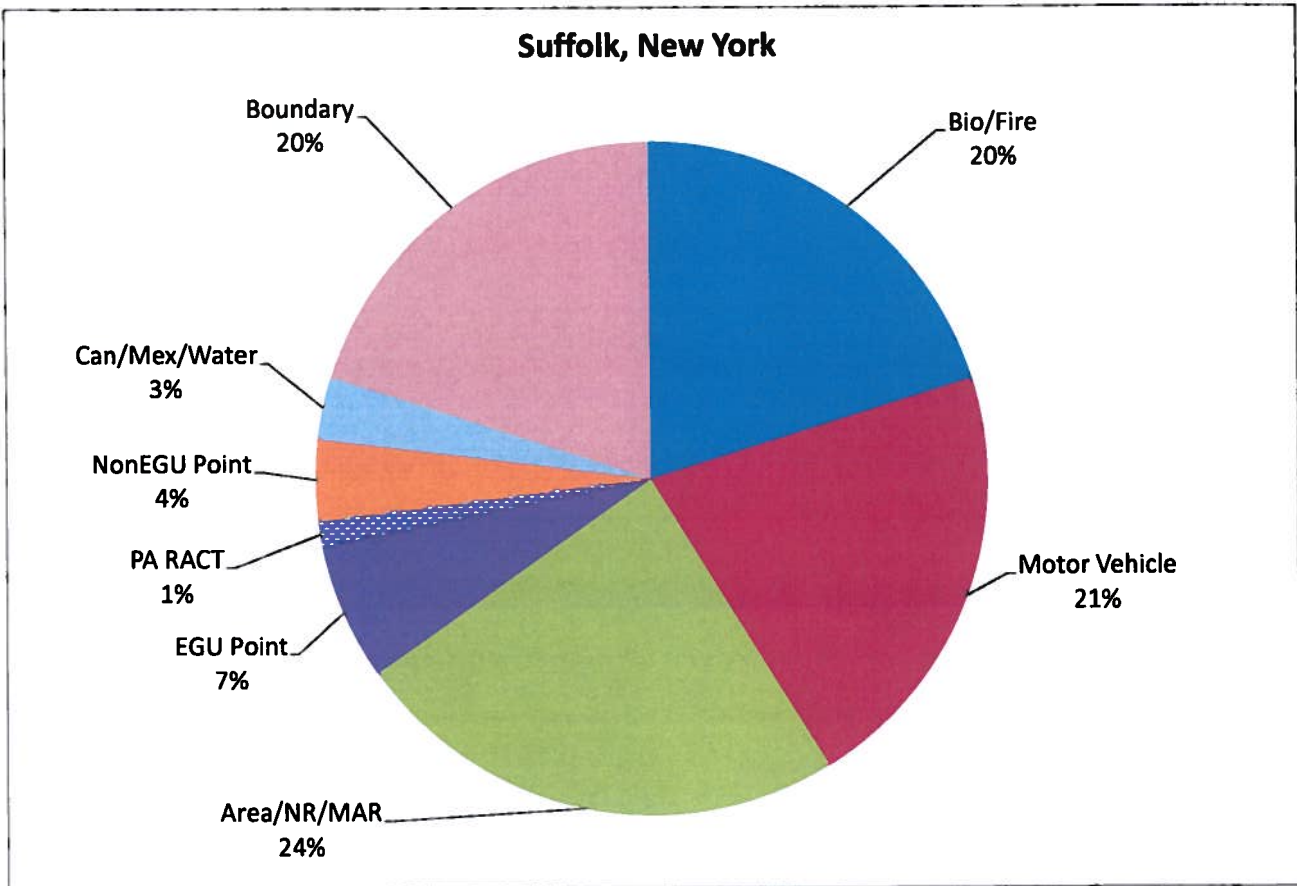
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 361030002 Suffolk, New York

Scenario Max 2017 DV

Base Case 5.14	80.8
PA RACT II	79.8

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	1.27	1,587	0.01	6.06E-06	1,587	0.00	1.27
DE	0.56	388	0.05	1.24E-04	388	0.00	0.56
MD	1.91	5,107	0.16	3.20E-05	5,107	0.00	1.91
NJ	15.56	4,617	0.62	1.33E-04	4,617	0.00	15.56
NY	10.02	9,123	0.39	4.32E-05	9,123	0.00	10.02
PA	10.31	52,173	2.02	3.87E-05	27,010	-0.97	9.34
VA/DC	2.10	11,254	0.13	1.11E-05	11,254	0.00	2.10
NorthEast	0.03	4,272	0.00	0.00E+00	4,272	0.00	0.03
IL	1.64	15,810	0.33	2.07E-05	15,810	0.00	1.64
IN	1.79	43,910	0.52	1.18E-05	43,910	0.00	1.79
MI	1.36	32,421	0.30	9.20E-06	32,421	0.00	1.36
OH	3.22	29,693	0.43	1.46E-05	29,693	0.00	3.22
WI	0.31	8,801	0.03	3.28E-06	8,801	0.00	0.31
WV	0.83	25,606	0.13	5.26E-06	25,606	0.00	0.83
KY	1.27	38,993	0.22	5.67E-06	38,993	0.00	1.27
NC	0.55	22,048	0.07	3.05E-06	22,048	0.00	0.55
TN	0.65	6,382	0.05	7.53E-06	6,382	0.00	0.65
SOUTH	1.52	84,284	0.13	1.48E-06	84,284	0.00	1.52
AR	0.42	11,890	0.04	3.24E-06	11,890	0.00	0.42
MO	0.74	20,632	0.07	3.26E-06	20,632	0.00	0.74
OK	0.77	24,335	0.10	3.95E-06	24,335	0.00	0.77
TX	1.17	66,651	0.12	1.73E-06	66,651	0.00	1.17
WEST	3.57	182,298	0.36	1.95E-06	182,298	0.00	3.57



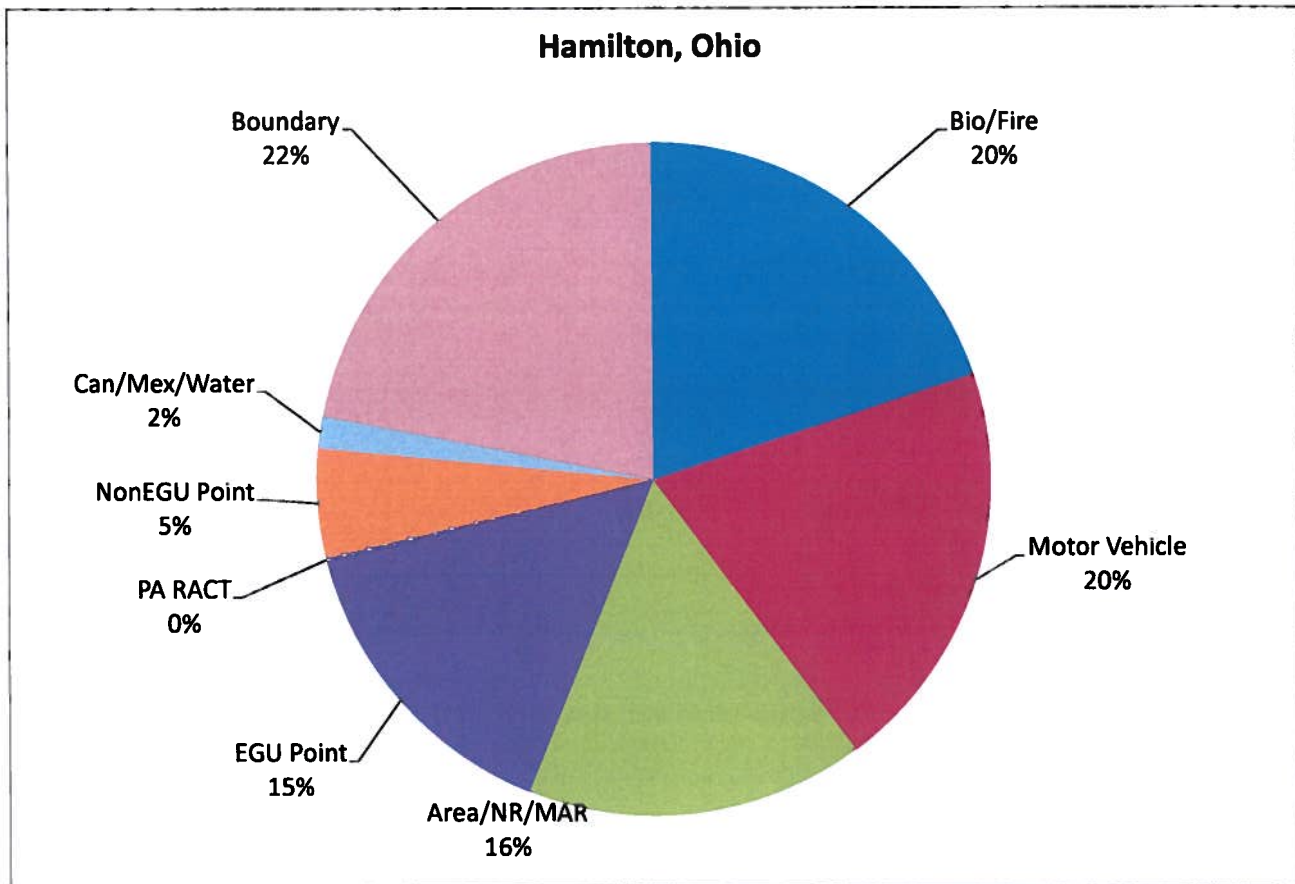
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 390610006 Hamilton, Ohio

Scenario Max 2017 DV

Base Case 5.14	79.1
PA RACT II	79.0

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.00	1,587	0.00	0.00E+00	1,587	0.00	0.00
DE	0.00	388	0.00	0.00E+00	388	0.00	0.00
MD	0.00	5,107	0.00	0.00E+00	5,107	0.00	0.00
NJ	0.00	4,617	0.00	0.00E+00	4,617	0.00	0.00
NY	0.30	9,123	0.02	2.21E-06	9,123	0.00	0.30
PA	0.79	52,173	0.23	4.45E-06	27,010	-0.11	0.67
VA/DC	0.22	11,254	0.01	8.96E-07	11,254	0.00	0.22
NorthEast	0.00	4,272	0.00	0.00E+00	4,272	0.00	0.00
IL	2.31	15,810	0.66	4.15E-05	15,810	0.00	2.31
IN	13.66	43,910	6.08	1.38E-04	43,910	0.00	13.66
MI	1.15	32,421	0.13	4.04E-06	32,421	0.00	1.15
OH	10.70	29,693	0.78	2.62E-05	29,693	0.00	10.70
WI	0.65	8,801	0.04	4.58E-06	8,801	0.00	0.65
WV	1.75	25,606	0.22	8.67E-06	25,606	0.00	1.75
KY	13.03	38,993	2.33	5.97E-05	38,993	0.00	13.03
NC	0.15	22,048	0.02	9.15E-07	22,048	0.00	0.15
TN	2.24	6,382	0.16	2.53E-05	6,382	0.00	2.24
SOUTH	2.63	84,284	0.20	2.39E-06	84,284	0.00	2.63
AR	1.53	11,890	0.14	1.19E-05	11,890	0.00	1.53
MO	1.05	20,632	0.09	4.40E-06	20,632	0.00	1.05
OK	1.22	24,335	0.19	7.87E-06	24,335	0.00	1.22
TX	2.64	66,651	0.32	4.84E-06	66,651	0.00	2.64
WEST	4.00	182,298	0.35	1.94E-06	182,298	0.00	4.00





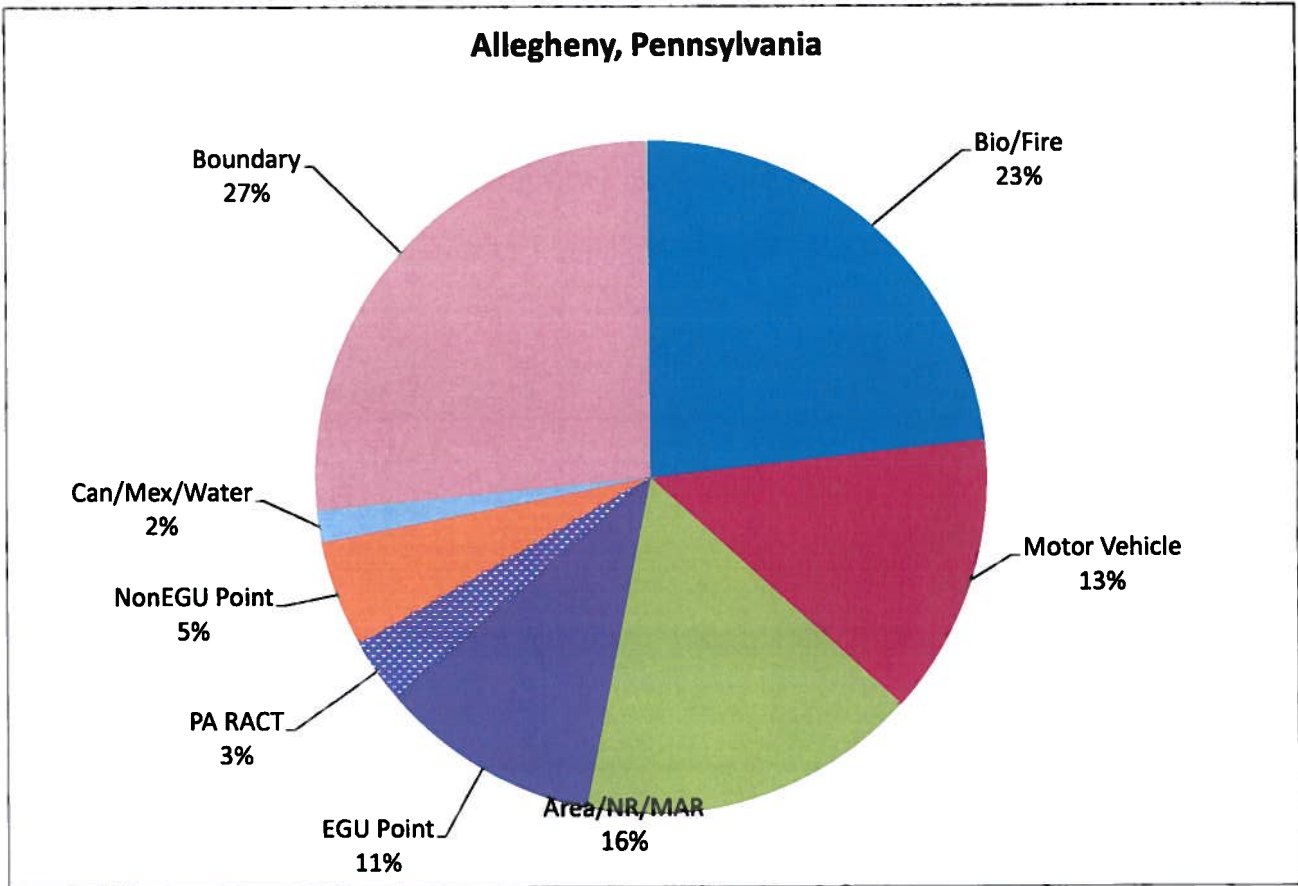
**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 420031005 Allegheny, Pennsylvania

Scenario Max 2017 DV

Base Case 5.14	76.5
PA RACT II	74.2

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.00	1,587	0.00	0.00E+00	1,587	0.00	0.00
DE	0.00	388	0.00	0.00E+00	388	0.00	0.00
MD	0.08	5,107	0.00	0.00E+00	5,107	0.00	0.08
NJ	0.00	4,617	0.00	0.00E+00	4,617	0.00	0.00
NY	0.30	9,123	0.01	1.03E-06	9,123	0.00	0.30
PA	21.24	52,173	4.84	9.28E-05	27,010	-2.34	18.90
VA/DC	0.16	11,254	0.01	8.37E-07	11,254	0.00	0.16
NorthEast	0.00	4,272	0.00	0.00E+00	4,272	0.00	0.00
IL	2.39	15,810	0.44	2.80E-05	15,810	0.00	2.39
IN	2.43	43,910	0.71	1.61E-05	43,910	0.00	2.43
MI	2.15	32,421	0.41	1.28E-05	32,421	0.00	2.15
OH	10.15	29,693	2.64	8.89E-05	29,693	0.00	10.15
WI	0.43	8,801	0.04	4.28E-06	8,801	0.00	0.43
WV	2.07	25,606	0.14	5.52E-06	25,606	0.00	2.07
KY	2.15	38,993	0.29	7.49E-06	38,993	0.00	2.15
NC	0.15	22,048	0.02	8.55E-07	22,048	0.00	0.15
TN	0.87	6,382	0.06	8.86E-06	6,382	0.00	0.87
SOUTH	1.54	84,284	0.09	1.12E-06	84,284	0.00	1.54
AR	0.56	11,890	0.05	3.96E-06	11,890	0.00	0.56
MO	0.92	20,632	0.08	3.65E-06	20,632	0.00	0.92
OK	0.82	24,335	0.10	4.26E-06	24,335	0.00	0.82
TX	1.33	66,651	0.13	1.98E-06	66,651	0.00	1.33
WEST	4.88	182,298	0.39	2.12E-06	182,298	0.00	4.88



**Impact Factor Calculation for Pennsylvania RACT II**

Monitor 421010024 Philadelphia, Pennsylvania

Scenario Max 2017 DV

Base Case 5.14	78.4
PA RACT II	76.4

Region	IPM 5.14 Base Case			Impact Factor (ppb/ton)	Pennsylvania RACT II		
	State Total (ppb)	EGU OS Tons	EGU (ppb)		EGU OS Tons	EGU Change (ppb)	State Total (ppb)
CT	0.04	1,587	0.00	0.00E+00	1,587	0.00	0.04
DE	2.15	388	0.44	1.14E-03	388	0.00	2.15
MD	5.35	5,107	0.60	1.18E-04	5,107	0.00	5.35
NJ	3.41	4,617	0.28	5.98E-05	4,617	0.00	3.41
NY	0.17	9,123	0.01	1.08E-06	9,123	0.00	0.17
PA	19.53	52,173	4.07	7.80E-05	27,010	-1.96	17.57
VA/DC	3.19	11,254	0.28	2.45E-05	11,254	0.00	3.19
NorthEast	0.04	4,272	0.00	0.00E+00	4,272	0.00	0.04
IL	1.66	15,810	0.42	2.68E-05	15,810	0.00	1.66
IN	2.73	43,910	0.98	2.22E-05	43,910	0.00	2.73
MI	0.47	32,421	0.12	3.65E-06	32,421	0.00	0.47
OH	5.23	29,693	1.02	3.45E-05	29,693	0.00	5.23
WI	0.24	8,801	0.02	2.24E-06	8,801	0.00	0.24
WV	2.36	25,606	0.61	2.39E-05	25,606	0.00	2.36
KY	3.08	38,993	0.61	1.57E-05	38,993	0.00	3.08
NC	0.70	22,048	0.13	5.81E-06	22,048	0.00	0.70
TN	0.94	6,382	0.09	1.39E-05	6,382	0.00	0.94
SOUTH	2.32	84,284	0.22	2.57E-06	84,284	0.00	2.32
AR	0.40	11,890	0.05	4.14E-06	11,890	0.00	0.40
MO	0.98	20,632	0.09	4.30E-06	20,632	0.00	0.98
OK	0.75	24,335	0.10	4.05E-06	24,335	0.00	0.75
TX	1.58	66,651	0.15	2.22E-06	66,651	0.00	1.58
WEST	3.15	182,298	0.32	1.73E-06	182,298	0.00	3.15

