2014 NEI Non Point

EPA Default Emission Estimates for Asphalt Paving Emissions – Cutback and Emulsified

Quality Assurance Summary - Differences between draft 2014 estimates and previous NEI estimates

The purpose of this document is to compare the 2014 EPA default VOC estimates with the previous EPA default VOC estimates applied to the 2011 NEI, and with the data in the final 2011 NEI v2 and to explain the differences observed with the 2014 default data. This comparison may help facilitate agencies’ review and acceptance of the 2014 data as their county estimates or alternatively to seek local data for emissions development. A comparison of the ratio HAPVOC sum to VOC is also covered.

The existing EPA default method was assessed and resulted in update of county emission estimates for the 2014 NEI.

The method assessment approach and updated emission calculation parameters are documented separately and the draft county emission estimates for the 2014 NEI are included in separate spreadsheet(s).

Overview – QA observations

*The 2014 NEI emissions update for cutback asphalt* applies the same asphalt activity as applied in the EPA 2011 default estimates but uses new annual mass emission factors for VOC; 5 HAPs – benzene; ethylbenzene, naphthalene, toluene, xylenes; and hydrogen sulfide. The emission factors are updated by integrating the national asphalt usage that the EPA obtained for the 2008 NEI cycle, and allocating HAP emissions based on composition data from asphalt product safety sheets. The updated VOC factor may be approximately 1.5 times larger than that previously applied. As such, the 2014 VOC national total is larger than the 2011 EPA default and the final 2011 v2. At a state-level, the EPA 2014 default VOC emissions are larger than the 2011 default.

The 2014 emissions may under-estimate (zero emissions) for some of the MARAMA states that have emissions in both the 2007 MANE-VU & VA inventory and in the 2011 NEI v2.

*Those MARAMA states should be alerted to the draft estimates of zero emissions to correct if applicable.*

*The 2014 NEI emissions update for emulsified asphalt* applies the same asphalt activity as applied in the EPA 2011 default estimates but uses new annual mass emission factors for VOC, 1 HAP – naphthalene; and hydrogen sulfide. The emission factors were updated by integrating the national asphalt usage that the EPA obtained for the 2008 NEI cycle, and allocating HAP emissions based on composition data from asphalt product safety sheets. The updated VOC emission factor applied for the 2014 may be roughly 4.0 times larger than that previously applied. As such, the national 2014 VOC emissions are larger than the 2011 EPA default and the final 2011 v2. The state-level 2014 default VOC estimates are larger than the EPA 2011 default. As with the cutback asphalt paving estimates, the 2014 emissions for emulsified asphalt may under-estimate (zero emissions) for the MARAMA states when many of those states have emissions in both the 2007 MANE-VU & VA inventory and in the 2011 NEI v2. Though this is more so the case with cutback asphalt than for emulsified asphalt.

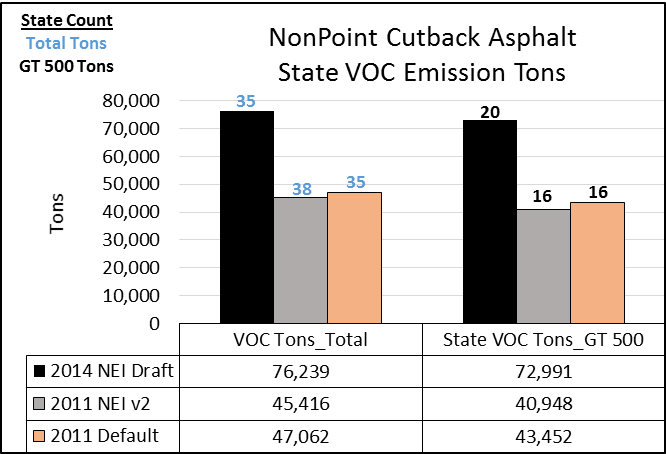
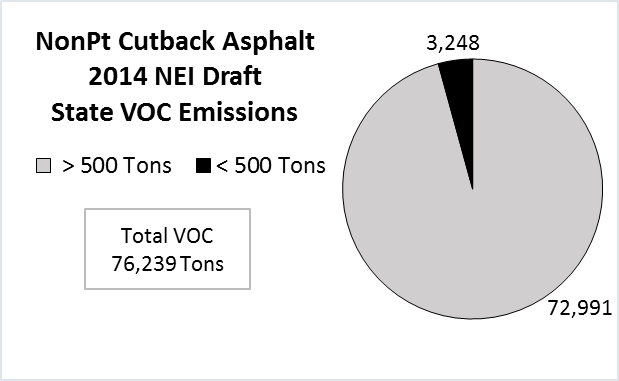
*Those MARAMA states should be alerted to the draft estimates of zero emissions to correct if applicable.*

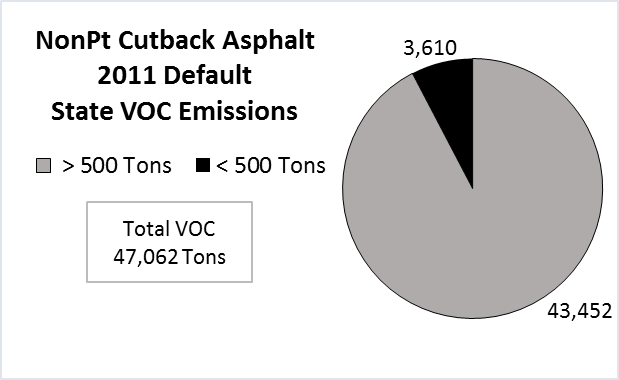
*The majority of states applied the EPA 2011 default VOC emission estimates for the 2011 v2.*

That will likely also occur for the 2014 NEI.

The manner in which the state level asphalt usage is distributed to the counties is updated for the 2014 NEI and is different than the state-to-county allocation method applied in previous default method. For each state, and the counties with greater than 100 tons VOC emissions for cutback asphalt, the range of activity distribution fractions applied for the 2014 default were compared with that applied in the previous 2011 NEI default method. The maximum county fraction per state for the 2014 default compared within 1/10 of that applied for the 2011 NEI default method. The average county fraction per state for the 2014 default was the same as for the 2011 default method.

*Emission differences in the 2014 default have more to do with the updated emission factors for cutback and emulsified*.



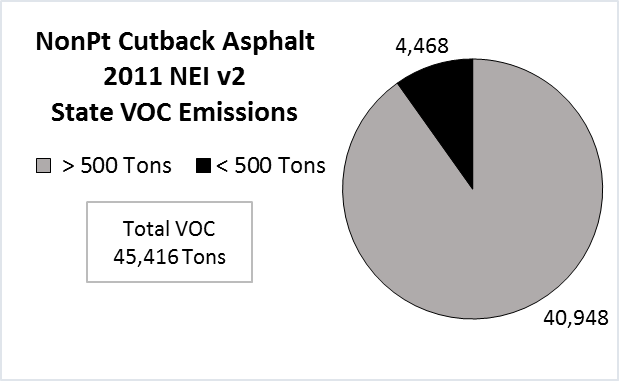


Observations for cutback include:

2014 draft emissions are larger than previous EPA default.

Slightly less emissions in the final 2011 v2 compared to the 2011 EPA default estimates, the indication of some state/local agencies that submitted their own data.

In all of the inventories, the states with greater than 500 tons contribute the majority of the national VOC emissions,

i.e., 95%, 92%, 90% in the 2014 draft, 2011 EPA default, and the 2011 v2 respectively.

Cutback - Compare HAPVOC to VOC

2014 NEI Draft, update of EPA default method and values

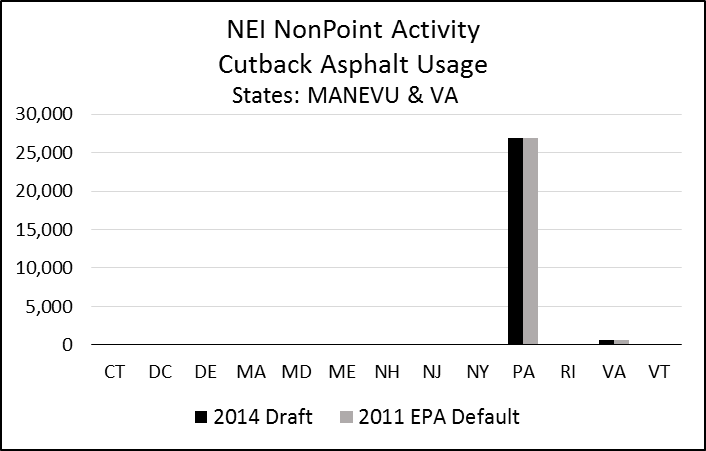
- (5) HAPs: benzene, ethylbenzene, napthalene, toluene, xylenes; HAPVOC sum/VOC ratio =0.07

2011NEI v2 -

Previous EPA default method for VOC and/or HAP-Aug, 34 states/ locals

- (3) HAPs: ethylbenzene, toluene, xylenes, HAPVOC sum / VOC ratio =0.15

State/ Local submissions, 6 submissions VOC only; 7 submissions for VOC and 3 HAPs, HAPVOC sum/VOC ratio =0.2



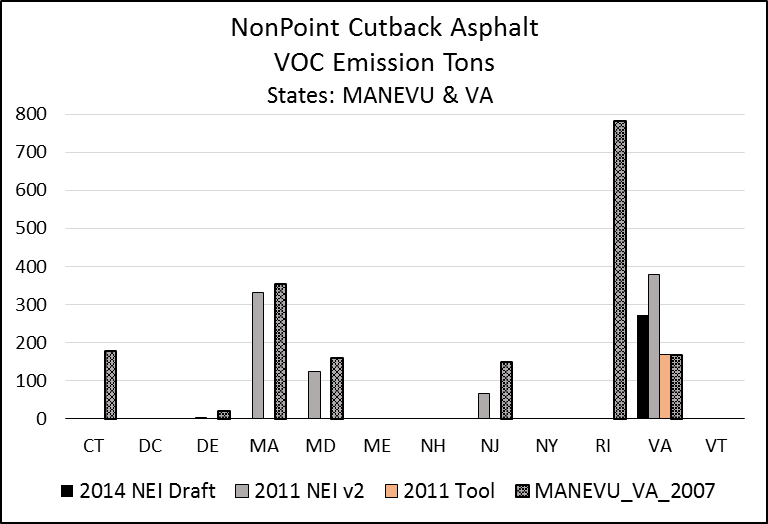
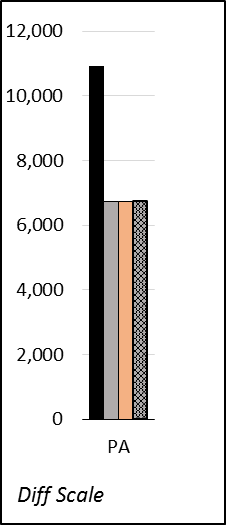
Observations for cutback cont’:

The state-level activity used for the 2014 draft is the same as used in the previous 2011 EPA default tool.

For many of the MANEVU states, there is a discrepancy between the zero-level state activity and the (non-zero) VOC emissions in the inventory comparisons, although the state total emissions are not very significant, i.e., most are less than 400 tons.

For DC, ME, NH, NY, and VT – the zero activity and zero emissions are common to all inventories.

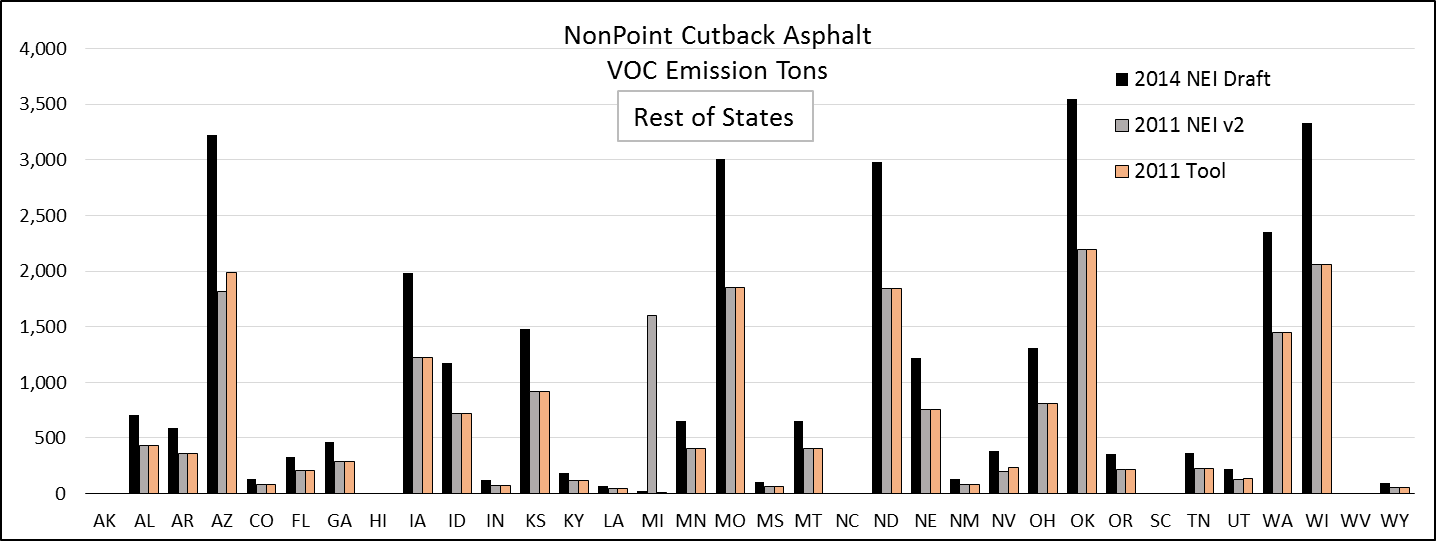
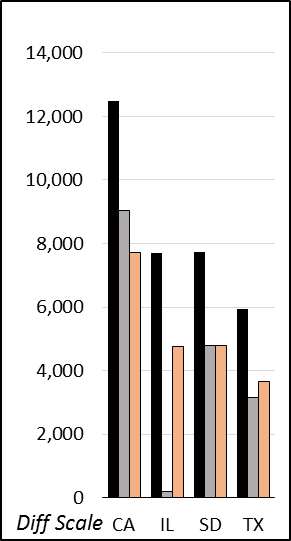
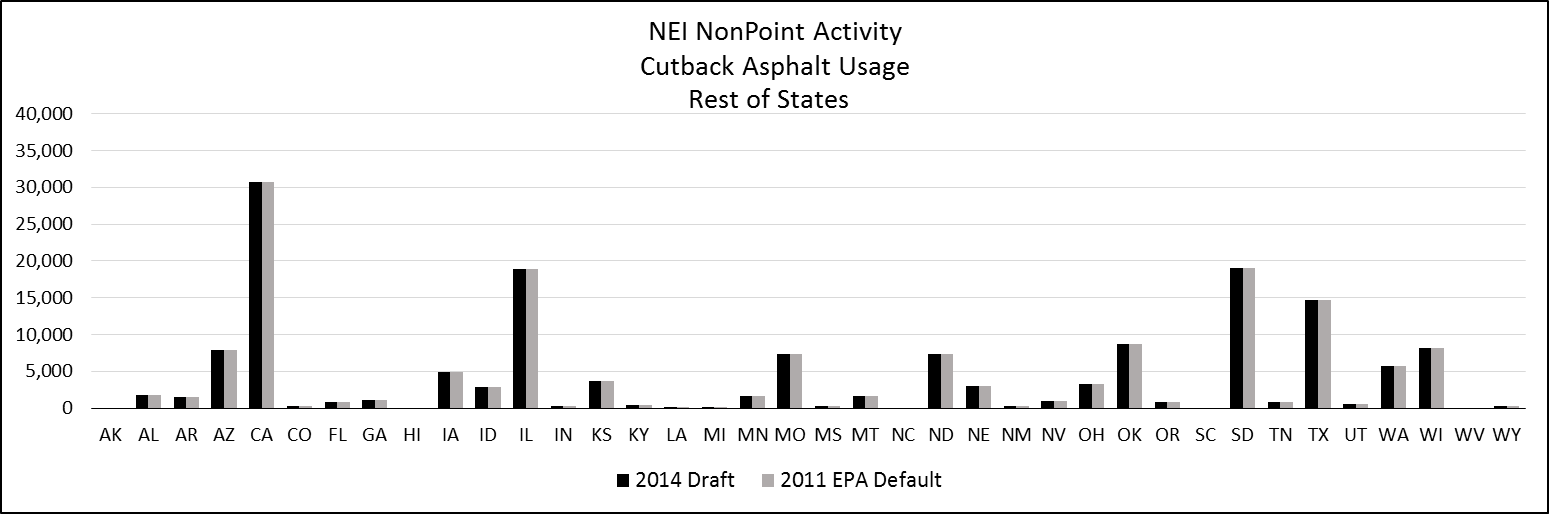
For PA, the 2014 draft estimate is about larger 1.5 times larger than the previous inventory estimates, similar to the pattern for the new VOC emission factor applied in the 2014 draft, which is about 1.5 times larger than the previous factor.

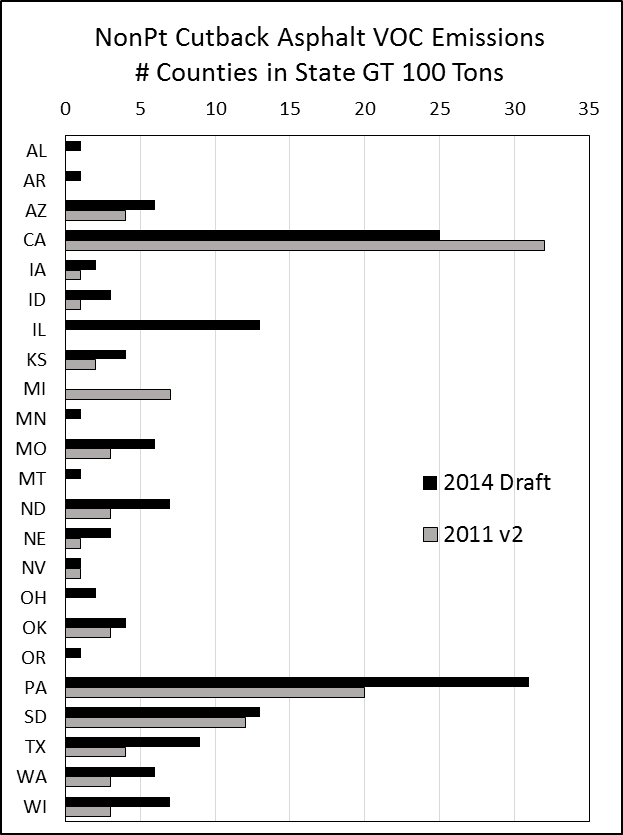
For VA, the 2014 draft estimate is also about larger 1.5 times larger than the previous the 2011 EPA default estimate. VADEQ submitted emissions for the 2011 v2 that were about twice as much as the 2011 EPA default.

Observations for cutback cont’:

The majority of states used the VOC emissions from the EPA 2011 default estimates for the 2011 v2.

IL emissions submittal to the 2011 v2 was significantly lower than the 2011 default estimates. TX and AZ submissions to 2011 v2 were slightly lower.

The 2014 draft estimates are higher for all states.



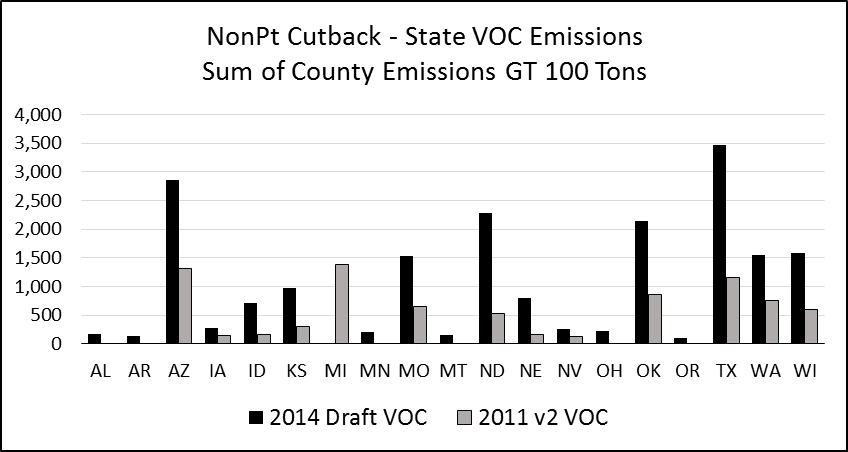
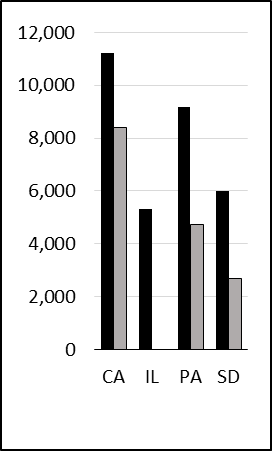
More observations, cutback asphalt:

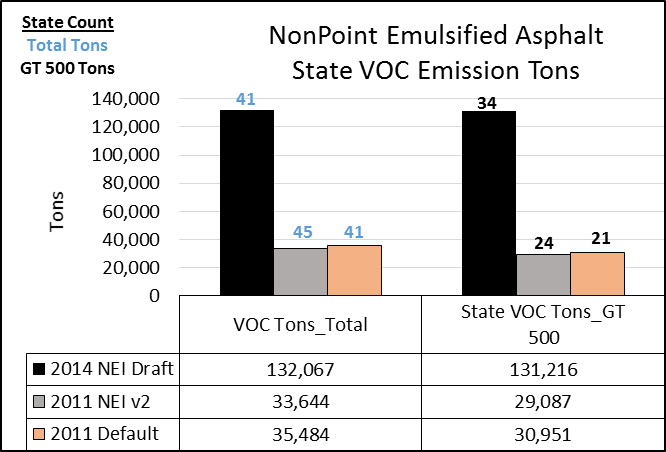
In the 2014 draft, for states that have counties with VOC emissions greater than 100 tons, there are a larger number of counties than were in the 2011 v2.

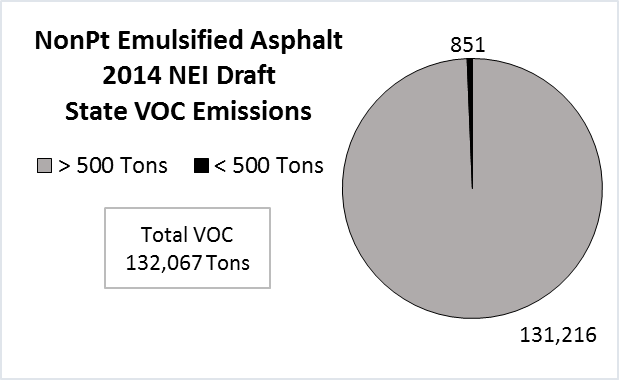
For CA, in the 2014 draft – there are approximately 7 fewer counties with greater than 100 tons VOC than were in the 2011 v2.

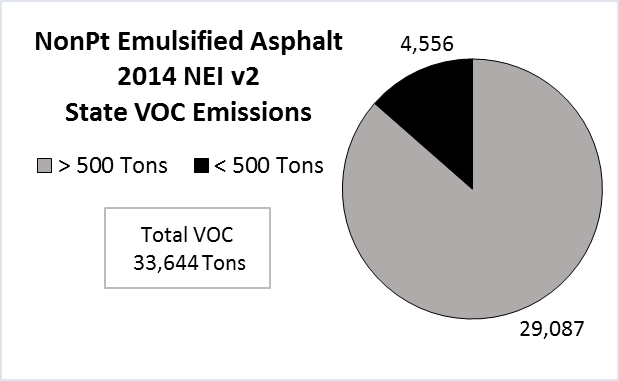
In the 2014 draft estimates, several states have counties with greater than 100 tons of VOC when were none greater than 100 tons in the 2011 v2, i.e., AL, AZ, MN, MT, OH, OR, and IL; though only IL emissions appear significant.

MI had some counties with greater than 100 tons of VOC emissions in the 2011 v2 and there are none in the 2014 draft.



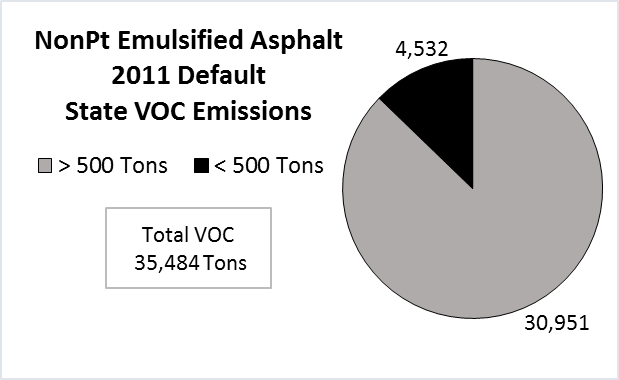




Observations for emulsified include:

The 2014 draft emissions are substantially larger, by approximately 3.7 times, than in the previous EPA default (2011). A similar pattern is indicated for the new VOC emission factor applied in the 2014 draft, which may be roughly 4 times larger than the previous factor.

There are slightly less VOC emissions in the final 2011 v2 than were estimated in the EPA 2011 default, indicating that some state/local agencies submitted their own data.

In all of the inventories, the states with greater than 500 tons contribute the majority of the national VOC emissions, i.e., 99%, 86%, and 87% in the 2014 draft, 2011 EPA default, and the 2011 v2 respectively.

Emulsified - Compare HAPVOC to VOC

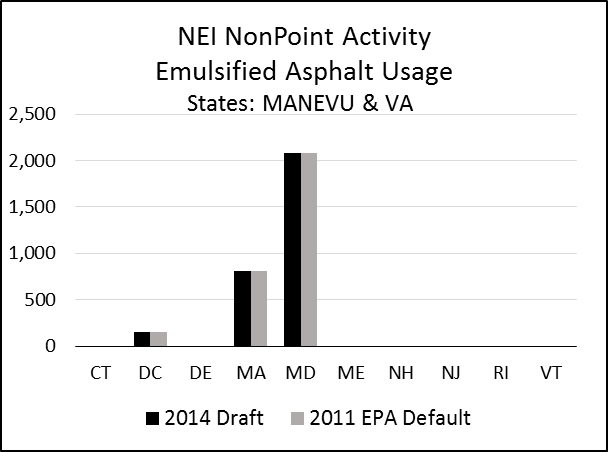
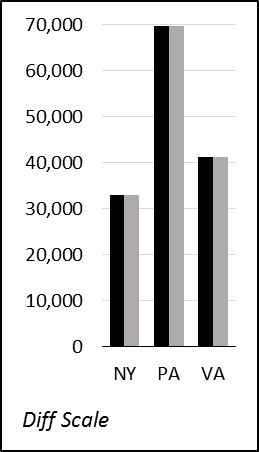
2014 NEI Draft, update of EPA default method and values

- (1) HAP: napthalene; HAPVOC sum/VOC ratio = 0.03

2011NEI v2 -

Previous EPA default method was for VOC only, applied for 31 states/ locals

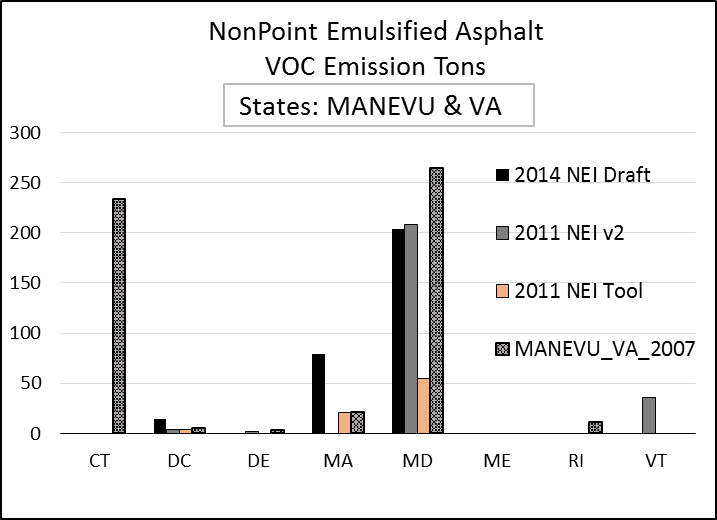
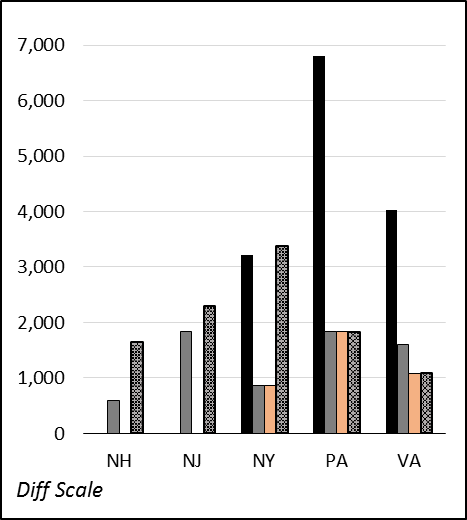
State/ Local submissions, 17 submissions VOC only; 2 of 17 submissions for VOC and 1 HAP (napthalene)

Observations for emulsified cont’:

The state-level activity used for the 2014 draft is the same as used in the previous 2011 EPA default tool.

For many of the MANEVU states, there is a discrepancy between the zero-level state activity and the (non-zero) VOC emissions in the inventory comparisons, although in most cases the state total emissions are not very significant, i.e., most are less than 300 tons - while NH and NJ are more, between 500 – 2000 tons.

For ME, the zero activity and zero emissions are common to all inventories.

For PA, the 2014 draft estimate is about 3.7 times larger than the previous inventory estimates, similar to the pattern for the new VOC emission factor applied in the 2014 draft, which may be roughly 4.0 times larger than the previous factor.

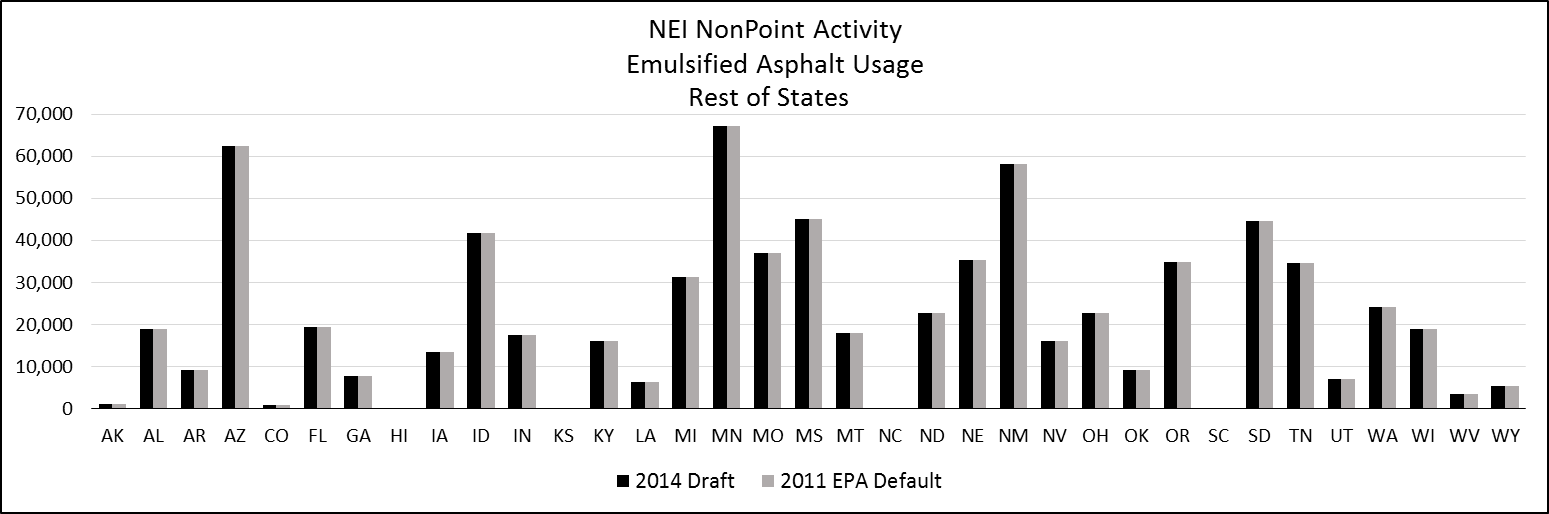
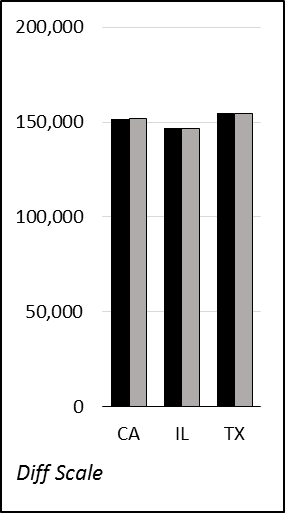
For VA, the 2014 draft estimate is about larger 2.5 times larger than the previous the 2011 EPA default estimate. VADEQ submitted emissions for the 2011 v2 that were about 1.5 times larger than the 2011 EPA default.

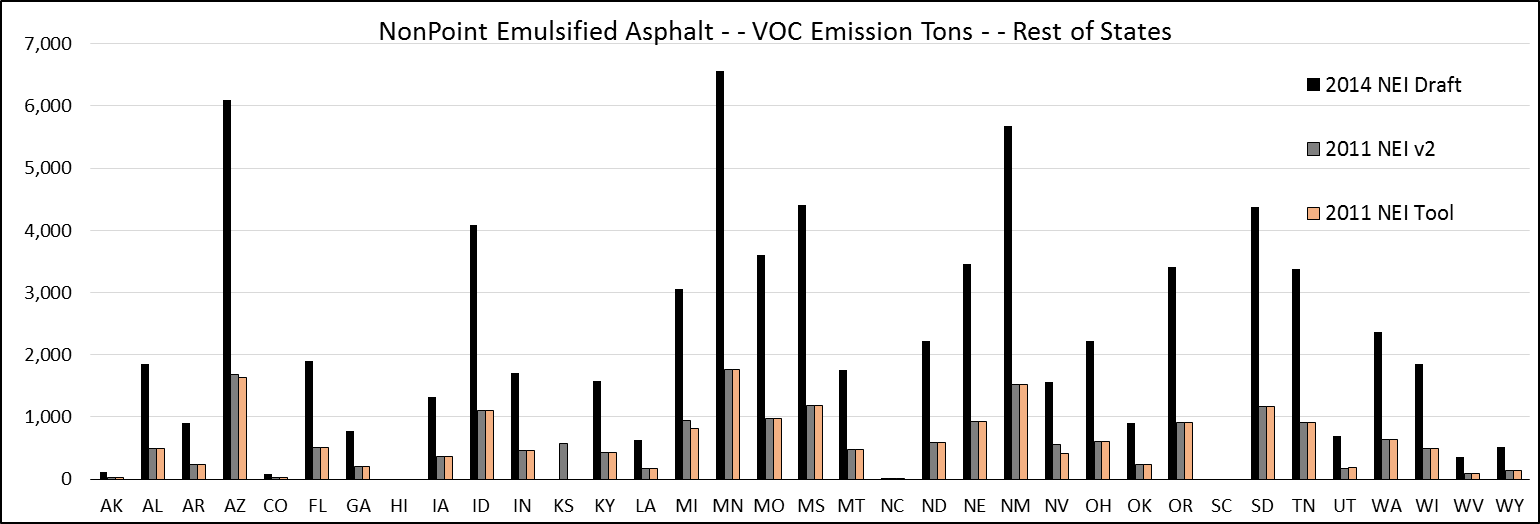
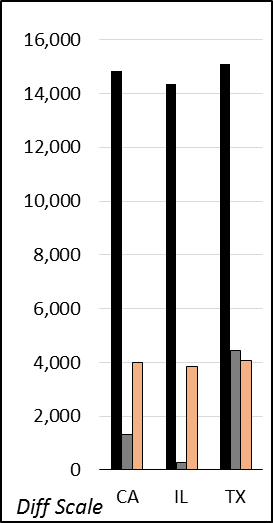
Observations for emulsified cont’:

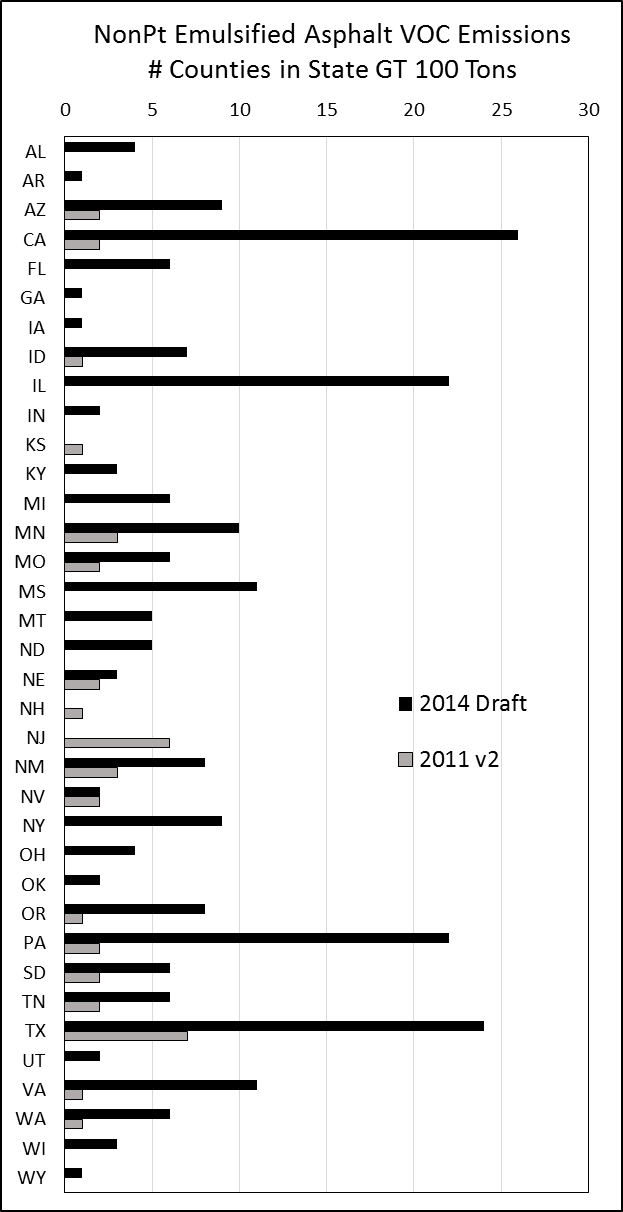
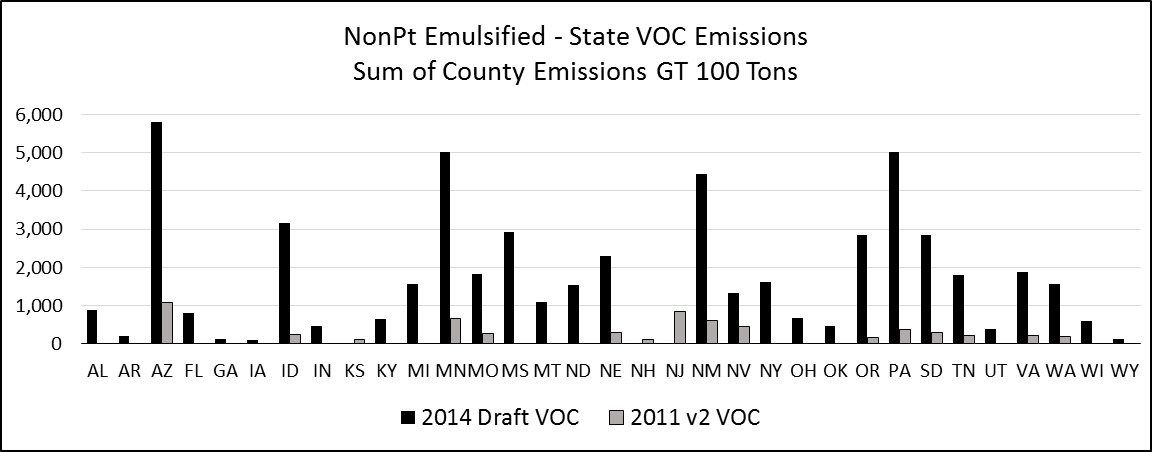
The majority of states used the VOC emissions from the EPA 2011 default estimates for the 2011 v2.

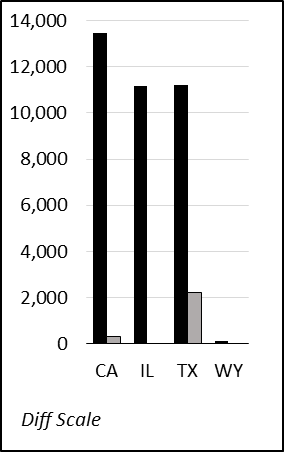
IL emissions submittal to the 2011 v2 was significantly lower than the 2011 default estimates. TX and AZ submissions to 2011 v2 were slightly lower.

The IL and CA emissions submittal to the 2011 v2 were significantly lower than the 2011 default estimates, while AZ, MI, NV, and TX submissions for 2011 v2 were slight higher than the EPA 2011 default.









More observations, emulsified asphalt:

In the 2014 draft, for states that have counties with VOC emissions greater than 100 tons – there are significantly more counties with greater than 100 tons VOC than were in the 2011 v2.

In the 2014 draft estimates, many states have counties with greater than 100 tons of VOC when there were none greater than 100 tons in the 2011 v2 – though only MI, MS, MT, ND, NY, and IL emissions appear significant with those county sums greater than 1000 tons.