RA BRIEF

Date Prepared: May 22, 2019 **Priority Level:** 3 **EPA Goal Supported:** Improve Air Quality

Issue: High cancer risk estimates for Ethylene Oxide (EtO) in Region 3—Status of Review

Context:

1. EtO is a listed hazardous air pollutant in the 1990 Clean Air Act Amendments. EPA updated its EtO cancer risk estimate in 2016.
2. National Air Toxics Assessment (NATA) used this new risk estimate for its assessment (released August 2018) and found the cancer risk to be 30-60 times higher than previous values.
3. Nationally, there are 11 EtO facilities identified in the 2014 NATA with estimates of risks (for people living near these facilities) greater than 1000 in a million.
4. Region 3 has 2 of those facilities:
    - B. Braun Med Inc., Allentown, PA
    - Union Carbide, So. Charleston, WV
5. Region 3 in total has about 26 known EtO facilities that was reported in NATA.
6. Region 5 conducted ambient air sampling of Sterigenics (a commercial sterilizer) in Willowbrook, IL. The results show high concentrations of EtO with some measurements that equated to over 1000 in a million risk. The Illinois Department of Environmental Protection and the Illinois State Attorney General filed a seal order against Sterigenics, which is currently shutdown. These results have also garnered national concern and attention to EtO facilities (commercial sterilizers, hospitals, chemical plants). The Illinois Department of Health issued a cancer incidence assessment which showed higher than expected cancers related to EtO (lymphoma, breast cancer).
7. Region 3 inspected the B. Braun Facility in October 2018 and did not identify any areas of concern with their CAA compliance at the time of the inspection.
8. Office of Air and Radiation directed regional offices (Feb. 2019) to share information and develop consistent messaging and communication with State/Local (S/L) agencies, communities and facilities.

Critical Messages:

1. Region 3's highest risk sources have been from coke oven emissions; the newly revised EtO risk estimates have surpassed many of the coke oven risks. We have 2 facilities with risks greater than Sterigenics (Braun, Allentown, PA and Union Carbide, Institute, WV)
2. The vast majority of R3 communities identified in NATA for EtO can be considered potential areas for Environmental Justice concerns based on preliminary analysis using the economic and demographic indices in EJ Screen.
3. Communities and environmental groups may be asking about health impacts, regulations, and permitting questions.

4. R3 has developed a plan to evaluate our EtO facilities:
   - First tier (5 facilities): focus on 100-1000 in a million risk
     - Confirm latest emissions, obtain modeling parameters, work with S/Ls
     - Remodel risk, using the latest emissions, determine latest cancer risk
     - Develop communication plan, focus on risk communication
     - Engage in discussions with facilities
     - Engage S/Ls and local communities
   - Second tier (remainder of list): We go down the list of the remaining facilities to confirm latest data to determine if additional remodeling is needed. If the risk remains low, a communication plan will be developed to reach out to the communities and facilities. Again, we would be working with our S/Ls.
   - OAQPS provided risk modeling results for the top 2 dozen or so national sources using 2017 NEI; we have analyzed it and are also working on doing the rest of R3 sources. Although the 2017 emissions for our top 4 facilities were lower compared to the 2014 NATA, *and* the resulting cancer risks did come down some, the risks however did not come down enough to move any of the facilities below 100 in a million risk. So, the top facilities are still our top facilities.
   - We have scheduled a team meeting on 5/23, Thursday at 9am to present the new info and to discuss options for next steps. These include:
     - Working with states: to get better emission release points locations at larger chemical plants in order to refine the exposure analysis
     - Working with states and permitting: to check if Title V permits or state permits have any requirements for stack testing
     - Working with states and enforcement: to order stack testing at these facilities to get better emission rates to refine modeling
     - Working with states and enforcement: to conduct fugitive sampling at these facilities using FID or PID.
     - Working with states and monitoring: As a last resort, we can see if the state wants to conduct ambient sampling.

Considerations:

1. Note that NATA is conducted on a national scale and it is meant to be used as a screening tool; high risk sources, such as EtO, are now being further assessed at a local level with local conditions.
2. This version of NATA uses 2014 emissions data, which does have a lag time as the 2017 emissions data are not due to EPA until early 2019. As such, we consulted with State and Local (S/L) agencies regarding more recent emission estimates and current conditions of the facilities.
3. We have been part of a national EtO workgroup to share experiences concerning air monitoring, community outreach and S/L collaboration. We also work closely with air enforcement as we moved forward in finding additional EtO sources.
4. We are notifying S/L air agencies of our activities and plan to share state-specific

information packages when completed in order to conduct outreach.

History & Demographics:

1. Based on EPA's 2016 update of its inhalation cancer risk estimate, EtO is categorized as carcinogenic to humans, sufficient exposure can cause lymphoid cancer and breast cancer in females. Children under 16 have greater susceptibility to EtO's inhalation cancer risk.
2. There is a Maximum Achievable Control Technology (MACT) regulation for EtO sterilization and fumigation facilities such as medical equipment suppliers, pharmaceuticals, other health related industries, spice manufacturers, large libraries, large museums and archives, and contract sterilizers.
    - Office of Air Quality Planning and Standards is planning to issue an interim final EtO sterilizer MACT this summer. A final rule is planned for Dec. 2019. A separate EtO rule is being considered for hospitals. A Miscellaneous Organic NESHAP (National Emission Standards for Hazardous Air Pollutants) is also being developed for some EtO operations.

First Tier Review (greater than 100 in a Million Risk—2014 NATA):

Facility	State	County	City
B BRAUN MED INC/ALLENTOWN	PA	Lehigh	ALLENTOWN
UNION CARBIDE CORPORATION-INSTITUTE	WV	Kanawha	INSTITUTE
Sterigenics	**IL**	**Dupage**	**Willowbrook**
UNION CARBIDE CORP -SO CHARLESTON FAC.	WV	Kanawha	SOUTH CHARLESTON
Covestro LLC - SOUTH CHARLESTON (Bayer Materialscience)	WV	Kanawha	SOUTH CHARLESTON
CRODA INC.	DE	New Castle	NEW CASTLE

Second Tier Review (less than 100 in a Million Risk—2014 NATA)

ST LUKES HOSP/MAIN BOILER PLT	PA	Lehigh	BETHLEHEM
Hercules Inc Aqualon Div	VA	Hopewell city	Hopewell
Evonik Goldshmidt Corp	VA	Hopewell city	Hopewell
UPMC MCKEESPORT/HOSPITAL	PA	Allegheny	MCKEESPORT
SUNOCO LOGISTICS MARCUS HOOK INDUSTRIAL COMPLEX	DE	New Castle	CLAYMONT
Rhodia Inc	PA	Delaware	Marcus Hook
OAKLAND VA MED CTR/PGH	PA	Allegheny	PITTSBURGH
SOUTH HILLS HEALTH SYS/JEFFERSON REG MED CTR	PA	Allegheny	PITTSBURGH
CAMC General Hospital	WV	Kanawha	CHARLESTON
Elite Spice	MD	Howard	Jessup
ICL-North America Inc - GALLIPOLIS FERRY PLANT	WV	Mason	GALLIPOLIS FERRY
VA MED CTR AND NHCU/PHILA	PA	Philadelphia	PHILADELPHIA
DuPont Teijin Films	VA	Chesterfield	Chester
CHRISTIANA CARE HEALTH SERVICES - CHRISTIANA HOSPITAL	DE	New Castle	NEWARK
LONZA INC/WILLIAMSPORT PLT	PA	Lycoming	WILLIAMSPORT
COVESTRO - New Martinsville	WV	Marshall	Proctor
Medical Mfg Corp	PA	Erie	Erie
CRODA INC/DRAKETOWN ROAD	PA	Clinton	MILL HALL
YORK WALLCOVERINGS INC/YORK	PA	York	YORK
Virginia Tech	VA	Montgomery	Blacksburg
CHILDRENS HOSP OF PGH/LAWRENCEVILLE*	PA	Allegheny	PITTSBURGH

*--Not reported in 2014 NATA but reported in 2017 National Emissions Inventory, need modeling.