Timeline

March: Pull together Fumigation Workgroup

April: Organize State practices in spreadsheet

May-June: Discussions on State permitting, modeling and control technology
Coordination for States

July-Aug: Develop White Paper to summarize current status
## Fumigant Pollutants

<table>
<thead>
<tr>
<th></th>
<th>Methyl Bromide</th>
<th>Sulfuryl Fluoride</th>
<th>Phosphine</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Classification</strong></td>
<td>VOC, HAP</td>
<td>MD TAP</td>
<td>HAP</td>
</tr>
<tr>
<td><strong>US Registration</strong></td>
<td>1961 (used in 1920’s)</td>
<td>1959</td>
<td>1999 (but around since the 1780’s)</td>
</tr>
<tr>
<td><strong>Characteristics</strong></td>
<td>Colorless, Odorless</td>
<td>Colorless, Odorless</td>
<td>Colorless, Garlic/Fish Odor</td>
</tr>
<tr>
<td><strong>Impact on Environment</strong></td>
<td>Ozone Depleting Substance (ODS)</td>
<td>Could contribute to Climate Change</td>
<td>unknown</td>
</tr>
<tr>
<td><strong>Banned</strong></td>
<td>January 1, 2005</td>
<td>Proposed in 2014, but never happened.</td>
<td>No</td>
</tr>
<tr>
<td>State</td>
<td>Fumigation Regulation</td>
<td>Threshold</td>
<td>Boundary / Buffer</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------</td>
<td>-----------</td>
<td>-------------------</td>
</tr>
<tr>
<td>DE</td>
<td>None; Title V</td>
<td>VOC major &gt;25 ton/yr. HAP &gt; 10 ton/yr.</td>
<td>No Minimum, but known source is located ~ 1 mi from residences</td>
</tr>
<tr>
<td>MD</td>
<td>AQ permit required for &gt; 1 tpy or VOC, HAP or MD TAP</td>
<td>Prohibits VOC &gt; 20 lbs/day unless controlled 85% Must install T-BACT and meet TAP ambient impact requirements</td>
<td>Concentration of the pollutant at the Property Line and beyond must be less than any applicable threshold and risk based screening levels established for each TAP</td>
</tr>
<tr>
<td>NJ</td>
<td>None, NJAC 7:27-8.2 (catch all to get fumigators in) plan to develop rules</td>
<td>&gt;50 lb/hr Based on processing rate of materials used</td>
<td>Case by Case basis determination</td>
</tr>
<tr>
<td>NC</td>
<td>None specific; Synthetic Minor and Title V</td>
<td>SM less than or = 10 tpy Title V &gt; 10 tpy</td>
<td>None. There are currently no setback limitations in the existing permits.</td>
</tr>
<tr>
<td>PA</td>
<td>PA Code Chapter 128</td>
<td>1.370 lb/hr</td>
<td>200 feet</td>
</tr>
<tr>
<td>PA – PHL</td>
<td>None, AMR VI for ambient MBr</td>
<td>Limits &lt; MBr 2.7 tpy (1.254 lb/hr); Phos 0.0462 lb/hr and 0.0609 tpy</td>
<td></td>
</tr>
<tr>
<td>VA</td>
<td>Yes, since 2011 Statute Code of VA: 10.1-1308.01</td>
<td>HAP major (10 tpy); exempt if not HAP major</td>
<td>300 feet buffer or monitor @ property line</td>
</tr>
<tr>
<td>WV</td>
<td>None; General Permitting for MBr</td>
<td>HAPs &gt; 2 lb/hr or 5 tpy; max potential</td>
<td></td>
</tr>
</tbody>
</table>
What should be included in a fumigation permit?

<table>
<thead>
<tr>
<th>Facility Name / Location</th>
<th>Emissions (lb/hr &amp; tpy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object / Product being fumigated (including size and quantity)</td>
<td>Control devices, if applicable</td>
</tr>
<tr>
<td>Type of fumigant (MBr, Phos, SF)</td>
<td>Discharge parameters (i.e., stack ht., flowrate, exit velocity)</td>
</tr>
<tr>
<td>Method of application (including containment system)</td>
<td>Risk assessment</td>
</tr>
<tr>
<td>Fumigation (application) Rate and Quantity</td>
<td>Monitoring requirement</td>
</tr>
<tr>
<td>Frequency and duration of fumigations (Hour/Day/Yr)</td>
<td>Signage requirements before/during/after fumigation event.</td>
</tr>
<tr>
<td>Volume to be fumigated</td>
<td>Recordkeeping after the event - report fumigation activity and actual quantity of fumigant used, along with actual duration of aeration and any controls that may have been used.</td>
</tr>
<tr>
<td>Duration of aeration</td>
<td></td>
</tr>
</tbody>
</table>
## NJ Risk Screening Worksheet

### NDEP Division of Air Quality Risk Screening Worksheet

**For Long-Term Carcinogenic and Noncarcinogenic Effects and Short-Term Effects**

**October 2017**

For source operations emitting air toxics, one worksheet should be completed for each emission source, which should include all toxics above reporting thresholds or for which there is a federally enforceable limit included in an approved permit. Based on the assumptions made when generating the model, the following sources may not use this worksheet: (1) Sources without stacks, such as certain dry cleaners, degreasers, storage tanks, and gasoline stations, (2) sources with stacks with a horizontal or downward discharge direction, or (3) sources with stack height less than 10 feet. See the Technical Manual 2003 Guidance on Preparing a Risk Assessment for Air Contaminant Emissions for a complete list of assumptions. For information on how to evaluate risk from other kinds of sources, contact Air Quality Evaluation at 609-292-0722.

To see a listing of air toxics by CAS number, click on the "CAS Index" tab at the bottom of this worksheet page.

This is a protected file. Changes are allowed only to certain cells (those in yellow). It is also a "read only" file. To save the data you input, select "File" on the menu above, then "Save As" in your own files, under the name of your choice. Input data only to yellow fields. Incremental cancer risk (IR) and hazard quotient (HQ) will calculate automatically when you type in the stack parameters (stack height and distance to property line) and an emission rate.

For references for toxicity data (URFs and RIfs), see the links at www.nj.gov/dep/air/sas/risk.html.

### Long-Term Effects

**Q** = Annual emission rate (in tons per year)

**URF** = Unit risk factor (for carcinogenic risk)

**IR** = Annual average ambient air concentration

**BC** = Reference concentration (for noncarcinogenic effects)

**HQ** = Hazard quotient (for noncarcinogenic effects)

**FER** = Further Evaluation Required (See Notes for thresholds)

### Short-Term Effects

**Q** = Hourly emission rate (in pounds per hour)

**BC** = Short-term reference concentration (for noncarcinogenic effects)

**HQ** = Hazard quotient for short-term noncarcinogenic effects

**FER** = Further Evaluation Required (See Notes for thresholds)

### Example

**HAP** | **CAS No.** | **Air Toxic** | **Q** | **URF** | **IR** | **BC** | **HQ** | **Q** | **FER**
--- | --- | --- | --- | --- | --- | --- | --- | --- | ---
1 | 7502 | Acetone | 0.1 | 0.5 | 1 | 1 | 0 | 0 | 0
2 | 6284 | Acetone | 1 | 0.5 | 1 | 1 | 0 | 0 | 0
3 | 7589 | Acetone, monohydric | 1 | 0.5 | 1 | 1 | 0 | 0 | 0

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**Notes**

- **FER** = Further Evaluation Required (See Notes for thresholds)
- **IR** = Incremental risk
- **HQ** = Hazard quotient
- **BC** = Reference concentration
- **URF** = Unit risk factor
- **Q** = Emission rate (in pounds per hour)
- **FER** = Further Evaluation Required

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**Conclusion**

- **FER** = Further Evaluation Required (See Notes for thresholds)

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**References**

- For toxicity data (URFs and RIfs), see the links at www.nj.gov/dep/air/sas/risk.html.
Fumigation Control Technology & Alternative Fumigants

- Nordiko (Australia)
- Value Recovery (New Jersey)
- Linde Group (Germany)
- Spectros Instruments (Boston)
  - Mebrom Gas Destruction Technology (Australia)
- Others?
Potential Solutions to Consider

CONSISTENCY

- Regulations / Policies to be consistent between states (State & Federal Rulemaking)
- Good Fumigation Practices: Use least toxic fumigant, for a short time period and long aeration time.
- Agencies should take a proactive approach when issuing air permits by providing Stakeholder Outreach events
Potential Solutions to Consider

EPA / FEDERAL AGENCY INVOLVEMENT

- 112 (c) MACT source category for fumigation
- Alternative fumigants usage:
  - e.g., go to USDA to get approval for ethyl formate – approved in other countries, but not in US
Potential Solutions to Consider

TECHNICAL APPROACH

- Control Technologies & Industry Cooperation
- Dispersion modeling, Risk Mitigation, Raise Stacks, ...
- Monitoring Data
- Testing procedures
- Review of any verification / testing of permitted sources
Next Steps / Recommendations

✓ Letter from MARAMA to EPA on MACT Fumigation Category

✓ Ongoing quarterly engagement via MARAMA fumigation workgroup to:
  ✓ Develop consistency among the agencies, including components within the permit.
  ✓ Continue research of fumigation practices / controls
A big thank you to the Fumigation Workgroup!!

Thank you
Questions?

Thank you.