

# Working Group Meeting #4

April 30, 2026, 1:30 p.m.

## Proposed Amended Rule 1401 – New Source Review of Toxic Air Contaminants

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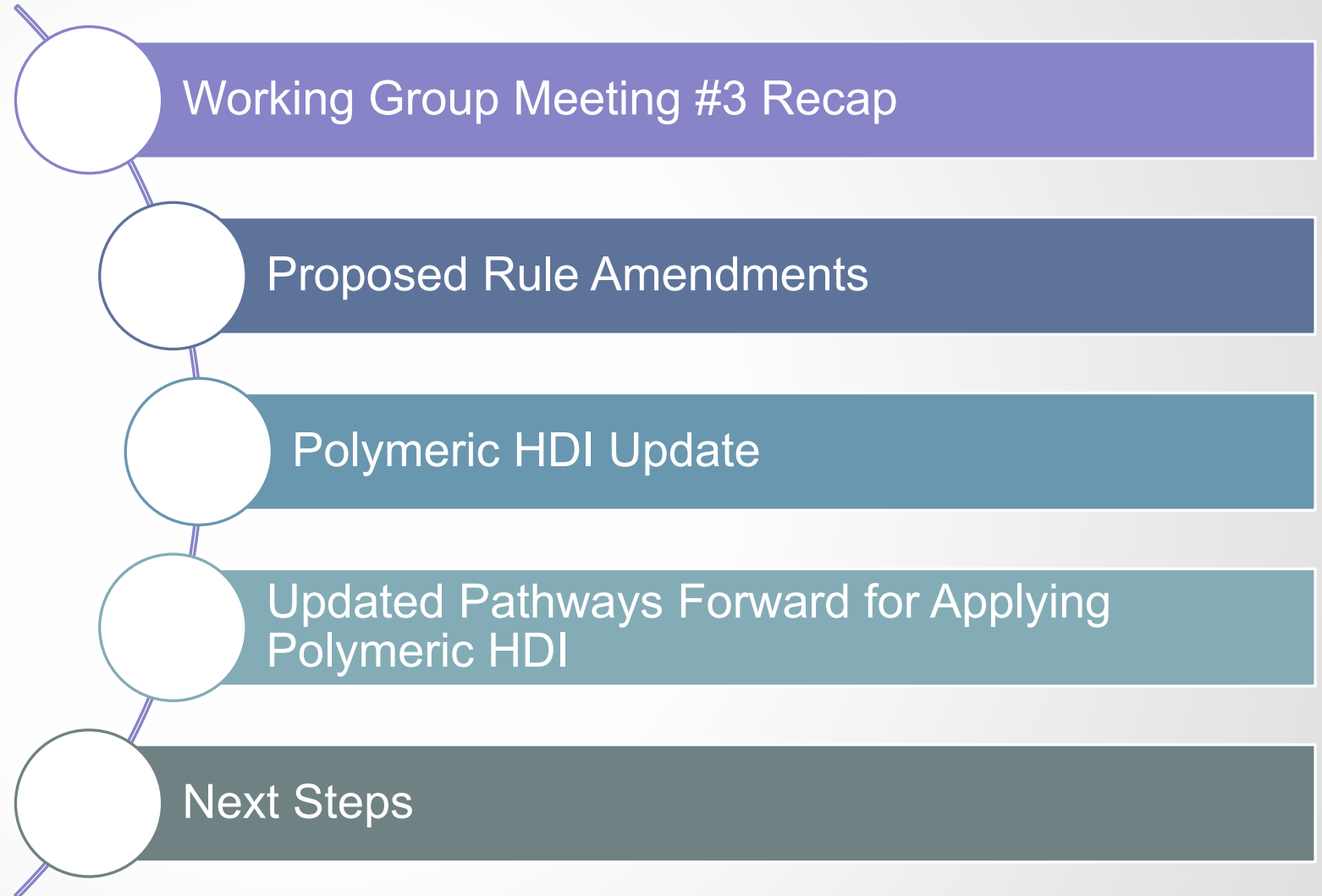
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# Agenda

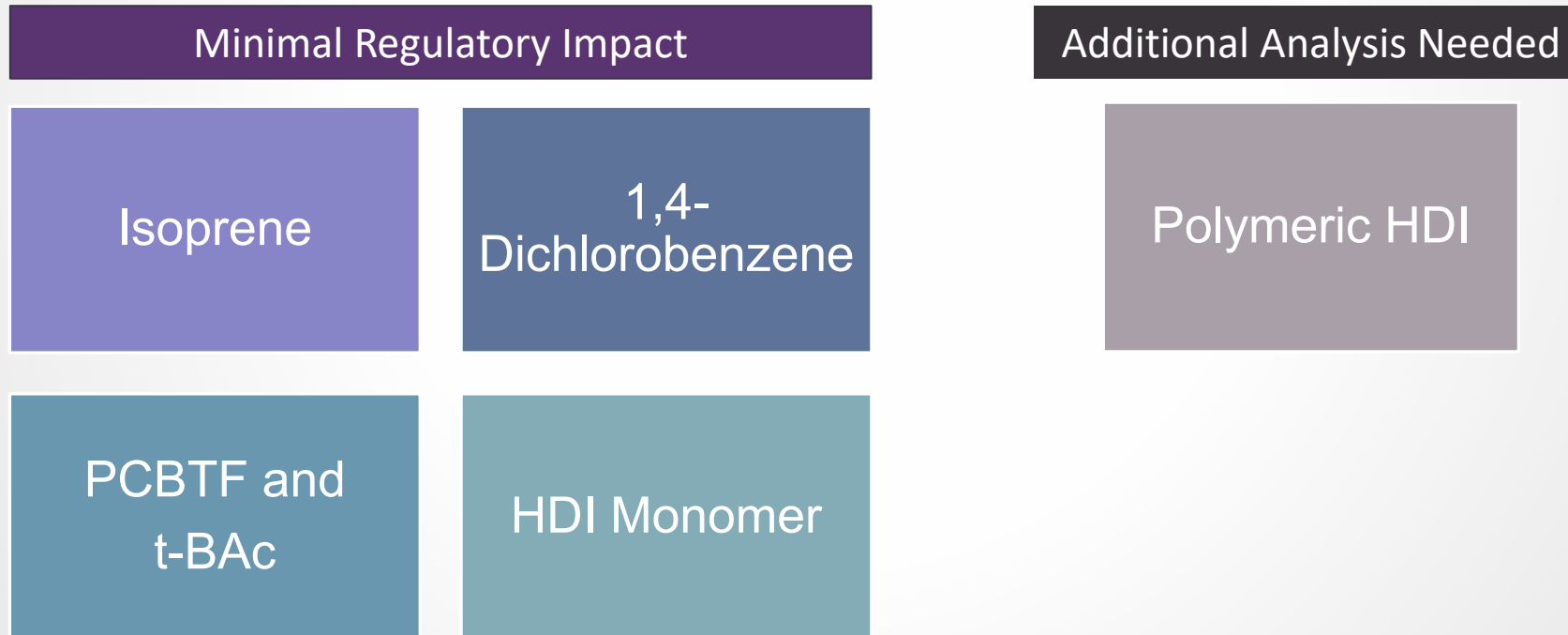


# Working Group Meeting #3 Recap

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# Working Group Meeting #3 Recap

- Provided an update and recap on the PAR 1401 rule development schedule
- Discussed proposed rule amendments
- Updated regulatory impacts:



# Polymeric HDI Initial Assessment

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- A study conducted by the Ontario Ministry of the Environment in 2006 concluded an emission rate of 4.8%-6.3%
- Based on an initial assessment using Tier I HRA, permitting Polymeric HDI may be challenging as the allowable throughput would be restrictive

## **Preliminary Assessment:**

- Additional analysis needed to understand:
  - Concentration ranges of polymeric HDI in products
  - How common hardeners are used
  - Usage and mixing ratios
  - Any alternative polymeric HDI emission rates
  - Possible alternative compounds to polymeric HDI
- Stakeholder input requested for more information

# Proposed Rule Amendments

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# Updated Proposed Amendments to Rule 1401

- For clarity and to align more closely to the CARB and OEHHA Consolidated Table, PAR 1401 will update Table I to:
  - Include child compounds of new and existing parent compounds
  - Remove two compounds that are not listed in the consolidated table

| CAS #             | SUBSTANCE  | EFFECTIVE DATE    |                   |                   |                   |
|-------------------|--|-------------------|-------------------|-------------------|-------------------|
|                   |  | CANCER            | CHRONIC           | 8-HOUR            | ACUTE             |
| 7440-38-2         | <b>arsenic and arsenic compounds (inorganic)</b><br>including, but not limited to:<br>arsenic compounds (inorganic oxides) | 12/07/1990        | 06/15/2001        | <u>06/15/2001</u> | 08/13/1999        |
| <u>7778-39-4</u>  | <u>arsenic acid</u>  | <u>12/07/1990</u> | <u>06/15/2001</u> | <u>06/15/2001</u> | <u>08/13/1999</u> |
| <u>1303-28-2</u>  | <u>arsenic pentoxide</u>   | <u>12/07/1990</u> | <u>06/15/2001</u> | <u>06/15/2001</u> | <u>08/13/1999</u> |
| <u>1327-53-3</u>  | <u>arsenic trioxide</u>  | <u>12/07/1990</u> | <u>06/15/2001</u> | <u>06/15/2001</u> | <u>08/13/1999</u> |
| 7784-42-1         | arsine   |                   | 09/10/2010        | <u>06/15/2001</u> | 08/13/1999        |
| <u>7778-44-1</u>  | <u>calcium arsenate</u>  | <u>12/07/1990</u> | <u>06/15/2001</u> | <u>06/15/2001</u> | <u>08/13/1999</u> |
| <u>1303-00-0</u>  | <u>gallium arsenide</u>  | <u>12/07/1990</u> | <u>06/15/2001</u> | <u>06/15/2001</u> | <u>08/13/1999</u> |
| 1332-21-4         | asbestos   | 06/01/1990        |                   |                   |                   |
| <u>77536-66-4</u> | <u>actinolite</u>  | <u>06/01/1990</u> |                   |                   |                   |
| <u>12172-73-5</u> | <u>amosite</u>   | <u>06/01/1990</u> |                   |                   |                   |
| <u>77536-67-5</u> | <u>anthophyllite</u>   | <u>06/01/1990</u> |                   |                   |                   |
| <u>12001-29-5</u> | <u>chrysotile</u>  | <u>06/01/1990</u> |                   |                   |                   |
| <u>12001-28-4</u> | <u>crocidolite</u>   | <u>06/01/1990</u> |                   |                   |                   |
| <u>77536-68-6</u> | <u>tremolite</u>   | <u>06/01/1990</u> |                   |                   |                   |
| 71-43-2           | benzene (including benzene from gasoline)  | 06/01/1990        | 08/18/2000        | <u>08/18/2000</u> | 08/13/1999        |

# Polymeric HDI Update

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# Polymeric HDI Assessment Update

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- Staff continued investigating polymeric HDI by:
  - Evaluating application and permits
  - Meeting with coating manufacturers and other industry stakeholders
  - Understanding other air districts permitting practices for polymeric HDI
- To determine the extent of the permitting challenges, the investigation focuses on assessing:
  - Usage of polymeric HDI (concentration ranges, prevalence of polymeric HDI in coating products, mixing ratios, and usage)
  - Any alternative polymeric HDI emission rates
  - Possible alternatives to polymeric HDI

# Application and Permit Evaluation

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As part of the application for a paint spray booth, technical data sheets (TDS) are submitted for the products that will be sprayed

- A TDS specifies for each product the ingredients/compounds and the corresponding concentrations
- Staff reviewed 90 spray booth applications from 2018-2023 for industries such as automotive coatings, aerospace coatings, metal coatings, wood coatings, and architectural coatings to determine the typical concentration of polymeric HDI in products

| Affected Industry  | Concentration Range of polymeric HDI | Average Concentration |
|--|--------------------------------------|-----------------------|
| Autobody Shops (Rule 1151)   | 50%-80%                              | 60%                   |
| Coating of Metal Parts (Rule 1107) and Aerospace Coating (Rule 1124) | 20%-100%                             | 70%                   |

# Application and Permit Evaluation - Conclusion

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- Concentrations of polymeric HDI are in higher ranges
  - Increased potential for higher polymeric HDI emissions
  - Lower permitted usage for these products
- Products that contain polymeric HDI are prevalent in many different industries:
  - Polymeric HDI containing products were present in all autobody shops that use polyurethane coating
  - Industries such as aerospace and metal coatings also used products containing polymeric HDI to coat aircraft parts, signage, scaffolds, and heavy-duty equipment
- Concentration used for initial assessment of polymeric HDI is consistent with the concentrations found in TDS



# Discussions With Coating Manufacturers and Facilities

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- Staff met with coating manufacturers and facilities to better understand the usage of polymeric HDI

| Questions   | Response from Industry   |
|---|--|
| How prevalent is polymeric HDI?   | Polymeric HDI is a critical compound and component in polyurethane coating chemistry   |
| Is there an alternative emission rate for polymeric HDI other than the 2006 Ontario study?  | No alternative study or emission factor identified   |
| Is there an alternative to polymeric HDI? Any plans for reformulation to remove HDI?  | No known alternative so reformulation is uncertain   |
| Our initial assessment shows usage of HDI containing products will be quite restrictive, what is the typical actual usage of products containing polymeric HDI? | Average autobody shop sprays around 1-2 L per hour of coating containing polymeric HDI<br><i>(2 – 3 times more than the limit in the initial assessment)</i> |

# Polymeric HDI in Other Air Districts

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## Santa Barbara APCD

- Received one permit application last year but experienced permitting difficulties with acute hazard index threshold
- Used an emission factor based on Ontario study
- Met with coating manufacturer last year but no progress or solution reached

## San Joaquin Valley APCD

- Issued a permit for an autobody shop in 2024 with an hourly emission rate for HDI

# Summary/Conclusion of Updated Assessment

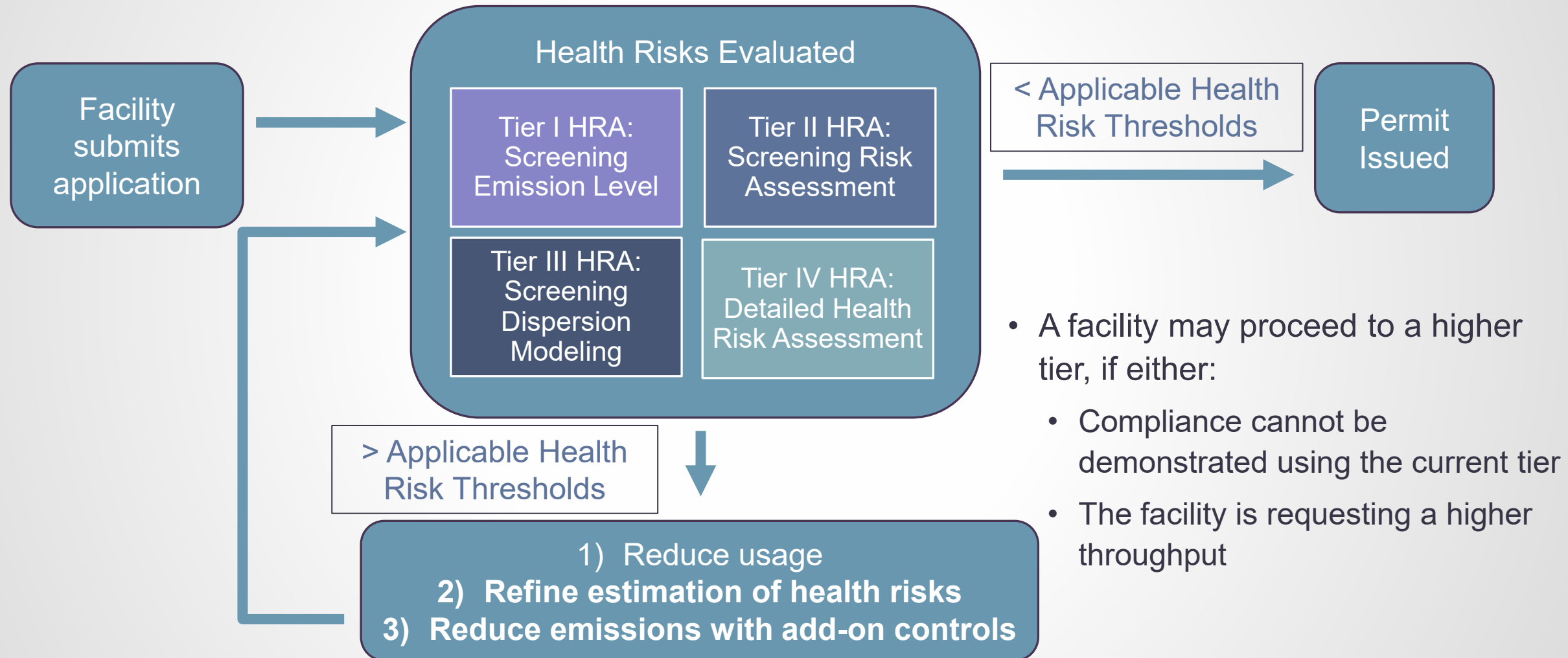
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- Based off investigations, the following conclusions can be drawn:
  - Polymeric HDI is a necessary compound in coatings and there is no alternative available
  - Only emission rate available is based off the Ontario study
  - Other air districts have experienced difficulty with permitting due to polymeric HDI and its impact due to the acute hazard index
  - New, modified, or relocated permit applications may need to lower their throughput to not exceed the Rule 1401 acute hazard index threshold (based on an initial assessment using Tier I HRA)

# Updated Pathways Forward for Applying Polymeric HDI

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# Evaluating Health Risks During Permitting



# Evaluating Polymeric HDI Emissions During Permitting

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- An initial evaluation using Tier I HRA determined that impacts from polymeric HDI are anticipated when calculating the acute hazard index

| Rule 1401 Cancer Risk Threshold | Rule 1401 Noncancer Risk Threshold |
|---------------------------------|------------------------------------|
| 1 in a million without T-BACT   | Acute hazard index of 1            |
| 10 in a million with T-BACT     | Chronic hazard index of 1          |

- Two pathways were identified to allow new, modified, or relocated applications to apply polymeric HDI with a workable throughput limit
  - Conduct a more refined estimation of health risks
  - Install and implement add-on controls

# Background on Health Risk Assessments (HRAs)

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- HRA tiers are in order of increasing complexity providing a more refined estimate of health risk than the lower tier that may result in an increased throughput
- The higher the HRA tier, the more information is required, such as:
  - Distance from the source to the nearest off-site residential and worker receptor(s)
  - Source characteristics, such as stack height and/or building dimensions
  - Operating schedule
  - Geographic location
  - Air dispersion modeling such as AERSCREEN or AERMOD
- Additionally, the facility may propose a lower throughput or alternative assumptions to be evaluated such as alternative emission rates, control efficiency, particle size distribution, etc
- **Refining the estimation of health risks and/or modifying the operating assumptions would allow a greater throughput than using a Tier I HRA**

# Applicable Controls for Polymeric HDI

- Study conducted by the Ontario Ministry of the Environment in 2006 analyzed the particle size distribution
  - 99.98-100% of particle size is greater than or equal to 0.3 microns
- Unlike other paint emissions that are vapors, polymeric HDI emissions can be controlled as a particulate
- Other toxic rules controlling particulate emissions from spraying operations require the use of HEPA filters (e.g., Rule 1469.1 – Spraying Operations Using Coatings Containing Chromium)

**Table 6: Dry Filter Booth Particle Size Distribution by Test Scenario**

| DuPont Canada, Inc.           |                                    |        |        |        |        |       |       |       |       |       |       |
|-------------------------------|------------------------------------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|
| Size <sup>1</sup>             | 0.3µm                              | 0.4µm  | 0.5µm  | 0.65µm | 0.8µm  | 1.0µm | 1.6µm | 2.0µm | 3.0µm | 4.0µm | 5.0µm |
| Scenario 1                    | 42.97%                             | 20.69% | 11.62% | 7.53%  | 8.94%  | 4.39% | 1.71% | 1.86% | 0.25% | 0.03% | 0.00% |
| Scenario 2                    | 33.32%                             | 24.18% | 12.33% | 8.74%  | 11.60% | 4.42% | 2.44% | 2.56% | 0.35% | 0.04% | 0.01% |
| Scenario 3                    | 29.09%                             | 25.78% | 11.84% | 9.05%  | 13.64% | 4.10% | 2.83% | 3.16% | 0.45% | 0.06% | 0.01% |
| Scenario 4                    | 21.04%                             | 27.89% | 11.21% | 10.02% | 17.49% | 4.08% | 3.58% | 4.08% | 0.54% | 0.05% | 0.01% |
| Scenario 5                    | 35.90%                             | 24.15% | 13.54% | 8.33%  | 9.47%  | 4.55% | 1.75% | 1.95% | 0.31% | 0.04% | 0.01% |
| Scenario 6                    | 40.91%                             | 21.54% | 11.69% | 7.68%  | 9.46%  | 4.39% | 1.85% | 2.09% | 0.33% | 0.04% | 0.01% |
| BASF, Toronto, Ontario Canada |                                    |        |        |        |        |       |       |       |       |       |       |
| Scenario 1                    | Detector Saturated at 0.3 µm range |        |        |        |        |       |       |       |       |       |       |
| Scenario 2                    | 43.71%                             | 20.76% | 10.89% | 7.13%  | 8.88%  | 3.39% | 2.50% | 2.45% | 0.25% | 0.02% | 0.00% |
| Scenario 3                    | 44.18%                             | 20.60% | 10.71% | 7.16%  | 9.01%  | 3.22% | 2.49% | 2.38% | 0.22% | 0.02% | 0.00% |

Table Note: <sup>1</sup>Particles  $\geq 7.5 \mu\text{m}$  accounted for  $< 0.000001\%$

# Discussion on Controls for Polymeric HDI

- High efficiency filters would be a viable control technology to reduce polymeric HDI emissions
- HEPA filters can achieve a capture efficiency of 99.97% for particles 0.3 microns or larger
- Spray booths equipped with HEPA filters are commercially available and it is possible to retrofit existing spray booths with HEPA filters
- **Implementing an effective control technology can increase the usage limit of products containing polymeric HDI even with existing parameters (e.g., emission rate)**

(Adopted March 4, 2005)(Amended June 4, 2021)

**RULE 1469.1      SPRAYING OPERATIONS USING COATINGS  
CONTAINING CHROMIUM**

- (a) Purpose  
The purpose of this rule is to reduce emissions of hexavalent chromium from spray coating and related operations.
- (b) Applicability  
This rule applies to an owner or operator conducting spraying of chromate coatings.
- (c) Definitions  
For the purpose of this rule the following definitions shall apply:
- (1) APPROVED CLEANING METHOD means cleaning using a wet mop, damp cloth, wet wash, low pressure spray nozzle, HEPA VACUUM, protective coverings, or other method as approved by the Executive Officer.
  - (2) APPROVED HEALTH RISK ASSESSMENT means a health risk assessment prepared p  
Executive Officer.
  - (3) BENCH SPRAY BOO  
enclosure area typically



# Polymeric HDI Assessment Summary

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- Polymeric HDI is a necessary compound in coatings
  - No alternative available
  - Reformulation anticipated to take many years
- Only emission rate available is based off the Ontario study
- Without additional measures, permitting difficulties with polymeric HDI are anticipated during the health risk assessment when calculating the acute hazard index
- Two pathways are available:
  - Conduct a more refined estimation of health risks when evaluating emissions using any of the HRA tiers
  - Install and implement add-on controls such as HEPA filters
- Impacts associated with the addition of polymeric HDI to PAR 1401 Table I will be evaluated and presented at a future public meeting

# Next Steps

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Conduct Public  
Workshop



Public Hearing  
scheduled in August

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