Clean Air Act Section 114 Survey Questions

For Chemical Manufacturers

(chemical manufacturing process units, elastomer product process units, polyether polyol manufacturing process units, and other affected facilities or sources subject to certain SOCMI related NESHAP and/or NSPS)

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**1.0 Facility Information**

1. Facility name.
2. Is the facility directly subject to:[[1]](#footnote-2)
   1. 40 CFR part 60, subpart III? (Yes/No)
   2. 40 CFR part 60, subpart NNN? (Yes/No)
   3. 40 CFR part 60, subpart RRR? (Yes/No)
   4. 40 CFR part 60, subpart VV? (Yes/No)
   5. 40 CFR part 60, subpart VVa? (Yes/No)
   6. 40 CFR part 63, subparts F, G, H, and/or I (i.e., the Hazardous Organic NESHAP)? (Yes/No). If Yes, please specify which subpart(s) apply (F, G, H, I)
      1. 40 CFR part 63, subpart F (Yes/No)
      2. 40 CFR part 63, subpart G (Yes/No)
      3. 40 CFR part 63, subpart H (Yes/No)
      4. 40 CFR part 63, subpart I (Yes/No)
   7. 40 CFR part 63, subpart U? (Yes/No)
   8. 40 CFR part 63, subpart PPP? (Yes/No)
3. Does your facility comply with the Consolidated Air Rule (40 CFR part 65 rules) as an option for any of the rules listed above? (Yes/No). If Yes, please specify which rules.
   1. 40 CFR part 65, subpart A (Yes/No)
   2. 40 CFR part 65, subpart C (Yes/No)
   3. 40 CFR part 65, subpart D (Yes/No)
   4. 40 CFR part 65, subpart E (Yes/No)
   5. 40 CFR part 65, subpart F (Yes/No)
   6. 40 CFR part 65, subpart G (Yes/No)
4. Is the facility a major source of HAP? (Yes/No)
5. Did the facility recently reclassify (or plan to reclassify in the future) as a minor source of HAP as a result of the rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act” (see 85 FR 73954)? (Yes, recently reclassified; Yes, plan to reclassify; No)
6. Facility address (physical location).
7. Facility location.
   1. Latitude coordinates (decimal degrees to five decimal places).
   2. Longitude coordinates (decimal degrees to five decimal places).
8. Facility mailing address (if different than physical address).
9. Dun and Bradstreet number (or DUNS) for your facility (if available).
10. Name of legal owner of facility.
    1. Physical address (physical location) of legal owner of facility.
    2. Mailing address (if different than physical address) of legal owner of facility.
11. Name of legal operator of facility, if different from legal owner.
    1. Physical address (physical location) of legal operator of facility.
    2. Mailing address (if different than physical address) of legal operator of facility.
12. Name and title of contact(s) able to answer questions about the completed survey.
    1. Contact(s) telephone number.
    2. Contact(s) e-mail address.
13. Are you part of a larger corporate entity or joint venture? (Yes/No)
    1. If the facility is operated under a joint partnership, provide the following for each partner:
       1. Partner name.
       2. Percent ownership.
       3. Number of employees (approximate number of employees including all subsidiaries, branches, and related establishments owned).
       4. Provide the 2017 annual revenue (dollars) for each partner.
    2. If the facility is operated under a larger corporate entity, provide the following:
       1. Name of parent company.
       2. Total number of employees for the parent company (approximate number of employees including all subsidiaries, branches, and related establishments owned).
       3. Provide the 2017 annual revenue (dollars) for the parent company.
       4. Select the statement that best applies:
          1. Facility is fully independent of parent company.
          2. Parent company provides some financial support.
          3. Facility and parent company are fully integrated.
14. Submit a copy of the current air permit(s) under which the facility is operating.
15. Submit a copy of any consent decree(s) and/or other specific air-related agreement(s) under which the facility is operating, if applicable.

**2.0 Emission Points and Control Devices Related to Process Units and Other SOCMI Operations**

**2.1 Process Units**

1. Provide a unique identifier for each chemical manufacturing process unit, elastomer product process unit, polyether polyol manufacturing process unit, and any other process unit at your facility that has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride. Where possible, use the identifier in the facility’s air permit. **THE IDS PROVIDED MUST BE USED THROUGHOUT THIS SURVEY.**
2. Identify whether the process unit is considered one or more of the following according to Federal regulations (select all that apply):
   1. “Chemical Manufacturing Process Unit” subject to 40 CFR part 63, subparts F through H and defined by 40 CFR 63.101.
   2. “Chemical Manufacturing Process Unit” as defined by 40 CFR 63.101 but meets the criteria specified in 40 CFR 63.100(l)(1)(iii).
   3. “Elastomer Product Process Unit” subject to 40 CFR part 63, subpart U and defined by 40 CFR 63.482.
   4. “Polyether Polyol Manufacturing Process Unit” subject to 40 CFR part 63, subpart PPP and defined by 40 CFR 63.1423.
   5. Other (specify).
3. For each process unit, identify the number of:
   1. “Air Oxidation Reactors” that are:
      1. Affected facilities subject to 40 CFR part 60, subpart III and defined by 40 CFR 60.611;
      2. Not subject to 40 CFR part 60, subpart III.
   2. “Distillation Units” that are:
      1. Affected facilities subject to 40 CFR part 60, subpart NNN and defined by 40 CFR 60.661;
      2. Not subject to 40 CFR part 60, subpart NNN.
   3. “Reactor Processes” that are:
      1. Affected facilities subject to 40 CFR part 60, subpart RRR and defined by 40 CFR 60.701;
      2. Not subject to 40 CFR part 60, subpart RRR.
4. For each process unit, identify:
   1. When construction commenced (Month/Day/Year).
   2. If applicable, when modified or reconstructed (Month/Day/Year).

**2.2 Air Pollution Control Devices**

1. Provide a unique identifier for each air pollution control device associated with each chemical manufacturing process unit, elastomer product process unit, polyether polyol manufacturing process unit, and any other process unit at your facility that has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride. Where possible, use the identifier in the facility’s air permit. **THE IDS USED MUST BE USED THROUGHOUT THIS SURVEY.**
2. For each air pollution control device, provide the following:
   1. Type of control device.
      1. Recuperative thermal oxidizer/incinerator.
      2. Regenerative thermal oxidizer/incinerator.
      3. Thermal oxidizer/incinerator.
      4. Catalytic oxidizer/incinerator.
      5. Boiler.
      6. Process heater.
      7. Flare.
      8. Scrubber (specify type).
      9. Condenser.
      10. Carbon adsorber.
      11. Cyclone (or multiple cyclones).
      12. Electrostatic precipitator.
      13. Fabric filter.
      14. Injection (specify type).
      15. Selective catalytic reduction (SCR).
      16. Selective non-catalytic reduction (SNCR).
      17. Other (provide a brief description).
   2. Year installed.
   3. Does it control HAP emissions from a (check all that apply):
      1. Process vent(s), including but not limited to, process vents from air oxidation reactors, distillation units, and/or reactor processes.
      2. Storage vessel(s).
      3. Transfer rack(s).
      4. Wastewater stream(s).
      5. Heat exchange system(s).
      6. Equipment leak(s).
      7. Pressure relief device(s).
      8. Other (specify).
3. Is the control device in operation at all times, including during startup and shutdown events? (Yes/No) If no, describe when the control device is activated (or deactivated) during startup (shutdown).
4. What is the control device efficiency (for HAP emissions)?
5. Is there any expected change in control device efficiency during startup and/or shutdown events? (Yes/No) If yes, explain the expected change in efficiency.
6. Is the vent gas flow rate to the control device typically higher, lower, or unchanged during startup and/or shutdown events?
7. Capital cost for control device (based on installation year).
8. Typical annual operating and maintenance cost for control device.

**2.3 Emission Points, Process Flow Diagrams, and Plot Plans**

1. Provide a unique identifier for each emission point associated with each chemical manufacturing process unit, elastomer product process unit, and polyether polyol manufacturing process unit. Also, provide a unique identifier for each emission point at your facility that is associated with other process units where the process unit(s) has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride. Where possible, use the identifier in the facility’s air permit. **THE IDS USED MUST BE USED THROUGHOUT THIS SURVEY.** [Note: the response to this question is considered complete when the response to question 2 of this sub-section is completed.]
2. Using the template provided to you, create a crosswalk between emission point IDs, process unit IDs, and control device IDs used in this survey. Create a new row for each combination, as necessary. **IMPORTANT: In addition to the emission point IDs, process unit IDs, and control device IDs used in this survey, the crosswalk must also include the “emission release point,” “emission unit,” and “process” IDs used in the 2017 National Emissions Inventory (your facility’s 2017 National Emissions Inventory is provided as a supplement to this survey) regardless of whether the survey IDs are the same or different than those IDs used in the inventory. This portion of the crosswalk is intended to help EPA connect responses to this survey to the specific emissions reported in the inventory.** As part of this crosswalk, indicate whether any CEMS is installed on an emission point stack:
   1. CO CEMS.
   2. NOx CEMS.
   3. O2 CEMS.
   4. PM CEMS.
   5. SO2 CEMS.
   6. THC CEMS.
   7. Other (specify).
3. Provide a complete process flow diagram (PFD) (or set of complete PFDs, if more appropriate) illustrating the connectivity (from feedstocks to products) between each emission point, process unit, and control device. Emission sources provided in the list below must be included on the PFD. Use a unique identifier for each emission source. Where possible, use the identifier in the facility’s air permit. **ALL ID’S DISPLAYED ON THE PFD MUST MATCH THE IDS USED THROUGHOUT THIS SURVEY**. The PFDs should clearly identify all emission point IDs, process unit IDs, and if applicable, the control device (including control device IDs) to which the emission source is routed.[[2]](#footnote-3)
   1. Air oxidation reactors.
   2. Distillation units.
   3. Reactor processes.
   4. Process vents.
   5. Atmospheric vents not considered to be a process vent under any rule mentioned in Section 1.0 of this survey.
   6. Storage vessels.
   7. Transfer racks.
   8. On-site wastewater collection and treatment systems.
   9. Discharges of wastewater to a collection system.
   10. Heat exchange systems (i.e., cooling towers, not individual heat exchangers).
4. Provide a copy of an existing plot plan for each chemical manufacturing process unit, elastomer product process unit, polyether polyol manufacturing process unit, and any other process unit at your facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride. Separate plot plans must be provided for each process unit (if your facility contains multiple). The plot plant should clearly indicate:
   1. The unique ID used for each process unit, consistent with the ID provided in the PFD.
   2. Each unique emission point ID indicating the location at which emissions from the process unit are released to the atmosphere; if controlled, this would be the stack associated with the control device.
5. Review the 2017 National Emissions Inventory for each emission point.
6. Provide all historical stack testing and sampling and analysis data test reports with available supporting documentation for all HAP (e.g., organic, inorganic, metals, etc.), VOC, and/or THC stack tests conducted from 2016 through 2020 for any emission point associated with an air oxidation reactor, distillation unit, reactor process, chemical manufacturing process unit, elastomer product process unit, polyether polyol manufacturing process unit, or any other process unit at the facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride.

**2.4 Production**

Provide the following for each chemical manufacturing process unit, elastomer product process unit, polyether polyol manufacturing process unit, and any other process unit at the facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride:

1. Provide a unique identifier for each chemical manufacturing process unit, elastomer product process unit, polyether polyol manufacturing process unit, and any other process unit at your facility that has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride. Where possible, use the identifier in the facility’s air permit. **THE IDS PROVIDED MUST BE USED THROUGHOUT THIS SURVEY.**
2. Primary product or primary intermediate product for years 2017, 2018, 2019, and 2020; and estimated percent consumed onsite. If applicable to the process unit, the primary product should be determined using procedures specified in 40 CFR 63.100(d), 40 CFR 63.480(f), or 40 CFR 63.1420(e).
3. Total capacity and actual production of the primary product or primary intermediate product for years 2017, 2018, 2019, and 2020 (tons per year). *{Capacity information should be based on the highest expected production of the primary product* *or primary intermediate product.}*
4. Provide the year that the process unit began production of the primary product or primary intermediate product and estimate the remaining useful economic life of the process unit.
5. Is the process unit designed and operated as flexible operation unit as described in either 40 CFR 63.101, 40 CFR 63.482, or 40 CFR 63.1423? If yes, list both the year and the primary product of the process unit for each year that the primary product changed since the process unit became subject to the rule, if applicable.

**3.0 Gas Streams**

**3.1 Process Vents (as defined by certain SOCMI related NESHAP and/or NSPS)**

For each process vent at your facility that is associated with a chemical manufacturing process unit, elastomer product process unit, or polyether polyol manufacturing process unit; and for each process vent at any other process unit at the facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride, provide the following:

1. A unique identifier for each process vent. Where possible, use the identifier in the facility’s air permit.
2. The unique identifier of the process unit(s) associated with the process vent. [Use the same ID(s) you used in Section 2.0 of this survey.] [Please separate each ID by a semi-colon.]
3. The emission point ID(s) associated with the process vent. [Use the same ID(s) you used in Section 2.0 of this survey.] [Please separate each ID by a semi-colon.]
4. Provide the total resource effectiveness (TRE) index value of each process vent based on the applicable Federal regulation. In a separate file, submit calculations (or assumptions, if applicable) that support each TRE value.
5. Select the definition that best describes each process vent: (select all that apply – e.g., NSPS vent stream may also be also subject to a NESHAP)
   1. Vent stream (as defined in 40 CFR 60.611).
   2. Vent stream (as defined in 40 CFR 60.661).
   3. Vent stream (as defined in 40 CFR 60.701).
   4. Batch process vent (as defined in 40 CFR 63.101 and 40 CFR 63.111).
   5. Group 1 process vent (as defined in 40 CFR 63.101 and 40 CFR 63.111).
   6. Group 2 process vent (as defined in 40 CFR 63.101 and 40 CFR 63.111).
   7. Group 1 batch front-end process vent (as defined in 40 CFR 63.482).
   8. Group 2 batch front-end process vent (as defined in 40 CFR 63.482).
   9. Aggregate batch vent stream (as defined in 40 CFR 63.482) that contains one or more Group 1 batch front-end process vents.
   10. Aggregate batch vent stream (as defined in 40 CFR 63.482) that contains only Group 2 batch front-end process vents.
   11. Group 1 continuous front-end process vent (as defined in 40 CFR 63.482).
   12. Group 2 continuous front-end process vent (as defined in 40 CFR 63.482).
   13. Group 1 combination of batch process vents (as defined in 40 CFR 63.1423).
   14. Group 2 combination of batch process vents (as defined in 40 CFR 63.1423).
   15. Group 1 continuous process vent (as defined in 40 CFR 63.1423).
   16. Group 2 continuous process vent (as defined in 40 CFR 63.1423).
   17. Other (specify).
6. Select the halogenated characteristic that best describes each process vent: (select all that apply – e.g., NSPS vent stream may also be subject to a NESHAP)
   1. Halogenated vent stream (as defined in 40 CFR 60.611).
   2. Halogenated vent stream (as defined in 40 CFR 60.661).
   3. Halogenated vent stream (as defined in 40 CFR 60.701).
   4. Halogenated vent stream (as defined in 40 CFR 63.111).
   5. Halogenated batch front-end process vent (as defined in 40 CFR 63.482).
   6. Halogenated continuous front-end process vent (as defined in 40 CFR 63.482).
   7. Halogenated aggregate batch vent stream (as defined in 40 CFR 63.482).
   8. None of the above.
7. Characterize the process vent as:
   1. Routine.
   2. Non-routine (e.g., malfunctions, emergencies).
8. Provide the specific citation(s) of the emissions standard(s) in the Federal regulation(s) that apply to each process vent. To help the responder understand how to answer this question, some examples of specific citations are included below:
   1. A vent stream (as defined in 40 CFR 60.611) may comply with the emissions standards specified in 40 CFR 60.612(a). [i.e., reduces emissions of TOC (minus methane and ethane) by 98 weight-percent, or to a TOC (minus methane and ethane) concentration of 20 ppmv on a dry basis corrected to 3 percent oxygen, whichever is less stringent]
   2. A Group 1 process vent (as defined in 40 CFR 63.101 and 40 CFR 63.111) may comply with the emissions standards specified in 40 CFR 63.113(a)(2) and (c)(1). [i.e., uses a combustion device to reduce emissions of total organic HAP by 98 weight-percent or to a concentration of 20 parts per million by volume, whichever is less stringent; AND the gas stream exiting the combustion device is conveyed to a halogen reduction device, such as a scrubber, before it is discharged to the atmosphere]
   3. A Group 2 process vent (as defined in 40 CFR 63.101 and 40 CFR 63.111) may comply with the TRE standard specified in 40 CFR 63.112(d). [i.e., the TRE for the process vent is greater than 1.0 but less than or equal to 4.0]
   4. A Group 1 continuous front-end process vent (as defined in 40 CFR 63.482) may comply with the emissions standards specified in 40 CFR 63.485(s). [i.e., routes emissions of organic HAP to an internal combustion engine]
   5. A Group 2 continuous process vent (as defined in 40 CFR 63.1423) may comply with the TRE standard specified in 40 CFR 1425(c)(4)(ii). [i.e., the TRE for the process vent is greater than 4.0]
   6. Non-routine, only subject to SSM related regulation.
9. If applicable, select whether the process vent complies with a “percent reduction” or “concentration” based standard. If neither, select “neither”.
10. Does the process vent ever operate “in ethylene oxide service”? (Yes/No) For purposes of this question, “in ethylene oxide service” means each batch and continuous process vent in a process that, when uncontrolled, contains a concentration of greater than or equal to 1 ppmv undiluted ethylene oxide, and when combined, the sum of all these process vents would emit uncontrolled ethylene oxide emissions greater than or equal to 5 lb/yr. If information exists that suggests ethylene oxide could be present in a batch or continuous process vent, then the batch or continuous process vent is considered to be “in ethylene oxide service” unless an analysis is performed as specified in §63.2492 to demonstrate that the batch or continuous process vent does not meet the definition of being “in ethylene oxide service”. Examples of information that could suggest ethylene oxide could be present in a batch or continuous process vent, include calculations based on safety data sheets, material balances, process stoichiometry, or previous test results provided the results are still relevant to the current operating conditions. If yes:
    1. Select which of the following best describes the type of production line the process vent is associated with:
       1. An ethylene oxide production line that uses a silver catalyst and air as the oxidant for the process.
       2. An ethylene oxide production line that uses a silver catalyst and pure oxygen as the oxidant for the process.
       3. A different type of ethylene oxide production line (specify).
       4. A production line where its primary purpose is not to produce ethylene oxide, but rather uses ethylene oxide as a reactant or intermediate to produce something else such as (select all that apply):
          1. Ethylene glycol.
          2. Ethylene glycol ethers.
          3. Ethanol amines.
          4. Ethoxylates.
          5. Diethylene glycol and triethylene glycol.
          6. Polyethylene glycols.
          7. Polyols.
          8. Other (specify).
       5. A production line where its primary purpose is not to produce ethylene oxide, but ethylene oxide is produced as a by-product.
    2. Briefly describe/characterize the process vent “in ethylene oxide service.” For example, the vent could be a re-absorber vent, regenerator vent, argon vent, poly kettle vent, or something else.
11. Is there a potential to emit metal HAP from the process vent? If yes:
    1. Identify each metal HAP that might be present in the vent stream, and briefly explain the origin of these emissions.
    2. Are these emissions included in your facility’s 2017 National Emissions Inventory? (Y/N) If no, you must update the inventory to include these emissions.
12. Information about non-Federal requirements and other actions:
    1. Cite any applicable State and Local air regulations. Although not required, you may provide (if available) any information about your specific air permit conditions that are used to comply with each State or Local air regulation.
    2. What other actions, if any, have your facility taken beyond those required by Federal, State, and Local regulation to specifically reduce or eliminate HAP emissions from the process vent (e.g., add-on control, improvements to add-on control, work practice or operational procedure, process change, or pollution prevention measures). Include in your description the affected HAP and reduction efficiency. Additionally, include any monitored parameters to ensure operation of the emission reduction technique, and the frequency at which monitoring is performed. Describe any ongoing parameter monitor quality assurance/control and the frequency that the parameter monitor quality assurance/control is performed.

**3.2 Atmospheric Vents (not considered to be a process vent under certain SOCMI related NESHAP and/or NSPS)**

The intent of this section is to collect information on continuous and noncontinuous gas streams that release to the atmosphere and are not required to be controlled, and are not regulated by or are exempted by, the rules mentioned in Section 1.0 of this survey. For example, this section is intended to cover atmospheric vents such as batch process vents associated with a chemical manufacturing process unit subject to 40 CFR part 63, subparts F through H and defined by 40 CFR 63.101, continuous gas streams that contains less than 0.005 weight percent total organic HAP at the point of discharge to the atmosphere, continuous gas streams that do not meet the criteria specified in §63.107(c) or (e), continuous gas streams exiting an analyzer, noncontinuous bleeder valves that operate and release to the atmosphere under low pressure, noncontinuous maintenance vents, and other vents. This section is not intended to collect information on Pressure Relief Devices (PRDs); specific questions regarding PRDs are in Section 3.3 of this survey.

For each atmospheric vent (not required to be controlled, and are not regulated by or are exempted by, the rules mentioned in Section 1.0 of this survey) at your facility that is associated with a chemical manufacturing process unit, elastomer product process unit, or polyether polyol manufacturing process unit; and for each atmospheric vent at any other process unit at the facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride, provide the following:

1. A unique identifier for each atmospheric vent. Where possible, use the identifier in the facility’s air permit.
2. The unique identifier of the process unit(s) associated with the atmospheric vent. [Use the same ID(s) you used in Section 2.0 of this survey.] [Please separate each ID by a semi-colon.]
3. The emission point ID(s) associated with the atmospheric vent. [Use the same ID(s) you used in Section 2.0 of this survey.] [Please separate each ID by a semi-colon.]
4. A brief description of the atmospheric vent that provides enough information for the EPA to understand why the vent is not required to be controlled by, is not regulated by, or is exempted by, the rules mentioned in Section 1.0 of this survey, including whether the vent is continuous or noncontinuous.
5. The composition of the gas stream at the point of discharge to the atmosphere as follows:
   1. Name and CAS number of each HAP (e.g., organic, inorganic, metals) in the gas stream.
   2. Weight % of each HAP in the gas stream.
   3. Weight % of each non-HAP component in the gas stream.
   4. Are these emissions included in your facility’s 2017 National Emissions Inventory? (Y/N) If no, you must update the inventory to include these emissions.
6. Provide the following characteristics of the atmospheric vent:
   1. Volumetric flowrate of the gas stream at a standard temperature of 20℃:
      1. Standard cubic meters per minute.
      2. Standard cubic meters per year.
      3. Include an explanation of the method used for these estimates:
         1. Previous test results provided the tests are representative of current operating practices at the process unit.
         2. Bench-scale or pilot-scale test data representative of the process under representative operating conditions.
         3. Maximum value specified or implied within a permit limit applicable to the atmospheric vent.
         4. Design analysis based on accepted chemical engineering principles, measurable process parameters, or physical or chemical laws or properties.
         5. Stack test.
         6. Continuous parameter monitoring system.
         7. Other (specify).
   2. Net heating value of the gas stream (megajoules per standard cubic meter). Include an explanation of the method used for this estimate:
      1. Previous test results provided the tests are representative of current operating practices at the process unit.
      2. Bench-scale or pilot-scale test data representative of the process under representative operating conditions.
      3. Maximum value specified or implied within a permit limit applicable to the atmospheric vent.
      4. Design analysis based on accepted chemical engineering principles, measurable process parameters, or physical or chemical laws or properties.
      5. Stack test.
      6. Continuous parameter monitoring system.
      7. Other (specify).
   3. Emission rate of Total Organic Compounds (TOC):
      1. Kilograms per hour (minus methane and ethane).
      2. Kilograms per year (minus methane and ethane).
      3. Include an explanation of the method used for these estimates:
         1. Engineering judgment.
         2. Material balance.
         3. Stack test.
         4. Continuous emission monitoring system.
         5. Manufacturer specification.
         6. EPA, state, or local agency emission factor.
         7. Other (specify).
   4. Emission rate of total organic HAP:
      1. Kilogram per hour.
      2. Kilogram per year.
      3. Include an explanation of the method used for these estimates:
         1. Engineering judgment.
         2. Material balance.
         3. Stack test.
         4. Continuous emission monitoring system.
         5. Manufacturer specification.
         6. EPA, state, or local agency emission factor.
         7. Other (specify).

**3.3 Pressure Relief Devices (PRDs)**

1. Number of PRDs in organic HAP service at your facility (as defined by 40 CFR 63.161, if applicable; as defined by 40 CFR 63.191, if applicable; or as defined by 40 CFR 63.1423, if applicable).
   1. Number of these PRDs that vent to atmosphere.
   2. Number of these PRDs that vent to control or back into process.
   3. For these PRDs that discharged to the atmosphere in the past 5 years (2016-2020).
      1. Provide total duration of each event using calendar timestamps.
      2. Provide reason for each event.
      3. Estimate the total amount (pounds) of VOC released to the atmosphere during each event. Include an explanation of the method used for this estimate:
         1. Engineering judgment.
         2. Material balance.
         3. Stack test.
         4. Continuous emission monitoring system.
         5. Manufacturer specification.
         6. EPA, state, or local agency emission factor.
         7. Other (specify).
      4. Estimate the total amount (pounds) of HAP released to the atmosphere during each event. Include an explanation of the method used for this estimate:
         1. Engineering judgment.
         2. Material balance.
         3. Stack test.
         4. Continuous emission monitoring system.
         5. Manufacturer specification.
         6. EPA, state, or local agency emission factor.
         7. Other (specify).
      5. During each event, was ethylene oxide released to the atmosphere? (Yes/No)
      6. If available, provide total amount (pounds) of each speciated HAP released to the atmosphere during each event, and the method used to determine these emissions.
2. Number of PRDs at your facility NOT defined by 40 CFR 63.161, 40 CFR 63.191, or 40 CFR 63.1423 (and in the comments field provide a list that generally describes/categorizes these PRDs; separate each description by a semi-colon).
   1. Number of these PRDs that vent to atmosphere.
   2. Number of these PRDs that vent to control or back into process.
   3. For these PRDs that discharged to the atmosphere in the past 5 years (2016-2020).
      1. Provide total duration of each event using calendar timestamps.
      2. Provide reason for each event.
      3. Estimate the total amount (pounds) of VOC released to the atmosphere during each event. Include an explanation of the method used for this estimate:
         1. Engineering judgment.
         2. Material balance.
         3. Stack test.
         4. Continuous emission monitoring system.
         5. Manufacturer specification.
         6. EPA, state, or local agency emission factor.
         7. Other (specify).
      4. Estimate the total amount (pounds) of HAP released to the atmosphere during each event. Include an explanation of the method used for this estimate:
         1. Engineering judgment.
         2. Material balance.
         3. Stack test.
         4. Continuous emission monitoring system.
         5. Manufacturer specification.
         6. EPA, state, or local agency emission factor.
         7. Other (specify).
      5. During each event, was ethylene oxide released to the atmosphere? (Yes/No)
      6. If available, provide total amount (pounds) of each speciated HAP released to the atmosphere during each event, and the method used to determine these emissions.
   4. Briefly explain if any of these PRDs are regulated by any Federal air regulation and provide the citation for the rule.
3. Is your facility subject to:
   1. The EPA’s Chemical Accident Prevention Provisions (40 CFR part 68)? (Yes/No) If yes:
      1. Select which prevention program your facility complies with:
         1. Program 1
         2. Program 2
         3. Program 3
      2. Submit all reports of risk management plan (RMP) reportable accidents that occurred in the last 5 years (2016 through 2020).
   2. The Occupational Safety and Health Administration’s (OSHA) Process Safety Management rule (29 CFR 1910.119)? (Yes/No)
4. Are you required to conduct root cause analysis and corrective action for certain PRD releases? If so, what rule requires you to do this?
5. Do you use a device(s) or a monitoring system that is capable of identifying releases from a PRD and recording the time and duration of each pressure release from a PRD? (Yes/No)
   1. If yes, what percentage of the number of PRDs in organic HAP service at your facility are equipped with this device(s)?
   2. Capital cost (optional). If provided, include contextual information to understand the capital cost (e.g., number of devices, types of equipment included in cost).
   3. Typical annual operating and maintenance cost (optional). If provided, include contextual information to understand this cost (e.g., number of devices, types of equipment included in cost).

**3.4 Catalyst Use**

If you use a catalyst in any operation at your facility that is associated with a chemical manufacturing process unit, elastomer product process unit, or polyether polyol manufacturing process unit; or if you use a catalyst in any operation at any other process unit at the facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride, and the handling and/or regeneration activities of the catalyst create any type of air pollution emissions to the atmosphere, answer the following questions:

1. Provide a unique identifier for the catalyst.
2. Provide a unique identifier of the process unit(s) that uses the catalyst. [Use the same ID(s) you used in Section 2.0 of this survey.] [Please separate each ID by a semi-colon.]
3. Briefly describe the composition (e.g., chemical makeup) of the catalyst.
4. Briefly describe the reason the catalyst is used.
5. If applicable, briefly describe how the catalyst is regenerated, including the frequency of this activity (cycles per year).
6. Are HAP emissions controlled or released directly to the atmosphere during the handling and/or regeneration activities of the catalyst? If controlled, briefly describe how HAP emissions are controlled.
7. Provide total amount (pounds) of each speciated HAP (e.g., organic, inorganic, metals, etc.) released to the atmosphere in the last 5 years (2016 through 2020) due to the handling and/or regeneration activities of the catalyst.
8. Basis for the emissions estimate.
9. Are these emissions (for 2017 only) included in your facility’s 2017 National Emissions Inventory? (Y/N) If no, you must update the inventory to include these emissions.

**4.0 Storage Vessels**

**4.1 Storage Vessel Characteristics and Design**

For each storage vessel at your facility that is associated with a chemical manufacturing process unit, elastomer product process unit, or polyether polyol manufacturing process unit; and for each storage vessel at any other process unit at the facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride, provide the following:

1. A unique identifier for each storage vessel. Where possible, use the identifier in the facility’s air permit.
2. The unique identifier of the process unit(s) associated with the storage vessel. [Use the same ID(s) you used in Section 2.0 of this survey.] [Please separate each ID by a semi-colon.]
3. The emission point ID(s) associated with the storage vessel. [Use the same ID(s) you used in Section 2.0 of this survey.] [Please separate each ID by a semi-colon.]
4. Information about non-Federal requirements and other actions:
   1. Cite any applicable State and Local air regulations. Although not required, you may provide (if available) any information about your specific air permit conditions that are used to comply with each State or Local air regulation.
   2. What other actions, if any, have your facility taken beyond those required by Federal, State, and Local regulation to specifically reduce or eliminate HAP emissions from the storage vessel (e.g., add-on control, improvements to add-on control, work practice or operational procedure, process change, or pollution prevention measures). Include in your description the affected HAP and reduction efficiency. Additionally, include any monitored parameters to ensure operation of the emission reduction technique, and the frequency at which monitoring is performed. Describe any ongoing parameter monitor quality assurance/control and the frequency that the parameter monitor quality assurance/control is performed.
5. Vessel design (select the option below that best fits) and answer whether the facility conducts uncontrolled inert purges on the storage vessel? (Y/N) If yes, briefly describe the situation an uncontrolled inert purge is used and how often.
   1. Fixed roof vessel vented to atmosphere.
   2. Fixed roof vessel vented to control device.
   3. Fixed roof vessel using vapor balancing.
   4. External floating roof.
   5. External floating roof with geodesic dome roof.
   6. Internal floating roof.
   7. Horizontal vessel (atmospheric or low pressure).
   8. High pressurized (>15 psig) sphere or bullet vessel.
   9. Other (specify).
6. Vessel operating pressure:
   1. Atmospheric.
   2. Low pressure (2.5 to 15 psig).
   3. High pressure (≥ 15 psig).
7. Select the NESHAP category that best describes each storage vessel:
   1. Table 5 to Subpart G of Part 63—Group 1 Storage Vessels at Existing Sources.
   2. Table 6 to Subpart G of Part 63—Group 1 Storage Vessels at New Sources.
   3. Neither Table 5 or 6 to Subpart G of Part 63, but considered Group 2 storage vessel under Subpart G of Part 63.
   4. Table 3 to Subpart U of Part 63—Group 1 Storage Vessels at Existing Affected Sources.
   5. Table 4 to Subpart U of Part 63—Group 1 Storage Vessels at New Sources.
   6. Neither Table 3 or 4 to Subpart U of Part 63, but considered Group 2 storage vessel under Subpart U of Part 63.
   7. Table 3 to Subpart PPP of Part 63—Group 1 Storage Vessels at Existing and New Affected Sources.
   8. Not Table 3 to Subpart PPP of Part 63, but considered Group 2 storage vessel under Subpart PPP of Part 63.
   9. None, does not meet any category described in the selections above.
8. Select the configuration that best describes how the storage vessel complies with the Federal air regulation(s) selected in previous question:
   1. Uses a fixed roof and an internal floating roof.
   2. Uses an external floating roof.
   3. Uses an external floating roof converted to an internal floating roof (i.e., fixed roof installed above external floating roof).
   4. Uses a closed vent system and control device (other than a flare).
   5. Uses a closed vent system and a flare.
   6. Routes emissions to a fuel gas system or to a process.
   7. Uses vapor balance.
   8. Group 2 storage vessel that is not part of an emissions average.
   9. Group 2 storage vessel that is part of an emissions average.
   10. Other (specify).
9. Vessel diameter (feet).
10. Vessel height (or length if horizontal) (feet).
11. Maximum liquid height (feet).
12. Vessel capacity (cubic feet).
13. Is the vessel heated? (Yes/No) If heated, specify target temperature (degrees Fahrenheit).
14. Is the vessel fully-insulated, partially-insulated, not-insulated?
15. Total throughput of all liquid stored in the vessel in 2017 (gallons).
16. Number of turnovers in vessel in 2017.
17. Identify how the vessel is filled:
    1. Submerged pipe.
    2. Splash loading.
    3. Bottom loading.
    4. Other (specify).
18. External shell color (choose best option):
    1. Aluminum/Specular.
    2. Aluminum/Diffuse.
    3. Aluminum/Mill finish, unpainted.
    4. Beige/Cream.
    5. Brown.
    6. Black.
    7. Gray/Light.
    8. Gray/Medium.
    9. Green/Dark.
    10. Red/Primer.
    11. Rust/Red Iron Oxide.
    12. Tan.
    13. White.
19. External shell paint condition (choose best option):
    1. New.
    2. Average.
    3. Aged.
20. For fixed roof vessels:
    1. Roof shape:
       1. Cone.
       2. Dome.
    2. Roof color (choose best option):
       1. Aluminum/Specular.
       2. Aluminum/Diffuse.
       3. Aluminum/Mill finish, unpainted.
       4. Beige/Cream.
       5. Brown.
       6. Black.
       7. Gray/Light.
       8. Gray/Medium.
       9. Green/Dark.
       10. Red/Primer.
       11. Rust/Red Iron Oxide.
       12. Tan.
       13. White.
    3. Roof paint condition (choose best option):
       1. New.
       2. Average.
       3. Aged.
    4. Is the roof vapor-tight? (Yes/No) [Enter "No" for bolted roofs or riveted roofs in which roof or shell plates are not vapor-tight.]
    5. Total number of vents on the vessel that are either open to the atmosphere or are designed to open to the atmosphere under low pressure. [This question is not intended to collect information on Pressure Relief Devices (PRDs); specific questions regarding PRDs are in Section 3.3 of this survey. For purposes of this question, a vent is considered any potential point of discharge (excluding releases due to fitting leaks, equipment leaks, and PRDs) from the vessel to the atmosphere, such as a conservation vent, eave vent, breather vent, or purge vent to the atmosphere, regardless of whether or not the vent is currently regulated by a rule.]
21. For floating roof vessels:
    1. Specify the number of deck fittings using the specific template provided with this survey.
    2. Select the most appropriate description of the vessel and floating roof rim seal type:
       1. Welded Tank, Mechanical Shoe Seal, Primary only.
       2. Welded Tank, Mechanical Shoe Seal, Shoe mounted Secondary.
       3. Welded Tank, Mechanical Shoe Seal, Rim-mounted secondary.
       4. Welded Tank, Liquid-mounted Seal, Primary Only.
       5. Welded Tank, Liquid-mounted Seal, Weather Shield.
       6. Welded Tank, Liquid-mounted Seal, Rim-mounted Secondary.
       7. Welded Tank, Vapor-Mounted Seal, Primary only (most common).
       8. Welded Tank, Vapor-Mounted Seal, Weather Shield.
       9. Welded Tank, Vapor-Mounted Seal, Rim-mounted secondary.
       10. Riveted Tank, Mechanical Shoe Seal, Primary only.
       11. Riveted Tank, Mechanical Shoe Seal, Shoe mounted Secondary.
       12. Riveted Tank, Mechanical Shoe Seal, Rim-mounted secondary.
    3. Are rim seals tight-fitting (≤ 1/8" gaps) or average?
    4. Is the deck welded or bolted?
    5. Total length of deck seams (feet).
    6. Number of 2017 roof landings.
    7. Number of times vessel was emptied in 2017 after roof landing.
    8. Minimum floor to roof height at shell when landed (feet).
    9. After the emptying operation is complete, describe the remaining liquid in the vessel:
       1. Full liquid heel [the remaining liquid covers the entire bottom of the vessel].
       2. Partial liquid heel [leaves a heel of liquid in or near the sump].
       3. Drain-dry [all of the standing liquid has been removed, including from the bottom of the sump].
    10. Internal floating roof only:
        1. If known, effective column diameter (inches).
        2. Total number of vents on the vessel that are either open to the atmosphere or are designed to open to the atmosphere under low pressure. [This question is not intended to collect information on Pressure Relief Devices (PRDs); specific questions regarding PRDs are in Section 3.3 of this survey. For purposes of this question, a vent is considered any potential point of discharge (excluding releases due to fitting leaks, equipment leaks, and PRDs) from the vessel to the atmosphere, such as a conservation vent, eave vent, breather vent, or purge vent to the atmosphere, regardless of whether or not the vent is currently regulated by a rule.]
    11. External floating roof only:
        1. Steel peripheral pontoon deck or steel double deck?
22. For vessels that use a closed vent system and a control device, specify the number of periods of planned routine maintenance of the control device in the past 7 years (2014-2020) during which the control device was unable to meet an otherwise applicable emission standard.
    1. Provide total duration of each event using calendar timestamps.
    2. Provide reason for each event.
23. Does the storage vessel ever operate “in ethylene oxide service”? (Yes/No) For purposes of this question, “in ethylene oxide service” means storage tanks of any capacity and vapor pressure storing a liquid that is at least 0.1 percent by weight of ethylene oxide. If knowledge exists that suggests ethylene oxide could be present in a storage tank, then the storage tank is considered to be “in ethylene oxide service” unless sampling and analysis is performed as specified in §63.2492 to demonstrate that the storage tank does not meet the definition of being “in ethylene oxide service”. Examples of information that could suggest ethylene oxide could be present in a storage tank, include calculations based on safety data sheets, material balances, process stoichiometry, or previous test results provided the results are still relevant to the current operating conditions.

**4.2 Materials Stored**

For each HAP-containing material stored in a storage vessel identified in section 4.1 of this survey, provide the following:

1. Specify the name(s) of the HAP-containing material stored in the vessel in 2017.
2. Specify the storage tank ID(s) storing the material in 2017.
3. Specify whether the material contains HAP listed on:
   1. Table 2 to Subpart F of Part 63? (Yes/No)
   2. Table 5 to Subpart U of Part 63? (Yes/No)
   3. Table 4 to Subpart PPP of Part 63? (Yes/No)
4. Material type, select the following that most closely characterizes the HAP-containing material that is stored:
   1. Raw material.
   2. Product.
   3. Intermediate.
5. Temperature of material when stored (degrees Fahrenheit).
6. Total vapor pressure of material when stored at storage temperature (kilopascals).
7. Maximum true vapor pressure of the total organic HAP in material when stored at storage temperature (kilopascals).
8. Composition of constituents in vessel:
   1. Average molecular weight of stored liquid (pounds per pound mole).
   2. Average molecular weight of vapor space (pounds per pound mole).
   3. Density of stored liquid (pounds per cubic feet).
   4. Density of vapor phase (pounds per cubic feet).
   5. Liquid phase:
      1. Name of each non-HAP constituent in stored liquid.
      2. Weight % of each non-HAP constituent in the stored liquid.
      3. Mole fraction of each non-HAP constituent in the stored liquid
      4. Name and CAS number of each HAP constituent in stored liquid.
      5. Weight % of each HAP constituent in the stored liquid.
      6. Mole fraction of each HAP constituent in the stored liquid.
   6. Vapor phase:
      1. Name of each non-HAP constituent in the vapor space.
      2. Weight % of each non-HAP constituent in the vapor space.
      3. Mole fraction of each non-HAP constituent in the vapor space.
      4. Name and CAS number of each HAP constituent in the vapor space.
      5. Weight % of each HAP constituent in the vapor space.
      6. Mole fraction of each HAP constituent in the vapor space.
   7. Basis for compositions:
      1. MSDS.
      2. Engineering judgement.
      3. Sampling. If sampling, specify method used.
      4. Other (specify).

**4.3 Degassing**

For each storage vessel identified in section 4.1 of this survey that has been degassed *{Degassing is the removal and displacement of vapors from the storage vessel using fresh air or nitrogen, usually done for cleaning, maintenance, inspection, and repair.}*, provide the following:

1. For the last degassing event:
   1. Date of event (calendar year).
   2. Was the vessel cleaned during the last gassing event? (Yes/No)
   3. Control used during the event:
      1. None, vessel vented to atmosphere.
      2. Portable internal combustion engine.
      3. Portable thermal oxidizer.
      4. Portable condensation system.
      5. Portable flare.
      6. Permanent onsite control device (provide control device ID).
      7. Other (specify).
2. Date of the next expected degassing event (calendar year).
3. Cite all State and Local air regulations that apply to degassing events. Although not required as part of this question, you may provide (if available) any information about your specific air permit conditions that are used to comply with each State or Local air regulation.
4. If not already specified in the State and Local air regulation, provide a description of the criteria, if any, that is used before degassing a storage vessel (e.g., vent streams ≤10-percent of the LEL, vent streams ≤ 5 psig, no more than 50 lb of air contaminant allowed to be released to the atmosphere).

**4.4 Other storage vessels**

If your facility is subject to 40 CFR 63, subpart F, then for each storage vessel (if any) at your facility that is not assigned to a chemical manufacturing process unit based on the provisions specified at 40 CFR 63.100(g)(3)(i) and (ii), provide the following: [these would be storage vessels you did not include in your answers to questions in section 4.1.]

1. A unique identifier for each storage vessel. Where possible, use the identifier in the facility’s air permit
2. Is HAP-containing material stored in the vessel? (Yes/No)
3. Vessel diameter (feet).
4. Vessel height (or length if horizontal) (feet).
5. Vessel capacity (cubic feet).
6. Cite all Federal air regulations that apply to the storage vessel. [Please separate each regulation by a semi-colon.]
7. Cite all State and Local air regulations that apply to the storage vessel. Although not required as part of this question, you may provide (if available) any information about your specific air permit conditions that are used to comply with each State or Local air regulation. [Please separate each regulation by a semi-colon.]
8. Total amount of VOC and HAP emissions released from the storage vessel in 2017 (lbs) and provide the method used to determine these emissions.

**5.0 Transfer Racks**

**5.1 Regulations**

1. Provide a unique identifier for each transfer rack at your facility that is associated with a chemical manufacturing process unit, elastomer product process unit, or polyether polyol manufacturing process unit; and for each transfer rack that is associated with any other process unit at the facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride. Where possible, use the identifier in the facility’s air permit. [For the purposes of this survey, a transfer rack means the system used to load organic liquids into tank trucks and railcars at a single geographic site. It includes all loading arms, pumps, meters, shutoff valves, relief valves, and other piping and equipment necessary for the transfer operation. Transfer equipment that are physically separate (i.e., do not share common piping, valves, and other equipment) are considered to be separate transfer racks.]
2. The unique identifier of the process unit(s) associated with the transfer rack. [Use the same ID(s) you used in Section 2.0 of this survey.] [Please separate each ID by a semi-colon.]
3. The emission point ID(s) associated with the transfer rack. [Use the same ID(s) you used in Section 2.0 of this survey.] [Please separate each ID by a semi-colon.]
4. Select the Federal air regulations that apply to each transfer rack (select all that apply):
   1. 40 CFR part 63, subparts F through I (i.e., the Hazardous Organic NESHAP). If you select this option, then also:
      1. Specify if the transfer rack meets the description specified in 40 CFR 63.100(f)(9) such that it only transfer liquids containing organic HAP as impurities.
      2. Specify if the transfer rack meets the description specified in 40 CFR 63.100(f)(10) such that it vapor balances during all loading operations.
      3. If the transfer rack does not meet the description specified in 40 CFR 63.100(f)(9) or (10), then:
         1. Specify the 2017 rack weighted average HAP partial pressure of the transfer rack.
         2. Submit all 2017 analyses required by 40 CFR 63.130(e).
         3. Specify whether the transfer rack has halogenated emission streams? (Yes/No) If yes, then select the compliance option being used:
            1. 40 CFR 63.126(d)(1)(i).
            2. 40 CFR 63.126(d)(1)(ii).
            3. 40 CFR 63.126(d)(2).
   2. 40 CFR part 63, subpart PPP. If you select this option, then also specify whether the transfer rack:
      1. Meets the description specified in 40 CFR 63.1420(c)(10) as it only transfer liquids containing HAP as impurities.
      2. Meets the description specified in 40 CFR 63.1420(c)(11) as it vapor balances during all loading operations.
   3. Other (specify).
   4. None.
5. Select the configuration (all that apply) that best describes how the transfer rack complies with Federal air regulation(s) (if a Federal air regulation applies):
   1. Routes emissions to a fuel gas system.
   2. Routes emissions to a process.
   3. Routes emissions through a closed-vent system to a non-flare control device.
   4. Routes emissions through a closed-vent system to a flare.
   5. Routes emissions through a vapor collection system (as defined in 40 CFR 63.111) to a non-flare control device. (if Yes, then provide a description of the control device in the comments field)
   6. Routes emissions through a vapor collection system (as defined in 40 CFR 63.111) to a flare.
   7. Uses submerged loading.
   8. Uses bottom loading.
   9. Uses vapor balance used during all loading operations at this loading rack.
   10. Group 2 transfer rack.
   11. Other (specify).
6. Information about non-Federal requirements and other actions:
7. Cite all State and Local air regulations that apply to the transfer rack. Although not required as part of this question, you may provide (if available) any information about your specific air permit conditions that are used to comply with each State or Local air regulation.
8. What other actions, if any, have your facility taken beyond those required by Federal, State, and Local regulation to specifically reduce or eliminate HAP emissions from the transfer rack (e.g., add-on control, improvements to add-on control, work practice or operational procedure, process change, or pollution prevention measures). Include in your description the affected HAP and reduction efficiency. Additionally, include any monitored parameters to ensure operation of the emission reduction technique, and the frequency at which monitoring is performed. Describe any ongoing parameter monitor quality assurance/control and the frequency that the parameter monitor quality assurance/control is performed.

**5.2 Transfer Rack Design**

For each transfer rack identified in section 5.1 of this survey, provide the following:

1. Transfer rack services (select all that apply):
2. Tank/tank truck loading.
3. Rail car loading.
4. Number of loading arms and/or hoses at transfer rack.
5. Maximum throughput capacity of transfer rack (gallons per day).
6. Does the transfer rack only transfer liquids containing HAP as impurities? (Yes/No)
7. Specify the total number of hours in 2017 HAP-containing material (exclude material containing HAP only as impurities) was loaded into tank trucks and railcars using the transfer rack.
8. Does the transfer rack ever operate “in ethylene oxide service”? (Yes/No) For purposes of this question, “in ethylene oxide service” means racks that transfer any liquid that is at least 0.1 percent by weight of ethylene oxide.

**5.3 Materials Transferred**

For each HAP-containing material that is loaded into tank trucks or railcars in 2017 using a transfer rack identified in section 5.1 of this survey:

1. Specify the name of the material of the HAP-containing material that is loaded.
2. Specify the transfer rack(s) used to load the specific material. [Use the same transfer rack IDs used in Section 5.1 of this survey.] [Please separate each ID by a semi-colon.]
3. Specify the 2017 throughput of the specific material through each transfer rack used in 2017 (gallons per day).
4. Did you answer the “material stored” questions about this material in Section 4.2 of this survey? (Yes/No)
   1. If yes, you must use the same material name that you used to respond to Section 4.0 of this survey to respond to question 1 of this section, and then you do not have to answer any other questions in this section.
   2. If no, you must continue to answer all other questions in this section.
5. Specify whether the material contains HAP listed on:
6. Table 2 to Subpart F of Part 63? (Yes/No)
7. Table 5 to Subpart U of Part 63? (Yes/No)
8. Table 4 to Subpart PPP of Part 63? (Yes/No)
9. Material type, select the following that most closely characterizes the HAP-containing material that is stored:
10. Raw material.
11. Product.
12. Intermediate.
13. Temperature of material when loaded (degrees Fahrenheit).
14. Total vapor pressure of material when loaded at average loading temperature (kilopascals).
15. Maximum true vapor pressure of the total organic HAP in material when loaded at average loading temperature (kilopascals).
16. Composition of constituents:
17. Average molecular weight of liquid (pounds per pound mole).
18. Average molecular weight of vapor space (pounds per pound mole).
19. Density of liquid (pounds per cubic feet).
20. Density of vapor phase (pounds per cubic feet).
21. Liquid phase:
22. Name of each non-HAP constituent in liquid.
23. Weight % of each non-HAP constituent in the liquid.
24. Mole fraction of each non-HAP constituent in the liquid
25. Name and CAS number of each HAP constituent in liquid.
26. Weight % of each HAP constituent in the liquid.
27. Mole fraction of each HAP constituent in the liquid.
28. Vapor phase:
29. Name of each non-HAP constituent in the vapor space.
30. Weight % of each non-HAP constituent in the vapor space.
31. Mole fraction of each non-HAP constituent in the vapor space.
32. Name and CAS number of each HAP constituent in the vapor space.
33. Weight % of each HAP constituent in the vapor space.
34. Mole fraction of each HAP constituent in the vapor space.
35. Basis for compositions:
36. MSDS.
37. Engineering judgement.
38. Sampling. If sampling, specify method used.
39. Other (specify).

**6.0 Wastewater**

**6.1 Wastewater Regulations and Other Details**

1. Provide a unique identifier for each wastewater stream at your facility (no matter whether the wastewater stream is regulated by a Federal air regulation or not) that is associated with a chemical manufacturing process unit, elastomer product process unit, or polyether polyol manufacturing process unit; and for each wastewater stream that is associated with any other process unit at the facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride. Where possible, use the identifier in the facility’s air permit.
2. The unique identifier of the process unit(s) associated with the wastewater stream. [Use the same ID(s) you used in Section 2.0 of this survey.] [Please separate each ID by a semi-colon.]
3. The emission point ID(s) associated with the wastewater stream. [Use the same ID(s) you used in Section 2.0 of this survey.] [Please separate each ID by a semi-colon.]
4. Select the Federal air regulations that apply to each wastewater stream (select all that apply):
5. 40 CFR part 63, subparts F through I (i.e., the Hazardous Organic NESHAP).
6. 40 CFR part 63, subpart U.
7. 40 CFR part 63, subpart PPP.
8. Other (specify).
9. None.
10. Information about non-Federal requirements and other actions:
    1. Cite all State and Local air regulations that apply to the wastewater stream. Although not required as part of this question, you may provide (if available) any information about your specific air permit conditions that are used to comply with each State or Local air regulation.
    2. What other actions, if any, have your facility taken beyond those required by Federal, State, and Local regulation to specifically reduce or eliminate HAP emissions from the wastewater stream (e.g., add-on control, improvements to add-on control, work practice or operational procedure, process change, or pollution prevention measures). Include in your description the affected HAP and reduction efficiency. Additionally, include any monitored parameters to ensure operation of the emission reduction technique, and the frequency at which monitoring is performed. Describe any ongoing parameter monitor quality assurance/control and the frequency that the parameter monitor quality assurance/control is performed.
11. Select the configuration that best describes how the wastewater stream complies with Federal air regulation(s) (select the first option if a Federal air regulation does not apply):
    1. Federal air regulation does not apply to this wastewater stream. If you select this answer, then provide the following additional information:
       1. Flow rate (liters per minute):
          1. Average.
          2. Maximum.
          3. Basis for determining flow rate values.
          4. Briefly describe the point measurement:
             1. point of determination.
             2. downstream of the point of determination.
             3. other (specify).
       2. Flow-weighted annual average total HAP concentration (parts per million by weight):
          1. Minimum.
          2. Maximum.
          3. Average.
          4. Basis for determining flow-weighted annual average concentrations.
          5. Briefly describe the point of measurement:
             1. point of determination.
             2. downstream of the point of determination.
             3. other (specify).
       3. Name and CAS number of each HAP in the wastewater stream.
       4. Concentration (ppmw) of each HAP in the wastewater stream.
       5. Specify control technology, and/or management or work practices used (if any) to reduce HAP emissions from the wastewater stream, including whether the wastewater stream complies with Group 1 control requirements.
    2. Group 2 wastewater stream. If you select this answer, then provide the following additional information:
       1. Flow rate (liters per minute):
          1. Average.
          2. Maximum.
          3. Basis for determining flow rate values.
          4. Briefly describe the point of measurement:
             1. point of determination.
             2. downstream of the point of determination.
             3. other (specify).
       2. Flow-weighted annual average total HAP concentration (parts per million by weight):
          1. Minimum.
          2. Maximum.
          3. Average.
          4. Basis for determining flow-weighted annual average concentrations.
          5. Briefly describe the point of measurement:
             1. point of determination.
             2. downstream of the point of determination.
             3. other (specify).
       3. Name and CAS number of each HAP in the wastewater stream.
       4. Concentration (ppmw) of each HAP in the wastewater stream.
       5. Specify control technology, and/or management or work practices used (if any) to reduce HAP emissions from the wastewater stream, including whether the wastewater stream complies with Group 1 control requirements.
    3. Maintenance wastewater stream. If you select this answer, then provide the following additional information:
       1. Flow rate (liters per minute):
          1. Average.
          2. Maximum.
          3. Basis for determining flow rate values.
          4. Briefly describe the point of measurement:
             1. point of determination.
             2. downstream of the point of determination.
             3. other (specify).
       2. Flow-weighted annual average total HAP concentration (parts per million by weight):
          1. Minimum.
          2. Maximum.
          3. Average.
          4. Basis for determining flow-weighted annual average concentrations.
          5. Briefly describe the point of measurement:
             1. point of determination.
             2. downstream of the point of determination.
             3. other (specify).
       3. Name and CAS number of each HAP in the wastewater stream.
       4. Concentration (ppmw) of each HAP in the wastewater stream.
       5. Specify control technology, and/or management or work practices used (if any) to reduce HAP emissions from the wastewater stream, including whether the wastewater stream complies with Group 1 control requirements.
    4. Reduces, by removal or destruction, the total concentration of regulated HAP to a level less than 50 ppmw.
    5. Reduces, by removal or destruction, individual regulated HAP to a level less than 10 ppmw.
    6. Uses a design steam stripper which meets the design criteria specified in §63.138(d).
    7. Uses a waste management unit or treatment process to reduce by at least 99 percent, by removal or destruction, the total mass flow rate of regulated HAP.
    8. Uses a waste management unit or treatment process to reduce, by removal or destruction, the mass flow rate of each regulated HAP by at least the fraction removed (Fr) values specified by the regulation.
    9. Uses a waste management unit or treatment process to achieve the required mass removal (RMR) of regulated HAP specified by the regulation.
    10. Uses a biological treatment unit that achieves a RMR of at least 95 percent for all regulated HAP as specified by the regulation.
    11. Treats the wastewater or residual in a permitted RCRA hazardous waste incinerator, a RCRA permitted process heater or boiler, or discharges it to a properly permitted underground injection well.
    12. Uses a 1 megagram per year total source mass flow rate exemption option.
    13. Discharges to onsite or offsite wastewater treatment or hazardous waste treatment.
    14. Uses a decanter, steam stripper, thin film evaporator, or distillation unit to separate the water phase from the organic phase(s).
    15. Hard pipes the entire wastewater stream to onsite treatment as a hazardous waste, or hard pipes the entire wastewater stream to a point of transfer to onsite or offsite hazardous waste treatment.
    16. Other (specify).
12. Does the wastewater stream ever operate “in ethylene oxide service”? (Yes/No) For purposes of this question, “in ethylene oxide service” means the wastewater contains at least 0.1 percent by weight of ethylene oxide.
13. Does the wastewater stream immediately discharge to closed collection prior to any treatment? (Y/N) If no, briefly describe the discharge location.

**6.2 Wastewater Management Units**

For each on-site wastewater management unit at your facility that is associated with a chemical manufacturing process unit, elastomer product process unit, or polyether polyol manufacturing process unit; and for each on-site wastewater management unit that is associated with any other process unit at the facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride, provide the following:

1. A unique identifier for the on-site wastewater management unit.
2. Briefly describe the on-site wastewater management unit (Examples of waste management units include: Wastewater tanks, surface impoundments, individual drain systems, and biological wastewater treatment units. Examples of equipment that may be waste management units include containers, air flotation units, oil-water separators or organic-water separators, or organic removal devices such as decanters, strippers, or thin-film evaporation units.)
3. The wastewater stream(s) associated with the wastewater management unit. [Use the same ID(s) you used in Section 6.1 of this survey.] [Please separate each ID by a semi-colon.]
4. A unique identifier for each individual drain system (as defined in 40 CFR 63.111). Where possible, use the identifier in the facility’s air permit. For each individual drain system:
   1. Is the individual drain system controlled using a cover, and not vented? (Yes/No)
   2. Is the individual drain system controlled using a cover, and vented to a process? (Yes/No)
   3. Is the individual drain system controlled using a cover, and vented through a closed vent system to a control device? (Yes/No)
   4. Is the individual drain system controlled using water seal controls or a tightly fitting cap or plug for drains, tightly fitting solid covers for junction boxes, and covers or enclosures for sewer lines? (Yes/No)
5. A unique identifier for each wastewater tank (as defined in 40 CFR 63.111). Where possible, use the identifier in the facility’s air permit. For each wastewater tank:
   1. Is the wastewater tank controlled using a fixed roof? (Yes/No)
   2. Is the wastewater tank being controlled using a fixed roof and a closed-vent system routed to a control device? (Yes/No)
   3. Is the wastewater tank controlled using an external floating roof? (Yes/No)
   4. Is the wastewater tank controlled using a fixed roof with an internal floating roof? (Yes/No)
   5. Is the wastewater tank controlled using something else? (Yes/No, if Yes specify)
6. A unique identifier for each surface impoundment (as defined in 40 CFR 63.111). Where possible, use the identifier in the facility’s air permit. For each surface impoundment:
7. Briefly describe the surface impoundment (including size and type).
8. Is the surface impoundment controlled using a cover with a closed-vent system that routes to a control device? (Yes/No)
9. Is the surface impoundment controlled using a floating flexible membrane cover? (Yes/No)
10. A unique identifier for each oil-water separator (as defined in 40 CFR 63.111). Where possible, use the identifier in the facility’s air permit. For each oil-water separator:
11. Is the oil-water separator controlled using a fixed roof and a closed vent system routed to a control device? (Yes/No)
12. Is the oil-water separator controlled using a floating roof? (Yes/No)
13. Is the oil-water separator controlled using something else? (Yes/No, if Yes specify)
14. For each waste management unit or treatment process complying with 40 CFR 63.138(f) [i.e., you use the waste management unit or treatment process to achieve the RMR of regulated HAP specified by the regulation. Compliance is determined using 145(e) or (f) depending on the type of treatment process used.]:
15. List each Table 8 or Table 9 compound entering the waste management unit or treatment process. [Please separate each compound by a semi-colon.]
16. Select whether you are using:
    * 1. A nonbiological treatment process.
      2. Aerobic biological treatment process.
      3. Closed anaerobic biological treatment process.
      4. Open biological treatment process.
17. If using a biological treatment process, does the process meet the definition of “enhanced biological treatment process” in 40 CFR 63.111? (Y/N) If yes:
18. List all HAPs that are part of the aggregate of all wastewater streams using the “enhanced biological treatment process”.
19. Does the aggregate of all wastewater streams using the “enhanced biological treatment process” contain at least 99 percent by weight of compounds on list 1 of table 36 to 40 CFR 63, subpart G? (Y/N)
20. For each biological treatment unit complying with 40 CFR 63.138(g) [i.e., you use a biological treatment unit that achieves a RMR of at least 95 percent for all regulated HAP as specified by the regulation. Compliance is determined using 145(e) or (g) depending on whether the biological treatment process is aerobic or anaerobic.]:
21. Are any of the wastewater streams already in compliance with 138(b)(1), (c)(1), (d), (e), (f), or (h)? (Y/N) If Yes:
    * 1. Specify each wastewater stream and which provision the wastewater stream is already in compliance with.
      2. The total HAP mass flow rate (lb/hr) of each wastewater stream (i.e., the amount of HAP from the wastewater stream that is not required to be included in the total mass flow rate entering the biological treatment unit for the purpose of demonstrating compliance).
22. List each Table 8 or Table 9 compound entering the biological treatment unit [Please separate each compound by a semi-colon.]
23. Select whether you are using:
    * 1. Open biological treatment process.
      2. Closed aerobic biological treatment process.
      3. Closed anaerobic biological treatment process.
24. If using a biological treatment process, does the process meet the definition of “enhanced biological treatment process” in 40 CFR 63.111? (Y/N) If yes:
    * 1. List all HAPs that are part of the aggregate of all wastewater streams using the “enhanced biological treatment process”.
      2. Does the aggregate of all wastewater streams using the “enhanced biological treatment process” contain at least 99 percent by weight of compounds on list 1 of table 36 to 40 CFR 63, subpart G? (Y/N)

**7.0 Heat Exchange Systems**

**7.1 Heat Exchange System Details**

For each heat exchange system at your facility that is associated with a chemical manufacturing process unit, elastomer product process unit, or polyether polyol manufacturing process unit; and for each heat exchange system at any other process unit at the facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride, provide the following:

1. Provide a unique identifier for each heat exchange system. Where possible, use the identifier in the facility’s air permit.
2. The unique identifier of the process unit(s) associated with the heat exchange system. [Use the same ID(s) you used in Section 2.0 of this survey.] [Please separate each ID by a semi-colon.]
3. The emission point ID(s) associated with the heat exchange system. [Use the same ID(s) you used in Section 2.0 of this survey.] [Please separate each ID by a semi-colon.]
4. Heat exchange system design:
   1. Once-through cooling water system.
   2. Natural draft cooling tower.
   3. Induced draft (fans at outlet) cooling tower.
   4. Forced draft (fans for inlet air) cooling tower.
   5. Other (specify).
5. Cooling water recirculation rate for cooling tower systems or discharge rate for once-through systems (gallons per minute).
6. Does the heat exchange system meet the requirements for exemption listed in:
7. §63.104(a)(1)? (Yes/No)
8. §63.104(a)(2)? (Yes/No)
9. §63.104(a)(3)? (Yes/No)
10. §63.104(a)(4)? (Yes/No)
11. §63.104(a)(5)? (Yes/No)
12. §63.104(a)(6)? (Yes/No)
13. Provide the total number of heat exchangers serviced by the heat exchange system (including heat exchangers servicing all manufacturing processes at your facility if they share the heat exchange system that services chemical manufacturing process units, elastomer product process units, and/or polyether polyol manufacturing process units).
14. Provide the total number of heat exchangers serviced by the heat exchange system that services:
15. Chemical manufacturing process units subject to 40 CFR part 63, subparts F through H.
16. Elastomer product process units subject to 40 CFR part 63, subpart U.
17. Polyether polyol manufacturing process units subject to 40 CFR part 63, subpart PPP.
18. Does other water and/or waste sources from any operations at the facility get disposed of through (or injected into) the heat exchange system? (Yes/No) If yes:
19. Describe where the other water and/or waste sources come from (if possible, use the same terminology used on the PFDs submitted with this survey).
20. Is the flow intermittent or continuous?
    * 1. If intermittent, estimate how many gallons per month?
      2. If continuous, estimate how many gallons per minute?
21. Is there a potential for HAP to be in this other water and/or waste source? (Yes/No) If yes, provide worst case speciated HAP (name and CAS number) flow-weighted annual average concentrations, or the annual arithmetic average concentrations (parts per million by weight) and the basis for determining the values.
22. Does the heat exchange system ever operate “in ethylene oxide service”? (Yes/No) For purposes of this question, “in ethylene oxide service” means heat exchange systems that contain any liquid that is at least 0.1 percent by weight of ethylene oxide.

**7.2 NPDES**

For each once-through cooling water system identified in section 7.1 of this survey, provide the following:

1. Description of the outfall point (discharge point) of the cooling water.
2. Is the outfall point (discharge point) shared with other outfalls from the facility (e.g., wastewater treatment outfall or stormwater outfall)? (Yes/No) If yes, provide a description of these outfalls.
3. Is the heat exchanger subject to a National Pollutant Discharge Elimination System (NPDES) permit? (Yes/No) If yes:
   1. Do either of the following apply? [§63.104(a)(3)]
      1. Allowable discharge of 1 part per million by volume or less above influent concentration? (Yes/No)
      2. Allowable discharge of 10 percent or less above influent concentration? (Yes/No)
   2. Does the permit require monitoring for detection of leaks of process fluid into cooling water? (Yes/No) If yes, select all that apply: [§63.104(a)(4)]
      1. Permit specifies normal range of the parameter or condition.
      2. Permit requires quarterly or more frequent monitoring.
      3. Permit requires reporting and correction of leaks.
   3. Submit a copy of the NPDES permit.

**7.3 Additives**

For each heat exchange system identified in section 7.1 of this survey, provide the following:

1. Are any gas/chemical additives injected in cooling water? (Yes/No) If yes:
   1. List the name and CAS number of any HAP contained in the additives.
   2. Provide the addition rate and units (e.g., lb/min, lb/gal cooling water) of each HAP because of additives injected in cooling water.

**7.4 Regulations**

For each heat exchange system identified in section 7.1 of this survey, provide the following:

1. Information about non-Federal requirements and other actions:
   1. Cite all State and Local air regulations that apply to the heat exchange system. Although not required as part of this question, you may provide (if available) any information about your specific air permit conditions that are used to comply with each State or Local air regulation.
   2. What other actions, if any, have your facility taken beyond those required by Federal, State, and Local regulation to specifically reduce or eliminate HAP emissions from the heat exchange system (e.g., add-on control, improvements to add-on control, work practice or operational procedure, process change, or pollution prevention measures). Include in your description the affected HAP and reduction efficiency. Additionally, include any monitored parameters to ensure operation of the emission reduction technique, and the frequency at which monitoring is performed. Describe any ongoing parameter monitor quality assurance/control and the frequency that the parameter monitor quality assurance/control is performed.
2. Select the Federal air regulations that apply to each heat exchange system (select the option that best fits):
   1. 40 CFR 63.104. (Yes/No)
   2. 40 CFR 63.104 via 40 CFR 63.502(b). (Yes/No)
   3. 40 CFR 63.104 via 40 CFR 63.1435. (Yes/No)
   4. 40 CFR 63.104 via 40 CFR 63.11499. (Yes/No)
   5. Other (specify).
   6. None.
3. Select the monitoring option according to 40 CFR 63.104(b) that the facility has chosen for detecting leaks in each heat exchange system:
4. Monitor for leaks by entire heat exchange system.
   * 1. Current frequency of monitoring:
        1. Hourly.
        2. Daily.
        3. Weekly.
        4. Monthly.
        5. Quarterly.
        6. Annually.
        7. Other (specify).
     2. If not using a surrogate indicator of leaks, describe the method used to determine the concentration of the monitored substance in the cooling water (i.e., any EPA-approved method listed in 40 CFR 136 as long as the method is sensitive to concentrations as low as 10 parts per million and the same method is used for both entrance and exit samples. Alternative methods may be used upon approval by the Administrator.).
5. Monitor for leaks by a combination of heat exchangers.
6. Current frequency of monitoring:
   * + 1. Hourly.
       2. Daily.
       3. Weekly.
       4. Monthly.
       5. Quarterly.
       6. Annually.
       7. Other (specify).
7. If not using a surrogate indicator of leaks, describe the method used to determine the concentration of the monitored substance in the cooling water (i.e., any EPA-approved method listed in 40 CFR 136 as long as the method is sensitive to concentrations as low as 10 parts per million and the same method is used for both entrance and exit samples. Alternative methods may be used upon approval by the Administrator.).
8. Identify each group of heat exchangers and provide the number of heat exchangers in each group.
9. Monitor for leaks by sampling at the inlet and outlet of each heat exchanger.
10. Current frequency of monitoring:
11. Hourly.
12. Daily.
13. Weekly.
14. Monthly.
15. Quarterly.
16. Annually.
17. Other (specify).
18. If not using a surrogate indicator of leaks, describe the method used to determine the concentration of the monitored substance in the cooling water (i.e., any EPA-approved method listed in 40 CFR 136 as long as the method is sensitive to concentrations as low as 10 parts per million and the same method is used for both entrance and exit samples. Alternative methods may be used upon approval by the Administrator.).
19. Identify each heat exchanger.
20. Monitor for leaks using a surrogate indicator of leaks.
21. Select what surrogate indicator is being used:
22. Ion specific electrode monitoring.
23. pH.
24. Conductivity.
25. Other (specify).
26. Submit the monitoring plan required by 40 CFR 63.104(c)(1) through (c)(3).

**7.5 Leaks**

For each heat exchange system identified in section 7.1 of this survey, provide the following:

1. What method(s) is used to detect leaks in the heat exchange system (e.g., provide the EPA-approved method listed in part 136 or if the Modified El Paso Method is used)?
2. Identify each detected leak in the last 5 years (2016 through 2020) by providing:
   1. Date detected.
   2. Date repaired.
   3. Days to repair.
   4. Reason for delay (for each repair taking longer than 45 calendar days):
      1. The leaking equipment was isolated from the process.
      2. The repair was technically infeasible without a shutdown, and the shutdown was expected within the next 2 months.
      3. The repair was technically infeasible without a shutdown, and the shutdown for repair would cause greater emissions than the potential emissions from delaying repair.
      4. The repair was technically infeasible without a shutdown, and the necessary equipment, parts or personnel were not available.
      5. Other (specify).
      6. Did not use delay repair.
   5. For each leak, was ethylene oxide released into the atmosphere? (Yes/No)
   6. If available, provide total amount (pounds) of each speciated HAP released to the atmosphere due to the leak, and the method used to determine these emissions.
   7. List the method that was used to detect each leak.

**8.0 Flares**

**8.1 Flare Type**

For each flare at your facility that is associated with a chemical manufacturing process unit, elastomer product process unit, or polyether polyol manufacturing process unit; and for each flare associated with any other process unit at the facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride, provide the following:

1. Provide a unique identifier for each flare.
2. Type of flare:
   1. Elevated flare. *{An elevated flare is composed of a system that first collects waste gases and passes them through a flare stack which is essentially a hollow pipe; combustion takes place at the top of the flare stack or flare tip which is comprised of the burners and a system to mix the air and fuel.}*
   2. Ground level flarewith an elevated stack for release of effluent gases. *{A ground flare is composed of a system where the flare tip and combustion zone are at the ground level.}*
   3. Ground level flare without an elevated stack for release of effluent gases.
   4. Other (specify).
3. Flare assist type:
   1. Unassisted.
   2. Steam assisted. *{Steam assisted means any flare which adds any steam to the flare stack or flare tip for purposes including, but not limited to, protecting the design of the flare tip, promoting turbulence for mixing, or inducing air into the flame.}*
   3. Air assisted. *{Air assisted means any flare which adds any assist air to the flare stack or flare tip for purposes including, but not limited to, protecting the design of the flare tip, promoting turbulence for mixing, or inducing air into the flame.}*
   4. Pressure assisted. *{Pressure assisted means any flare which uses a high pressure drop burner tip to enhance atomization and fuel-to-air mixing.}*
   5. Pressure and steam assisted.
   6. Other (specify).
4. If pressure assisted, does the flare meet the following definition of a “pressure-assisted multi-point flare”? (Yes/No) [A “pressure-assisted multi-point flare” means a flare system consisting of multiple flare burners in staged arrays whereby the vent stream pressure is used to promote mixing and smokeless operation at the flare burner tips. Pressure-assisted multi-point flares are designed for smokeless operation at velocities up to Mach = 1 conditions (i.e., sonic conditions), can be elevated or at ground level, and typically use cross-lighting for flame propagation to combust any flare vent gases sent to a particular stage of flare burners.]
5. If “pressure-assisted multi-point flare”, does the facility operate the flare under an approved alternative means of emission limitation? (Yes/No)

**8.2 Specifications**

For each flare identified in section 8.1 of this survey, provide the following:

1. Maximum flare vent gas flow rate capacity (standard cubic feet per hour and pounds per hour) disaggregated into:
   1. Smokeless capacity.
   2. Hydraulic load capacity.
2. Diameter of flare (feet).
3. Flare release height (feet).
4. Continuous pilot flame:
   1. Number of pilots.
   2. Does the flare have a pilot re-ignition system? (Yes/No).
      1. Automatic or manual re-ignition?
5. Unobstructed cross sectional area of flare tip (feet) [if unassisted, steam assisted, or air assisted].

**8.3 Operation**

For each flare identified in section 8.1 of this survey, provide the following:

1. Specify the actual hours operation of the flare for 2017: *{use best available data, and group the hours into the following categories}*
   1. Routine or normal operation.
   2. Intermittent:
      1. Startup.
      2. Shutdown.
      3. Upsets.
   3. Standby (i.e., sweep or purge gas only with no regulated material going to the flare).
   4. Other (specify).
2. Number of visible emissions/smoking events in the past 7 years (2014-2020).
   1. Provide total duration of each event using calendar timestamps.
   2. Provide reason for each event.
3. Number of maximum permitted velocity exceedances in the past 7 years (2014-2020).
   1. Provide total duration of each exceedance using calendar timestamps.
   2. Provide reason for each exceedance.

**8.4 Reduction Measures**

For each flare identified in section 8.1 of this survey, provide the following:

1. Flare reduction measures (select all that apply):
   1. Flare gas recovery system, but not designed to recover 100 percent of flare gas during normal operations.
   2. Flare gas recovery system designed to recover 100 percent of flare gas during normal operations.
   3. Root cause and corrective action analysis for flare events exceeding a set flow rate level.
   4. Other management practice or work practice to reduce HAP emissions (specify).
   5. Capital cost (optional).

**8.5 Monitoring Equipment**

For each flare identified in section 8.1 of this survey, provide the following:

1. Identify any monitoring equipment installed on the flare header (select all that apply):
   1. Flow meter (to measure flare vent gas flow rate).
      1. Type/model/manufacturer (optional).
   2. Gas chromatograph (to measure the composition of flare vent gas).
      1. Type/model/manufacturer (optional).
      2. List each compound the gas chromatograph monitors.
      3. Capital cost (optional).
   3. BTU analyzer (to measure heat content of flare vent gas).
      1. Type/model/manufacturer (optional).
      2. Capital cost (optional).
   4. Canister sampling system (to measure the composition and/or heat content of flare vent gas).
   5. Other (specify).
2. For each steam assisted flare:
   1. Monitoring equipment installed to manage flow rate of assist steam:
      1. Flow meter, manifold, and valve instrumentation.
      2. Manual valve setting.
      3. Other (specify).
   2. How fine tuned can the facility control the assist steam flow rate?
      1. Within 5 percent accuracy.
      2. Within 10 percent accuracy.
      3. Other (specify).
   3. Capital cost (optional).
   4. Typical annual operating and maintenance cost (optional).
3. For each air assisted flare:
   1. Monitoring equipment installed to manage flow rate of assist air (select all that apply):
      1. Hi/low settings on blower.
      2. Damper.
      3. Variable fan drive.
      4. Other (specify).
   2. How fine tuned can the facility control the assist air flow rate?
      1. Within 5 percent accuracy.
      2. Within 10 percent accuracy.
      3. Other (specify).
   3. Capital cost (optional).
   4. Typical annual operating and maintenance cost (optional).

**8.6 Regulations**

For each flare identified in section 8.1 of this survey, provide the following:

1. Is the flare directly subject to, or will directly be subject to in the future, any of the following rules?[[3]](#footnote-4)
   1. Refinery NESHAP at §63.670? (Yes/No)
   2. Ethylene Production NESHAP at §63.1103(e)(4)? (Yes/No)
   3. Organic Liquid Distribution NESHAP at §63.2380? (Yes/No)
   4. Miscellaneous Organic NESHAP at §63.2450(e)(5)? (Yes/No)
2. Cite any applicable State and Local air regulations. Although not required as part of this question, you may provide (if available) any information about your specific air permit conditions that are used to comply with each State or Local air regulation.

**8.7 Flare Vent Gas Characteristics**

For each flare identified in section 8.1 of this survey, provide the following:

1. Average lower heating value of flare vent gas[[4]](#footnote-5) (British thermal units per standard cubic feet @ 68 degrees Fahrenheit) and the basis for determining value.
2. Average flow rate of flare vent gas (pounds per hour) and the basis for determining value.
3. Minimum flow rate of flare vent gas (pounds per hour) and the basis for determining value.
4. Annual average total HAP concentration of flare vent gas (parts per million by weight) and the basis for determining the value.
5. Annual average hydrogen concentration of flare vent gas (parts per million by weight) and the basis for determining the value.
6. Annual average VOC concentration of flare vent gas (parts per million by weight) and the basis for determining the value.

**9.0 Equipment Leaks**

**9.1 Imaging Device and Other Equipment Leak Monitoring Systems**

1. Do you own or have ready access to an optical or thermal imaging device for detecting equipment leaks? (Yes/No) If yes:
   1. Provide the manufacturer and model number.
   2. Which of the following best describes the use of the imaging device by the facility? (Select all that apply.)
      1. At the frequency required by a Federal or other air regulation in order to demonstrate compliance *{if selected, specify the regulation and provide the rule citation that requires use of the imaging device}*.
      2. To voluntarily check for leaks on a routine basis (quarterly or more frequently).
      3. To voluntarily check for leaks on an occasional basis (less frequently than quarterly).
      4. To voluntarily check for leaks following non-routine operations.
      5. Other (specify).
2. In order to detect equipment leaks, have you ever used a sensor network or obtained air samples from one or more points on a continuous sequential basis and analyzed the samples with gas chromatography, infrared spectrophotometry, flame ion detection, or an equivalent or alternative method? (Yes/No) If yes, briefly describe the system including what pollutant(s) is being monitored (e.g., VOC, HAP, or the specific pollutant), the frequency it is being monitored, the number of sampling locations, and the process unit(s) the system is intended to serve. [Use the same process unit ID(s) you used in Section 2.0 of this survey.]

**9.2 Regulations**

For each chemical manufacturing process unit, elastomer product process unit, polyether polyol manufacturing process unit, and other process unit at the facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride, provide the following:

1. Provide a unique identifier for each process unit.
2. Select the Federal air regulations the facility is complying with for equipment leaks (select the option that best fits):
3. 40 CFR 63, subpart H. (Yes/No)
4. 40 CFR 63, subpart H via 40 CFR 63.502(a). (Yes/No)
5. 40 CFR 63, subpart H via 40 CFR 63.1434(a). (Yes/No)
6. Other (specify).
7. None.
8. Do you use 40 CFR 63.160(b) and/or 40 CFR 63.160(c) to comply with other 40 CFR part 60 and/or 40 CFR part 61 equipment leak provisions? (Yes/No) If yes, what other 40 CFR part 60 and/or 40 CFR part 61 equipment leak rules would your facility be subject to if you did not use 40 CFR 63.160(b) and/or 40 CFR 63.160(c)?
9. Cite any applicable State, Local, or other air regulation the facility is complying with for equipment leaks, including any consent decrees. Although not required as part of this question, you may provide (if available) any information about your specific air permit conditions that are used to comply with each State or Local air regulation.
10. Excluding items discussed in section 9.1 of this survey, what other actions, if any, have your facility taken beyond those required by Federal, State, and Local regulation to specifically reduce or eliminate HAP and VOC emissions from equipment leaks (e.g., leakless valves, tighter leak definitions than those required, pollution prevention measures). Include in your description the affected HAP and reduction efficiency. Additionally, include any monitored parameters to ensure operation of the emission reduction technique, and the frequency at which monitoring is performed. Describe any ongoing parameter monitor quality assurance/control and the frequency that the parameter monitor quality assurance/control is performed.

**9.3 Equipment Leaks by Type and Process**

For each chemical manufacturing process unit, elastomer product process unit, polyether polyol manufacturing process unit, and other process unit at the facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride, provide the following:

1. Select each type of equipment servicing the process unit.
   1. Pumps in light liquid service.
   2. Pumps in heavy liquid service.
   3. Valves in gas and vapor service (or in gas service).
   4. Valves in light liquid service.
   5. Valves in heavy liquid service.
   6. Connectors in gas and vapor service (or in gas service).
   7. Connectors in light liquid service.
   8. Connectors in heavy liquid service.
   9. Open-ended valves or lines (including those with caps, blind flanges, plugs, or second valves).
   10. Compressors.
   11. Instrumentation systems.
   12. Sampling connection systems.
   13. Pressure relief valves in gas and vapor service (or in gas service) that vent to atmosphere.
   14. Pressure relief valves in gas and vapor service (or in gas service) routed to a control device or process.
   15. Pressure relief valves in liquid service routed to an on-site treatment system, process, or drain system.
   16. Pressure relief valves in liquid service *not* routed to an on-site treatment system, process, or drain system.
   17. Agitators in gas and vapor service and light liquid service.
   18. Agitators in heavy liquid service.
   19. Surge control vessels and bottoms receivers.
   20. Other*. {Includes any other fugitive emissions source not already provided that is monitored similar to equipment. Specify the types of fugitive emissions sources.}*
2. For each type of equipment servicing the process unit that is either: “in ethylene oxide service,” “in HAP service but not in ethylene oxide service,” and/or “in VOC service”,[[5]](#footnote-6) provide the following (except for surge control vessels and bottoms receivers):
   1. Number of pieces of equipment. *{If no specific count is available, provide best estimate}*
   2. Number of pieces of equipment monitored. *{Do not include unsafe or difficult-to-monitor equipment in this count}*
   3. Number of leaks detected in 2017.
      1. Number of these leaks repaired in 2017 without delay of repair.
      2. Number of these leaks repaired in 2017 using delay of repair.
      3. Number of these leaks not repaired in 2017 because of delay of repair.
   4. Monitoring frequency (select all that apply):
      1. No monitoring is performed.
      2. No set monitoring interval.
      3. Less frequently than annually (including skip periods) (Specify).
      4. Annually.
      5. Semiannually.
      6. Quarterly.
      7. Monthly.
      8. Biweekly.
      9. Weekly or more frequently.
      10. Other (Specify)
   5. Monitoring method (select all that apply):
      1. Instrument monitoring (e.g., handheld analyzer).
      2. Sensory monitoring.
      3. Other (specify).
   6. Leak definition (parts per million by volume) (select all that apply for calendar year 2017).
      1. No leak definition (no monitoring is performed).
      2. Detection by sensory monitoring.
      3. 10,000 parts per million by volume.
      4. 5,000 parts per million by volume.
      5. 2,000 parts per million by volume.
      6. 1,000 parts per million by volume.
      7. 500 parts per million by volume.
      8. Less than 500 parts per million by volume.
   7. Total amount of VOC and HAP emissions released from leaks of these equipment in 2017 (lbs) aggregated by:
      1. Leaks repaired in 2017 without delay of repair.
      2. Leaks repaired in 2017 using delay of repair.
      3. Leaks not repaired in 2017 because of delay of repair.
      4. Provide the method used to determine these emissions.
3. For surge control vessels and bottoms receivers, provide the following:
   1. Provide a unique identifier for each surge control vessel and bottoms receiver.
   2. Vessel capacity (cubic meters).
   3. Maximum true vapor pressure of total organic HAP at operating temperature (kilopascals).
   4. Select the configuration that best describes how emissions from the surge control vessel and bottoms receiver is controlled:
      1. Routes through a closed-vent system back to the process.
      2. Routes through a closed-vent system to a control device meeting the requirements of 40 CFR 63.172.
      3. Complies with 40 CFR 63.119(b).
      4. Complies with 40 CFR 63.119(c).
      5. Is not controlled.
      6. None of the above.
   5. Cite any applicable State, Local, or other air regulation the facility is complying with for surge control vessels and bottoms receivers, including any consent decrees. Although not required as part of this question, you may provide (if available) any information about your specific air permit conditions that are used to comply with each State or Local air regulation.
   6. What other actions, if any, have your facility taken beyond those required by Federal, State, and Local regulation to specifically reduce or eliminate HAP and VOC emissions from surge control vessels and bottoms receivers. Include in your description the affected HAP and reduction efficiency. Additionally, include any monitored parameters to ensure operation of the emission reduction technique, and the frequency at which monitoring is performed. Describe any ongoing parameter monitor quality assurance/control and the frequency that the parameter monitor quality assurance/control is performed.

**9.4 Total VOC and Speciated HAP Composition of Typical Stream by Process Unit**

For each chemical manufacturing process unit, elastomer product process unit, polyether polyol manufacturing process unit, and other process unit at the facility where the process unit has the potential to emit benzene, 1,3-butadiene, ethylene oxide, ethylene dichloride, and/or vinyl chloride, provide average total VOC and speciated HAP compositions of a typical stream at your facility:

1. Name and CAS number of each HAP contained in typical stream of process unit.
2. Weight % of each HAP contained in typical stream of process unit.
3. Weight % of total VOC contained in typical stream of process unit.

**9.5 Equipment Leak Repair Schedule**

1. Describe the leak repair schedule used at your facility. If different types of equipment are subject to different repair schedules, identify each equipment type and applicable repair schedule. Include the time period for first attempt at repair and full repair.

**10.0 Startup, Shutdown, and Malfunction**

1. Provide a copy of the facility Startup, Shutdown, and Malfunction Plan (SSMP), if required to maintain one.

**10.1 Planned Shutdown**

1. For planned equipment openings associated with maintenance activities at your facility:
   1. Cite all State and Local air regulations that apply to equipment openings associated with maintenance activities. Although not required as part of this question, you may provide (if available) any information about your specific air permit conditions that are used to comply with each State or Local air regulation.
   2. If not already specified in the State and Local air regulation, provide a description of the criteria, if any, that is used before opening equipment for maintenance activities (e.g., vent streams ≤10-percent of the LEL, vent streams ≤ 5 psig, no more than 50 lb of air contaminant allowed to be released to the atmosphere).

*The following remaining questions in this section encompass entire chemical manufacturing process units, elastomer product process units, and polyether polyol manufacturing process units. For the purposes of this survey, a planned shutdown event means a routine shutdown, scheduled in advance, for preventative maintenance, which are typically scheduled and budgeted for multiple months in advance.*

1. Frequency of planned shutdown events (years).
2. Average amount of time required to shutdown during a planned event (hours).
3. Describe steps, work-practices, processes, or techniques the facility uses to minimize emissions during planned shutdown events.
4. Have you ever collected emissions data during a planned shutdown event? (Yes/No) If yes, explain the type of emissions data collected.
5. Do you expect emissions to be higher, lower, or unchanged during planned shutdown events compared to normal operations? Provide an explanation for your answer.
6. For the last planned shutdown provide:
   1. Date of last planned shutdown.
   2. Amount of time required to shutdown during the event (hours).
   3. Provide a description of the last planned shutdown.
   4. Identify each HAP released (name and CAS number) during the event, the amount released (pounds), and a basis for the amount released.
   5. Identify each point source and fugitive source emission point associated with the event (use emission point IDs used in this survey).

**10.2 Unplanned Shutdown**

*The following questions encompass entire chemical manufacturing process units, elastomer product process units, and polyether polyol manufacturing process units. For the purposes of this survey, an unplanned shutdown event is due to external events outside the control of the operator (i.e., natural disaster or power failure).*

1. Average frequency of unplanned shutdown events (years).
2. Average amount of time required to shutdown during an unplanned event (hours).
3. Have you ever collected emissions data during an unplanned shutdown event? (Yes/No) If yes, explain the type of emissions data collected.
4. Do you expect emissions to be higher, lower, or unchanged during unplanned shutdown events compared to normal operations? Provide an explanation for your answer.
5. For the last unplanned shutdown provide:
   1. Date of last unplanned shutdown.
   2. Amount of time required to shutdown during the event (hours).
   3. Provide a description of the last unplanned shutdown.
   4. Identify each HAP released (name and CAS number) during the event, the amount released (pounds), and a basis for the amount released.
   5. Identify each point source and fugitive source emission point associated with the event (use emission point IDs used in this survey).

**10.3 Startup**

*The following questions encompass entire chemical manufacturing process units, elastomer product process units, and polyether polyol manufacturing process units.*

1. Are there process differences between startup events and normal operations? (Yes/No) If yes:
   1. Provide an explanation of the differences.
   2. Do the differences present increased safety risks to workers or testers? (Provide an explanation.)
2. Have you ever collected emissions data during a startup event? (Yes/No) If yes, explain the type of emissions data collected.
3. Do you expect emissions to be higher, lower, or unchanged during startup events compared to normal operations? Provide an explanation for your answer.
4. For the last startup provide:
   1. Date of last startup.
   2. Amount of time required to startup during the event (hours).
   3. Provide a description of the last startup.
   4. Identify each HAP released (name and CAS number) during the event, the amount released (pounds), and a basis for the amount released.
   5. Identify each point source and fugitive source emission point associated with the event (use emission point IDs used in this survey).

**10.4 Malfunctions**

1. Identify each malfunction event during the last 5 years (2016-2020) where emissions exceeded normal emissions, normal controls were bypassed, or the effectiveness of the normal control was reduced and provide the following:
   1. Date of event (mm/dd/yyyy).
   2. Duration of the event (hours).
   3. Description of the event.
   4. Identify each point source and fugitive source emission point associated with each malfunction (use emission point IDs used in this survey).
   5. For each HAP released during the event, provide the following:
      1. HAP name and CAS Number.
      2. Amount of HAP released during the event (pounds).
      3. Description of method used to estimate the amount of HAP that was released during the event.

**11.0 Ambient, Fenceline, Area, and Safety Monitors**

1. Have you done any monitoring for HAP emissions detection (excluding LDAR programs discussed in section 9.1)? (Yes/No) If yes, for each monitoring event, provide information on the type of monitor, standard operating procedures including quality assurance/quality control (QA/QC), the location of the monitor on a plot plan, the pollutant(s) monitored, the detection level of the monitor, alarm level of the monitor that would indicate an issue, and actual monitored value.
2. Indicate which monitors have produced alarms and provide records in the past 5 years (2016-2020) of when each alarm has occurred.
3. Provide a detailed description of the procedure for alarm investigation, including any analyses that are performed to resolve the issue (if an issue is found).
   1. What is the action level that triggers an alarm and the level that triggers the analyses?
   2. If available, what type of emission reductions have been observed since implementing the monitoring program(s).
4. Provide records of all upset/reportable releases of HAP from the facility from 2016 through 2020 discovered by ambient, fenceline, or area and safety monitoring. Include date, incident description, and quantity of releases reported. Provide the basis for the emission estimates.
5. Provide a description of personnel exposure monitoring program. Provide specific details on how initial and periodic determinations of employee 8-hour time weighted average exposure for each job classification in each work area are performed. Provide a description of methods that are used to detect the presence or release of the monitored HAP in the work area (such as personal exposure monitoring, continuous monitoring devices, etc.) and provide actual readings/results of these measurements from 2016 through 2020.

1. For purposes of this question, the facility is “directly” subject to the rule if it meets the applicability requirements of the rule. The facility is not “directly” subject to a rule just because a different rule (for which the facility is subject to according to applicability) references portions of the rule. In other words, the facility is not directly subject to Rule-B if the facility complies with a portion of Rule-B just because Rule-A requires the facility to comply with that portion of Rule-B; instead, in this example, the facility is directly subject to Rule-A. [↑](#footnote-ref-2)
2. Equipment that provides the same unit operation (e.g., distillation units) may be grouped on the PFD if, and only if, the IDs for each piece of equipment represented by the group are included on the PFD, and all emission points from the grouped equipment are clearly identified. [↑](#footnote-ref-3)
3. For purposes of this question, the facility is “directly” subject to the rule if it meets the applicability requirements of the rule. The facility is not “directly” subject to a rule just because a different rule (for which the facility is subject to according to applicability) references portions of the rule. In other words, the facility is not directly subject to Rule-B if the facility complies with a portion of Rule-B just because Rule-A requires the facility to comply with that portion of Rule-B; instead, in this example, the facility is directly subject to Rule-A. [↑](#footnote-ref-4)
4. For purposes of this survey, flare vent gas means all gas found just prior to the flare tip. This gas includes all flare waste gas (i.e., gas from facility operations that is directed to a flare for the purpose of disposing of the gas), that portion of flare sweep gas that is not recovered, flare purge gas and flare supplemental gas, but does not include pilot gas, total steam or assist air. [↑](#footnote-ref-5)
5. For purposes of this question, “in ethylene oxide service” means the any equipment that contains or contacts a fluid (liquid or gas) that is at least 0.1 percent by weight of ethylene oxide. If information exists that suggests ethylene oxide could be present in equipment, the equipment is considered to be “in ethylene oxide service” unless sampling and analysis is performed as specified in §63.2492 to demonstrate that the equipment does not meet the definition of being “in ethylene oxide service”. Examples of information that could suggest ethylene oxide could be present in equipment, include calculations based on safety data sheets, material balances, process stoichiometry, or previous test results provided the results are still relevant to the current operating conditions.] [↑](#footnote-ref-6)