

January 19, 2012, Workshop on Chemical Data Reporting (CDR) Rule Case Studies for Byproduct/Recycling Reporting

Scenario 1

In its operations, ABC Company uses an etchant to strip copper off of a substrate. The process results in a mixture containing a complex combination of substances. The mixture is sent to XYZ Recycler to extract the elemental copper by electrolytic reduction. The remaining components of the mixture are disposed of by XYZ Recycler.

U.S. Environmental Protection Agency (EPA) guidance states that the byproduct manufacturer (ABC) should report the spent etchant and the recycler (XYZ) should report the elemental copper (assuming other requirements, such as production volume, are met).

- *What does ABC Company report as the chemical identifying number?*
- *How does ABC Company report under the reporting element “Is Chemical Substance Being Recycled, Remanufactured, Reprocessed, or Reused?”*
- *If there is more than 100,000 pounds (lbs) of etchant sent to XYZ Recycler, what does ABC Company report under processing and use information under Part III?*
- *What does XYZ Recycler report as the chemical identifying number?*
- *How does XYZ Recycler report under the reporting element “Is Chemical Substance Being Recycled, Remanufactured, Reprocessed, or Reused?”*

Scenario 2

In its process to produce Chemical Substance A, GEF Company produces 100,000 lbs/year of a byproduct, Mixture B, which is a mixture of chemical substances, one of which is formed via a chemical reaction -- Chemical A, while others were present in the original starting materials, Chemicals X, Y, and Z. Based on its technical expertise, GEF Company is aware of the individual components that make up the byproduct, and each component is listed on the Toxic Substances Control Act (TSCA) Inventory. Due to processing variability, however, GEF Company does not know the specific percentage of each component in the byproduct. GEF Company has not notified the mixture to EPA as a “new chemical” because it is not used for commercial purposes and there is no regulatory obligation to notify mixtures if the individual components of the mixture are listed on the Inventory.

The byproduct mixture is sent off-site to Company 123 for further processing. Company 123 extracts Chemical X via a chemical reaction. Chemical X was one of the starting materials used to produce Chemical Substance A. After Chemical X is extracted, the mixture is disposed of by MNO Company.

- *Is GEF Company obligated to report under the CDR? If yes,*

- *Which substances does GEF report? Chemical A? Chemical X? Chemical Y? Chemical Z? Mixture B?*
 - *What does GEF Company report as the chemical identifying number?*
 - *What does GEF Company report as the volumes manufactured?*
 - *How does GEF Company report under the reporting element “Is Chemical Substance Being Recycled, Remanufactured, Reprocessed, or Reused?”*
- *What are the reporting obligations for 123 Company?*

Scenario 3

Site A purchases and uses sulfuric acid in its operations, which generates a spent sulfuric acid byproduct mixture, Mixture SA. Mixture SA is a mixture of water, sulfuric acid, and unspecified impurities. Mixture SA has the same CAS Number as sulfuric acid. No new sulfuric acid is contained in Mixture SA.

Mixture SA is shipped to Site B. At Site B, Mixture SA is reacted to convert the sulfuric acid to sulfur dioxide. The sulfur dioxide is reacted to create sulfur trioxide. The sulfur trioxide is then reacted to form sulfuric acid.

- *What are the reporting obligations for Site A for Mixture SA?*
- *What are the reporting obligations for Site B for Mixture SA, sulfuric acid, sulfur dioxide, and sulfur trioxide?*

Scenario 4

MNO Company, a metal processing facility, has an agreement with Company 678 to remove its wastewater/spent baths for treatment. It is technically feasible to recover Metal G from the soluble metal compounds in the wastewater. If market value of Metal G is high, Company 678 will engage in the recovery process. If the market value of Metal G is low, Company 678 will dispose of the wastewater without recovering Metal G.

Once the wastewater leaves the MNO Company facility, MNO Company is unaware as to whether Metal G is extracted from the wastewater or not. In other words, MNO Company cannot be certain as to the amount of its wastewater that Company 678 uses as a “feedstock” for manufacture of Metal G.

- *Is MNO Company obligated to report the wastewater? If so,*
- *What does MNO Company report as the chemical identifying number?*

- *How does MNO Company determine the volumes that are reportable?*
- *How does MNO Company report under the reporting element “Is Chemical Substance Being Recycled, Remanufactured, Reprocessed, or Reused?”*

Scenario 5

Company X reacts purchased Chemical A and purchased Chemical B to form Product AB and a byproduct mixture. The byproduct mixture consists of unreacted Chemical A and by-product Chemical C, which is a chemical that is coincidentally formed via a chemical reaction during the manufacture of Product AB. There is no CAS Number for the byproduct mixture, but there are CAS Numbers for Chemicals A, Chemical B, Chemical C, and Product AB, all of which are listed on the TSCA Inventory.

Company X ships the byproduct mixture to Company Y. Company Y distills the byproduct mixture to separate the mixture into Chemical A and Chemical C. No chemical bonds are formed or broken in the distillation process. Company Y uses Chemical A and Chemical C for commercial processing operations.

Company X is aware that Company Y separates Chemical A and Chemical C from the byproduct mixture by distillation and that the substances are then used commercially.

- *What are the CDR reporting obligations for Company X for Chemical A, Chemical B, Chemical C, Product AB, and byproduct mixture?*
 - *For each substance that Company X is to report, how does it report under the reporting element “Is Chemical Substance Being Recycled, Remanufactured, Reprocessed, or Reused?”*
- *What are the CDR reporting obligations for Company Y for Chemical A, Chemical B, Chemical C, Product AB, and byproduct mixture?*
 - *For each substance that Company Y is to report, how does it report under the reporting element “Is Chemical Substance Being Recycled, Remanufactured, Reprocessed, or Reused?”*

Scenario 6

Using information in Scenario 5, except Company X is aware that the byproduct mixture contains a small amount of unintended unspecified impurities. Company Y’s treatment of the byproduct mixture remains the same -- distillation to separate into Chemical A and Chemical C, which are used for commercial processing operations. Company Y’s distillation also results in a

third component, Mixture M, which contains the impurities in the original byproduct mixture. Company Y disposes of Mixture M.

- *What are the CDR reporting obligations for Company X for Chemical A, Chemical B, Chemical C, Product AB, byproduct mixture, and Mixture M?*
 - *For each substance that Company X is to report, how does it report under the reporting element “Is Chemical Substance Being Recycled, Remanufactured, Reprocessed, or Reused?”*

- *What are the CDR reporting obligations for Company Y for Chemical A, Chemical B, Chemical B, Product AB, byproduct mixture, and Mixture M?*
 - *For each substance that Company Y is to report, how does it report under the reporting element “Is Chemical Substance Being Recycled, Remanufactured, Reprocessed, or Reused?”*

Scenario 7

Using information in Scenario 5, except Company X is not aware that Company Y separates the byproduct mixture into component chemical substances that are used commercially.

- *What are the CDR reporting obligations for Company X for Chemical A, Chemical B, Chemical C, Product AB, and byproduct mixture?*
 - *For each substance that Company X is to report, how it report under the reporting element “Is Chemical Substance Being Recycled, Remanufactured, Reprocessed, or Reused?”*

Scenario 8

Company X manufactures Polymer Q in the presence of Solvent G, purchased from an outside vendor, in a reactor. At the end of the polymerization, there exists in the reactor the following: polymer and spent solvent mixture, Mixture TT, which consists of unreacted raw materials, unspecified impurities, and Solvent G. Polymer Q is physically separated from Mixture TT by filtration. Mixture TT is transferred to a storage tank. From the storage tank it is not further processed or purified, but is transferred back to the reactor where it is used for its solvent properties. Mixture TT continues to be recycled each time Polymer is manufactured.

- *What are the reporting obligations for Company X for Polymer Q, Solvent G, and Mixture TT?*

Scenario 9

Company X reacts purchased Chemical A and purchased Chemical B to form Intermediate AB. A byproduct mixture, Mixture K, consisting of potassium iodide (KI) and water is formed. The components of the byproduct mixture are on the TSCA Inventory, the mixture itself is not.

Mixture K is sold to Company Y. Company Y oxidizes the KI to form iodine. The iodine is used for commercial purposes. Company X is aware of Company Y's handling of the byproduct mixture.

- *What are the CDR reporting obligations for Company X for Intermediate AB and Mixture K?*

- *Is the byproduct mixture exempt from CDR reporting under 40 C.F.R. §720.30(g)(3)? If not,*
 - *What CAS Number is used for the byproduct mixture if one does not already exist?*
 - *How would Company X determine production volume for the byproduct mixture? Is it the entire volume of the byproduct, or only the weight of the KI in the mixture?*

- *What are the CDR reporting obligations for Company Y for Mixture K, KI, iodine, and water?*

Scenario 10

Company X reacts raw materials, including monomers and other agents, in the presence of a purchased Solvent A to form Polymer P. A spent solvent mixture, Mixture SS, is formed. Mixture SS consists of Solvent A, unreacted starting materials, and unspecified impurities. Mixture SS is collected in a storage tank.

Mixture SS is transferred to a distillation column, where it is distilled to separate Solvent A from the impurities and the unreacted starting materials. No bonds are formed or broken. The distilled Solvent A is transferred back to the reactor where it is again used as solvent. For purposes of the scenario, the impurities and unreacted starting materials are incinerated.

- *What are the CDR reporting obligations for Company X for Polymer P, Mixture SS, and Solvent A?*

Scenario 11

Using information in Scenario 10, except Mixture SS is shipped to Company Y and Company Y distills out the Solvent A. Company Y then ships the Solvent A back to Company X for commercial use.

- *What are the CDR reporting obligations for Company X for Mixture SS and Solvent A?*
- *What are the CDR reporting obligations for Company Y for Mixture SS and Solvent A?*

Scenario 12

Company X manufactures refrigerant Gases A, B, and C at the same plant site in three different operations. As part of the manufacturing process, off-spec gases are generated. An off-spec gas is the same substance as the intended refrigerant gas, but it fails to meet commercial specifications (*e.g.*, it is contaminated with the purchased compressor oil in the manufacturing process and as such, fails to meet required purity levels).

Off-spec gases A1, B1, and C1 from the three manufacturing operations are collected in a consolidation tank. The resultant mixture, Mixture P, which includes the three off-spec gases and compressor oil, is sold to Company Y. Company Y distills Mixture P to separate the three different gases into Recovered Gas A, Recovered Gas B, and Recovered Gas C. No chemical bonds are broken or formed. The compressor oil is incinerated. The three separated gases (Recovered Gases A, B, and C) are sold by Company Y for commercial use. Company X knows how Company Y is handling the off-spec gases byproduct mixture.

- *What are the CDR reporting obligations for Company X for Gases A, B, C, A1, B1, C1, Mixture P, Recovered Gas A, Recovered Gas B, and Recovered Gas C?*
- *What are the CDR reporting obligations for Company Y for Gases A, B, C, A1, B1, C1, Mixture P, Recovered Gas A, Recovered Gas B, and Recovered Gas C?*

Scenario 13

In 2011, Company A produced 180,000 lbs of substance X that met product specifications and was sold. Company A also produced 20,000 lbs of Substance X that was off-spec for color due to traces of a highly colored impurity, although its assay was approximately 99 percent Substance X. Company A reworked the off-spec Substance X by distillation to remove the impurity. The distilled Substance X met the color specification and was > 99 percent pure. The recovered volume was approximately 20,000 lbs. Company X determined that their CDR-reportable volume of Substance X in 2011 was 200,000 lbs.

- *How does Company A report under the reporting element “Is Chemical Substance Being Recycled, Remanufactured, Reprocessed, or Reused?”*
- *Would the response to the question above be different if Company A never considered disposing of the off-spec Substance X as waste, but instead of*

purification, chose to sell it at a lower price into an application for which color did not matter?

- *Is the purification activity reportable under Part III -- Processing and Use Information? If so, what is the appropriate code for the Type of Industrial Processing and Use?*

Scenario 14

In its chemical production unit, Company A uses carbon canisters to remove excess organic alcohol during the manufacture of another chemical substance. Company A sends used carbon canisters to Company Z, where Company Z removes the spent carbon to regenerate the carbon. The absorbed hydrocarbons are removed from the carbon through a heating process and are disposed of as waste. Company Z repacks the canister with fresh carbon, new and/or regenerated and sends the canisters back to Company A for use. Through its relationship with Company Z, Company A receives the regenerated canisters at a reduced fee.

- *Is Company A obligated to report under the CDR? If yes,*
 - *What does Company A report as the chemical identifying number?*
 - *What does Company A report as the volumes manufactured?*
 - *How does Company A report under the reporting element “Is Chemical Substance Being Recycled, Remanufactured, Reprocessed, or Reused?”*
- *What are the reporting obligations for Company Z?*

Scenario 15

Company X purchases and uses a palladium catalyst. The palladium catalyst is commercially supplied on a carbon support, which allows the catalyst to be in a finely divided state with a large surface area to increase its catalytic activity. Such a catalyst is described by the supplier as a mixture of palladium (CAS Number 7440-05-3) and carbon (CAS Number 7440-44-0), consistent with common industry practice. During use of the catalyst, the palladium becomes progressively more deactivated by adsorption of impurities onto the palladium surface. When its catalytic performance is no longer acceptable, the catalyst is sent to Company Y, a precious metal reclaimer, and Company X is credited for the value of the palladium. The process used by Company Y for catalyst regeneration is not known to Company X.

- *What are the reporting obligations for Company X? What chemicals are reportable? How should volumes for reportable chemicals be determined?*

Scenario 16

Company EG, a U.S. based company, sends outdated computers, cell phones, and other office equipment (e.g., copiers, fax machines) to CR Recycling Group. There is no exchange of

funding between Company EG and CR Recycling. CR Recycling Group may refurbish the equipment and resell to the general public, or it may take the components of the equipment and reuse within its own processes. As part of the procedure to re-use components, CR Recycling will extract metals used in solder within the outdated equipment for reuse. Company EG is not aware how CR Recycling will process the equipment it provides.

- *Is Company EG obligated to report under the CDR? If yes,*
 - *What does Company EG report as the chemical identifying number?*
 - *What does Company EG report as the volumes manufactured?*

- *What are the reporting obligations for CR Recycling Group?*

Scenario 17

Using information in Scenario 16, except Company EG is aware that the contributed office equipment will not be refurbished and will only be used to extract usable components, including metals.

- *Is Company EG obligated to report under the CDR? If yes,*
 - *What does Company EG report as the chemical identifying number?*
 - *What does Company EG report as the volumes manufactured?*

- *What are the reporting obligations for CR Recycling Group?*

Scenario 18

Using information in Scenario 16, except Company EG is not a U.S. based company, but sends its office equipment to CR Recycling Group, which is a U.S. company.

- *Is Company EG obligated to report under the CDR? If yes,*
 - *What does Company EG report as the chemical identifying number?*
 - *What does Company EG report as the volumes manufactured?*

- *What are the reporting obligations for CR Recycling Group?*