For more information on asbestos-related issues, see files on indoor air quality, types of pollutants.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

ASBESTO
(ASBESTOS)
CAS # 1332-21-4

División de Toxicología ToxFAQs™ Septiembre 2001

Esta hoja informativa contesta las preguntas más frecuentes acerca de los efectos del asbesto sobre la salud. Para más información, por favor llame al Centro de Información de ATSDR al 1-888-422-8737. Esta hoja informativa forma parte de una serie de resúmenes acerca de sustancias peligrosas y sus efectos sobre la salud. Es importante que usted entienda esta información ya que esta sustancia puede ser dañina. Los efectos de la exposición a cualquier sustancia tóxica dependen de la dosis, la duración, la manera como usted está expuesto, sus hábitos y características personales y de la presencia de otras sustancias químicas.

IMPORTANTE: La exposición al asbesto ocurre generalmente al respirar aire contaminado en lugares de trabajo que usan o manufacturan asbesto. También se encuentra asbesto en el aire de viviendas que están siendo derruidas o renovadas. La exposición al asbesto puede producir problemas serios en los pulmones y además causar cáncer. Se ha encontrado asbesto en 83 de los 1,585 sitios de la Lista de Prioridades Nacionales identificados por la Agencia de Protección Ambiental (EPA).

¿Qué es el asbesto?

Asbesto es el nombre asignado a un grupo de seis materiales fibrosos diferentes (amosita, crisolita, crocidolita y las formas fibrosas de tremolita, actinolita, y antofilita) que ocurren en forma natural en el ambiente. Los minerales de asbesto tienen fibras largas y resistentes que se pueden separar y son suficientemente flexibles como para ser entrelazadas y también resisten altas temperaturas. Debido a estas características, el asbesto se ha usado para una gran variedad de productos manufacturados, principalmente en materiales de construcción (tejas para techado, baldosas y azulejos, productos de papel y productos de cemento con asbesto), productos de fricción (embrague de automóviles, frenos, componentes de la transmisión), materias textiles termoresistentes, envases, empaquetaduras, y revestimientos. Algunos productos de vermiculita o de talco pueden contener asbesto.

¿Qué le sucede al asbesto cuando entra al medio ambiente?

Las fibras de asbesto pueden pasar al aire o al agua a causa de la degradación de depósitos naturales o de productos de asbesto manufacturados. Las fibras de asbesto no se evaporan al aire ni se disuelven en agua. Las fibras de diámetro pequeño y las partículas pequeñas pueden permanecer suspendidas en el aire por largo tiempo y así ser transportadas largas distancias por el viento y el agua antes de depositarse. Las fibras y partículas de mayor tamaño tienden a depositarse más rápido.

Las fibras de asbesto no pueden movilizarse a través del suelo. Las fibras de asbesto generalmente no son degradadas a otros compuestos y permanecerán virtualmente inalteradas por largo tiempo.

¿Cómo podría yo estar expuesto al asbesto?

Todos estamos expuestos a pequeñas cantidades de asbesto en el aire que respiramos. Estos niveles varían entre 0.00001 y 0.0001 fibras por mililitro de aire; los niveles más altos se encuentran generalmente en ciudades y en áreas industriales.

Gente que trabaja en industrias que fabrican o usan productos de asbesto o que trabajan en la minería de asbesto puede estar expuesta a altos niveles de asbesto. Gente que vive cerca de estas industrias también puede estar expuesta a altos niveles de asbesto en el aire.

Las fibras de asbesto pueden liberarse al aire al perturbar materiales que contienen asbesto durante el uso del producto, demoliciones, mantenimiento, reparación y renovación de edificios o viviendas. En general, la exposición puede ocurrir solamente cuando el material que contiene asbesto es perturbado de manera tal que libera partículas o fibras al aire.

El agua potable puede contener asbesto de fuentes naturales o de cañerías de cemento que contienen asbesto.

¿Cómo puede afectar mi salud el asbesto?

El asbesto afecta principalmente a los pulmones y a la membrana que envuelve a los pulmones, la pleura. Respirar altos niveles de fibras de asbesto por largo tiempo puede producir lesiones que parecen cicatrices en el pulmón y en la pleura. Esta enfermedad se llama asbestosis y ocurre comúnmente en trabajadores expuestos al asbesto, pero no en el público en general. La gente con asbestosis tiene dificultad para respirar, a menudo tiene tos, y en casos graves sufre dilatación del corazón. La asbestosis es una enfermedad grave que eventualmente puede producir incapacidad y la muerte.

Respirar niveles de asbesto más bajos puede producir alteraciones en la pleura, llamadas placas. Las placas pleurales pueden ocurrir en

trabajadores y ocasionalmente en gente que vive en áreas con altos niveles ambientales de asbesto. Los efectos de las placas pleurales sobre la respiración generalmente no son serios, pero la exposición a niveles más altos puede producir un engrosamiento de la pleura que puede restringir la respiración.

¿Qué posibilidades hay de que el asbesto produzca cáncer?

El Departamento de Salud y Servicios Humanos (DHHS), la Organización Mundial de la Salud (WHO) y la EPA han determinado que el asbesto es carcinógeno para seres humanos.

Se sabe que respirar asbesto pueden aumentar el riesgo de cáncer en seres humanos. Hay dos tipos de cáncer producidos por exposición al asbesto: cáncer del pulmón y mesotelioma. El mesotelioma es un cáncer de la pleura o del tejido que envuelve la cavidad abdominal (el peritoneo). El cáncer producido por el asbesto no aparece inmediatamente, sino que se manifiesta después de varios años. Los estudios en trabajadores sugieren también que respirar asbesto puede aumentar las posibilidades de contraer cáncer en otras partes del cuerpo (estómago, intestino, esófago, páncreas y los riñones), aunque esto es más incierto. La identificación y el tratamiento tempranos de todo cáncer puede aumentar la calidad de vida y la sobrevivencia de la persona.

La combinación de exposición al asbesto y al humo de cigarrillo aumenta considerablemente las posibilidades de contraer cáncer del pulmón. Por lo tanto, si usted ha estado expuesto al asbesto, debería dejar de fumar. Esta puede ser la acción más importante que usted puede tomar para mejorar su salud y disminuir el riesgo de contraer cáncer.

¿Cómo puede el asbesto afectar a los niños?

No sabemos si la exposición al asbesto producirá defectos de nacimiento u otros efectos sobre el desarrollo en seres humanos. En animales expuestos al asbesto no se han observado defectos de nacimiento.

Es probable que los efectos sobre la salud de niños expuestos a altos niveles de asbesto sean similares a los observados en adultos.

¿Cómo pueden las familias reducir el riesgo de exposición al asbesto?

En general, los materiales que contienen asbesto que no son perturbados o dañados no constituyen un riesgo para la salud y por lo tanto pueden dejarse sin tocar. Si usted sospecha que puede estar expuesto al asbesto en su hogar, contacte a su departamento estatal o local de salud o a las oficinas regionales de la EPA para averiguar como examinar su hogar y como encontrar una compañía con experiencia para remover o contener las fibras.

¿Hay algún examen médico que demuestre que he estado expuesto al asbesto?

Los niveles bajos de asbesto pueden medirse en la orina, las heces, líquidos mucosos o en lavados pulmonares de la población general. Los niveles mayores que el promedio de fibras de asbesto en tejidos pueden confirmar la exposición, pero no pueden predecir si le afectará la salud.

Para evaluar enfermedades relacionadas a la exposición al asbesto se necesitan una historia completa, examen físico y pruebas de diagnóstico. La radiografía del pecho es la mejor herramienta para detectar cambios en los pulmones que resultan de la exposición al asbesto. Pruebas de función pulmonar y sondeos computarizados en tres dimensiones del pulmón también ayudan en el diagnóstico de enfermedades relacionadas al asbesto.

¿Qué recomendaciones ha hecho el gobierno federal para proteger la salud pública?

En 1989 la EPA prohibió todo nuevo uso del asbesto; los usos establecidos con anterioridad a esta fecha todavía se permiten. La EPA estableció reglamentos que requieren la inspección de escuelas para verificar si hay o no asbesto dañado, y para eliminar o reducir la exposición ya sea removiendo el asbesto o cubriéndolo. La EPA reglamenta la liberación de asbesto de fábricas y durante demolición o renovación de edificios para prevenir que el asbesto pase al ambiente. La EPA ha propuesto una concentración límite de 7 millones de fibras por litro de agua potable para fibras largas (5 µm de longitud o más). La Adminitración de Salud y Seguridad Ocupacional (OSHA) ha establecido límites de 100,000 fibras con longitudes de 5 µm o más por metro cúbico de aire en el lugar trabajo durante jornadas de 8 horas diarias, 40 horas semanales.

Referencias

Agencia para Sustancias Tóxicas y el Registro de Enfermedades. (ATSDR). 2001. Reseña Toxicológica del Asbesto (en inglés). Atlanta, GA: Departamento de Salud y Servicios Humanos de los EE.UU., Servicio de Salud Pública.

¿Dónde puedo obtener más información? Para más información, contacte a la Agencia para Sustancias Tóxicas y el Registro de Enfermedades, División de Toxicología, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Teléfono: 1-888-422-8737, FAX: 770-488-4178. La dirección de la ATSDR via WWW es http://www.atsdr.gov/es/ en español. La ATSDR puede informarle donde encontrar clínicas de salud ocupacional y ambiental. Sus especialistas pueden reconocer, evaluar y tratar enfermedades causadas por la exposición a sustancias peligrosas. Usted también puede contactar su departamento comunal o estatal de salud o de calidad ambiental si tiene más preguntas o inquietudes.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

ASBESTOS
CAS # 1332-21-4

Division of Toxicology ToxFAQs™ September 2001

This fact sheet answers the most frequently asked health questions (FAQs) about asbestos. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, individual susceptibility and personal habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to asbestos usually occurs by breathing contaminated air in workplaces that make or use asbestos. Asbestos is also found in the air of buildings that are being torn down or renovated. Asbestos exposure can cause serious lung problems and cancer. This substance has been found at 83 of the 1,585 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is asbestos?

Asbestos is the name given to a group of six different fibrous minerals (amosite, chrysotile, crocidolite, and the fibrous varieties of tremolite, actinolite, and anthophyllite) that occur naturally in the environment. Asbestos minerals have separable long fibers that are strong and flexible enough to be spun and woven and are heat resistant. Because of these characteristics, asbestos has been used for a wide range of manufactured goods, mostly in building materials (roofing shingles, ceiling and floor tiles, paper products, and asbestos cement products), friction products (automobile clutch, brake, and transmission parts), heat-resistant fabrics, packaging, gaskets, and coatings. Some vermiculite or talc products products may contain asbestos.

What happens to asbestos when it enters the environment?

Asbestos fibers can enter the air or water from the breakdown of natural deposits and manufactured asbestos products. Asbestos fibers do not evaporate into air or dissolve in water. Small diameter fibers and particles may remain suspended in the air for a long time and be carried long distances by wind or water before settling down. Larger diameter fibers and particles tend to settle more quickly.

Asbestos fibers are not able to move through soil. Asbestos fibers are generally not broken down to other compounds and will remain virtually unchanged over long periods.

How might I be exposed to asbestos?

We are all exposed to low levels of asbestos in the air we breathe. These levels range from 0.00001 to 0.0001 fibers per milliliter of air and generally are highest in cities and industrial areas.

People working in industries that make or use asbestos products or who are involved in asbestos mining may be exposed to high levels of asbestos. People living near these industries may also be exposed to high levels of asbestos in air.

Asbestos fibers may be released into the air by the disturbance of asbestos-containing material during product use, demolition work, building or home maintenance, repair, and remodeling. In general, exposure may occur only when the asbestos-containing material is disturbed in some way to release particles and fibers into the air.

Drinking water may contain asbestos from natural sources or from asbestos-containing cement pipes.

How can asbestos affect my health?

Asbestos mainly affects the lungs and the membrane that surrounds the lungs. Breathing high levels of asbestos fibers for a long time may result in scar-like tissue in the lungs and in the pleural membrane (lining) that surrounds the lung. This disease is called asbestosis and is usually found in workers exposed to asbestos, but not in the general public. People with asbestosis have difficulty breathing, often a cough, and in severe cases heart enlargement. Asbestosis is a serious disease and can eventually lead to disability and death.

Breathing lower levels of asbestos may result in changes called plaques in the pleural membranes. Pleural plaques can occur in workers and sometimes in people living in areas with high environmental levels of asbestos. Effects on breathing from pleural plaques alone are not usually serious, but higher exposure can lead to a thickening of the pleural membrane that may restrict breathing.

How likely is asbestos to cause cancer?

The Department of Health and Human Services (DHHS), the World Health Organization (WHO), and the EPA have determined that asbestos is a human carcinogen.

It is known that breathing asbestos can increase the risk of cancer in people. There are two types of cancer caused by exposure to asbestos: lung cancer and mesothelioma. Mesothelioma is a cancer of the thin lining surrounding the lung (pleural membrane) or abdominal cavity (the peritoneum). Cancer from asbestos does not develop immediately, but shows up after a number of years. Studies of workers also suggest that breathing asbestos can increase chances of getting cancer in other parts of the body (stomach, intestines, esophagus, pancreas, and kidneys), but this is less certain. Early identification and treatment of any cancer can increase an individual's quality of life and survival.

Cigarette smoke and asbestos together significantly increase your chances of getting lung cancer. Therefore, if you have been exposed to asbestos you should stop smoking. This may be the most important action that you can take to improve your health and decrease your risk of cancer.

How can asbestos affect children?

We do not know if exposure to asbestos will result in birth defects or other developmental effects in people. Birth defects have not been observed in animals exposed to asbestos.

It is likely that health effects seen in children exposed to high levels of asbestos will be similar to the effects seen in adults.

How can families reduce the risk of exposure to asbestos?

Materials containing asbestos that are not disturbed or deteriorated do not, in general, pose a health risk and can be left alone. If you suspect that you may be exposed to asbestos in your home, contact your state or local health department or the regional offices of EPA to find out how to test your home and how to locate a company that is trained to remove or contain the fibers.

Is there a medical test to show whether I've been exposed to asbestos?

Low levels of asbestos fibers can be measured in urine, feces, mucus, or lung washings of the general public. Higher than average levels of asbestos fibers in tissue can confirm exposure but not determine whether you will experience any health effects.

A thorough history, physical exam, and diagnostic tests are needed to evaluate asbestos-related disease. Chest x-rays are the best screening tool to identify lung changes resulting from asbestos exposure. Lung function tests and CAT scans also assist in the diagnosis of asbestos-related disease.

Has the federal government made recommendations to protect human health?

In 1989, EPA banned all new uses of asbestos; uses established before this date are still allowed. EPA established regulations that require school systems to inspect for damaged asbestos and to eliminate or reduce the exposure by removing the asbestos or by covering it up. EPA regulates the release of asbestos from factories and during building demolition or renovation to prevent asbestos from getting into the environment.

EPA has proposed a concentration limit of 7 million fibers per liter of drinking water for long fibers (lengths greater than or equal to 5 μm). The Occupational Safety and Health Administration has set limits of 100,000 fibers with lengths greater than or equal to 5 μm per cubic meter of workplace air for 8-hour shifts and 40-hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2001. Toxicological Profile for Asbestos. Update. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html . ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES
AND DISEASE REGISTRY

BENCENO
(BENZENE)
CAS # 71-43-2

División de Toxicología ToxFAQs™ Septiembre 1997

Esta hoja informativa contesta las preguntas más frecuentes acerca de los efectos del benceno sobre la salud. Para más información, por favor llame al Centro de Información de ATSDR al 1-888-422-8737. Esta hoja informativa forma parte de una serie de resúmenes acerca de sustancias peligrosas y sus efectos sobre la salud. Es importante que usted entienda esta información ya que esta sustancia puede ser dañina. Los efectos de la exposición a cualquier sustancia tóxica dependen de la dosis, la duración, la manera como usted está expuesto, sus hábitos y características personales y de la presencia de otras sustancias químicas.

IMPORTANTE: El benceno es una sustancia química ampliamente usada, generada tanto por procesos naturales como por actividades humanas. Respirar benceno puede causar somnolencia, mareo y pérdida del conocimiento; la exposición de larga duración produce alteraciones en la médula de los huesos y puede causar anemia y leucemia. Se ha encontrado benceno en por lo menos 813 de los 1,430 sitios de la Lista de Prioridades Nacionales identificados por la Agencia de Protección Ambiental (EPA).

¿Qué es el benceno?

El benceno es un líquido incoloro de aroma dulce. Se evapora al aire rápidamente y es poco soluble en agua. Es sumamente inflamable y se forma tanto de procesos naturales como de actividades humanas.

El benceno es usado extensamente en los Estados Unidos; está listado entre los 20 productos químicos de mayor volumen de producción. Algunas industrias usan benceno para manufacturar otros productos químicos usados en la fabricación de plásticos, resinas, nilón y fibras sintéticas. También se usa benceno para hacer ciertos tipos de gomas, lubricantes, tinturas, detergentes, medicamentos y pesticidas. Los volcanes e incendios forestales constituyen fuentes naturales de benceno. El benceno es también un constituyente natural del petróleo crudo, gasolina y humo de cigarrillo.

¿Qué le sucede al benceno cuando entra al medio ambiente?

❏ Procesos industriales constituyen la principal fuente de benceno en el medio ambiente.
❏ El benceno puede pasar al aire desde el agua y desde el suelo.
❏ Reacciona en el aire con otros productos químicos y se degrada en unos pocos días.
❏ El benceno en el aire puede adherirse a lluvia o nieve y así ser transportado de nuevo al suelo.
❏ Se degrada más lentamente en agua y en el suelo, y puede pasar a través del suelo a aguas subterráneas.
❏ El benceno no se acumula en plantas o en animales.

¿Cómo podría yo estar expuesto al benceno?

❏ El aire libre contiene niveles bajos de benceno provenientes de humo de cigarrillo, gasolineras, emisiones industriales y del tubo de escape de automóviles.
❏ El aire interior generalmente contiene niveles de benceno más altos; estos provienen de productos que contienen benceno tales como pegamentos, pinturas, cera para muebles, y detergentes.
❏ El aire en los alrededores de vertederos o de gasolinerías contendrá niveles de benceno más altos.
❏ Escapes de tanques de almacenaje subterráneos o de vertederos que contienen benceno pueden contaminar agua de manantiales.
❏ Gente que trabaja en industrias que fabrican o usan benceno puede estar expuesta a los más altos niveles de benceno.
❏ Una de las fuentes principales de exposición al benceno es el humo de cigarrillo.

¿Cómo puede afectar mi salud el benceno?

Respirar niveles de benceno muy altos puede causar la muerte, mientras que niveles altos pueden causar somnolencia, mareo, aceleración del latido del corazón, dolores de cabeza, temblores, confusión y pérdida del conocimiento. Comer o tomar altos niveles de benceno puede causar vómitos o

irritación del estómago, mareo, somnolencia o convulsiones; rápido latido cardíaco y la muerte.

El efecto principal de la exposición de larga duracion (365 días o más) al benceno es en la sangre. El benceno produce efectos nocivos en la médula de los huesos y puede causar una disminución en el número de glóbulos rojos, lo que conduce a anemia. El benceno también puede producir hemorragias y daño al sistema inmunitario, aumentando así las posibilidades de contraer infecciones

Algunas mujeres que respiraron altos niveles de benceno por varios meses tuvieron menstruaciones irregulares y el tamaño de sus ovarios disminuyó. No se sabe si la exposición al benceno afecta al feto durante el embarazo o la fertilidad en hombres.

Estudios en animales que respiraron benceno durante la preñez han descrito bajo peso de nacimiento, retardo en la formación de hueso y daño en la médula de los huesos.

¿Qué posibilidades hay de que el benceno produzca cáncer?

El Departamento de Salud y Servicios Humanos (DHHS) ha determinado que el benceno es un reconocido carcinógeno en seres humanos. La exposición de larga duración a altos niveles de benceno en el aire puede producir leucemia, un cáncer a los tejidos que fabrican las células de la sangre.

¿Hay algún examen médico que demuestre que he estado expuesto al benceno?

Hay varios exámenes que pueden revelar si usted ha estado expuesto al benceno. Hay un examen que mide el benceno en el aliento; este examen debe hacerse poco después de la exposición. También se puede medir el benceno en la sangre, sin embargo, debido a que el benceno desaparece rápidamente de la sangre, las mediciones son precisas solo en casos de exposiciones recientes.

En el organismo, el benceno es convertido en productos llamados metabolitos. Ciertos metabolitos pueden medirse en la orina. Sin embargo, este examen debe hacerse con prontitud después de la exposición y su resultado no indica con confianza a cuanto benceno estuvo expuesto, ya que los metabolitos en la orina pueden originarse de otras fuentes.

¿Qué recomendaciones ha hecho el gobierno federal para proteger la salud pública?

La EPA ha establecido un límite permisible máximo en agua potable de 0.005 miligramos de benceno por litro de agua (0.005 mg/L). La EPA require que se le notifique en casos de derrames o de liberación al medio ambiente de 10 libras o más de benceno.

La Administración de Salud y Seguridad Ocupacional (OSHA) establece un límite de exposición en el aire del lugar trabajo de 1 parte por millón (1 ppm) en una jornada de 8 horas, 40 horas semanales.

Definiciones

Anemia: Reducción en la habilidad de la sangre para transportar oxígeno
CAS: Servicio de Resúmenes de Sustancias Químicas.
Carcinógeno: Sustancia que puede producir cáncer.
Metabolitos: Productos de degradación de sustancias químicas.
Miligramo: Un milésimo de gramo.
Pesticida: Sustancia para matar plagas.

Referencias

Agencia para Sustancias Tóxicas y el Registro de Enfermedades. (ATSDR). 1997. Reseña Toxicológica del Benceno (edición actualizada)(en inglés). Atlanta, GA: Departamento de Salud y Servicios Humanos de los EE. UU., Servicio de Salud Pública.

¿Dónde puedo obtener más información? Para más información, contacte a la Agencia para Sustancias Tóxicas y el Registro de Enfermedades, División de Toxicología, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Teléfono: 1-888-422-8737, FAX: 770-488-4178. La dirección de la ATSDR via WWW es http://www.atsdr.gov/es/ en español. La ATSDR puede informarle donde encontrar clínicas de salud ocupacional y ambiental. Sus especialistas pueden reconocer, evaluar y tratar enfermedades causadas por la exposición a sustancias peligrosas. Usted también puede contactar su departamento comunal o estatal de salud o de calidad ambiental si tiene más preguntas o inquietudes.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

BENZENE
CAS # 71-43-2

Agency for Toxic Substances and Disease Registry ToxFAQs September 1997

This fact sheet answers the most frequently asked health questions (FAQs) about benzene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Benzene is a widely used chemical formed from both natural processes and human activities. Breathing benzene can cause drowsiness, dizziness, and unconsciousness; long-term benzene exposure causes effects on the bone marrow and can cause anemia and leukemia. Benzene has been found in at least 813 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is benzene?

(Pronounced bĕn′zēn′)

Benzene is a colorless liquid with a sweet odor. It evaporates into the air very quickly and dissolves slightly in water. It is highly flammable and is formed from both natural processes and human activities.

Benzene is widely used in the United States; it ranks in the top 20 chemicals for production volume. Some industries use benzene to make other chemicals which are used to make plastics, resins, and nylon and synthetic fibers. Benzene is also used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides. Natural sources of benzene include volcanoes and forest fires. Benzene is also a natural part of crude oil, gasoline, and cigarette smoke.

What happens to benzene when it enters the environment?

- Industrial processes are the main source of benzene in the environment.
- Benzene can pass into the air from water and soil.
- It reacts with other chemicals in the air and breaks down within a few days.
- Benzene in the air can attach to rain or snow and be carried back down to the ground.
- It breaks down more slowly in water and soil, and can pass through the soil into underground water.
- Benzene does not build up in plants or animals.

How might I be exposed to benzene?

- Outdoor air contains low levels of benzene from tobacco smoke, automobile service stations, exhaust from motor vehicles, and industrial emissions.
- Indoor air generally contains higher levels of benzene from products that contain it such as glues, paints, furniture wax, and detergents.
- Air around hazardous waste sites or gas stations will contain higher levels of benzene.
- Leakage from underground storage tanks or from hazardous waste sites containing benzene can result in benzene contamination of well water.
- People working in industries that make or use benzene may be exposed to the highest levels of it.
- A major source of benzene exposures is tobacco smoke.

How can benzene affect my health?

Breathing very high levels of benzene can result in death, while high levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Eating or drinking foods containing high levels of benzene can cause vomiting, irritation of the stomach, dizziness, sleepiness, convulsions, rapid heart rate, and death.

The major effect of benzene from long-term (365 days or longer) exposure is on the blood. Benzene causes harmful effects on the bone marrow and can cause a decrease in red blood cells leading to anemia. It can also cause excessive bleeding and can affect the immune system, increasing the chance for infection.

Some women who breathed high levels of benzene for many months had irregular menstrual periods and a decrease in the size of their ovaries. It is not known whether benzene exposure affects the developing fetus in pregnant women or fertility in men.

Animal studies have shown low birth weights, delayed bone formation, and bone marrow damage when pregnant animals breathed benzene.

How likely is benzene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that benzene is a known human carcinogen. Long-term exposure to high levels of benzene in the air can cause leukemia, cancer of the blood-forming organs.

Is there a medical test to show whether I've been exposed to benzene?

Several tests can show if you have been exposed to benzene. There is test for measuring benzene in the breath; this test must be done shortly after exposure. Benzene can also be measured in the blood, however, since benzene disappears rapidly from the blood, measurements are accurate only for recent exposures.

In the body, benzene is converted to products called metabolites. Certain metabolites can be measured in the urine. However, this test must be done shortly after exposure and is not a reliable indicator of how much benzene you have been exposed to, since the metabolites may be present in urine from other sources.

Has the federal government made recommendations to protect human health?

The EPA has set the maximum permissible level of benzene in drinking water at 0.005 milligrams per liter (0.005 mgL). The EPA requires that spills or accidental releases into the environment of 10 pounds or more of benzene be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit of 1 part of benzene per million parts of air (1 ppm) in the workplace during an 8-hour workday, 40-hour workweek.

Glossary

Anemia: A decreased ability of the blood to transport oxygen.

Carcinogen: A substance with the ability to cause cancer.

CAS: Chemical Abstracts Service.

Chromosomes: Parts of the cells responsible for the development of hereditary characteristics.

Metabolites: Breakdown products of chemicals.

Milligram (mg): One thousandth of a gram.

Pesticide: A substance that kills pests.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Benzene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

MERCURIO
(MERCURY)
CAS # 7439-97-6

División de Toxicología ToxFAQs™ Abril 1999

Esta hoja informativa contesta las preguntas más frecuentes acerca de los efectos del mercurio sobre la salud. Para más información, por favor llame al Centro de Información de ATSDR al 1-888-422-8737. Esta hoja informativa forma parte de una serie de resúmenes acerca de sustancias peligrosas y sus efectos sobre la salud. Es importante que usted entienda esta información ya que esta sustancia puede ser dañina. Los efectos de la exposición a cualquier sustancia tóxica dependen de la dosis, la duración, la manera como usted está expuesto, sus hábitos y características personales y de la presencia de otras sustancias químicas.

IMPORTANTE: La exposición al mercurio ocurre al respirar aire contaminado, al ingerir agua y alimentos contaminados y a raíz de tratamientos médicos y dentales. Altos niveles de mercurio pueden dañar el cerebro, los riñones y el feto. Esta sustancia química se ha encontrado en por lo menos 714 de los 1,467 sitios de la Lista de Prioridades Nacionales identificados por la Agencia de Protección Ambiental (EPA).

¿Qué es el mercurio?

El mercurio es un metal que ocurre en forma natural en el ambiente y que tiene varias formas químicas. El mercurio metálico es un líquido inodoro, de color blanco-plateado brillante. Al calentarlo se transforma en un gas inodoro e incoloro.

El mercurio se combina con otros elementos, por ejemplo cloro, azufre u oxígeno para formar compuestos de mercurio inorgánicos o "sales," las que son generalmente polvos o cristales blancos. El mercurio también se combina con carbono para formar compuestos de mercurio orgánicos. El más común, metilmercurio, es producido principalmente por organismos microscópicos en el suelo y en el agua. Mientras mayor es la cantidad de mercurio en el medio ambiente, mayor es la cantidad de metilmercurio que estos organismos producen.

El mercurio metálico se usa en la producción de gas de cloro y soda cáustica y también se usa en termómetros, tapaduras dentales y pilas. Las sales de mercurio se usan en cremas para aclarar la piel y en cremas y ungüentos antisépticos.

¿Qué le sucede al mercurio cuando entra al medio ambiente?

❑ El mercurio inorgánico (mercurio metálico y compuestos de mercurio inorgánicos) pasa al aire durante la extracción de depósitos minerales, al quemar carbón y basura y de plantas industriales.

❑ El mercurio pasa al agua o a la tierra de depósitos naturales, de basurales y de actividad volcánica.

❑ El metilmercurio puede ser formado en el agua y el suelo por pequeños organismos llamados bacterias.

❑ El metilmercurio se acumula en los tejidos de peces. Peces de mayor tamaño y de mayor edad tienden a tener niveles de mercurio más altos.

¿Cómo podría yo estar expuesto al mercurio?

❑ Al comer pescados o mariscos contaminados con metilmercurio.

❑ Al respirar vapores de mercurio generados por incineradores, industrias que queman combustibles que contienen mercurio o cerca de donde se ha derramado mercurio.

❑ Por liberación de mercurio durante tratamientos médicos o dentales.

❑ Al respirar aire contaminado en el trabajo o por contacto de la piel durante uso en el trabajo (servicios dentales y de salud y otras industrias que usan mercurio).

❑ En la práctica de ceremonias o ritos en que se usa el mercurio.

¿Cómo puede afectar mi salud el mercurio?

El sistema nervioso es muy susceptible a todas formas de mercurio. El metilmercurio y los vapores de mercurio metálico son más nocivos que otras formas, ya que una mayor cantidad de estas formas de mercurio llega al cerebro. La exposición a altos niveles de mercurio metálico, inorgánico, u orgánico puede dañar en forma permanente a los riñones, el cerebro, y al feto. Los efectos sobre la función cerebral pueden manifestarse como irritabilidad, timidez, temblores, alteraciones a la vista o la audición y problemas de la memoria.

La exposición por corto tiempo a altos niveles de vapores de mercurio metálico puede causar lesiones al pulmón, náusea, vómitos, diarrea, aumento de la presión sanguínea o del pulso, salpullidos e irritación a los ojos.

¿Qué posibilidades hay de que el mercurio produzca cáncer?

Hay datos disponibles, aunque inadecuados, acerca de todas las formas del mercurio y cáncer en seres humanos. El cloruro mercúrico produjo un aumento en varios tipos de tumores en ratas y ratones, y el metilmercurio produjo tumores del riñón en ratones machos. La EPA ha determinado que el cloruro mercúrico y el metilmercurio son posiblemente carcinogénicos en seres humanos.

¿Cómo puede el mercurio afectar a los niños?

Niños muy pequeños son más sensibles al mercurio que adultos. El mercurio en el cuerpo de la madre pasa al feto, en donde puede acumularse. También puede pasar al niño a través de la leche materna. No obstante, los beneficios de amamantar pueden ser mayores que los posibles efectos nocivos del mercurio en la leche materna.

Efectos nocivos del mercurio que puede pasar de la madre al feto incluyen daño cerebral, retardamiento mental, incoordinación, ceguera, convulsiones e incapacidad para hablar. Niños con envenenamiento de mercurio pueden desarrollar problemas al sistema nervioso y sistema digestivo y lesiones al riñón.

¿Cómo pueden las familias reducir el riesgo de exposición al mercurio?

Maneje y deseche cuidadosamente productos que contienen mercurio tales como termómetros o tubos de luz fluorescentes. No use la aspiradora si se derrama mercurio ya que éste de vaporizará y la exposición aumentará. Si se ha derramado una gran cantidad de mercurio, contacte al departamento de salud. Enseñe a los niños a no jugar con líquidos plateados brillantes.

Disponga en debida forma de medicamentos viejos que contienen mercurio. Mantenga todo medicamento que contenga mercurio fuera del alcance de los niños.

Mujeres embarazadas y niños deben mantenerse alejados de cuartos donde se ha usado mercurio líquido.

Infórmese acerca de avisos de advertencia sobre animales silvestres y peces en su área a través de su departamento de salud pública o de recursos naturales.

¿Hay algún examen médico que demuestre que he estado expuesto al mercurio?

Hay exámenes que miden la cantidad de mercurio en el organismo. Muestras de sangre y de orina se usan para evaluar la exposición a mercurio metálico y a formas de mercurio inorgánico. El nivel de mercurio en la sangre o en el cabello se usa para evaluar la exposición a metilmercurio. Su doctor puede tomar muestras para mandarlas a un laboratorio especial.

¿Qué recomendaciones ha hecho el gobierno federal para proteger la salud pública?

La EPA ha establecido un límite de 2 partes de mercurio por mil millones de partes de agua potable (2 ppmm).

La Administración de Alimentos y Drogas (FDA) ha establecido un nivel permisible máximo de 1 parte de metilmercurio por cada millón de partes de mariscos (1 ppm).

La Administración de Salud y Seguridad Ocupacional (OSHA) ha establecido límites de 0.1 miligramos de mercurio orgánico por metro cúbico de aire (0.1 mg/m^3) en el aire del trabajo y 0.05 mg/m^3 para vapor de mercurio metálico en jornadas de 8 horas diarias y 40 horas semanales.

Referencias

Agencia para Sustancias Tóxicas y el Registro de Enfermedades. (ATSDR). 1999. Reseña Toxicológica del Mercurio (en inglés). Atlanta, GA: Departamento de Salud y Servicios Humanos de los EE.UU., Servicio de Salud Pública.

¿Dónde puedo obtener más información? Para más información, contacte a la Agencia para Sustancias Tóxicas y el Registro de Enfermedades, División de Toxicología, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Teléfono: 1-888-422-8737, FAX: 770-488-4178. La dirección de la ATSDR via WWW es http://www.atsdr.gov/es/ en español. La ATSDR puede informarle donde encontrar clínicas de salud ocupacional y ambiental. Sus especialistas pueden reconocer, evaluar y tratar enfermedades causadas por la exposición a sustancias peligrosas. Usted también puede contactar su departamento comunal o estatal de salud o de calidad ambiental si tiene más preguntas o inquietudes.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

MERCURY
CAS # 7439-97-6

Agency for Toxic Substances and Disease Registry ToxFAQs April 1999

This fact sheet answers the most frequently asked health questions (FAQs) about mercury. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to mercury occurs from breathing contaminated air, ingesting contaminated water and food, and having dental and medical treatments. Mercury, at high levels, may damage the brain, kidneys, and developing fetus. This chemical has been found in at least 714 of 1,467 National Priorities List sites identified by the Environmental Protection Agency.

What is mercury?
(Pronounced mŭr′kyə-rē)

Mercury is a naturally occurring metal which has several forms. The metallic mercury is a shiny, silver-white, odorless liquid. If heated, it is a colorless, odorless gas.

Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or "salts," which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds. The most common one, methylmercury, is produced mainly by microscopic organisms in the water and soil. More mercury in the environment can increase the amounts of methylmercury that these small organisms make.

Metallic mercury is used to produce chlorine gas and caustic soda, and is also used in thermometers, dental fillings, and batteries. Mercury salts are sometimes used in skin lightening creams and as antiseptic creams and ointments.

What happens to mercury when it enters the environment?

- Inorganic mercury (metallic mercury and inorganic mercury compounds) enters the air from mining ore deposits, burning coal and waste, and from manufacturing plants.
- It enters the water or soil from natural deposits, disposal of wastes, and volcanic activity.
- Methylmercury may be formed in water and soil by small organisms called bacteria.
- Methylmercury builds up in the tissues of fish. Larger and older fish tend to have the highest levels of mercury.

How might I be exposed to mercury?

- Eating fish or shellfish contaminated with methylmercury.
- Breathing vapors in air from spills, incinerators, and industries that burn mercury-containing fuels.
- Release of mercury from dental work and medical treatments.
- Breathing contaminated workplace air or skin contact during use in the workplace (dental, health services, chemical, and other industries that use mercury).
- Practicing rituals that include mercury.

How can mercury affect my health?

The nervous system is very sensitive to all forms of mercury. Methylmercury and metallic mercury vapors are more harmful than other forms, because more mercury in these forms reaches the brain. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems.

Short-term exposure to high levels of metallic mercury vapors may cause effects including lung damage, nausea,

vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation.

How likely is mercury to cause cancer?

There are inadequate human cancer data available for all forms of mercury. Mercuric chloride has caused increases in several types of tumors in rats and mice, and methylmercury has caused kidney tumors in male mice. The EPA has determined that mercuric chloride and methylmercury are possible human carcinogens.

How can mercury affect children?

Very young children are more sensitive to mercury than adults. Mercury in the mother's body passes to the fetus and may accumulate there. It can also can pass to a nursing infant through breast milk. However, the benefits of breast feeding may be greater than the possible adverse effects of mercury in breast milk.

Mercury's harmful effects that may be passed from the mother to the fetus include brain damage, mental retardation, incoordination, blindness, seizures, and inability to speak. Children poisoned by mercury may develop problems of their nervous and digestive systems, and kidney damage.

How can families reduce the risk of exposure to mercury?

Carefully handle and dispose of products that contain mercury, such as thermometers or fluorescent light bulbs. Do not vacuum up spilled mercury, because it will vaporize and increase exposure. If a large amount of mercury has been spilled, contact your health department. Teach children not to play with shiny, silver liquids.

Properly dispose of older medicines that contain mercury. Keep all mercury-containing medicines away from children.

Pregnant women and children should keep away from rooms where liquid mercury has been used.

Learn about wildlife and fish advisories in your area from your public health or natural resources department.

Is there a medical test to show whether I've been exposed to mercury?

Tests are available to measure mercury levels in the body. Blood or urine samples are used to test for exposure to metallic mercury and to inorganic forms of mercury. Mercury in whole blood or in scalp hair is measured to determine exposure to methylmercury. Your doctor can take samples and send them to a testing laboratory.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 2 parts of mercury per billion parts of drinking water (2 ppb).

The Food and Drug Administration (FDA) has set a maximum permissible level of 1 part of methylmercury in a million parts of seafood (1 ppm).

The Occupational Safety and Health Administration (OSHA) has set limits of 0.1 milligram of organic mercury per cubic meter of workplace air (0.1 mg/m^3) and 0.05 mg/m^3 of metallic mercury vapor for 8-hour shifts and 40-hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for mercury. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Asbestos Regulation Frequently Asked Questions

The Clean Air Act (CAA) requires the U. S. Environmental Protection Agency (EPA) to develop and enforce regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health. In accordance with Section 112 of the CAA, EPA established National Emissions Standards for Hazardous Air Pollutants (NESHAP) to protect the public. Asbestos was one of the first hazardous air pollutants regulated under Section 112. On March 31, 1971, EPA identified asbestos as a hazardous pollutant, and on April 6, 1973, EPA first promulgated the Asbestos NESHAP in 40 CFR Part 61. In 1982, EPA delegated primary authority for the implementation and enforcement of the Asbestos NESHAP to the State of Florida.

The Florida Department of Environmental Protection (DEP) administers an asbestos removal program under Chapter 62-257, Florida Administrative Code. The Asbestos NESHAP has been adopted by reference in section 62-204.800, Florida Administrative Code.

The program's intent is to minimize the release of asbestos fibers during activities involving the processing, handling, and disposal of asbestos-containing material. Accordingly, the Asbestos NESHAP specifies work practices to be followed during demolitions and renovations of all structures, installations, and buildings (excluding residential buildings that have four or fewer dwelling units). In addition, the regulations require the owner of the building and/or the operator to notify the applicable DEP District Office or Local Pollution Control Agency before any demolition, or before renovations of buildings that contain a certain threshold amount of asbestos or asbestos containing materials.

What is the purpose of the Asbestos NESHAP regulation?

As stated above, the purpose is to protect the public health by minimizing the release of asbestos when facilities, which contain asbestos-containing materials (ACMs), are demolished or renovated.

What is a "facility?"

As defined in the regulation, a "facility" is any institutional, commercial, public, industrial or residential structure, installation or building (including any structure, installation or building containing condominiums, or individual dwelling units operated as a residential cooperative, but excluding residential buildings having four or fewer dwelling units); any ship; or any active or inactive waste disposal site. Any building, structure or installation that contains a loft used as a dwelling is not considered residential. Any structure, installation, or building that was previously subject to the Asbestos NESHAP is not excluded, regardless of its current use or function.

Are facilities constructed in the past 10 years subject to the asbestos regulations?

Yes. There is no exclusion date in the asbestos regulations for facilities constructed in the past 10 years.

If I renovate several two-family units, are the units defined as a "facility?"

Residential buildings which have four or fewer dwelling units are not considered "facilities" unless they are part of a larger installation (for example, an army base, company housing, apartment or housing complex, part of a group of houses subject to condemnation for a highway right-of-way, an apartment which is an integral part of a commercial facility, etc.).

Are mobile homes or mobile structures regulated by the Asbestos NESHAP?

Mobile homes used as single-family dwellings are not subject to Asbestos NESHAP unless part of a larger installation. Mobile structures used for non-residential purposes are subject to NESHAP.

Are Federal facilities regulated by the Asbestos NESHAP?

Yes.

Are single-family private residences regulated by the Asbestos NESHAP?

No.

What is a renovation?

A renovation is altering a facility or one or more facility components in any way, including the stripping or removal of Regulated Asbestos Containing Materials (RACM) from a facility component. A renovation could be, but not limited to, any interior renovation or remodel not affecting load-supporting structural members or a roof replacement.

What is a demolition?

A demolition means the wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations or the intentional burning (i.e. practice burns) of any facility.

Is roofing work classified as a renovation or a demolition?

Normally, roofing work with ACM is classified as a renovation in the Asbestos NESHAP. If roofing work involves wrecking or taking out load-supporting structural members, then the work would be classified as a demolition. Also see Roofing FAQ.

How much asbestos must be present before the Asbestos NESHAP work practice standards apply to renovation projects?

Asbestos NESHAP regulations must be followed for all renovations of facilities with at least **80 linear meters (260 linear feet)** of regulated asbestos-containing materials (RACM) on pipes, or **15 square meters (160 square feet)** of regulated asbestos-containing materials on other facility components, or at least **one cubic meter (35 cubic feet)** off facility components where the amount of RACM previously removed from pipes and other facility components could not be measured before stripping. These amounts are known as the "threshold" amounts.

How much asbestos must be present before the Asbestos NESHAP work practice standards apply to demolition projects?

Asbestos NESHAP regulations must be followed for demolitions of facilities with at least **80 linear meters (260 linear feet)** of regulated asbestos-containing materials (RACM) on pipes, **15 square meters (160 square feet)** of regulated asbestos-containing materials on other facility components, or at least **one cubic meter (35 cubic feet)** off facility components where the amount of RACM previously removed from pipes and other facility components could not be measured before stripping. However, all demolitions must notify the appropriate regulatory agency, even if no asbestos is present at the site, and all demolitions and renovations are "subject" to the Asbestos NESHAP insofar as owners and operators must determine if and how much asbestos is present at the site.

Am I required to submit a notification form for a demolition project when no asbestos is present?

Yes. All demolitions must have notifications submitted to the appropriate DEP District Office or Local Pollution Control Agency. See more questions regarding notification below.

Are homes that are demolished or renovated to build non-residential structures regulated by the Asbestos NESHAP?

Yes. For example, the Asbestos NESHAP regulates multiple residential structures that are demolished as part of an urban renewal project, a highway construction project, or a project to develop a shopping mall. A single home which is converted into a non-residential structure is also regulated by the Asbestos NESHAP. For example, if someone buys a house and converts it into a store, the renovation is subject to the Asbestos NESHAP.

What is encapsulation, and is it regulated by the Asbestos NESHAP?

Encapsulation is the application of a material with a sealant to stop it from releasing fibers. Normally, the Asbestos NESHAP does not regulate encapsulation unless it involves removing or stripping asbestos. However, if encapsulation is done using methods that damage asbestos and release fibers it would be covered. For example, high pressure spraying to apply encapsulant could damage asbestos. Also, if friable RACM is encapsulated, the RACM is still covered by the Asbestos NESHAP if renovation or demolition occurs.

What is a notification?

A notification is a written notice of intent to renovate or demolish. Notifications must contain certain specified information, including but not limited to, the scheduled starting and completion date of the work, the location of the site, the names of operators or asbestos removal contractors, methods of removal and the amount of asbestos, and whether the operation is a demolition or renovation. See Section 61.145(b) of the Asbestos NESHAP regulation.

Whom do I notify?

You should notify the DEP District Office or Local Pollution Control Agency in your area of the demolition or renovation operations subject to NESHAP. See contact information for proper submittal of notification form.

How do I notify?

The completed notification form may be submitted by mail, hand or commercial delivery service to the appropriate DEP District Office or Local Pollution Control Agency.

Who is responsible for submitting a notification -- the owner of the building, which is being demolished or renovated, or the contractor?

The NESHAP regulation states that either the owner of the building or operator of the demolition or renovation operation can submit the notification. Usually, the two parties decide together who will notify. If no adequate notice is provided, one or both parties can be held liable.

When a condominium complex is being renovated, who as owner, is responsible for submitting a notification?

While owners and operators share responsibility for proper notification, the condominium or co-op board is responsible as the owner. The board should ensure that they are told when work takes place on individual units, so that they can comply with notification requirements, especially if multiple operators are involved.

Is there a form for notifications?

Yes, there is a form for notification. You can obtain a form, and instructions on how to fill it out, from your DEP District Office, Local Pollution Control Agency or online at http://www.dep.state.fl.us/air/forms/asbestos.htm#asbestos

When I notify regarding a renovation, what date do I consider the start date?

For a renovation, the start date is the day that the removal of asbestos-containing material, or any other asbestos-handling activities, including precleaning, construction of containment, or other activities that could disturb the asbestos, will begin.

When I notify regarding a demolition, do I give the start date of the demolition or of the asbestos removal? Which date do I use to determine whether I've met the 10-day waiting period?

For a demolition, the start date is the date that the removal or any removal related activity begins. The date the demolition starts also must be reported. The waiting period should be calculated based on the start date of the removal or if no removal is required then the start date of the demolition. The waiting period is necessary to give inspectors time to visit the site before activity begins.

Can a demolition and a renovation be notified on the same notification form?

Yes. The notification form should include information for both the renovation and demolition. For example, start/finish dates, contractors, waste disposal site(s), etc.

Does the 10-day notification requirement refer to "calendar" days or "working" days?

The asbestos regulations specify "working days." A “working day” is Monday through Friday and includes holidays that fall on any of the days Monday through Friday.

Is the 10 working days in the waiting period ever reduced?

No. The reduction of the waiting period is not allowed in the asbestos regulations.

Is the 10-day waiting period required on all asbestos projects?

No. An emergency renovation is the only project where the 10-day waiting period is not required for notification.

What constitutes an emergency renovation?

An emergency renovation is a renovation that was not planned, but results from a sudden, unexpected event that either immediately produces unsafe conditions, or that, if not quickly remedied, could be reasonably foreseen to result in an unsafe or detrimental effect on health or is necessary to protect equipment and avoid unreasonable financial burden. The term includes renovations necessitated by non-routine equipment failures. For example, the explosion of a boiler in a chemical plant might require emergency renovations, since such an explosion would disrupt normal operations. However, renovations involving routine repairs are not emergencies.

Under what conditions must I notify for emergency renovations? When must I notify?

First, inspect the facility and determine the amount of RACM that may have to be removed or disturbed to repair the facility. (If you don't have the time to have samples analyzed, you should assume that all insulation is RACM.) Then, if the amount of RACM is in excess of the threshold amount, you should mail or deliver a notification as soon as possible, but certainly no later than the following workday. A notification, which is postmarked more than one working day after the emergency, will be considered in violation of the notification requirements. DEP recommends that you send the notice by overnight express mail, and that you phone in a notification as well to the DEP District Office or Local Pollution Control Agency.

What is a "nonscheduled renovation operation"?

A "nonscheduled renovation operation" is a renovation operation that is caused by the routine failure of equipment which is expected to occur based on past operating experience, but for which an exact date cannot be predicted.

Do I have to notify for non-scheduled operations? When?

Yes, if you can predict based on past experience that renovations will be necessary during the calendar year and the amount of asbestos is likely to exceed the jurisdictional amount, notification is required. This notification must be submitted at least 10 working days before the end of the calendar year preceding the year for which notice is being given.

Note: Single renovation projects which exceed the threshold amount are not covered by this type of notice. A separate notification is required for these projects.

Must I notify the agency again if I know that a specific renovation project involving more than the threshold amount (including the work covered by the calendar year notice for non- scheduled operations) is about to occur at a specific time?

Yes.

When does a notification need to be revised?

A notification must be revised if information contained in the original notice has changed. For example, you must revise the notification if you change the start date of an operation. If the change relates to the amount of RACM involved, you need only revise the notification if the amount changes by more than 20 percent.

When do I submit a revised notification?

You should telephone the DEP District Office or Local Pollution Control Agency as soon as possible after you realize the revision is necessary, and should then mail or hand deliver a written notice. If you delay the start date of a project, the DEP District Office or Local Pollution Control Agency must receive the revised notification no later than the original start date. If you plan to begin work before the date specified in the original notice, the DEP District Office or Local Pollution Control Agency must receive the revised notice at least 10 working days before the revised start date.

Does the Asbestos NESHAP require a building owner or operator to remove damaged or deteriorating asbestos-containing material?

No. Not unless a renovation of the facility is planned which would disturb the ACM and it exceeds the threshold amount.

What does "adequately wet" mean?

To "adequately wet" ACM means to sufficiently mix or penetrate the material with liquid to prevent the release of particulates. If visible emissions are observed coming from ACM, then the material has not been adequately wetted. However, the absence of visible emissions is not evidence of being adequately wet.

If a facility is being demolished under an order of a State or local government because the facility is structurally unsound, and therefore unsafe, do all the normal regulations covering demolitions apply?

No. The applicable regulations are specified in section 61.145 (a)(3) of 40 CFR subpart M (Asbestos NESHAP).

If a facility is being demolished under an order of a State or local government, must all the debris be treated as asbestos-contaminated waste?

If, for safety reasons, the RACM in the facility is not removed prior to demolition, the RACM must be kept adequately wet during the wrecking operations. After wrecking, all the contaminated debris must be kept adequately wet until disposal. All contaminated debris which cannot be segregated and cleaned should be disposed of as asbestos waste.

What is friable asbestos-containing material?

Friable ACM is any material containing more than one percent asbestos (as determined by Polarized Light Microscopy) that, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure.

What is non-friable ACM?

Non-friable ACM is any material containing more than one percent asbestos (as determined by Polarized Light Microscopy) that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. Under the Asbestos NESHAP, non-friable ACM is divided into two categories. **Category I non-friable ACM** are asbestos-containing resilient floor coverings (commonly known as vinyl asbestos tile (VAT)), asphalt roofing products, packings and gaskets. These materials rarely become friable. All other non-friable ACM are considered **category II non-friable ACM**.

Must I remove category I non-friable material prior to demolition or renovation?

Under normal circumstances, category I non-friable materials need not be removed prior to demolition or renovation, because generally these materials do not release significant amounts of asbestos fibers, even when damaged. This is not, however, a hard and fast rule. If category I materials have become friable or are in poor condition, they must be removed. Also, if you sand, grind, abrade, drill, cut or chip any non-friable materials, including category I materials, you must treat the material as friable, if more than the jurisdictional amount is involved.

Must I remove category II non-friable materials prior to demolition or renovation?

These materials should be evaluated on a case-by-case basis. If category II non-friable materials are likely to become crushed, pulverized or reduced to powder during demolition or renovation, they should be removed before demolition or renovation begin. For example, A/C (asbestos cement) siding on a building that is going to be demolished with a wrecking ball should be removed, because it is likely that the siding will be pulverized by the wrecking ball.

Does non-friable waste, if broken, damaged, etc., have to be wetted and contained?

Non-friable ACM that has been damaged during a demolition or renovation operation such that some portions of the material are crumbled, pulverized or reduced to powder is covered by the Asbestos NESHAP if the facility contains more than the threshold amount of RACM. However, category II non-friable ACM that has a high probability of being damaged by the demolition or renovation forces expected to act on the materials such that it will be crumbled, pulverized, or reduced to powder must be removed prior to the demolition or renovation operation. It is the owner's or operator's

responsibility to make these determinations. If the asbestos-containing materials are made friable then the Asbestos NESHAP would apply, including adequately wetting and containing the material.

How should I handle bulk waste from a facility that contained RACM and that was not found until after demolition began?

The demolition debris must be treated as asbestos-containing waste. Adequately wet the demolition debris until collected for disposal and during loading, transport it in covered vehicles and emit no visible emissions to the outside air as required by 61.150 of asbestos NESHAP. The waste must be deposited at an acceptable waste disposal site.

Can I transport bulk asbestos waste without placing it in containers as long as I keep the waste pile wet?

No. After wetting, seal all asbestos-containing waste material in leak-tight containers while wet and label with the appropriate signs and labels. If the waste will not fit into containers, it must be placed in leak-tight wrapping. However, for facilities that are demolished without removing the RACM and for ordered demolitions, the material must be adequately wet after the demolition has occurred and again when loading the material for transport to a disposal site. RACM covered by this paragraph may be transported in bulk without being placed in leak-tight containers or wrapping.

How should I label asbestos-containing waste that is being taken away from the facility?

You should label the containers or wrapped materials with the name of the waste generator and the location at which the waste was generated. An OSHA warning label must also be used.

Where can I obtain a list of permitted landfills?

The DEP District Office or Local Pollution Control Agency can supply a list of permitted asbestos disposal sites upon request. The DEP Bureau of Solid and Hazardous Waste maintains a list of permitted landfills on their website at http://www.dep.state.fl.us/waste/quick_topics/database_reports/default.htm.

What should the owner or operator of a waste disposal site do if it is determined that there is a discrepancy between the amount of waste that left the facility and the amount of waste that was delivered to the site?

The waste site owner or operator must contact the demolition/renovation owner or operator, and attempt to reconcile the discrepancy. If they cannot do so within 15 days after the waste was received, the waste site owner or operator must notify both the delegated agency responsible for the facility from which the waste was removed, and the delegated agency responsible for the area in which the waste was disposed.

Does the NESHAP regulation require air monitoring during renovation or removal?

No.

Does the Asbestos NESHAP regulation require me to have my property inspected for asbestos?

No, not unless demolition or renovation is planned. The NESHAP regulation requires that a thorough inspection for asbestos be conducted before demolition or renovation. An inspection for asbestos should provide an inspection report or supporting information that identifies all asbestos containing materials in the facility or part of the facility affected by the renovation or demolition.

What is a bulk sample?

A bulk sample is a solid quantity of insulation, floor tile, building material, etc., that is suspected of containing asbestos fibers that will be analyzed for the presence and quantity of asbestos.

Will DEP test my building for asbestos for me?

No. Owners and operators are responsible for getting their buildings tested.

How can I find someone to do the testing?

Contact a Florida licensed Asbestos Consultant in your area for information on sampling and testing for asbestos. The consultants are normally listed in the yellow pages of the phone book. The Florida Department of Business and Professional Regulation licenses the consultants in Florida and provide an online search at https://www.myfloridalicense.com/Default.asp.

How do laboratories analyze bulk samples?

Laboratories analyze bulk samples a number of ways. Most laboratories use Polarized Light Microscopy (PLM). Some laboratories use Transmission Electron Microscopy (TEM). However, there is currently no published method for bulk analysis using TEM.

How much does it cost to have a bulk sample analyzed?

The cost varies with the method. The cost of PLM analysis ranges from $20.00 to $100.00. The average cost is $30.00. TEM analysis is more expensive.

Does an inspector have the right to enter any facility and the containment area?

Yes. Inspectors have the right under the section 403.091 Florida Statutes to inspect a facility to determine compliance with applicable regulations. Inspectors are trained and equipped to do this safely. Contact your DEP District Office or Local Pollution Control Agency for more details on this subject.

Is visible asbestos-containing debris on the ground outside a removal job considered a "visible emission," and a violation of the NESHAP?

Yes. Dry friable asbestos insulation on the ground violates the "adequately wet" requirement, and can be considered evidence of a visible emission.

Is it appropriate for an inspector to open any bags outside the designated contaminated area?

Yes. The inspector may open any bags outside the designated contaminated area to inspect them. The inspector may use a glovebag or other control techniques. The inspector will then properly reseal the bag, or request that the operator do so.

Must an inspector witness improper removal of more than 160 square feet or 260 linear feet of asbestos-containing material to prove a violation of the NESHAP regulation?

No. First, the inspector must gather information about the quantity of asbestos to prove that the project is subject to the NESHAP standards. Second, the inspector must prove that there has been improper removal. The two tasks are distinct from each other.

Do inspectors need to follow facility training requirements including fit testing?

No.

What training is required in the Asbestos NESHAP?

The Asbestos NESHAP requires at least one trained supervisor, such as a foreman or management-level person, employed by the owner and/or operator to be present at any site where RACM is stripped, removed, or otherwise disturbed at any facility which is being demolished or renovated and is regulated by NESHAP. Evidence of the training must be posted and made available for inspection at the demolition or renovation site. Training includes, at a minimum: applicability, notification, material identification, control procedures, waste disposal, reporting and record keeping, asbestos hazards and worker protection.

Every 2 years the trained individual is required to receive refresher training. Information about the training and refresher courses is available from the Florida Department of Business and Professional Regulation at http://www.state.fl.us/dbpr/pro/asbest/asb_index.shtml.

Asbestos Roofing Frequently Asked Questions

Asbestos-containing material (ACM) is material containing more than one percent asbestos as determined using the methods specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy. The Asbestos NESHAP classifies ACM as either "friable" or "nonfriable". Friable ACM is ACM that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure. Nonfriable ACM is ACM that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

Nonfriable ACM is further classified as either Category I ACM or Category II ACM. Category I ACM and Category II ACM are distinguished from each other by their potential to release fibers when damaged. **The applicability of the Asbestos NESHAP to Category I and II ACM depends on: (1) the condition of the material at the time of demolition or renovation, (2) the nature of the operation to which the material will be subjected, (3) the amount of ACM involved.**

If the coverage threshold for RACM is met or exceeded in a renovation or demolition operation, then all friable ACM in the operation, and in certain situations, nonfriable ACM in the operation, are subject to the NESHAP.

What is the purpose of the Asbestos NESHAP regulation?

The purpose of the asbestos NESHAP regulation is to protect the public health by minimizing the release of asbestos when facilities that contain asbestos-containing materials (ACMs) are demolished or renovated.

What is a "facility?"

As defined in the regulation, a "facility" is any institutional, commercial, public, industrial or residential structure, installation or building (including any structure, installation or building containing condominiums, or individual dwelling units operated as a residential cooperative, but excluding residential buildings having four or fewer dwelling units); any ship; or any active or inactive waste disposal site. Any building, structure or installation that contains a loft used as a dwelling is not considered residential. Any structure, installation, or building that was previously subject to the Asbestos NESHAP is not excluded, regardless of its current use or function.

Are facilities constructed in the past 10 years subject to the asbestos regulations?

Yes. There is no exclusion date in the asbestos regulations for facilities constructed in the past 10 years.

What are Category I asbestos-containing materials?

Category I ACM includes asbestos-containing gaskets, packings, resilient floor coverings, resilient floor covering mastic, and asphalt roofing products containing more than one percent asbestos. Asphalt roofing products, which may contain asbestos, include built-up roofing; asphalt-containing single ply membrane systems; asphalt shingles; asphalt-containing underlayment felts; asphalt-containing roof coatings and mastics; and asphalt-containing base flashings. ACM roofing products that use other bituminous or resinous binders (such as coal tars or pitches) are also considered to be Category I ACM.

What are Category II asbestos-containing materials?

Category II ACM includes all other nonfriable ACM, for example, asbestos-cement (A/C) shingles, A/C tiles, and transite boards or panels containing more than one percent asbestos. Generally speaking, Category II ACM is more likely to become friable when damaged than is Category I ACM.

What asbestos-containing materials are regulated under the Asbestos NESHAP?

ACM regulated under the NESHAP is referred to as "regulated asbestos-containing material" (RACM). RACM is defined in 40 CFR 61.141 of the NESHAP and includes: (1) friable asbestos-containing material; (2) Category I nonfriable ACM that has become friable; (3) Category I nonfriable ACM that has been or will be sanded, ground, cut, or abraded; or (4) Category II nonfriable ACM that has already been or is likely to become crumbled, pulverized, or reduced to powder.

Is roofing work classified as a renovation or a demolition?

Normally, roofing work with ACM is classified as a renovation in the Asbestos NESHAP. If roofing work involves wrecking or taking out load-supporting structural members, then the work would be classified as a demolition.

What is a renovation?

A renovation is altering a facility or one or more facility components in any way, including the stripping or removal of Regulated Asbestos Containing Materials (RACM) from a facility component. A renovation could be, but not limited to, any interior renovation or remodel not affecting load-supporting structural members or a roof replacement.

What is a demolition?

A demolition means the wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations or the intentional burning (i.e. practice burns) of any facility.

How much asbestos must be present before the Asbestos NESHAP work practice standards apply to roofing projects?

When a rotating blade (RB) roof cutter or equipment that similarly damages the roofing material is used to remove Category I nonfriable asbestos-containing roofing material, the removal of 5580 ft^2 or more of asbestos-containing roofing material will create at least 160 ft^2 of RACM and is subject to the NESHAP. If the removed material is less than 5580 ft^2 then the removal is not subject to the NESHAP, except that notification is always required for demolitions.

When the removal of Category II nonfriable asbestos-containing roofing material is at least 160 ft^2 and the removal methods will crumble, pulverize, reduce to powder, or contaminate with other RACM, the removal is subject to the NESHAP.

When the total asbestos-containing roof area undergoing renovation is less than 160 ft^2, the NESHAP does not apply, regardless of the removal method to be used, the type of material (Category I or II), or its condition (friable versus nonfriable), except that notification is always required for demolitions.

Is an asbestos inspection required prior to the start of a roofing project?

YES. The Asbestos NESHAP requires a thorough inspection for the presence of asbestos prior to the start of all renovations and/or demolitions.

Are roofing projects on single-family private residences regulated by the Asbestos NESHAP?

No.

Is a licensed asbestos contractor required to remove an asbestos-containing roof?

Licensing questions concerning asbestos industry should be directed to the Florida Department of Business and Professional Regulation at http://www.state.fl.us/dbpr/pro/asbest/asb_index.shtml.

What training is required for roofing projects in the Asbestos NESHAP?

Beginning on November 20, 1991, the Asbestos NESHAP requires at least one trained supervisor, such as a foreman or management-level person, employed by the owner and/or operator to be present at any site where RACM is stripped, removed, or otherwise disturbed at any facility which is being demolished or renovated and is regulated by NESHAP. Evidence of the training must be posted and made available for inspection at the demolition or renovation site. Training includes, at a minimum: applicability, notification, material identification, control procedures, waste disposal, reporting and record keeping, asbestos hazards and worker protection.

Every 2 years the trained individual is required to receive refresher training. Information about the training and refresher courses is available from the Florida Department of Business and Professional Regulation at http://www.state.fl.us/dbpr/pro/asbest/asb_index.shtml.

If I have asbestos roofing questions, whom should I contact?

Please contact the DEP District Office or Local Pollution Control Agency in your area to answer any asbestos roofing questions.

CHLOROFLUOROCARBON (CFC) QUESTION & ANSWER FACTSHEET

Under Title VI of the Clean Air Act (CAA), the Environmental Protection Agency (EPA) is responsible for several programs that protect the stratospheric ozone layer. Regulations promulgated by EPA to protect the ozone layer are in Title 40, Part 82 of the Code of Federal Regulations (commonly referred to as 40 CFR Part 82).

Most air-conditioning and refrigeration appliances not regulated as motor vehicle air conditioners are regulated under section 608 of the CAA. This program covers a number of service practices, refrigerant reclamation, technician certification, and other requirements. In addition, this program covers halon fire suppression system installation and certain emissions of halons.

Motor vehicle air conditioner systems are regulated under section 609 of the CAA. Section 609 regulates on-road car and truck air-conditioning systems, as well as technician certification and service equipment for those systems. The sale of small cans of certain ozone-depleting refrigerants is restricted to technicians certified under this program.

For decades, CFC-12 was used as the refrigerant in motor vehicle air conditioning systems. However, scientists have shown that it damages the ozone layer. In response, the world decided to end production of ozone-depleting substances. Additionally, to make sure existing CFC-12 is used as much as possible, rather than being wasted and released to the atmosphere, EPA issued regulations under section 609 of the Clean Air Act to require that shop technicians use special machines to recycle CFC-12.

SECTION 608

Does the Florida Department of Environmental Protection regulate stationary refrigeration and air conditioning within the state?

> No. The Florida Department of Environmental Protection does not have the statutory authority to administer a stationary refrigeration and air conditioning program. The federal requirements are applicable within the state. The federal Web site for stationary source information is: http://www.epa.gov/ozone/title6/608/

SECTION 609

Does the Florida Department of Environmental Protection regulate CFCs?

The Florida Department of Environmental Protection has the statutory authority to administer a motor vehicle air conditioning program for Class I and Class II substances. Rule 62-281, Florida Administrative Code (F.A.C.), **http://www.dep.state.fl.us/air/rules/fac/62-281.pdf** adopts by reference the federal regulations relating to the requirements for servicing motor vehicle air conditioner systems. This means the federal certification and equipment requirements are applicable within the state.

If I witness someone intentionally releasing CFC into the air, whom do I contact?

If you are aware of a violation of any of the regulations promulgated under the Clean Air Act, EPA recommends you file a written complaint with your EPA Regional office coordinator. An electronic Adobe Acrobat (pdf) version of the complaint form is available from EPA. Download the complaint form (file size: 18K).

CONSUMER QUESTION & ANSWERS

How do I know if my vehicle uses CFC-12 (R-12, also known by the trade name Freon)?

You or your service technician can check under the hood for a label that identifies the refrigerant used in your vehicle's air conditioner system. By 1995, all new cars used HFC-134a.

My vehicle uses CFC-12, I understand that production of CFC-12 is banned because it depletes the ozone layer. What does this mean for me?

The continued use of CFC-12 is not banned even though production of CFC-12 ended on December 31, 1995. The use of CFC-12 is still permitted. Your service technician can continue to put CFC-12 in your vehicle now and your service technician can continue to put it in your vehicle as long as supplies are available. The CFC-12 used today is constantly being recovered and recycled. Some CFC-12 produced in 1994 and 1995 have been placed into inventory, so that there is still refrigerant available for sale presently, although the price continues to increase.

What if I suspect a leak in my air conditioner system?

You should practice preventive maintenance by having your service technician check your air conditioner system for leaks and you should have any leaks repaired. Keep in mind that having your leaks fixed is not an EPA or state of Florida requirement.

If I decide to convert my vehicle to another refrigerant, how will I know what changes are required?

EPA recommends that you consult your vehicle manufacturer or an authorized dealer or reputable service facility. Most manufacturers have available retrofit guidelines for vehicles manufactured after the mid-1980s. When converting any vehicle you should rely on the advice of a qualified service facility.

What new refrigerant will my service technician put into my vehicle? Are all substitutes OK?

Automakers are producing new vehicles with HFC-134a, which does not deplete the ozone layer. EPA evaluates all substitutes for CFC-12 under its Significant New Alternative Policy (SNAP) program in order to determine if they pose any risk to human health or to the environment. Currently, among **alternatives listed** as acceptable subject to use conditions, HFC-134a is the only one, which also has been fully tested and specified by automakers in their guidelines.

I have seen substitutes other than HFC-134a for sale. If I find out that EPA has not yet reviewed a particular alternative, or that EPA has not yet finished its review of the product, can I legally buy the product? What happens if I buy it now, and EPA decides in the future that it is not acceptable?

You can legally purchase the product even if the Agency has not yet made a determination as to its acceptability under the SNAP program. You should keep in mind that the SNAP program does not fully review the product for safety. If EPA later declares the product unacceptable, you do not legally need to remove it from your vehicle's air conditioner system, but you may choose to do so for your own health and safety. You should be aware that it may be costly to convert your system back to an acceptable alternative and that it is illegal to charge your system with a refrigerant that EPA has declared unacceptable. Keep in mind that using a refrigerant not yet reviewed and determined acceptable by EPA may result in damage to your air conditioner system components, including the compressor, and may limit your ability to have your vehicle's system serviced in the future.

Will any alternative refrigerant listed by EPA as acceptable work in my vehicle?

Although EPA's SNAP program determines what risks an alternative poses to human health and the environment, the Agency does not determine whether the alternative will provide adequate performance or will be compatible with the components of your a/c system.

I have heard that HFC-134a does not cool nearly as well as CFC-12. Is this true?

Vehicle manufacturers have designed air-conditioning systems for new vehicles that use HFC-134a while maintaining reliability and cooling performance. Specifications for converting CFC-12 air conditioner units to HFC-134a are also being designed to maintain performance, but this may vary depending on the condition of the unit prior to the conversion and on other factors.

TECHNICIAN QUESTIONS & ANSWERS

If I have lost my certificate, how do I get a replacement?

You may call EPA at (202) 564-9126.

What are the certification requirements for technicians performing motor vehicle air conditioner system service repairs in Florida?

Technicians who repair or service CFC-12 motor vehicle air conditioners must be trained and certified by an EPA-approved organization. Training programs must include information on the proper use of equipment, the regulatory requirements, the importance of refrigerant recovery, and the effects of ozone depletion. To be certified, technicians must pass a test demonstrating their knowledge in these areas. A list of approved testing programs is available from the above web site link.

What are the leak repair requirements in Florida?

EPA regulations do not dictate any particular service, as long as a technician is certified to work with refrigerant and any recycling equipment he or she uses meets EPA standards. EPA and Florida do not require that leak repair be performed before refrigerant is charged into a vehicle. In other words, EPA and Florida do permit top-off in motor vehicle air-conditioners.

Can I vent HFC-134a or other substitutes?

No. Effective November 15, 1995, section 608 of the Clean Air Act prohibits individuals from knowingly venting substitutes for CFC and HCFC refrigerants during the maintenance, service, repair and disposal of air-conditioning and refrigeration equipment. A fact sheet explains this prohibition in much more detail.
Note: Although this prohibition is part of section 608 (stationary refrigeration and air conditioning equipment), it also applies to section 609 (motor vehicle air conditioning).

Are there any substitutes other than HFC-134a that have been approved by EPA?

Several refrigerants have been designated as acceptable for motor vehicle use. All of these, including HFC-134a, must be used in accordance with several conditions on their use. For full details of these requirements, see EPA's fact sheet "Choosing and Using Alternative Refrigerants for Motor Vehicle Air Conditioning." In addition, in order to comply with the Clean Air Act, technicians must recover any alternative refrigerant using separate recovery equipment dedicated to that refrigerant.

I am interested in reclaiming facilities. Where do I find a list of reclamation facilities in my area?

Recycling means the use of a machine to remove impurities and oil and then recharge the refrigerant into either the same car or a different car. Recycled refrigerant is not as pure as reclaimed refrigerant. Recycling occurs in the service shop. Reclamation means the removal of all oil and impurities beyond that provided by on-site recycling equipment, and reclaimed refrigerant is essentially identical to new, unused refrigerant. Reclamation cannot be performed in the service shop. Rather, the shop generally sends refrigerant either back to the manufacturer or directly to a reclamation facility. A list of approved reclamation facilities may obtain form EPA at the following web site:.
http://www.epa.gov/ozone/title6/608/reclamation/reclist.html

What records do I need to keep?

Service shops must certify to EPA that they own approved CFC-12 equipment. If refrigerant is recovered and sent to a reclamation facility, the name and address of that facility must be kept on file. If a shop purchased a piece of CFC-12 recycling equipment in the past, and sent the certification to EPA, the shop does not need to send a second certification to EPA when it purchases a second piece of equipment, no matter what refrigerant that equipment is designed to handle.

List of Air Toxics Regulated in North Carolina

The following table lists the 188 Hazardous Air Pollutants (HAPs) regulated by the U.S. EPA and the 105 Toxic Air Pollutants (TAPs) regulated under the Air Toxics Rules in North Carolina.

Pollutant Name	CAS Number	HAP	TAP
Acetaldehyde	75-07-0	Y	Y
Acetamide	60-35-5	Y	
Acetic acid	64-19-7		Y
Acetonitrile	75-05-8	Y	
Acetophenone	98-86-2	Y	
Acetylaminofluorene, 2-	53-96-3	Y	
Acrolein	107-02-8	Y	Y
Acrylamide	79-06-1	Y	
Acrylic acid	79-10-7	Y	
Acrylonitrile	107-13-1	Y	Y
Allyl chloride	107-05-1	Y	
Aminobiphenyl, 4-	92-67-1	Y	
Ammonia	7664-41-7		Y
Ammonium chromate[1]	7788-98-9	Y	Y
Ammonium dichromate[1]	7789-09-5	Y	Y
Aniline	62-53-3	Y	Y
Anisidine, o-	90-04-0	Y	
Antimony compounds	ANTIMONYCPDS	Y	
Arsenic & inorganic arsenic compounds	ARSENICCPDS	Y	Y
Asbestos	1332-21-4	Y	Y
Aziridine	151-56-4	Y	Y
Benzene	71-43-2	Y	Y
Benzidene & salts	92-87-5	Y	Y
Benzo(a)pyrene[8]	50-32-8	Y	Y
Benzotrichloride	98-07-7	Y	
Benzyl chloride	100-44-7	Y	Y
Beryllium & compounds	BERYLCPDS	Y	Y
Beryllium chloride[2]	7787-47-5	Y	Y
Beryllium fluoride[2]	7787-49-7	Y	Y
Beryllium nitrate[2]	13597-99-4	Y	Y
Bioavailable chromate pigments as chrome VI			Y
Biphenyl	92-52-4	Y	
Bis-chloromethyl ether	542-88-1	Y	Y
Bromine	7726-95-6		Y
Bromoform	75-25-2	Y	
Butadiene, 1,3-	106-99-0	Y	Y

Cadmium & compounds	CADMIUMCPDS	Y	Y
Cadmium acetate[3]	543-90-8	Y	Y
Cadmium bromide[3]	7789-42-6	Y	Y
Calcium chromate[1]	13765-19-0	Y	Y
Calcium cyanamide	156-62-7	Y	
Calcium dichromate[1]		Y	Y
Captan	133-06-2	Y	
Carbaryl	63-25-2	Y	
Carbon disulfide	75-15-0	Y	Y
Carbon tetrachloride	56-23-5	Y	Y
Carbonyl sulfide	463-58-1	Y	
Catechol	120-80-9	Y	
Chloramben	133-90-4	Y	
Chlordane	57-74-9	Y	
Chlorine	7782-50-5	Y	Y
Chloroacetic acid	79-11-8	Y	
Chloroacetophenone, 2-	532-27-4	Y	
Chlorobenzene	108-90-7	Y	Y
Chlorobenzilate	510-15-6	Y	
Chloroform	67-66-3	Y	Y
Chloromethyl methyl ether	107-30-2	Y	
Chloroprene	126-99-8	Y	Y
Chromic acid	7738-94-5		Y
Chromium (VI) & compounds	CHROM6CPDS	Y	Y
Cobalt compounds	COBALTCPDS	Y	
Coke oven emissions	COKEOVNEM	Y	
Cresol	1319-77-3	Y	Y
Cresol, m-	108-39-4	Y	
Cresol, o-	95-48-7	Y	
Cresol, p-	106-44-5	Y	
Cumene	98-82-8	Y	
Cyanide compounds (see also hydrogen cyanide)	CNC	Y	
D, 2,4 (salts & esters)	94-75-7	Y	
DDE	72-55-9	Y	
Di(2-ethylhexyl)phthalate (DEHP)	117-81-7	Y	Y
Diazomethane	334-88-3	Y	
Dibenzofurans	132-64-9	Y	
Dibromo-3-chloropropane, 1,2-	96-12-8	Y	
Dibutylphthalate	84-74-2	Y	
Dichlorobenzene(p), 1,4-	106-46-7	Y	Y
Dichlorobenzidene, 3,3-	91-94-1	Y	
Dichlorodifluoromethane (CFC-12)	75-71-8		Y

Dichloroethyl ether	111-44-4	Y	
Dichlorofluoromethane	75-43-4		Y
Dichloropropene, 1,3-	542-75-6	Y	
Dichlorvos	62-73-7	Y	
Diethanolamine	111-42-2	Y	
Diethyl aniline, N,N-	121-69-7	Y	
Diethyl sulfate	64-67-5	Y	
Dimethoxybenzidine, 3,3-	119-90-4	Y	
Dimethyl aminoazobenzene	60-11-7	Y	
Dimethyl benzidine, 3,3-	119-93-7	Y	
Dimethyl carbamoyl chloride	79-44-7	Y	
Dimethyl formamide	68-12-2	Y	
Dimethyl hydrazine, 1,1-	57-14-7	Y	
Dimethyl phthalate	131-11-3	Y	
Dimethyl sulfate	77-78-1	Y	Y
Dinitro-o-cresol, 4,6- (& salts)	534-52-1	Y	
Dinitrophenol, 2,4-	51-28-5	Y	
Dinitrotoluene, 2,4-	121-14-2	Y	
Dioxane, 1,4-	123-91-1	Y	Y
Diphenylhydrazine, 1,2-	122-66-7	Y	
Epichlorohydrin	106-89-8	Y	Y
Epoxybutane, 1,2-	106-88-7	Y	
Ethyl acetate	141-78-6		Y
Ethyl acrylate	140-88-5	Y	
Ethyl benzene	100-41-4	Y	
Ethyl carbamate (urethane)	51-79-6	Y	
Ethyl chloride (chloroethane)	75-00-3	Y	
Ethyl mercaptan	75-08-1		Y
Ethylene dibromide	106-93-4	Y	Y
Ethylene dichloride (1,2-dichloroethane)	107-06-2	Y	Y
Ethylene glycol	107-21-1	Y	
Ethylene glycol monoethyl ether (see glycol ethers)	110-80-5		Y
Ethylene oxide	Dimethyl sulfide	Y	Y
Ethylene thiourea	96-45-7	Y	
Ethylenediamine	107-15-3		Y
Ethylidene dichloride (1,1-dichloroethane)	75-34-3	Y	
Fine mineral fibers	FINMINFIB	Y	
Fluorides			Y
Formaldehyde	50-00-0	Y	Y
Glycol ethers (see ethylene glycol monoethyl ether)	GLYCOLETHERS	Y	
Heptachlor	76-44-8	Y	
Hexachlorobenzene	118-74-1	Y	

Hexachlorobutadiene	87-68-3	Y	
Hexachlorocyclopentadiene	77-47-4	Y	Y
Hexachlorodibenzo-p-dioxin	57653-85-7		Y
Hexachloroethane	67-72-1	Y	
Hexamethylene-1,6-diisocyanate	822-06-0	Y	
Hexamethylphosphoramide	680-31-9	Y	
Hexane, isomers	HEXANEISO		Y
Hexane, n-	110-54-3	Y	Y
Hydrazine	302-01-2	Y	Y
Hydrogen chloride (hydrochloric acid)	7647-01-0	Y	Y
Hydrogen cyanide[4]	74-90-8	Y	Y
Hydrogen fluoride (hydrofluoric acid)	7664-39-3	Y	Y
Hydrogen sulfide	7783-06-4	Y	Y
Hydroquinone	123-31-9	Y	
Isophorone	78-59-1	Y	
Lead compounds	LEADCPDS	Y	
Lindane (all isomers)	58-89-9	Y	
Maleic anhydride	108-31-6	Y	Y
Manganese & compounds	MANGCPDS	Y	Y
Manganese cyclopentadienyl tricarbonyl[5]	12079-65-1	Y	Y
Manganese tetroxide[5]	1317-35-7	Y	Y
Mercury & compounds	MERCCPDS	Y	
Mercury, alkyl[6]	MERCALKYL	Y	Y
Mercury, aryl and inorganic compounds[6]	MERCARYL	Y	Y
Mercury, vapor	7439-97-6		Y
Methanol	67-56-1	Y	
Methoxychlor	72-43-5	Y	
Methyl bromide	74-83-9	Y	
Methyl chloride	74-87-3	Y	
Methyl chloroform	71-55-6	Y	Y
Methyl ethyl ketone	78-93-3	Y	Y
Methyl hydrazine	60-34-4	Y	
Methyl iodide	74-88-4	Y	
Methyl isobutyl ketone	108-10-1	Y	Y
Methyl isocyanate	624-83-9	Y	
Methyl mercaptan	74-93-1		Y
Methyl methacrylate	80-62-6	Y	
Methyl tertiary butyl ether	1634-04-4	Y	
Methylene bis(2-chloroaniline), 4,4-	101-14-4	Y	
Methylene chloride	75-09-2	Y	Y
Methylene diphenyl diisocyanate (MDI)	101-68-8	Y	
Methylenedianiline, 4,4-	101-77-9	Y	

Napthalene	91-20-3	Y	
Nickel & compounds	NICKCPDS	Y	
Nickel carbonyl[7]	13463-39-3	Y	Y
Nickel metal	7440-02-0		Y
Nickel subsulfide[7]	12035-72-2	Y	Y
Nickel, soluble compounds as nickel[7]	NICKSOLCPDS	Y	Y
Nitric acid	7697-37-2		Y
Nitrobenzene	98-95-3	Y	Y
Nitrobiphenyl, 4-	92-93-3	Y	
Nitrophenol, 4-	100-02-7	Y	
Nitropropane, 2-	79-46-9	Y	
Nitrosodimethylamine, N-	62-75-9	Y	Y
Nitrosomorpholine, N-	59-89-2	Y	
Nitroso-N-methylurea, N-	684-93-5	Y	
Parathion	56-38-2	Y	
Pentachloronitrobenzene	82-68-8	Y	
Pentachlorophenol	87-86-5	Y	Y
Perchloroethylene (tetrachloroethylene)	127-18-4	Y	Y
Phenol	108-95-2	Y	Y
Phenylenediamine, p-	106-50-3	Y	
Phosgene	75-44-5	Y	Y
Phosphine	7803-51-2	Y	Y
Phosphorus	7723-14-0	Y	
Phthalic anhydride	85-44-9	Y	
Polychlorinated biphenyls (aroclors)	1336-36-3	Y	Y
Polycyclic organic matter (POM) (see also benzo(a)pyrene)	POM	Y	
Potassium chromate[1]	7789-00-6	Y	Y
Potassium dichromate[1]	7778-50-9	Y	Y
Propane sultone, 1,3-	1120-71-4	Y	
Propiolactone, beta	57-57-8	Y	
Propionaldehyde	123-38-6	Y	
Propoxur (baygon)	114-26-1	Y	
Propylene dichloride	78-87-5	Y	
Propylene oxide	75-56-9	Y	
Propylenimine, 1,2-	75-55-8	Y	
Quinoline	91-22-5	Y	
Quinone	106-51-4	Y	
Radionuclides (including radon)	RADIONUC	Y	
Selenium compounds	SEC	Y	
Sodium chromate[1]	7775-11-3	Y	Y
Sodium dichromate[1]	10588-01-9	Y	Y

Soluble chromate compounds			Y
Strontium chromate[1]	7789-06-2	Y	Y
Strontium dichromate[1]		Y	Y
Styrene	100-42-5	Y	Y
Styrene oxide	96-09-3	Y	
Sulfuric acid	7664-93-9		Y
Tetrachloro-1,2-difluoroethane, 1,1,2,2-	76-12-0		Y
Tetrachloro-2,2-difluoroethane, 1,1,1,2-	76-11-9		Y
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	1746-01-6	Y	Y
Tetrachloroethane, 1,1,2,2-	79-34-5	Y	Y
Titanium tetrachloride	7550-45-0	Y	
Toluene	108-88-3	Y	Y
Toluene diamine, 2,4-	95-80-7	Y	
Toluene diisocyanate, 2,4-	584-84-9	Y	Y
Toluene diisocyanate, 2,6-isomers	91-08-7		Y
Toluidine, o-	95-53-4	Y	
Toxaphene	8001-35-2	Y	
Trichloro, 1,1,2- trifluoroethane, 1,2,2-	76-13-1		Y
Trichlorobenzene, 1,2,4-	120-82-1	Y	
Trichloroethane, 1,1,2-	79-00-5	Y	
Trichloroethylene	79-01-6	Y	Y
Trichlorofluoromethane	75-69-4		Y
Trichlorophenol, 2,4,5-	95-95-4	Y	
Trichlorophenol, 2,4,6-	88-06-2	Y	
Triethylamine	121-44-8	Y	
Trifluralin	1582-09-8	Y	
Trimethylpentane, 2,2,4-	540-84-1	Y	
Vinyl acetate	108-05-4	Y	
Vinyl bromide	593-60-2	Y	
Vinyl chloride	75-01-4	Y	Y
Vinylidene chloride	75-35-4	Y	Y
Xylene	1330-20-7	Y	Y
Xylene, m-	108-38-3	Y	
Xylene, o-	95-47-6	Y	
Xylene, p-	106-42-3	Y	
Zinc chromate[1]	13530-65-9	Y	Y
Zinc dichromate[1]		Y	Y

HAP-Hazardous Air Pollutant (1990 Clean Air Act/Title V)
TAP-Toxic Air Pollutant (NC Rules)

[1]These specific compounds are considered HAPs because they fall under the category of "Chromium Compounds"

[2]These specific compounds are considered HAPs because they fall under the category of "Beryllium Compounds"
[3]These specific compounds are considered HAPs because they fall under the category of "Cadmium Compounds"
[4]This specific compound is considered a HAP because it falls under the category of "Cyanide Compounds"
[5]These specific compounds are considered HAPs because they fall under the category of "Manganese Compounds"
[6]These specific compounds are considered HAPs because they fall under the category of "Mercury Compounds"
[7]These specific compounds are considered HAPs because they fall under the category of "Nickel Compounds"
[8]This specific compound is considered a HAP because it falls under the category of "Polycyclic Organic Matter"

Source: http://daq.state.nc.us/toxics/hap/taplist.shtml

Second Interim Report

Mercury Emissions and Mercury Controls For Coal-fired Electrical Utility Boilers

SEPTEMBER 1, 2004

North Carolina
Department of Environment and Natural Resources
Division of Air Quality

REQUIREMENT FOR THIS REPORT

Excerpted from the *North Carolina Clean Smokestacks Act*

[**Title**: An Act to Improve Air Quality in the State by Imposing Limits on the Emission of Certain Pollutants from Certain Facilities that Burn Coal to Generate Electricity and to Provide for Recovery by Electric Utilities of the Costs of Achieving Compliance with Those Limits]

SECTION 12. The General Assembly anticipates that measures implemented to achieve the reductions in emissions of oxides of nitrogen (NO_x) and sulfur dioxide (SO2) required by G.S. 143-215.107D, as enacted by Section 1 of this act, will also result in significant reductions in the emissions of mercury from coal-fired generating units. The Division of Air Quality of the Department of Environment and Natural Resources shall study issues related to monitoring emissions of mercury and the development and implementation of standards and plans to implement programs to control emissions of mercury from coal-fired generating units. The Division shall evaluate available control technologies and shall estimate the benefits and costs of alternative strategies to reduce emissions of mercury. The Division shall annually report its interim findings and recommendations to the Environmental Management Commission and the Environmental Review Commission beginning 1 September 2003. The Division shall report its final findings and recommendations to the Environmental Management Commission and the Environmental Review Commission no later than 1 September 2005. The costs of implementing any air quality standards and plans to reduce the emission of mercury from coal-fired generating units below the standards in effect on the date this act becomes effective, except to the extent that the emission of mercury is reduced as a result of the reductions in the emissions of oxides of nitrogen (NO_x) and sulfur dioxide (SO_2) required to achieve the emissions limitations set out in G.S. 143-215.107D, as enacted by Section 1 of this act, shall not be recoverable pursuant to G.S. 62-133.6, as enacted by Section 9 of this act.

GENERAL ASSEMBLY OF NORTH CAROLINA - SESSION 2001 – (SENATE BILL 1078)

Ratified the 19th day of June 2002. (Ch. SL 2002-4 S.13)

Marc Basnight - President Pro Tempore of the Senate
James B. Black - Speaker of the House of Representatives
Michael F. Easley- Governor

AN INVITATION FROM SECRETARY ROSS

TO: Environmental Review Commission
Environmental Management Commission

FROM: William G. Ross, Jr.

DATE: September 1, 2004

SUBJECT: Mercury and CO_2 Reports Required by Clean Smokestacks Act

On March 23, 2004, the United States Environmental Protection Agency recognized North Carolina and the Clean Smokestacks Act for outstanding, innovative efforts in improving air quality through regulatory and policy innovations and presented our state with a Clean Air Excellence Award. I had the privilege of saying a few words at the award ceremony in Washington, D.C., on behalf of our state, Governor Easley, and all the other partners who played vital roles in the passage of the law. It was a pleasure for me to describe the story of the Clean Smokestacks Act as a story about the power of innovation, partnerships, teamwork, and leadership.

The act, in addition to providing for major reductions in $S0_2$ and NO_X emissions from NC's 14 coal-fired power plants, directed our Division of Air Quality, over a three year period, to study and make recommendations concerning emissions of mercury and carbon dioxide.

As you know, these are important, controversial issues. For example, Donald Kennedy, the Editor of *Science*, has called climate change "the most serious issue" we face.

Last year, 2003, the Division, working with a broad group of interested parties, put together reports reviewing and summarizing the state of scientific research on mercury and carbon dioxide emissions. This year, 2004, the Division has updated the review of research, and has inventoried options for the recommendations we must make next year (2005). We now ask all interested parties to read this year's report and give us their views, questions and suggestions about it.

> In the upcoming year, as we consider what to recommend, we will evaluate options for action with a number of criteria and principles in mind. As a starting point for those criteria and principles, we plan to use ones suggested in a report of a November, 2003 Aspen Institute policy dialogue chaired by Eileen Claussen and Robert W. Fri. The title of the report is: *A Climate Policy Framework: Balancing Policy and Politics*. As adapted for use in the task that the General Assembly has given us, the criteria and principles are as follows:

1. Environmental effectiveness: How effective is the option in meeting its environmental and public health and welfare target, whether that target is public awareness, information collection and evaluation, or emission reduction?
2. Cost effectiveness: Will the option design allow cost-effective compliance? How will it affect the ability of business to compete?
3. Administrative feasibility: Can the option be administered and does it minimize administrative and transaction costs?
4. Distributional equity: Is the burden of compliance with the option fairly apportioned?
5. Political acceptability: Are there elements of option design that affect its political acceptability?
6. Technology development and diffusion: Will the option help provide a platform for technology development and diffusion?
7. Adaptability: Will the option be able to adapt to changing circumstances and incorporate new information?
8. Monitoring and counting: Will the option include things that can be monitored and are verifiable?
9. Encouraging long term success: Will the option encourage long-term progress and success?

As I mentioned above, we invite your input with respect to whether these are the appropriate criteria and principles and how the various options for recommendations come out when judged against the appropriate criteria and principles. Also, we invite you to suggest options that are not in our inventory and to tell us why such options should be considered.

In the interest of giving every citizen of our State, now and in the future, a reasonable opportunity to live a happy, healthy, and prosperous life, we solicit your input and appreciate your help.

PREFACE

The goal of this report is to present information concerning the state of knowledge for controlling mercury emissions and to begin establishing the cost/benefits relationships. This information needs to be openly considered, evaluated, discussed, and corrected where necessary. In other words, information contained in this report is anticipated to become the basis for the final report on September 1, 2005. In that report, the Department of Environmental and Natural Resources will present the Department's final findings and recommendations concerning mercury emissions from coal-fired electrical utility boilers. Stakeholders and all other interested parties are encouraged to comment on information contained in this report at their earliest convenience.

This 2004 report is based on informational updates, the three-day workshop at North Carolina State University sponsored by the Department of Environmental and Natural Resources, Stakeholders and other resources. The Department appreciates the efforts of all the workshop presenters, stakeholders and other individuals who committed their time and effort to the three-day workshop and the development of this 2004 report. This open process will continue in the development of the final report on this topic.

Portions of this document were taken directly from other government (non-copyrighted) documents in the interest of time and completeness. Some of these sections may have only minor wording changes from the original documents. Quotations are not strictly used to identify these parts, but a strong effort has been made to reference these documents and acknowledge them. The purpose has not been to claim credit for original work of others, but to provide as much detail and accuracy as possible within a limited time. Additional portions of this document have been transferred and condensed from the first interim report for document integrity.

"The greatest obstacle to discovery is not ignorance - it is the illusion of knowledge."

Daniel J. Boorstin (1914-2004)[1]

[1] Provided by O. Russell Bullock, Jr., NOAA Air Resources Laboratory, (On assignment to the U.S. EPA Office of Research and Development), Workshop on Mercury and CO_2, Raleigh, NC, April 19-21, 2004

Acronyms Used In This Report

AC – Activated carbon
ACI – Activated carbon injection
ALAPCO - Association of Local Air Pollution Control Officials
CAA – Clean Air Act – Primary federal clean air statute
CAIR – Clean Air Interstate Rule
CESP – Cold-side electrostatic precipitator
CEM – Continuous Emission Measurement
COHPAC™ - Compact Hybrid Particulate Collector
CO_2 – Carbon Dioxide
CSA – NC Clean Smokestacks Act
DAQ – NC Division of Air Quality
DENR – NC Department of Environment and Natural Resources
DHHS − NC Department of Health and Human Services
DMF − Division of Marine Fisheries
DOE – U. S. Department of Energy
DWQ − Division of Water Quality
EEI - Edison Electric Institute
EMC − NC Environmental Management Commission
EPA – U. S. Environmental Protection Agency
EPRI – Electric Power Research Institute
EU/ICR- Electric Utility Steam Generating Unit Mercury Information Collection Request
FF – Fabric filter
FGD – Flue gas desulfurization
Hg - mercury
HAP – hazardous air pollutant
IAQR – Interstate Air Quality Rule
IGCC - Integrated Coal Gasification Combined Cycle
kWh – Kilowatt hour (1000 watts for one hour)
MACT – Maximum Achievable Control Technology
MW - megawatts (million watts)
NC – North Carolina
NCSU – North Carolina State University
NESHAP - national emission standards for hazardous air pollutants
NHANES −National Health and Nutrition Examination Survey
NMA - National Mining Association
NO_x – Oxides of Nitrogen, including NO_2, the primary nitrogen species from combustion.
NPR – Notice of Proposed Rulemaking
PAC – Powdered Activated Carbon
PM – Particulate matter
RGM − Reactive Gaseous Mercury
SCR − Selective Catalytic Reduction
SIP − State Implementation Plan
SNCR − Selective Non-Catalytic Reduction
SO_2 – Sulfur Dioxide
SO_3 – Sulfur Trioxide
SO_x – Oxides of Sulfur, including SO_2, the primary combustion product of sulfur
STAPPA - State and Territorial Air Pollution Program Administrators
TBtu – trillion British thermal units
TMDL − Total Maximum Daily Load

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CHAPTER I EXECUTIVE SUMMARY

This executive summary provides highlights of this 2004 interim mercury report. Chapter II discusses the human risks of mercury species in different environments. The status of state and federal legislative and regulatory action is covered in Chapter III. A discussion of various mercury control devices for use at coal-fired electrical utility boilers is found in Chapter IV. Chapter V explains the use and limitations of two existing mercury emission estimating tools. Arguments concerning the influences of local atmospheric mercury emissions are presented in Chapter VI, including findings and views concerning the Florida Everglades study. Chapter VII reports North Carolina's coal-fires utility boiler characteristics and presents a comparison of speciated mercury emissions before and after the installation of emission control equipment to control of oxides of nitrogen and sulfur dioxide. A discussion follows in Chapter VIII of three options or directions that the Division of Air Quality may take when reporting its final findings and recommendations to the Environmental Management Commission and the Environmental Review Commission by September 2005.

Methylmercury is a serious health threat to humans, particularly to unborn and young children. Mounting scientific evidence and public concern argue strongly that mercury emissions must be reduced. The mercury health concern is primarily related to the existence of methylmercury in fish, resulting in fish advisories and associated health effects. These elevated levels are caused by mercury in the environment being converted to organic mercury, primarily methylmercury, which accumulates in predatory fish. Total mercury concentrations in North Carolina's rainwater are currently above levels believed necessary to allow natural processes to restore acceptable levels of methylmercury in fish.

North Carolina is one of the leading electricity producing states with 46 coal-fired utility boilers, with a total electrical generating capacity of approximately 13,300 megawatts. These coal-fired generating units currently account for up to 66 percent of total mercury emissions estimated to be emitted into the air in North Carolina.

In response to the Clean Smokestacks Act (CSA) of 2002, Progress Energy and Duke Power are required to reduce their nitrogen oxide (NO_x) emissions 77 percent by 2009 and their sulfur dioxide (SO_2) emissions 73 percent by 2013. While the CSA addresses NO_x and SO_2, the General Assembly recognized mercury emission issues and that reducing NO_x and SO_2 from utility boilers has the co-benefit of significant mercury emission reduction. The General Assembly, through the CSA, directed the Division of Air Quality (DAQ) to study mercury emission control performance and to make recommendations as to the course of further actions needed. In response, DAQ has calculated the estimated emissions for each NC utility boiler under its current and future configuration and highlights the following emission changes from current and future mercury emissions using conventional wet scrubber technology:

- Improvement in total mercury emission removal (from pre-CSA conditions) from 33% to 64%

- Nearly two-fold decrease in total mercury emissions from 2730 to 1460 lb/yr
- Nearly five-fold drop in oxidized mercury emissions from 1810 to 380 lb/yr.

Of the three species of mercury (elemental, oxidized, and particulate), it can be argued that oxidized mercury represents the most important species to control from the State's perspective because of its tendency to be deposited within the State. This significant reduction in oxidized mercury emissions suggests the possibility of considerable reductions in mercury deposition across NC.

A dramatic drop in oxidized mercury emissions could have major implications for reduced methylmercury contamination in fish. However, the relative contribution of global versus statewide and local mercury emissions to atmospheric mercury deposition is poorly understood and remains an area of scientific debate.

DAQ's estimated mercury reduction numbers should be considered conservative. Greater mercury reductions are anticipated from improvements in scrubber efficiency. Additionally, both mercury emission estimating tools did not include effects of possible mercury oxidation by selective catalytic converters. Recent studies indicate selective catalytic converters oxidize some elemental mercury, increasing mercury capture in scrubbers.

The electrical power sector is not the only industrial sector that would need to make significant reductions. The EPA is requiring a variety of industries to meet new maximum achievable control technology (MACT) standards, which will create emission reductions of both criteria and air toxics pollutants, including mercury. In addition, various changes and trends in industry are reducing other sources of mercury to the environment in rather dramatic proportions (e.g. changes in incineration processes, changes in the metallurgical industries, recycling changes, reductions in fluorescent bulb mercury content, etc.).

There are mercury emission sources in North Carolina that are not subject to the CSA. These non-CSA mercury sources currently represent approximately 34 percent of the total 2002 mercury emissions in North Carolina. From 2005 to 2012, the installation of SO_2 controls to meet the SO_2 cap are estimated to reduce CSA mercury sources to 43 percent of the total of mercury emissions in North Carolina. Non-CSA mercury sources percentage increases to 57 percent of a greatly reduced number of pounds of mercury then expected to be emitted in North Carolina.

There are two sources of mercury deposition: the "global pool" of elemental mercury that stays in the atmosphere for a number of months or years and speciated (elemental, oxidized, and particulate) mercury emissions generated by local sources. The United States presently accounts for three to five percent of total global mercury air emissions. Experts disagree on the relative effect of mercury deposition from the global pool and deposition from local emission sources. Atmospheric mercury models are under development at several institutions around the world, with a concerted effort on model

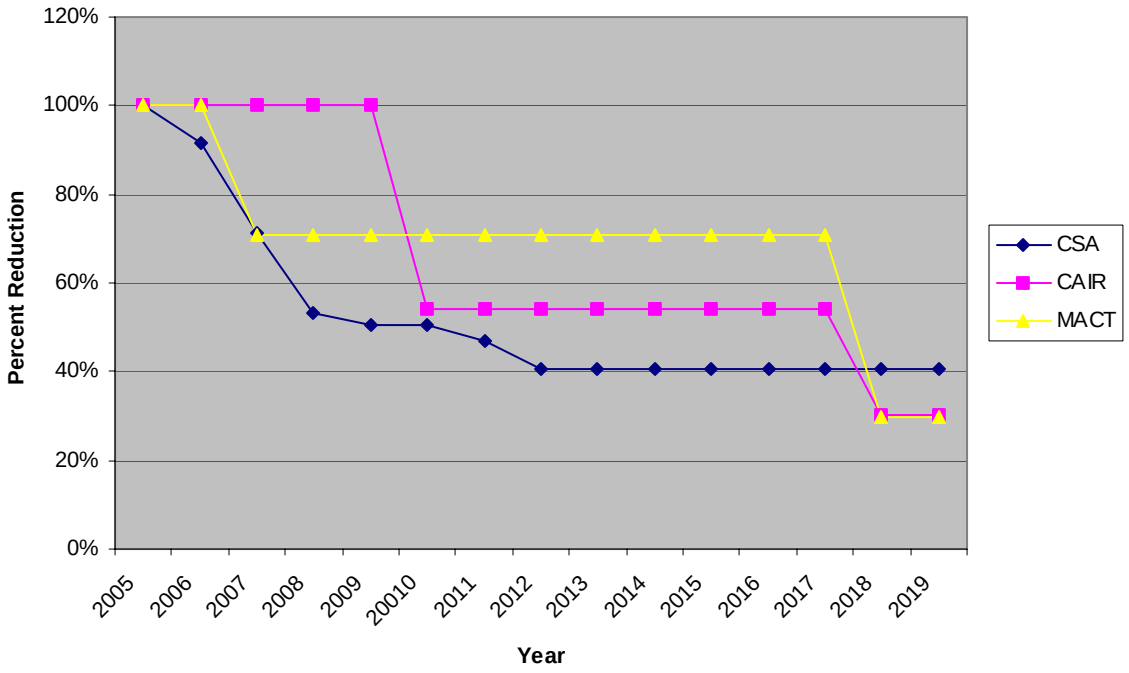
inter-comparison to identify important uncertainties in relative effects of global versus local mercury pollution.

However, at least one recently completed study indicates controlling local mercury emission sources may be important to local mercury deposition. In that study, the Florida Department of Environmental Protection examined an area of the Florida Everglades in an attempt to establish a link between airborne mercury emissions and methylmercury concentrations in top predator fish. This study provides the best example so far of the potential importance of dry deposition of mercury to total ecosystem impacts. Report findings point to a linear relationship existing between airborne mercury emissions and methylmercury concentrations in largemouth bass. The actual reduction of atmospheric sources of mercury in Florida was monitored. Since the peak deposition, monitoring showed a 60 percent decline in methylmercury in Everglades fish and wildlife in less than 15 years. The time required to achieve 50 percent of the ultimate response in fish tissue mercury concentrations is estimated to be approximately 10 years.

It is unknown if the results of this study are applicable in North Carolina as a predictive tool. South Florida's meteorology differs from that found in this State. There are also major differences in mercury sources (such as stack height and mercury emission speciation), topography, soil structure, and exposure to pollution affects across state borders. However, this study does demonstrate a strong direct correlation between decreases in mercury emissions and decreases in methylmercury in Everglade predatory fish.

The EPA has offered three approaches (proposals) to mercury emission reductions from coal-fired utility boilers. The first is to pursue traditional command-and-control of the federal Clean Air Act, section 112 MACT requirements for utility units. This proposal is estimated to reduce mercury emissions from 48 to 34 tons by January 2008. The second proposal is a cap-and-trade approach under guidelines outlined in the Clean Air Act, section 112(n)(1)(A). The third proposal involves a market-based, cap-and trade approach under section 111. The final rule is scheduled to be signed on or before March 2005.

The EPA mercury emission tool was used to estimate mercury emission reductions from the co-benefits of meeting requirements of the CSA. Credit for mercury reductions are credited for the year's planned project completion date. The following graph indicates the estimated CSA utility emissions are at or below both the proposed MACT and Clean Air Interstate Rule (CAIR) mercury reduction percentages until 2018.



The study of the complex and evolving science regarding mercury emission controls and their affects is not complete. Many (seemingly) conflicting theories on mercury chemistry and deposition exist. Within this unsettled legislative and scientific environment, DAQ is proposing three options to be considered for making specific mercury reduction recommendations in 2005.

1. Option one is to continue to study the problem and to defer any rulemaking action until a later time. The federal government, electric power industry, and pollution control industry are advancing the technology and state-of-the-science on the measurement, control, fate, and health effects of mercury emissions. The EPA is scheduled to finalize similar federal standards for controlling mercury emissions from coal-fired power plants in March 2005. The format of the federal requirements may add to the significant mercury emission reductions to be realized from the CSA. Additionally, it may be premature to accurately predict mercury emission reductions and corresponding deposition from in-state power plants resulting from co-benefits of the NOx and SO_2 control device installations that will result from the CSA.

2. The second option is to follow the lead of other states and set mercury emission standards. These states take the position that, while the science and technology are not fully developed, they are adequately developed to initiate rulemaking requirements. States with mercury standards appear to be acting from the basis that, since rulemaking has a history of forcing cost-effective technological developments, rulemaking will again be the engine for development.

3. Option three is to continue the study further, and then expect to set specific mercury emission standards at a later time. Upon completion of more comprehensive studies, DAQ would recommend that the General Assembly direct the Environmental Management Commission to initiate rulemaking. This option is based on the premise that it would be beneficial for all stakeholders to wait until additional information is available for additional future mercury control than to propose standards soon that may need to be revised later.

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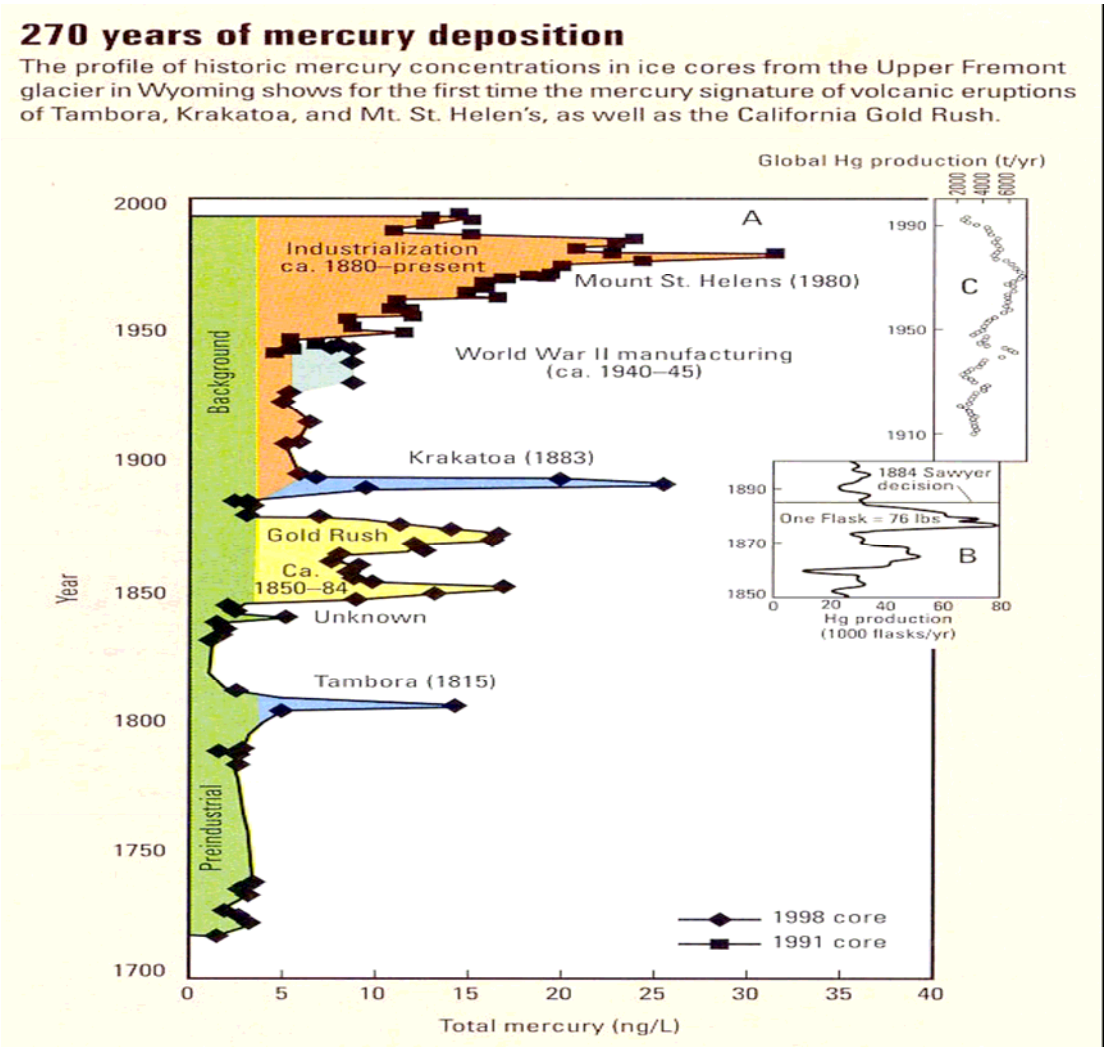
CHAPTER II MERCURY, METHYLMERCURY, AND RISKS

The United States presently accounts for 3 to 5 percent of total global mercury air emissions. Natural sources of mercury, such as volcanic eruptions and emissions from the ocean, are estimated to contribute about 40 percent of current worldwide mercury air emissions, whereas human-made sources account for the remaining 60 percent. Figure II-1 is a graphic representation of the connection between historical events and the age of deposits in the Upper Fremont glacier in Wyoming. The growth of Industrial mercury contributions is striking.

FIGURE II-1
270 YEARS OF MERCURY DEPOSITION



Courtesy of USGS.

ATMOSPHERIC MERCURY

Mercury in the atmosphere comes both from natural sources and from global emissions from human activities. Most of the mercury in the atmosphere is elemental mercury vapor, which may circulate in the atmosphere for years ("global pool") in a dynamic deposition and re-emission state of flux, and hence, can be transported thousand of miles from the source.[2] However, modeling studies recently have suggested that the rate of oxidation of elemental mercury in the atmosphere may be occurring twice as fast (half-life of six months instead of one year) as previously believed.

Mercury transformation processes from smokestack to earth are not yet well understood. Recent experiments using plume chemistry in a static plume dilution chamber, developed by the Electric Power Research Institute, may change the interpretation of chemistry used to calculate percentages of elemental mercury and oxidized (inorganic) mercury transported in the plume. [3] This study suggests that oxidized mercury rapidly converts to elemental mercury near the stack. This finding may explain measurements made near a large coal-fired power plant in Georgia. Based on mercury concentrations in coal burned at the plant, scientists predicted that the stack gases would contain 60-percent oxidized mercury and 40 percent elemental mercury. Mercury measured in air 15 miles downwind was found to be 9 percent oxidized mercury and 91 percent elemental mercury.[3] Mercury in an oxidized form is more amenable to removal by controls on the boiler (e.g., Scrubbers) and also believed to be deposited down wind of the plant than elemental mercury.

Information presented at the workshop on Mercury and CO_2 during April 19-21, 2004 is italicized.

Update On DAQ's Air Quality Measurements & Mercury Studies[4]

NC has relatively high mercury, well above US average, in terms of:

- *Emissions into ambient air*
- *Measurements in specific ambient airsheds*
- *Modeling in specific ambient airsheds*
- *Wet deposition levels*
- *Fish of selected species*
- *People who eat selected fish species*

Power Generation Is a Major Contributor to National Air Pollutant Emissions[5]

- *SO_2: 63%*
- *NOx: 22%*

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[2] Ref. 3, page 1.

[3] Ref. 18

[4] **Update On DAQ's Air Quality Measurements & Mercury Studies**, Steve Schliesser & Todd Crawford, NC Division of Air Quality, Workshop on Mercury and CO_2, Raleigh, NC, April 19-21, 2004

[5] **Mercury And CO_2 Emissions From The Power Generation Sector**, C.V. Mathai, Ph. D., Manager for Environmental Policy, Arizona Public Service Company, Phoenix, Arizona, Electricity and Fuel Diversity, Workshop on Mercury and CO_2, Raleigh, NC, April 19-21, 2004

- *Hg: 37%*
- *CO_2: ~40%*

A diverse fuel mix is critical to ensure electrical reliability, minimize price volatility, and strengthen national security

MERCURY IMPACT ON LAND

Mercury modeling efforts initially made an assumption that all inorganic mercury compounds that settled on the ground would eventually enter the surface water drainage system and accumulate in rivers, streams, and lakes. Contrary to that assumption, inorganic mercury compounds have been shown to have a strong propensity to attach to and remain on leafy vegetation and soil particles. The majority of inorganic mercury compounds found in water bodies arrive directly from the atmosphere. Mercury deposited on soil and vegetation does not appear to result in exposures believed to be detrimental to health through terrestrial exposure pathways.[6]

MERCURY IMPACT IN WATER

To be converted to organic mercury, elemental mercury must first combine with another element (such as sulfur, chlorine or oxygen) or combine with other compounds to form inorganic mercury compounds, and then undergo further reactions. Recent investigations suggest that a substantial portion of what is often considered "dissolved" mercury is actually mercury associated with macromolecular colloidal organic matter (submicroscopic particles that do not settle out). Either a living organism must act on this inorganic mercury compound or an organic compound must react with it to obtain organic mercury (methylmercury) and then undergo biological interactions.

METHYLMERCURY

The main pathway of introducing methylated mercury forms into aquatic systems is mediated by sulfate-reducing bacteria. While the amount of inorganic mercury is indeed an important factor, it is not the only important factor; nor is it necessarily the controlling factor. A number of parameters have been identified as important in influencing the production rates and abundance of methylmercury in aquatic systems. They include inorganic mercury loading, chemical speciation, water temperature, the availability of an organic substrate for sulfate-reducing bacteria, mercury demethylation activity (by bacteria), natural reduction-oxidation conditions, and in some cases photo-demethylation (light induced).[7] Demethylation is the opposite action of methylation, the creation of methylmercury.

To complicate the issue further, many of these parameters vary temporally and spatially in aquatic systems. Any of these parameters can potentially limit the abundance of bio-available methylmercury in an aquatic system.[8] Demethylation eliminates the toxic

[6] Ref. 7, page 18.
[7] Ref. 4, page 1.
[8] Ref. 4, page 1.

methylmercury molecule. Some types of bacteria, naturally occurring reduction-oxidation chemical reactions, and light break the molecular bonds of the methylmercury molecule. Mercury methylation and demethylation are constantly taking place at the same time in the same body of water.

Two lakes that are similar biologically, physically, and chemically have been shown to have different methylmercury concentrations in water, fish, and other aquatic organisms.[9] Additional factors influence the bioaccumulation of mercury in aquatic biota. They include the acidity (pH) of the water, length of the aquatic food chain, temperature, and dissolved organic material. Physical and chemical characteristics of a watershed, such as soil type and erosion or proportion of area that is wetlands, can affect the amount of mercury that is transported from soils to water bodies. Interrelationships among these factors are poorly understood and are likely to be site-specific. No single factor has been correlated with the extent of mercury bioaccumulation in all cases examined.

FOOD CHAIN

Organic mercury, primarily methylmercury, accumulates in long-lived animals. Predatory fish at the top of the food chain accumulate increasing concentrations of methylmercury in their body tissues (bioaccumulation), which becomes a health threat to humans who eat unsafe quantities of these fish.

MERCURY IMPACT ON PEOPLE'S HEALTH

HEALTH RISKS FROM ELEMENTAL AND INORGANIC MERCURY IN AIR

The elemental and inorganic mercury that exits the smoke stack becomes part of the global pool of mercury in the atmosphere or falling on land or water. Elemental and inorganic mercury are not believed to represent major health hazards in the ambient air environment.

HEALTH RISKS FROM ELEMENTAL AND INORGANIC MERCURY IN WATER

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water that do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals (MCLG). The MCLG for mercury has been set at 2 parts per billion (ppb) because EPA believes this level of exposure would not cause potential health problems.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies. The MCL for total mercury in drinking water has also been set at 2 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

[9] Ref. 5, Chapter 2, page 6.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations. EPA has found mercury to potentially cause kidney damage when people are exposed to it at levels above the MCL for relatively short periods of time.[10]

The U.S. Environmental Protection Agency (EPA) has announced the availability of a recommended fish tissue residue criterion for methylmercury to protect human health. This water quality criterion describes the maximum advisable concentration of methylmercury in freshwater and estuarine fish and shellfish tissue to protect consumers of fish and shellfish among the general population. EPA expects the criterion recommendation to be used as guidance by States, authorized Tribes, and EPA in establishing or updating water quality standards for waters of the United States. Because consumption of contaminated fish and shellfish is the primary route of human exposure to methylmercury, EPA is expressing this water quality criterion as a fish and shellfish tissue value rather than as a water column value. EPA is providing suggested approaches for relating this criterion to water column concentrations, and also plans to develop more detailed guidance to help water quality managers implement the methylmercury criterion in water pollution control programs.[11] The current EPA's recommended fish tissue residue criterion for freshwater and estuarine fish is 0.3 mg methylmercury per kilogram of fish.[12]

HEALTH RISKS FROM METHYLMERCURY IN AIR

Methylmercury is very unstable and breaks down rapidly when exposed to oxygen and sunlight. It is not believed to represent a health risk in ambient air because it is unable to exist there.

HEALTH RISKS FROM METHYLMERCURY IN WATER

Several fishing village epidemiological studies have been conducted to assess the neurodevelopment of children. Results show that the developing human nervous system to be particularly sensitive to methylmercury. The Seychelles Islands and Faroes Islands fishing village epidemiology studies of the 1980s and 1990s assessed the neurodevelopment of children from birth to several years old following maternal consumption of fish or whale meat on a routine basis during pregnancy. The Seychelles Islands are located in the Indian Ocean near Africa. The Seychelles Islands study was conducted by the University of Rochester School of Medicine and Dentistry. The Faroes Islands are located in North Atlantic between Scotland and Iceland. That study was conducted by the Harvard School of Public Health.[13]

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[10] http://www.epa.gov/safewater/contaminants/dw_contamfs/mercury.html
[11] http://www.epa.gov/waterscience/criteria/methylmercury/factsheet.html
[12] N.C. DHHS, Occupational and Environmental Epidemiology Branch, August 5, 2004
[13] Toxicological Effects of Methylmercury, National Research Council, 2000, National Academy Press.

The Seychelles Islands study evaluated approximately 740 mother-infant pairs where the mothers consumed 12 meals per week of fish with low levels of methylmercury of less than 0.3 ppm, which is less than the North Carolina's fish advisory action level of 0.4 ppm. The mercury levels in the mothers' hair during pregnancy were on average 6.8 ppm (range 0.5 – 27 ppm). A broad range of cognitive-behavioral tests were given to the children at approximately 6 months, 1 ½ years, 2 ½ years, 5 ½ years and 9 years. No effects were detected among the children. Based on this study, maternal consumption during pregnancy of fish with low methylmercury levels (less than 0.3 ppm) is accepted as safe. [15,14,]

The Faroes Islands study evaluated approximately 700 mother-infant pairs where the mothers consumed 1-3 meals per week of fish with low levels of methylmercury (less than 0.3 ppm) and 1 meal a month of pilot whale meat containing high levels of methylmercury (1 ppm and greater), which is higher than the North Carolina's action level of 0.4 ppm. The average hair levels of the Faroes mothers during pregnancy was 4.3 ppm (range 0.2 – 39 ppm), which is similar to Seychelles. When children were evaluated at 7 years of age, researchers detected deficits in attention, language, and memory. A maternal hair level of 10 ppm, a cord blood of 58 ppb, and a daily dose of 1 microgram per kilogram per day were found to be associated with a 10 percent risk of abnormalities in language, attention, and memory in children. Based on this study, maternal consumption of seafood with high methylmercury levels may be associated with an increased risk to the developing child.[15]

According to the American Academy of Pediatrics, the differences in the results of these studies may be due to the bolus or high doses that the Faroes Islands fetuses received from maternal consumption of pilot whale meat monthly verses the low doses that the Seychelles Islands fetuses received from maternal consumption of fish weekly. Additional studies are needed to further evaluate the issue of whether the bolus doses of methylmercury that were received by the Faroes children during the sensitive time periods of development are more likely to cause neurodevelopmental damage than the same doses given cumulatively over a period of several months. The average maternal hair levels and range of maternal hair levels for these two studies were similar but the doses were delivered differently.[16]

CURRENT NCDENR WATER AND AIR SAMPLING EFFORTS

DIVISION OF WATER QUALITY

The Division of Water Quality (DWQ) has two long-term programs that monitor mercury in surface waters. These two programs, the Ambient Water Quality Monitoring Program and the Fish Tissue Monitoring Program perform assessments of total mercury on a continual basis. Additional special studies are conducted in tandem with these long-term

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[14] Prenatal Methylmercury Exposure From Ocean Fish Consumption in the Seychelles Child Development Study, Myers G et al., 2003, *The Lancet* 361, pp 1686-1692

[15] EPA Mercury Report To Congress, Vol. 1 Summary, No.EPA-452/R-97-001

[16] Technical Report, *Mercury in the Environment: Implications for Pediatricians*, American Academy of Pediatrics, *Pediatrics* 108:1, pp 197-205, Goldman, l, Shanon, M, 2001.

programs in order to address specific questions or issues.

The Ambient Water Quality Monitoring Program involves the long-term water sampling of surface waters. Under this program, quarterly surface water samples are collected and analyzed for total mercury using EPA Method 245.1. With a reporting limit of 200 ng/L, this method typically identifies relatively large releases of mercury to surface waters and would not describe background or typical conditions. The DWQ chemistry laboratory is in the process of constructing a Class 1000 Clean Room in order to perform the new, low-level total mercury analytical methods described in EPA Method 1631. The DWQ expects that sample analysis will begin early 2005. With a total mercury reporting limit of 0.5 ng/L, EPA Method 1631 should allow the DWQ to determine background and typical levels of total mercury in surface waters, as well as begin to establish a database to determine trends.

The Ambient Water Quality Monitoring Program does not include the measurement of methylmercury in surface waters. Current methodology to determine methylmercury in surface waters is expensive and would require major equipment purchases for DWQ to perform the analyses.

The Fish Tissue Monitoring Program has collected thousands of fish tissue samples for mercury, and tens of thousands of fish tissue samples that includes a suite of other pollutants (e.g., PCBs, dioxin, pesticides). Since January 2000, the DWQ has processed over 800 fish tissue samples for total mercury from locations across the state. However, a majority of the samples were collected from eastern North Carolina. The DWQ continues to process up to 300 samples per year for fish tissue analysis, including total mercury. Multiple sizes and species of fish are collected and analyzed in order to provide a representation of those fish typically caught and consumed by fishermen. Presently, it is assumed that 100 percent of total mercury measured in higher trophic level fish is methylmercury (EPA 2001). This is a reasonable assumption since freshwater fish currently under advisory (i.e., bowfin, largemouth bass, chain pickerel) are high on the food chain. However, for smaller fish (e.g., sunfish), this may be an overestimation of the fraction of total mercury that is methylmercury.

In 2003, DWQ completed sampling and analysis for the Eastern Regional Mercury Study (ERMS). This study included the analysis of total mercury and methylmercury in surface water and sediment, and total mercury in fish from eastern North Carolina. Study sites tended to focus on the coastal plain physiographic region of the state (Figure II-2), however two sites were located in the piedmont. The ERMS study indicated that total mercury and methylmercury concentrations in surface water, sediment, and fish are similar to those found in other water bodies in the southern Atlantic drainage. Southern Atlantic drainage tends to have higher levels of methylmercury in surface waters than other northern and western states. The U.S. Environmental Protection Agency funded the laboratory analysis of total mercury and methylmercury.

The DWQ is currently conducting several special studies associated with mercury. This includes a special study near Riegelwood, NC (Cape Fear River Basin), additional marine

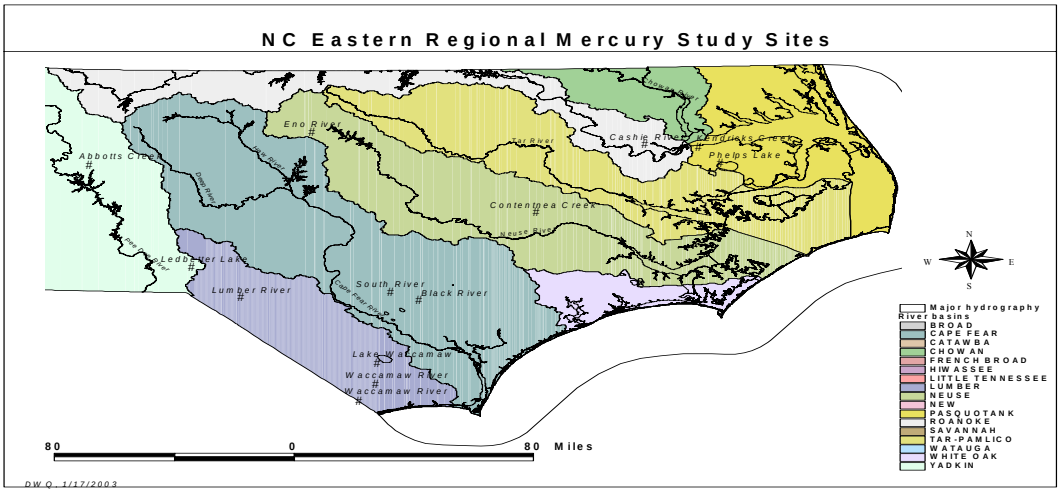
fish sampling and additional low-level mercury studies:

- The Riegelwood area monitoring study began in 2001 as a result of the closing of a chlor-alkali facility. The study seeks to evaluate the potential changes to fish tissue levels of total mercury as a result of the removal of a known atmospheric source. This study includes fish sampling and tissue analysis for total mercury at six downwind locations in the Cape Fear River Basin. Regular fish tissue sampling and analysis will continue as resources allow.

- Additional marine fish species analysis will be conducted as a joint effort between the DWQ, Division of Marine Fisheries, and the Department of Health and Human Services (DHHS). This follow-on study plans to focus on total mercury levels in spot, croaker, speckled trout, and bluefish. Additional species may be added if resources allow.

- Additional low-level mercury studies will be conducted to continue work begun in the ERMS. The additional studies will continue monitoring key DWQ-DAQ locations (i.e., Lakes Waccamaw, Lumber River Basin, and Lake Phelps, Pasquotank River Basin) and add new monitoring locations. New monitoring locations will be added to characterize total mercury and methylmercury west of the Yadkin River. The laboratory portion of this additional monitoring will be funded from a USEPA grant.

Figure II-2



DIVISION OF AIR QUALITY

The Division of Air Quality (DAQ) operates two North Carolina mercury wet (precipitation) deposition sites. The Pettigrew State Park site is located near Phelps Lake in Washington County, while the Waccamaw State Park site is stationed next to the atmospheric mercury monitoring unit near Lake Waccamaw.

Mercury levels in samples of eastern North Carolina rainwater vary widely from week to week but are comparable to data from sites across the United States. Volume-weighted average rainwater mercury levels are consistently higher at Lake Waccamaw than at a comparable site 150 miles to the north in remote northeastern North Carolina (Pettigrew State Park). Recent data from both sites during 1999 and 2000 suggests that mercury levels in precipitation may be declining in these areas. Levels declined to values typical of the more remote location at Pettigrew State Park between 1998 and 1999 at Lake Waccamaw State Park. In the years following however, the levels have crept back up. The reasons for this are definitively clear. Cleanup activities at the chlor-alkali facility have generated a considerable amount of fugitive mercury emissions. It is possible these "cleanup" emissions are to blame for the rise in mercury levels following the drop that was observed after the plant shut down in 1999. Continued sampling throughout the cleanup process and beyond should help to answer that question.

A new North Carolina mercury wet deposition measurement site is being planned. This sampling represents a joint venture by DAQ and DWQ. The existing air monitoring site is known as Condor, a CASTNET site. It is located inland from the coast in Montgomery County. The purpose of the new monitoring site is to collect background mercury concentrations. New mercury wet deposition equipment is being purchased for the site. The current schedule has valid data collection underway by late winter of 2004.

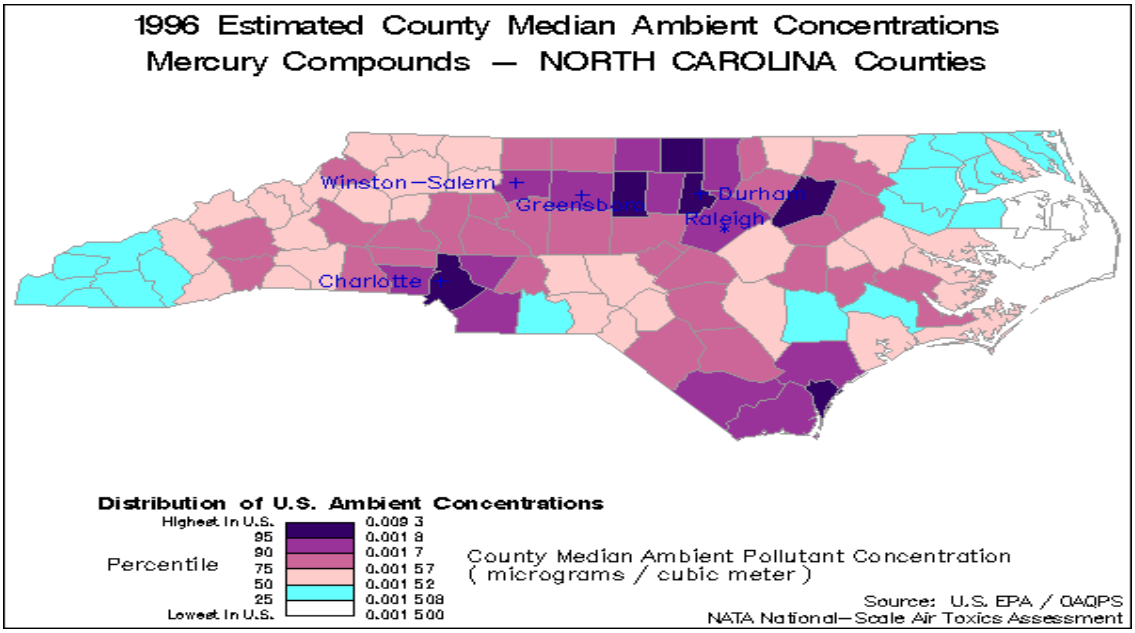
Additional DAQ mercury monitoring sites were located in the vicinity of Charlotte, North Carolina, to help define temporal and geographic trends in atmospheric mercury. To achieve this, two sampling equipment groups were operated continuously for one calendar year beginning March 2002. The first sampling site was a permanent site near the center of downtown Charlotte. Continuous data on total gaseous mercury and meteorological conditions was generated at this site. The downtown site also houses a variety of other instruments providing data for other DAQ atmospheric monitoring initiatives. It is anticipated that the data will create a snapshot of "urban" air quality conditions. Figure II-3 shows the estimated 1996 ambient mercury compound concentrations in North Carolina.

The second sampling equipment group is installed in a mobile monitoring trailer. The trailer was shared at three site locations on the perimeter of Charlotte over the course of the year. It is equipped to monitor for total gaseous mercury, reactive gaseous mercury, and elemental mercury, with the capability to also monitor for VOCs and carbonyls. These three site locations were selected to capture air quality conditions on the rapidly changing periphery of Charlotte. The final data collected are currently undergoing DAQ internal review.

At the July 30, 2004 stakeholder meeting, there was discussion about conducting a fish, air, and water sampling study to determine the mercury levels in these media before, during and after the utilities have made the CSA installments. The NC Division of Air Quality, NC Division of Public Health, NC Division of Water Quality, Duke Power, Progress Energy, Electric Power Research Institute and Research Triangle Institute could participate in the study design. Funding will be solicited to support this study. The study

length is anticipated to occur over 10-15 years. The progress of the study will be provided to the stakeholders and General Assembly on a biannual basis or sooner if needed.[17]

FIGURE II-3



NORTH CAROLINA FISH ADVISORIES

The most recent safe fish eating guidelines issued by the Department of Health and Human Services (DHHS) were prepared by the Medical Evaluation and Risk Assessment Unit (MERAU) and dated August 29, 2001. Women of childbearing age (15-44 years), pregnant women, nursing women, and children under 15 years may eat two meals per week of fish low in methylmercury, like farm-raised fish, canned tuna and other canned fish, fish sticks, shrimp, crab, lobster, clams, oysters, scallops, salmon, trout, cod, whitefish, pollock, mahi-mahi, ocean perch, halibut, haddock, flounder, croaker, herring, crappie, sunfish, white perch, yellow perch, and bream.[18] They should not eat any shark, swordfish, tilefish, or king mackerel.[19] Also, they should not eat bowfin (blackfish), chain pickerel (jack fish) or largemouth bass caught in North Carolina waters south and east of Interstate 85.

According to the guidelines, other women, men, and children over 15 years old may eat four meals per week of fish low in methylmercury, such as farm-raised fish, canned light tuna and other canned fish, fish sticks, shrimp, crab, lobster, clams, oysters, scallops, salmon, trout, cod, whitefish, pollock, mahi-mahi, ocean perch, halibut, haddock,

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[17] N.C. DHHS, Occupational and Environmental Epidemiology Branch, August 5, 2004

[18] All fish and shellfish should be properly prepared and cooked.

[19] On January 12, 2001 EPA and FDA issued national fish consumption advisories due to high levels of mercury in some marine fish. These advisories recommend that women of childbearing age and children should not eat shark, swordfish, king mackerel or tilefish.

flounder, croaker, herring, crappie, sunfish, white perch, yellow perch, and bream.[20]. They should eat no more than one meal per week of shark, swordfish, tilefish, or king mackerel. Also, they should eat no more than one meal per week of bowfin (blackfish), chain pickerel (jack fish), or largemouth bass caught in North Carolina waters south and east of Interstate 85.

[20] All fish and shellfish should be properly prepared and cooked.

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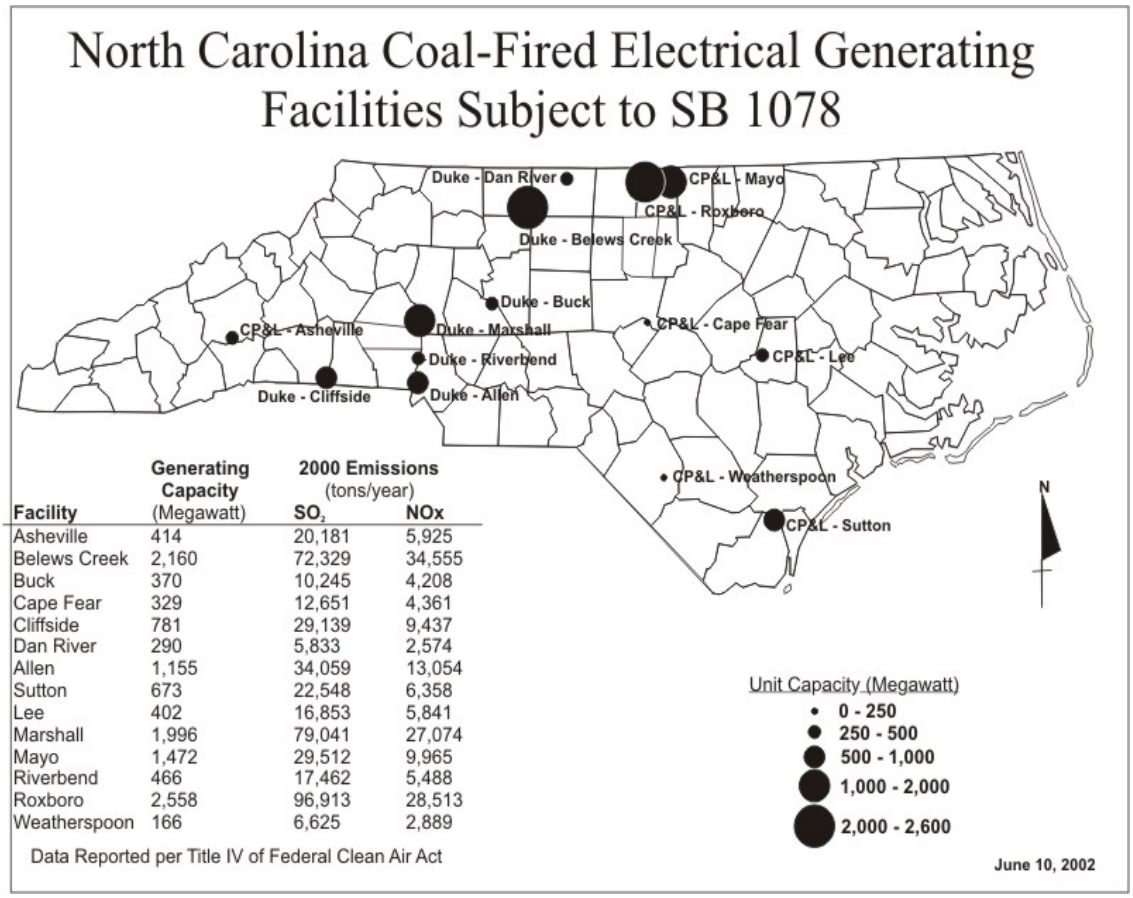
CHAPTER III LEGISLATIVE AND REGULATORY EFFORTS TO REDUCE MERCURY EMISSIONS

NORTH CAROLINA'S CLEAN SMOKESTACKS ACT (CSA)

In response to the CSA of 2002, the utility companies are required to reduce their NO_x emissions 78 percent by 2009 and their SO_2 emissions 73 percent by 2013. In order to achieve these requirements, Duke Energy and Progress Energy are in the process of installing flue gas desulfurization (FGD) wet and/or dry scrubbers to reduce SO_2 emissions, and combustion controls and post-combustion controls to lower NO_x emissions. Figure III-1 indicates the location and relative emissions of CSA boilers.

Figure III-1



Facility	Generating Capacity (Megawatt)	2000 Emissions (tons/year) SO_2	NOx
Asheville	414	20,181	5,925
Belews Creek	2,160	72,329	34,555
Buck	370	10,245	4,208
Cape Fear	329	12,651	4,361
Cliffside	781	29,139	9,437
Dan River	290	5,833	2,574
Allen	1,155	34,059	13,054
Sutton	673	22,548	6,358
Lee	402	16,853	5,841
Marshall	1,996	79,041	27,074
Mayo	1,472	29,512	9,965
Riverbend	466	17,462	5,488
Roxboro	2,558	96,913	28,513
Weatherspoon	166	6,625	2,889

CSA BOILER EMISSIONS

Coal-fired generating units currently account for approximately 66 percent of mercury emissions estimated to be emitted into the air in North Carolina. Emission control equipment planned for installation to meet the North Carolina Clean Smokestacks Act (CSA) are estimated to capture about 65 percent of mercury emissions from Duke

Power's and Progress Energy's coal-fired generating units in North Carolina by 2012.[21] Although the Act does not prescribe mercury-specific controls, these substantial mercury emission reductions are achieved as a secondary benefit (co-benefits). The proposed addition of wet scrubbers to control sulfur oxides (SO_2) is expected to reduce total mercury emissions from CSA coal-fired electrical generating units from an estimated 3,056 pounds per year (ppy) to 1,416 ppy.

Figure III-2 shows the relative percentage of each CSA affected electrical generating plant's contribution of mercury into the atmosphere in 2002 by Coal-fired boilers covered under CSA. The Roxboro, Marshall, and Belews Creek facilities combined mercury emissions are estimated to represent 60 percent of the total CSA mercury emissions.

There are mercury emission sources in North Carolina that are not subject to the CSA. A list of all sources reporting mercury emissions, including coal-fired boilers covered under CSA, was truncated with Craven County Wood Energy, who reported emissions of 6.91 pounds of mercury emissions in 2002 (see Appendix D). These non-CSA mercury sources represent approximately 34 percent (1,737 pounds) of the total 2002 (5,111 pounds) of mercury emissions in North Carolina. CSA boilers represent 66 percent (3,374 pounds). Figure III-3 graphically shows the predominance of the CSA boilers.

From 2005 to 2012, the installation of SO_2 controls to meet the SO_2 cap are estimated (EPA's Mercury Emission tool) to reduce CSA mercury sources to 43.5 percent (1,340 pounds) of the total (3,077 pounds) of mercury emissions in North Carolina. The assumption is that non-CSA mercury sources mercury discharge remains constant at 1,737 pounds of mercury per year. Figure III-3 shows that the remaining contribution of the non-CSA mercury sources percentage increases to 56.4 percent from 34 percent of a reduced number of pounds of mercury (5,111 to 3,077 pounds in 2012). Figure III-4 shows the new predominance of the non-CSA mercury sources in the State.

[21] See Appendix C

FIGURE III-2
PERCENT OF TOTAL MERCURY PRE-CSA BY FACILITY

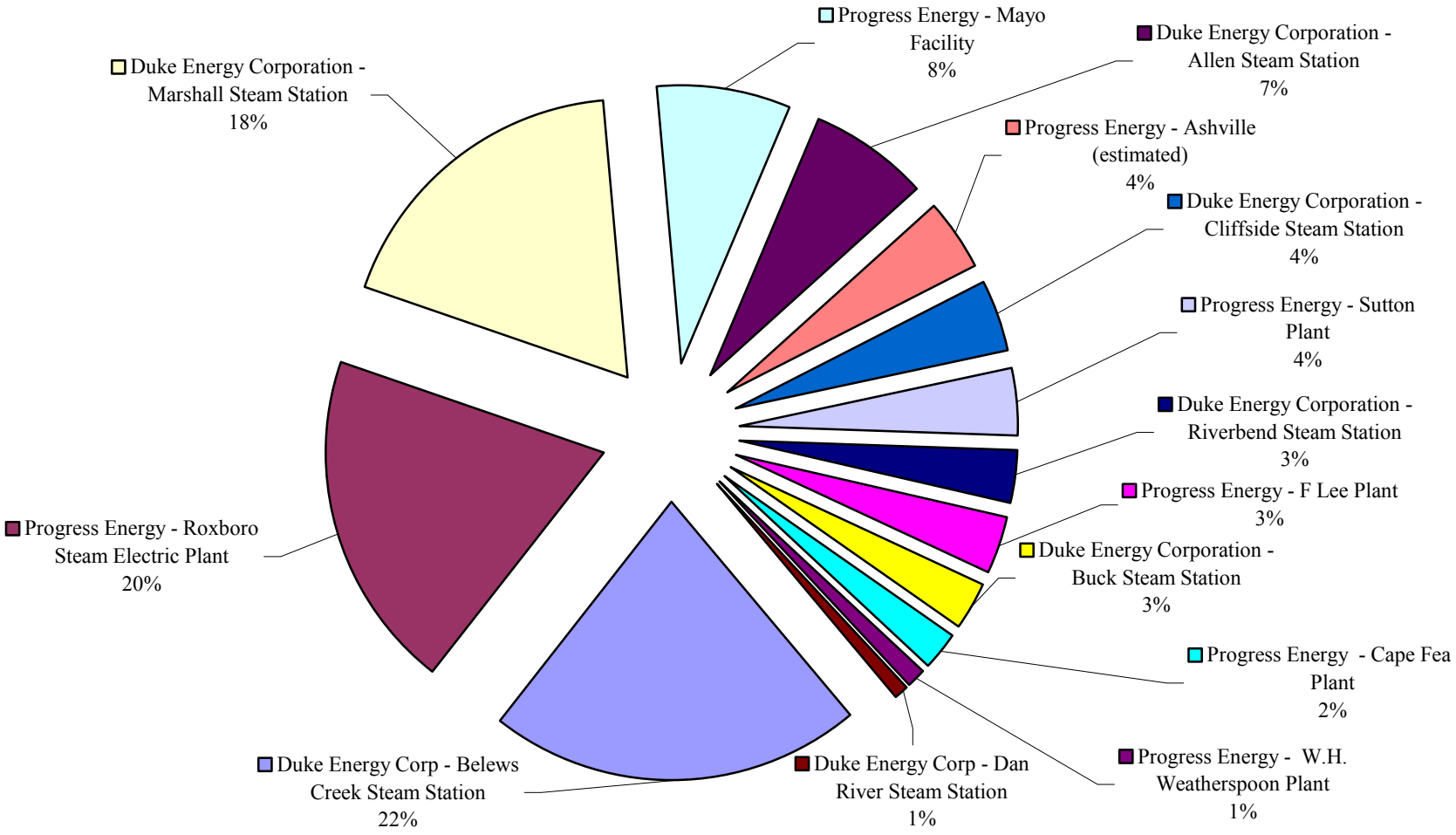


FIGURE III-3
PRE- CSA UTILITIES MERCURY CONTRIBUTION
66 PERCENT OF 5,111 LBS. MERCURY

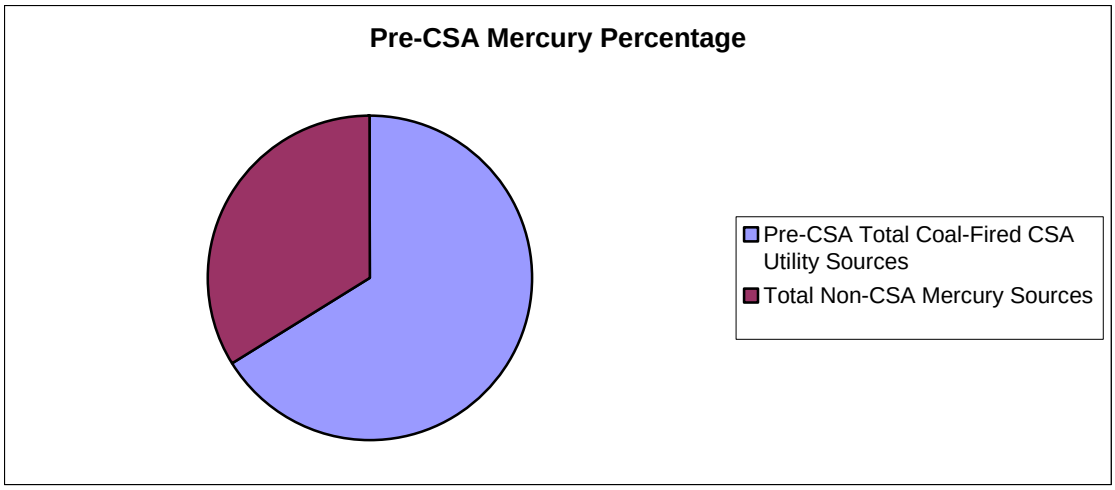
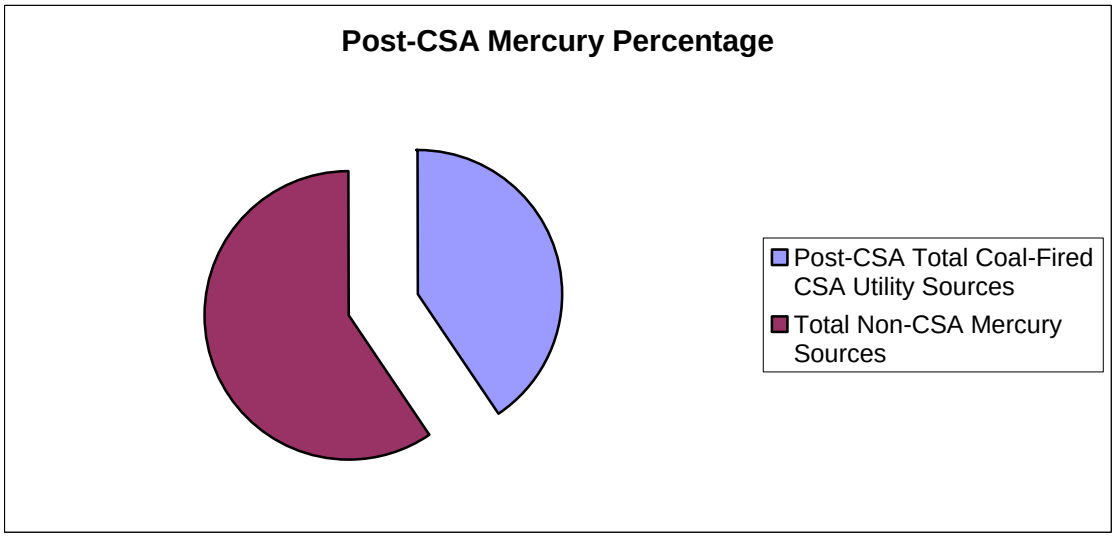


FIGURE III-4
POST- CSA UTILITIES MERCURY CONTRIBUTION
43.5 PERCENT OF 3,077 LBS. MERCURY



Information presented at the workshop on Mercury and CO_2 during April 19-21, 2004 is italicized.

CURRENT AND PROJECTED MERCURY EMISSIONS[22]

- *Current Emission Estimates*

[22] New North Carolina Coal-fired Utility Multiple Pollutant Regulations,2004 Electric Utilities Environmental Conference, Tucson, AZ, January 20, 2004, Steve Schliesser, QEP, Senior Engineer, NC Division of Air Quality

a. *Uncontrolled Emissions ~ 4,100 lb/yr*

b. *Cold-side ESP Efficiency – 29%*

c. *Hot-side ESP Efficiency – 11%*

d. *Controlled Emissions ~ 3,050 lb/yr*

e. *Overall Statewide Reduction – 25%*

- *Future Emission Estimates*

a. *Cold-side ESP / FGD Efficiency – 78%*

b. *Hot-side ESP /FGD Efficiency – 39%*

c. *Controlled Emissions ~ 1,370 lb/yr*

d. *Overall Statewide Reduction– 65%*

CURRENT CSA PROGRESS BY THE UTILITIES

Progress Energy reported to the North Carolina Utility Commission on April 1, 2004, that the total project cost in future dollars remains at $813 million. The company observed that the projected SO_2 removal rates have increased for scrubbed units, resulting in a cancellation of a planned scrubber for Lee 3. Significant construction at the Asheville and Roxboro plants is taking place in 2004.

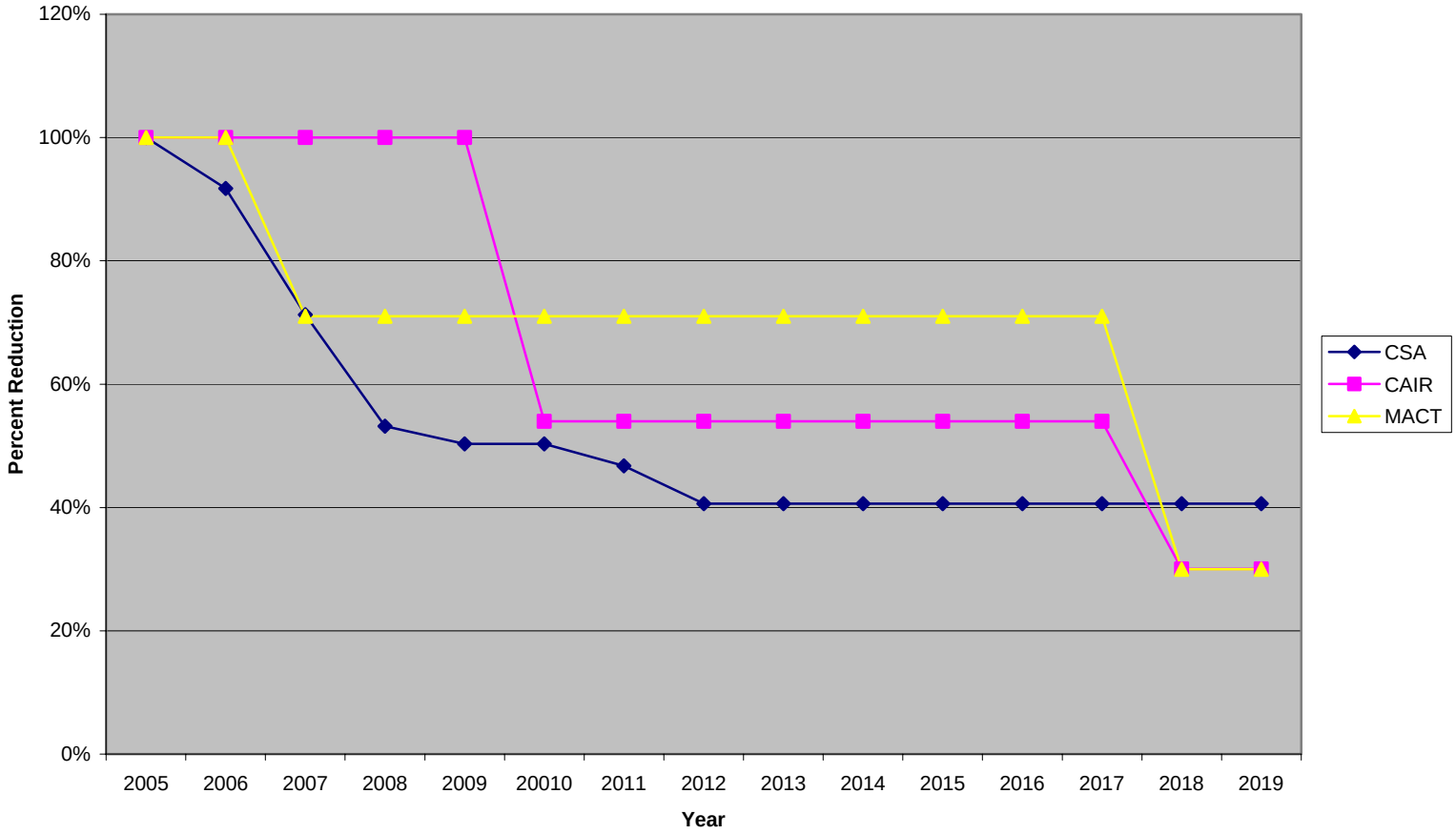
Duke Energy reported April 1, 2004, that its estimated compliance costs to be $1.526 billion. The company reported that the technologies expected to be required to support compliance have not changed.

The North Carolina Department of Environment and Natural Resources and the North Carolina Utilities Commission certified that "the actions taken to date by Progress Energy Carolinas, Inc. and Duke Power, a Division of Duke Energy Corporation, appear to be in accordance with the provisions and requirements of the Clean Smokestacks Act."[23]

The EPA Tool was used to estimate mercury emission reductions from the co-benefits of meeting requirements of the CSA. Credit for mercury reductions are credited for the year's planned completion date. Figure III-5 indicates the CSA utility emissions are at or below both the proposed MACT and Clean Air Interstate Rule (CAIR) mercury reduction percentages indicated until 2018.

[23] *The Implementation of the "Clean Smokestacks Act"*, A Report to the Environmental Review Commission and the Joint Legislative Utility Review Committee, June 1, 2004.

FIGURE III-5
COMPARISON OF CSA TO FEDERAL MACT AND CAIR PROPOSALS



CLEAN SMOKESTACKS & DUKE POWER'S MERCURY EFFORTS[24]

Power Plants in the US:

- *About 1/3 of Total US Non-Natural Emissions.*
- *About 1 % of Total Global Emissions.*
- *Mercury in coal is a "trace" element and concentrations emitted are very small.*
- *Low concentration makes control difficult.*
- *Control technologies not commercially ready. Extended run times needed to determine full impact.*
- *Inhalation of mercury from power plants is not an issue.*

Mercury types from coal combustion.

- *Elemental (Hg°), 40 to 60% (Bituminous Coal)*
- *Oxidized (HgCl), 40 to 60% (Bituminous Coal)*
- *Particulate Mercury, 0.05% Bituminous Coal)*

Co-Benefits

- *Case 1: SCR, ESP, & FGD*
- *Three Units 39% of projected system MW-hrs*
- *SCR oxidizes Hg to HgCl (80 – 90+%)*
- *Cold Side ESP 25 – 35% Hg collection*
- *FGD collects 80-90+% of oxidized Hg*
- *Expected overall Mercury removal of 80 to 90% reduction*

Duke Research:

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[24] Mercury - Power Plants, Clean Smokestacks & Mercury Efforts, Duke Power Workshop on Mercury and CO_2, Raleigh, NC, April 19-21, 2004

- *2001 – Collection efficiency across ESP (Marshall & Allen).*
- *2002 – Mercury oxidation with & without SCR (Cliffside 5).*
- *2004 – August: Mercury collection from pilot FGD (Marshall).*

Co-Benefits

- *Case 2: ESP, & FGD*
- *9 Units 43% of projected system MW-hrs*
- *Cold Side ESP 25 – 35% mercury collection*
- *FGD collects 50 to 60+% of remaining mercury*
- *Expected overall Mercury removal of 55 to 65% reduction*

Duke Research:

- *2005 – DOE: Pilot of oxidation catalyst downstream of ESP (Marshall).*
- *2004 – 1/04: Impact of Low NOx combustion on oxidation & ESP Collection efficiency (Marshall) – Increased oxidation & collection eff.*
- *2004 – 5/04: Verification of the impact of Low NOx combustion with different coals and unit (Allen).*

Co-Benefits *Case 3: Cold Side ESP*

- *1 Units .01% of projected system MW-hrs*
- *Cold Side ESP 25 – 35% mercury collection*

Duke Research:

- *2004 – DOE: Southern Co testing with activated carbon & impregnated carbon. Results to date 60-70% removal with activated carbon. Impregnated carbon may increase removal with less injection.*

Co-Benefits

- *Case 4: Hot Side ESP*
- *18 Units 17 % of projected system MW-hrs*

- *Hot Side ESP 0 – 9 % mercury collection*

Duke Research:

- *1999 – EPA ICR data request stack test on Cliffside 1.*
- *2003-2005 DOE: Impregnated carbon injection on Hot Side ESP.*
- *9/03 – 1 wk trial Cliffside 2*
- *Reduction: 30% full load, 70+% low load*
- *9/04 – 1 wk trial Cliffside 2 (verification of 9/03 results)*
- *2/05 – 1 month trial Buck 5*
- *Cliffside Unit 2 Hot Side ESP mercury Control, September 2003 trial.*

Continuous measurement of mercury is in the very early stage of development.

LEGISLATION TO CONTROL MERCURY EMISSIONS IN OTHER STATES[25]

The following bills were introduced in state legislatures for the 2003-2004 sessions to reduce mercury emissions and other pollutants from power plants.

Colorado – SB 140 sponsored by Senators Grossman and Williams – Requires large electrical power plants to install best available control technology by the later of 1/1/2014, or the date that is 40 years after the date on which the plant begins operation.

***Connecticut** (law) – HB6048 (Public Act 03-72) HB 6048 requires coal-fired power plants to comply with an emissions rate equal to or less than 0.6 pound of mercury per trillion BTU of heat input, or alternatively, an emissions rate comparable to a 90 percent reduction in mercury emissions. The legislation would achieve compliance through the installation of best available control technology (the act notes that if a facility installs and properly maintains the best available control technology and still fails to meet the emissions rate, it can request an alternative emissions rate from the Department of Environmental Protection

***Hawaii** – HB195 sponsored by Representative Morita - The purpose of this part is to regulate the emissions of nitrogen oxide, sulfur dioxide, mercury, and carbon dioxide by power plants, in order to protect the public health and safety and to enhance

[25] The National Caucus of Environmental Legislators, Compiled 2-4-04, http://www.ncel.net/news_uploads/96/Mercury.Power%20Plant%20emissions%20bills.doc,

environmental quality of life. The bill would reduce aggregate mercury emissions by an amount equal to ninety per cent from 1999 levels not later than January 1, 2007.

***Iowa** – HF435 sponsored by Representative Don Shoulz – Directs the state to set mercury emissions limits for coal fired power plants and waste incinerators by 2010.

***Maryland** – (DRAFT awaiting bill number) sponsored by Delegate James Hubbard – Sets emission limits from coal-fired power plants for nitrogen oxide, sulfur dioxide, mercury and carbon dioxide.

***Michigan** – HR187 sponsored by Representative Jack Minore - A resolution to urge the Environmental Protection Agency to reconsider and reverse its proposal to ease restrictions on mercury emissions.

***Minnesota** - HF803 sponsored by Representatives Johnson, S., Ozment, Ellison, Wagenius, Cox & SB1032 sponsored by Senators, Anderson**,** Pogemiller**,** Marty, Metzen - By July 1, 2010,an electric generation facility that uses coal as its primary fuel shall install applicable best available control technology identified by the United States Environmental Protection Agency for controlling criteria pollutants under the federal Clean Air Act, if installation of such technology is economically feasible. If installation of such technology is not economically feasible at a particular facility, the facility shall instead upgrade the facility to comply with the new source performance standards promulgated under the federal Clean Air Act applicable to a new coal-fired power plant of that type. The owner of a facility subject to this bill may opt to convert the facility to one that uses natural gas as the primary fuel to comply with that paragraph.

***New York** – AB479 sponsored by Assemblyman Pete Grannis – Directs the state to set mercury emissions limits for coal fired power plants and waste incinerators by 2010.

***New York** – AB5933 sponsored by Assemblyman Richard Brodsky - This bill requires the Department of Environmental Conservation ("DEC") to establish air pollution standards for power plants regarding nitrogen oxide, sulfur dioxide, carbon dioxide and mercury. Requires the commissioner to promulgate emergency regulations within thirty days such that electric generators of a 15MW capacity or more shall emit no more than 1.5 pounds per MW hour of Nitrogen oxide (NO_x) by 2004 and no more than 3 pounds per MW hour of sulfur dioxide (SO_2) by 2007. Requires the department to promulgate regulations for reductions in emissions of carbon dioxide and establish a cap by January 1, 2007, that is 7 percent less than the total 1990 CO_2 emissions. Requires the department to promulgate regulations for reduction in emissions of mercury from electric generators that is no more than 10 percent of the mercury emissions generated in 1999 by January 1, 2007.

***New York** – SB3172 sponsored by Senator Eric Schneiderman – This bill directs the state to set regulations reducing power plant emission of NO_x, SOx, CO_2 and mercury. The bill calls for a 90 percent reduction in mercury emissions.

Virginia – HB1472 sponsored by Representative Jack Reid - Establishes a schedule by which investor-owned public utilities that own or operate coal-fired generating units are required to reduce by specific amounts their emissions of oxides of nitrogen, sulfur dioxide and mercury. The utilities are to determine what technologies will be used to achieve the emission limits established by the bill. Any permit issued by the Air Pollution Control Board for a coal-fired generating unit, which is subject to this new law, will have to provide for testing, monitoring, record keeping and reporting to assure compliance with the reduction requirements. The bill also authorizes the Governor to enter into agreements with the utilities to transfer to the state any emissions allowance that may be acquired by the utilities under federal law. The Department of Environmental Quality and the State Corporation Commission (SCC) are to report annually to the status of the emissions reduction and cost recovery efforts to the committees having jurisdiction over the subject matter. In addition, the Department of Environmental Quality is required to conduct an ongoing analysis of the issues related to the development and implementation of standards and plans to control carbon dioxide (CO_2) from coal-fired generating units. The Department is also to evaluate available control technologies and perform a cost-benefit analysis of alternative strategies to reduce emissions of CO_2, and report its findings to the committees with jurisdiction

***Washington** - SB582 sponsored by Senator Keiser, Fraser and Kline – Requires the state to develop a toxic air emissions strategy that includes: 1) establishing a ten-year schedule to adopt emission reduction standards that significantly reduce emissions for the top ten toxic air pollutants and 2) undertaking actions, including any necessary rule making, to begin emission reductions for the six toxic air pollutants posing the greatest relative risk, as determined by the department, no later than January 1, 2006.

***Wisconsin –** On February 4, state legislators will request that the DNR reintroduce rules seeking an 80 percent reduction in mercury emissions by 2018. The rules were rejected by a legislative committee last December and were being held in limbo by the DNR Board, a group that has oversight over the DNR.

Other States' Actions

Massachusetts – On September 19, 2003, Governor Mitt Romney announced regulations that will require the state's oldest power plants to significantly reduce mercury emissions. The Executive Office of Environmental Affairs (EOEA) and the Massachusetts Department of Environmental Protection (DEP) have proposed a two-phase mercury emissions standard. The first phase requires facilities to capture 85 percent of the mercury contained in combusted coal by October 1, 2006. The second phase requires facilities to capture 95 percent of the mercury by October 1, 2012. In total, the regulations will cut mercury emissions by over 130 pounds per year. (Source: Massachusetts Dept. of Enviro. Protection news release, 9/13/03; http://www.state.ma.us/dep/pao/news/mercregs.htm)

***New Hampshire** – In 2002, New Hampshire passed the nation's first 4-pollutant law requiring reductions in NO_x, SO_2, CO_2, and mercury. The law requires an annual cap applicable to total mercury emissions from all affected sources burning coal as a fuel, to be recommended by the department not more than 60 days following the U.S.

Environmental Protection Agency's proposed regulation establishing a Maximum Achievable Control Technology (MACT) standard for mercury emissions from utility boilers, but in no case later than March 31, 2004, with timely consideration by the legislature expected by July 1, 2005. (Source: HB284 sponsored by Rep. Jeb Bradley)

*Sponsored or co-sponsored by a participant in the National Caucus of Environmental Legislators.

FEDERAL ACTIONS AND STATUS

In the January 30, 2004 Federal Register, EPA proposed new air rules for reducing emissions of sulfur dioxide (SO_2), nitrogen oxides (NO_x), and mercury. EPA proposed the Interstate Air Quality Rule, which focuses on states whose SO_2 and NO_x emissions are significantly contributing to fine particle and ozone pollution problems in other downwind states. The proposed Interstate Air Quality Rule would cover 29 states in the Eastern United States and the District of Columbia. In a separate but closely related action, EPA proposed the Utility Mercury Reduction Rule for controlling mercury emissions from power plants. Together, the Interstate Air Quality Rule proposal and mercury proposal create a multi-pollutant strategy to improve air quality throughout the U.S.[26]

INTERSTATE AIR QUALITY RULE[27]

EPA Administrator Mike Leavitt signed the proposed Interstate Air Quality Rule on December 17, 2003. The proposed Interstate Air Quality Rule would reduce emissions of SO_2 and NO_x in 29 eastern states and the District of Columbia in two phases. SO2 emissions would be reduced by 3.6 million tons in 2010 (approximately 40 percent below current levels) and by another 2 million tons per year when the rules are fully implemented (approximately 70 percent below current levels). NO_x emissions would be cut by 1.5 million tons in 2010 and 1.8 million tons annually in 2015 (about 65 percent below today's levels).

Each affected state would be required to revise its state implementation plan to include control measures to meet specific statewide emission reduction requirements. To achieve the required reductions in the most cost effective way, the proposal suggests that states regulate power plants under a cap and trade program similar to EPA's highly successful Acid Rain Program. Emissions would be permanently capped and could not increase.

CLEAN AIR INTERSTATE RULE (CAIR)[28]

On May 18, 2004, the Environmental Protection Agency proposed additional details and rule text supplementing its January 2004 proposal (and renaming it) to reduce interstate transport of fine particulate matter and ozone. The CAIR would require 29 eastern states and the District of Columbia to significantly reduce and permanently cap emissions of sulfur dioxide (SO_2) and/or nitrogen oxides (NO_x). In 2015, NO_x emissions from the

[26] http://www.epa.gov/oar/interstateairquality/
[27] http://www.epa.gov/oar/interstateairquality/basic.html
[28] http://www.epa.gov/oar/interstateairquality/pdfs/cairsuppfs51804final.pdf, Supplemental Proposal for Reducing Interstate Transport of Fine Particulate Matter and Ozone.

power sector would be 65 percent below today's levels. SO2 emissions from that sector would be 50 percent below current levels by 2015 and approximately 70 percent below current levels when fully implemented.

Reducing emissions of these pollutants will significantly address these health issues, in addition to improving visibility and protecting sensitive ecosystems. EPA's modeling predicts that when combined with existing emissions reduction requirements, this rule would help approximately 90 percent of "nonattainment areas" meet national air quality standards for ozone and particle pollution.

By addressing air pollutants from electric utilities in a cost-effective fashion, EPA's Clean Air Interstate Rule proposal would protect public health and the environment without interfering with the steady flow of affordable energy for American consumers and businesses. Each of the 29 states affected by the program and the District of Columbia must submit a plan to EPA that demonstrates it will meet its assigned statewide SO_2 and/or NO_x emissions budget (i.e., emissions reduction requirements). States can meet the emissions reduction requirements by either: joining the EPA-managed cap-and-trade programs for power plants, or achieving reductions through other emissions control measures.

UPDATE ON MACT PROPOSAL[29]

The proposed new proposed rulemaking (NPR) Clean Air Act (CAA), section 112 MACT rule would limit emissions of mercury from coal-fired EGUs and Ni from oil-fired EGUs. Exposure to mercury or nickel above identified thresholds has been demonstrated to cause a variety of adverse health effects. The NPR also proposed an alternative to regulate mercury from coal-fired EGUs and Ni from oil-fired EGUs under Section 111. In the January 30, 2004 NPR, EPA also proposed, in the alternative, standards of performance under CAA section 111 to establish a mechanism by which mercury emissions from new and existing coal-fired Utility Units would be capped at specified, nation-wide levels. A first phase cap would become effective in 2010 and a second phase cap would become effective in 2018. Facilities would demonstrate compliance with the standard by holding one ''allowance'' for each ounce of mercury emitted in any given year.

DESCRIPTION OF MERCURY EMISSION CREDIT TRADING RULE PROPOSAL

Allowances would be readily transferrable among all regulated facilities. EPA believes that such a ''cap and trade'' approach to limiting mercury emissions is the most cost effective way to achieve the reductions in mercury emissions from the power sector that are needed to protect human health and the environment. The added benefit of this cap-and trade approach is that it dovetails well with the sulfur dioxide (SO_2) and nitrogen oxides (NO_x) Interstate Air Quality Rule (IAQR) that was also proposed through a notice January 30, 2004 (69 FR 4565). That proposed rule would establish a broadly applicable Federal Actions and Status.

[29] Federal Register / Vol. 69, No. 51 / Tuesday, March 16, 2004 / Proposed Rules

In the January 30, 2004 Federal Register, EPA proposed new air rules for reducing emissions of SO_2, nitrogen oxides NO_x, and mercury. EPA proposed the Interstate Air Quality Rule, which focuses on states whose SO_2 and NO_x emissions are significantly contributing to fine particle and ozone pollution problems in other downwind states. The proposed Interstate Air Quality Rule would cover 29 states in the Eastern United States and the District of Columbia. In a separate but closely related action, EPA proposed the Utility Mercury Reduction Rule for controlling mercury emissions from power plants. Together, the Interstate Air Quality Rule proposal and mercury proposal create a multi-pollutant strategy to improve air quality throughout the U.S.[30]

REDUCING POWER PLANT EMISSIONS: EPA'S NEW PROPOSED RULES FOR MERCURY[31]

EPA Proposes to Reduce Utility Emissions through Current Clean Air Act (CAA) Authorities

1. *Interstate Air Quality Rule (IAQR) to address the contribution of transported SO_2/NO_x emissions to ozone (smog) and fine particle ($PM_{2.5}$) nonattainment problems in the Eastern U.S.*

Standards to Reduce Mercury Emissions and Deposition

1. *Section 112 standards*
   - *Maximum achievable control technology (MACT)*
   - *Command-and-control*
   - *Take comment on trading options*

2. *State-implemented section 111 standards*
   - *Emissions Guidelines and New Source Performance Standards*
   - *Market-based, cap-and-trade program*

Proposed Alternatives to Reduce Mercury Emissions from the Power Sector

- *Three individual approaches outlined in the January 30, 2004 proposal*

  1. *Propose traditional, command-and-control section 112 MACT requirements for utility units. Reduces mercury emissions from 48 to 34 tons by January 2008*

  2. *Propose cap-and-trade approach under guidelines outlined in section 112(n)(1)(A)*

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[30] http://www.epa.gov/oar/interstateairquality/

[31] Reducing Power Plant Emissions: EPA's New Proposed Rules For Mercury, William H. Maxwell, Combustion Group, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, Workshop on Mercury and CO2, Raleigh, NC, April 19-21, 2004

3. *Propose market-based, cap-and trade approach under section 111*

   a. *Revises December 20, 2000 finding that it is "appropriate and necessary" to regulate Utility Units under section 112*

   b. *Caps mercury emissions at 15 tons in 2018; interim cap for 2010 proposed to encourage early reductions in SO_2 and NO_x, generating additional mercury emissions reductions*

   c. *Final approach to be determined following completion of public hearings and close of public comment period*

Final rule signed on/before March 2005

SECTION 112 MACT

A. *Affected source definition*

1. *Electric Utility Steam Generating Unit (Utility Unit)*

   a. *Any fossil fuel-fired combustion unit of more than 25 MWe that serves a generator that produces electricity for sale*

      - *Cogeneration Utility Unit – unit that generates steam and electricity and supplies more than one-third of its potential electric output capacity and more than 25 MWe output to any utility power distribution system for sale*

      - *Cogeneration is defined as the simultaneous production of power (electricity) and another form of useful thermal energy (usually steam or hot water) from a single fuel-consuming process*

2. *Non-Utility Units, not subject to this rule*

      - *Any unit that meets the above definition, <u>but</u> combusts natural gas >98% of the time*

      - *Simple- and combined-cycle turbine units*

      - *Industrial boilers*

SECTION 111(D) – EMISSION GUIDELINES (EG)

1. *Requires EPA to prescribe regulations that outline a procedure by which <u>each State</u> shall submit plans which create standards of performance for existing sources for which air quality criteria have not been set but for which NSPS have been established.*

2. *Cap-and-Trade program reduces the overall amount of emissions by:*
   - *Requiring sources to hold allowances to cover their emissions on a <u>one-for-one basis</u>*
   - *Limiting overall allowances so that they cannot exceed specified levels (i.e., the "cap level"*
   - *Reducing the cap to less than the amount of emissions actually emitted, or allowed to be emitted, at the inception of the program*
   - *Allowing for a declining cap over time*
   - *Creating market-based incentives for early reductions*

SECTION 111 – REGULATORY APPROACH

1. *Primary goal is to reduce Utility Unit mercury emissions from current levels*
   - *2018 cap is permanent*

2. *Effectively becoming more stringent as more plants are required to keep their collective emissions below 15 tons*
   - *Near-term interim cap in 2010*

3. *Level will reflect the maximum level of mercury reductions achievable through FGD and SCR installations (for SO_2 and NO_X emission reductions) on units covered under the IAQR*

4. *Level is not prescribed in current proposal because of uncertainties associated with the ability of these controls to reduce mercury emissions*

5. *EPA seeks comment and technical information on the Phase I cap level*

6. *EPA believes that a carefully designed "multi-pollutant" approach – a program designed to control NO_X, SO_2, and mercury at the same time – is the most effective way to reduce emissions from the electric power sector*

Details of section 111 trading program are outlined in a Supplemental Notice of Proposed Rulemaking (SNPR), which was published on March 16, 2004

SNPR: MERCURY PROGRAM REQUIREMENTS UNDER SECTION 111

1. *Each State must submit a plan that demonstrates it will meet its assigned statewide mercury emissions budget*

    a. *States may join the trading program by adopting or referencing the model trading rule in State regulations; or, adopting regulations that mirror the necessary components of the model trading rule*

    b. *States can choose not to join the federal trading program and meet their budget through intra-state trading or no trading*

    c. *States can also choose to implement more stringent mercury emissions requirements*

2. *EPA has taken comment on a proposal to promulgate, under section 112(n)(1)(A), a cap-and-trade program for mercury from coal-fired utility units*

    a. *Trading program would be federally implemented with the EPA, instead of states, serving as the permitting authority*

SNPR: MONITORING MERCURY EMISSIONS

1. *Monitoring of mercury will resemble current monitoring of SO_2 and NO_x under the Acid Rain and NO_x SIP Call programs*

2. *A comprehensive QA/QC program ensures the adequacy of emissions data*

3. *Current monitoring in the Acid Rain and NO_x SIP Call programs averages over 98% availability*

4. *A petition process enables monitoring flexibility and facilitates the resolution of issues*

5. *Commensurate with the SO_2 and NO_x cap-and-trade programs, regulated sources would have the flexibility of using alternative monitoring approaches as long as such approaches meet the performance requirements in the rule*

SUMMARY

1. *Recent proposals are based on 3 major points regarding public health*

   - *Science continues to tell us to move aggressively on fine particles*
   - *There is growing evidence that ozone may be a larger problem than previously expected*
   - *Mounting scientific evidence and public concern/interest indicate that mercury emissions must be controlled*

2. *Administration strongly prefers the Clear Skies Act legislation instead of controlling NO_x, SO_2 and Hg under the existing CAA*

   - *EPA will stay with the current package of proposals, absent any movement on the legislation*
   - *EPA is committed to action*

3. *Power sector is not the only industrial sector EPA is looking towards to make significant reductions*

   - *Petroleum refining, car/truck/engine manufacturing, and construction equipment industries are making reductions through the Tier II, Heavy Duty Diesel, and Non-road Diesel rules*
   - *EPA is also requiring a variety of industries to meet new MACT standards, which will create emission reductions of both criteria and air toxics pollutants*

NEXT STEPS

Finalize Mercury Rule	*December 2004*
Finalize Interstate Air Quality Rule	*December 2004*

PROPOSED UTILITY MACT MERCURY EMISSION LIMITS[32]

	New Unit		*Existing Unit*	
Coal Rank	*10^{-6}*	*lb/MWh or lb/TBtu*	*10^{-6}*	*lb/MWh or lb/TBtu*
Bituminous	*6*	*0.57*	*21*	*2.0*
Subbituminous	*20*	*1.90*	*61*	*5.8*
Lignite-Fired	*62*	*5.82*	*98*	*9.2*

[32] Summary of Proposed Regulations: Mercury, Paul Farber, Sargent & Lundy, LLC Chicago, IL, Workshop on Mercury and CO_2, Raleigh, NC, April 19-21, 2004

IGCC Unit	*20*	*1.90*	*200*	*19*
Coal Refuse	*1.1*	*0.102*	*4.1*	*0.38*

Note: Emission limits for new units are proposed in 10^{-6} lb/MWh units only (12-month rolling average).
Equivalent lb/TBtu limits are provided for reference.
Existing units have the option of complying with either the lb/TBtu or lb/MWh emission limit.

INSIGHTS ON ECONOMIC IMPACTS OF UTILITY MERCURY AND CO_2 CONTROLS[33]

Mercury trading is very cost-effective compared to mercury unit-specific targets

EPA's proposed MACT would cost 5-10 times more than its proposed mercury Cap on NPV basis:

- *Mercury trading is far more cost-effective*
- *MACT achieves ~32 tons by 2008*
- *Mercury Cap achieves 15 tons by 2020 (32 tons at ~2012)*

Cost-effectiveness advantages of proposed trading rule would be heightened by technical improvements in mercury control options:

- *Timing flexibility gives opportunities for technology to improve before it must be implemented broadly.*
- *Trading "places a price" on mercury emissions which also incentivizes technical improvements better than MACT.*
- *Mercury trading tends to concentrate reductions on the largest sources.*

OTHER OPINIONS CONCERNING THE CONTROL OF MERCURY EMISSIONS

EDISON ELECTRIC INSTITUTE

In comments by Edison Electric Institute (EEI) to Environmental protection agency in response to 40 CFR Parts 60 and 63, Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units; Proposed Rule 40 CFR Parts 60, 72, and 75 Supplemental Notice for the Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility

[33] Insights on Economic Impacts of Utility Mercury and CO2 Controls, Anne Smith Charles River Associates, North Carolina DENR/DAQ Workshop on Mercury and CO2, Raleigh, NC, April 19-21, 2004

Steam Generating Units; Proposed Rule, June 29, 2004, the following major points were addressed:[34]

- EEI believes that, despite dramatic decreases in emissions from the electric generating sector in recent decades, further cost-effective reductions in emissions may be achieved under the proper framework, especially under a properly designed national cap-and-trade program.

- Legislation provides greater certainty for business and the environment, while regulation generally fails to address the overlapping nature of more than a dozen existing interconnected air programs.

- There are inconsistencies in the proposed rule. The preamble states that a unit is considered to be an oil-fired unit and subject to the nickel MACT if it is equipped to fire oil and/or natural gas, and if "it fires oil in amounts greater than or equal to two percent of its annual fuel consumption." However, the same preamble states that the nickel MACT would not apply to units that combust natural gas "greater than 98 percent of the time."

- Integrate and streamline these programs if the mercury rule is to achieve the desired emission reductions at reasonable cost to the American consumer. A cap-and-trade approach is the best way to reduce emissions from the electric utility industry. Such a rule would be protective of public health, scientifically sound, flexible, and cost-effective – all components of reasonable and sensible public policy.

- EPA should establish subcategories for the source category of electric utility steam generating units. Fluidized bed combustion units should be in a separate category and Integrated Gas Combined Cycle (IGCC) units should be exempt. Conventional boilers must be subcategorized by coal rank (bituminous, subbituminous and lignite); other considerations could include process differences and coal chemistry for further subcategorization.

- MACT floors for subcategories must account for the inherent variability in mercury emissions from the best performing units. There are numerous methods for addressing variability, and more than one approach may be necessary to account for variability related to fuel and variability related to plant operations.

- There is currently no justification for regulation beyond the MACT floor.

- There should be no additional requirements beyond what is required to meet the MACT floor for existing units and to satisfy NSPS requirements.

[34] http://www.eei.org/about_EEI/advocacy_activities/Environmental_Protection_Agency/EEI_mercury_final_040629.pdf

- There should be a choice between the least stringent of either a percent reduction standard (percent mercury removed as difference between mercury in coal and mercury emitted from stack) or input-based emission rate (stack concentration in lb/TBTU) standard.

ENVIRONMENTAL DEFENSE

Environmental Defense Recommends: [35]

- Reducing power plant pollution is critical to lowering local mercury deposition and avoiding the dangerous contamination of fish, wildlife and people.

- The EPA should issue strong mercury standards for power plants to reduce mercury pollution from 48 tons today to about 5 tons, or a 90 percent reduction. These reductions are consistent with national standards for other source sectors and achievable through available pollution-control technology.

- States with mercury deposition hot spots should pursue their own mercury pollution standards to protect local water bodies and public health, and all states should press for rigorous national standards.

THE NATIONAL MINING ASSOCIATION

Mr. Jack Gerard, president and CEO of the National Mining Association (NMA), said that after studying the Environmental Protection Agency's emissions data, NMA concludes that EPA's statistical analysis, sampling and methodology are inadequate for determining mercury reduction values for any coal type and for setting emissions limits. "In the absence of adequate emissions data for the wide variety of US coal types and power plants, and without demonstrated technologies for reducing mercury emissions, EPA cannot implement an effective MACT [maximum achievable control technology] rule for power plants, nor set accurate emissions allowances for a cap-and-trade program," Gerard went on to say that EPA's data represents at best only a partial snapshot of the industry. "We don't think it's wise to base decisions that will have far-reaching economic implications on inadequate data that reflect neither the differences among coal types nor the differences among power plant operations," NMA suggestions for mercury proposals include:

- A modification of EPA's cap-and-trade proposal that would allow for greater certainty in setting achievable emissions reductions. Under this proposal, hard data from actual mercury reductions achieved under EPA's new interstate air quality rule would lead to a fairer allocation of emissions allowances for coal types, allow for a more thorough assessment of

[35] http://www.environmentaldefense.org/documents/3370_MercuryPowerPlants.pdf

mercury abatement technologies commercially available, and form the basis of interim emissions allowances in 2015.

- New units should not be forced to rely on purchased credits alone for meeting emissions targets, but should be granted modest allowances to minimize the possibility that power plants would switch to more costly fuels and raise energy costs further.

- NMA suggests that banking of emissions credits be deferred until 2015, stating the later date would better ensure that target reductions in 2018 would be achieved without heavy use of credits banked throughout the longer, eight-year period proposed by EPA.

STAPPA/ALAPCO ORGANIZATION

The State and Territorial Air Pollution Program Administrators (STAPPA) and the Association of Local Air Pollution Control Officials (ALAPCO) are the two national associations representing air pollution control agencies in 54 states and territories and over 165 major metropolitan areas across the United States. State and local air pollution control officials formed STAPPA and ALAPCO over 30 years ago to improve their effectiveness as managers of air quality programs. The associations serve to encourage the exchange of information among air pollution control officials, to enhance communication and cooperation among federal, state and local regulatory agencies, and to promote good management of our air resources.

With respect to mercury, STAPPA and ALAPCO based their analysis on state actions to reduce mercury emissions. State mercury limits proposed or adopted in Connecticut, Massachusetts and New Jersey will achieve control efficiencies on the order of 90 percent or more, while in Wisconsin, where mostly western coal is used, limits are 80 percent. Accordingly, STAPPA and ALAPCO extrapolated such reductions nationwide and arrived at a recommended national mercury emission cap range of 5 to 10 tons per year by 2013; such a range accommodates both eastern and western coal. Further, this range is consistent with STAPPA and ALAPCO's October 2002 recommendation to the EPA Utility MACT Working Group, which, if implemented nationwide, would result in mercury emissions of less than 7.5 tons per year.

The associations also identified a range for an interim mercury emission cap of 15 to 20 tons per year, to be achieved by 2008. Mercury levels in this interim cap range they project to be should be largely achievable through the application of the same air pollution control equipment needed to achieve compliance with the interim NO_x and SO_2 caps that STAPPA and ALAPCO have identified in this analysis. Traditional control technologies for criteria pollutants have been shown to be effective for mercury reduction, especially when used in combination; the most effective for mercury is a combination of low-NO_x burner, selective catalytic reduction, baghouse and scrubber technologies. This interim cap range is also intended to encourage the use of mercury specific control technologies, such as activated carbon injection (ACI), by some facilities. ACI has low capital cost, especially with an existing baghouse, has been proven on

incinerators, and has been piloted and demonstrated and is currently available for coal. The 20-ton-per-year level results if mercury reductions are achieved in the same proportion as NO_x and SO_2 reductions under the recommended interim caps for those pollutants. The 15-tonper-year level reflects a desire to be more progressive in controlling mercury, because it is a hazardous air pollutant. Approximately twice the level that STAPPA and ALAPCO recommended for MACT, a 15-ton-per-year level for mercury is appropriate in the context of a harmonized strategy addressing multiple pollutants.[36]

On June 29, 2004, STAPPA and ALAPCO addressed problems they found with the "National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units: Proposed Rule," A copy of the letter is in Appendix B of this report. Primary concerns as cited in their letter include:

- STAPPA and ALAPCO are extremely dismayed with EPA's proposals to regulate hazardous air pollutants from electric utilities. "We do not believe the rule will adequately protect public health and the environment, a concern that is shared by many others," they said.

- STAPPA and ALAPCO strongly urge the agency to abandon its proposed strategy and, instead, develop final Maximum Achievable Control Technology (MACT) standards, with stringent emission limits and expeditious deadlines, as required by Section 112(d) of the Clean Air Act.

- The Clean Air Act clearly calls for emissions of hazardous air pollution from electric utilities to be regulated under Section 112. Therefore, EPA's proposal to regulate those sources under Section 111, instead, is totally inappropriate.

- The limits contained in the Section 111 proposal are not nearly stringent enough. The proposal calls for an interim emissions cap, expected to be 34 tons per year to be achieved by 2010 that, in fact, does not require any additional control of mercury beyond the co-benefits expected from other programs aimed at reducing emissions of sulfur dioxide and nitrogen oxide, such as the Interstate Air Quality Rule (IAQR).

- The EPA proposal sets MACT levels that would result in national emissions of 34 tons per year, which is clearly not consistent with the legislative mandate for calculating MACT under Section 112.

- EPA should establish a MACT standard that reflects *at least* "the average emission limitation achieved by the best performing 12 percent of the existing sources" or "the emission control that is achieved in practice by the best controlled similar source." Rather than recommending a specific

[36] http://www.4cleanair.org/Multi-P%20Analysis-FINAL-031504-lthd.pdf

technology, STAPPA and ALAPCO suggest a performance standard. Also, we prefer a common standard for bituminous and subbituminous coal, but different percent limits can be considered for the coal types, as long as the limits provide for very good controls of mercury emissions and do not promote fuel switching or blending to avoid controls.

- STAPPA and ALAPCO are extremely concerned that EPA is proposing on a national basis to allow trading of mercury emissions between utilities. "Not only do we question the legality of mercury trading, we are also very concerned that trading could lead to serious hotspot problems around the country."

- The concern about local sources causing local mercury hotspots must not be dismissed. Mercury emissions can travel great distances, some of the pollutant can also be deposited near its source. In fact, there is recent evidence that sources of mercury can have significant local impacts.

- STAPPA and ALAPCO believe it is reasonable to consider 90-percent control for sources using bituminous coal and 80-percent control for units firing subbituminous coal. These limits would result in a national emission reduction between 85-90 percent, which is much more stringent than the decreases expected from EPA's proposal.

- STAPPA and ALAPCO strongly urge EPA to abandon its proposed strategy, and, instead, develop final MACT standards with stringent limits as required by Section 112(d) of the Clean Air Act.

THE NORTH CAROLINA DIVISION OF AIR QUALITY

On June 29, 2004, the North Carolina Division of Air Quality (DAQ) addressed problems found with the EPA's proposed and supplemental proposed rules addressing national emission standards for hazardous air pollutants (NESHAP) for mercury and nickel, which were published in the Federal Register January 30, 2004 and March 16, 2004. A copy of the letter is in Appendix B of this report. DAQ's primary concerns extracted from the letter include:

1. The health effects of mercury in North Carolina

    - Mercury is a significant health problem in North Carolina. Methylmercury levels in fish from eastern North Carolina continue to be elevated above all of the existing toxicological benchmarks provided by the federal government.

    - The Department of Health and Human Services has advised women of childbearing age and small children not to consume these three species of fish when caught from surface waters south

and east of Interstate-85, and reduced consumption rates are recommended for the general public.

- Total mercury concentrations in rainwater are at or above levels that water quality agencies would seek in order to restore the ability to eat locally caught fish without an increased risk of neurological effects.

- Significant reduction in mercury emissions to the atmosphere is necessary for public health protection.

2. Comparison of the EPA Proposal with Existing Measures in North Carolina

- In 2002, North Carolina passed the Clean Smokestacks Act (CSA), which substantially cuts the state's coal-fired power plants emissions of multiple air pollutants that cause smog, haze and other pollution problems. The speed and amount of reduction of EPA's proposal are less than those for North Carolina's own requirements.

- The pollution controls required under the CSA are projected, as a co-benefit, to reduce mercury emissions in North Carolina by more than 50 percent by 2012.

- Under the proposed MACT, the reductions projected are 29 percent until 2018 nationally. In addition, there is no guarantee of site-specific reductions due to EPA's proposed Cap-and-Trade system.

1. Relationship Between the EPA Proposal and the Future Steps Required to be taken by North Carolina.

- DAQ encourages EPA to consider in its final rule the process North Carolina already has in motion for evaluating the health needs and available technologies for achieving additional mercury reductions.

- Given the significant early reductions from implementation of the CSA, North Carolina hopes EPA will pass regulations that require similar reductions in other States.

- The EPA rule needs to offer explicit right and authority for States to deal with residual local issues and to avoid preempting State programs.

- Compliance should be monitored using EPA Method 101A, since mercury continuous emission measurements (CEM)s will most likely not be commercially available, accurate, or reliable by the time that a mercury MACT rule is to be implemented. Title V permits will include compliance assurance monitoring (CAM) plans for periods between compliance tests. There should be an initial compliance demonstration followed by annual testing for large sources and biennial testing for small sources to demonstrate compliance with mercury MACT limits.

- Compliance with MACT limits should be on a facility basis rather than on a boiler-by boiler basis.

- The presumptive three-year compliance period contained in § 112(d) is too short to bring all coal-based units into compliance with mercury MACT limits. Several practical concerns limit the ability to design, build and finance the pollution control equipment that would need to be installed or retrofitted for the entire electric utility industry to comply with a MACT standard in only three years.

CHAPTER IV COAL-FIRED BOILER MERCURY CONTROLS

This chapter discusses mercury controls available to the electric utility coal-fired boiler industry. Information presented at the workshop on Mercury and CO_2 during April 19-21, 2004 is italicized.

INSIGHTS ON ECONOMIC IMPACTS OF UTILITY MERCURY AND CO_2 CONTROLS[37]

Various retrofit controls are possible
"Co-benefits" from PM, SO_2 and NO_X control equipment, especially for bituminous (eastern) coals:

- *Cold-side electrostatic precipitator (*CESP) *–removes ~35% of mercury; FF removes 75-90% of mercury*
- *Wet FGD + CESP removes 60-70% of mercury*
- *SCR with WFGD + CESP removes 85-90% of mercury*

Activated carbon injection (ACI):

- *Cheap to install, expensive to operate, for removals of 60-80%*

ACI with small baghouse:

- *Substantial capital cost, but lower operating costs 85%-90% removal appears possible*

All mercury controls still have uncertain removal potentials
Co-benefits are likely, but magnitude still speculative
ACI still being developed; not "commercialized" yet

PERFORMANCE AND COSTS OF MERCURY CONTROL TECHNOLOGY FOR BITUMINOUS COALS[38]

Status of Technologies for Oxidizing Mercury:

SCRS: DOCUMENTING PERFORMANCE ON FULL-SCALE INSTALLATIONS

- *Better performance on bituminous than subbituminous coals.*

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[37] Insights on Economic Impacts of Utility Mercury and CO2 Controls, Anne Smith Charles River Associates, North Carolina DENR/DAQ Workshop on Mercury and CO2, Raleigh, NC, April 19-21, 2004

[38] Performance and Costs of Mercury Control Technology for Bituminous Coals:, Michael D. Durham, Ph.D.,MBA , ADA-ES, Inc., NC DAQ Mercury and CO2 Workshop April 19-21, 2004 Raleigh, NC

- *Possibility of aging effects.*

- *Possibility of interferences from other chemicals.*

- *Catalysts are being designed to reduce oxidation of SO_3; this may impact oxidation of mercury.*

- *Oxidizing Catalysts: Pilot-scale testing under way.*

- *Oxidizing Chemicals: Some very short-term full-scale tests. Concerns with corrosion.*

SORBENT INJECTION UPSTREAM OF A WET SCRUBBER

- *Injection of AC and capture in ESP will provide an additional mechanism to reduce mercury emissions.*

- *Oxidation of mercury produced by carbon could enhance capture in FGD.*

- *Decreased mercury levels in scrubber could reduce potential for reemission of elemental mercury from scrubber.*

- *Two DOE/Industry full-scale field tests are scheduled:*

    1. *Georgia Power Yates; currently on-going, medium-sulfur bituminous coal, and*

    2. *AEP Conesville; Spring 2005, high-sulfur bituminous.*

ASH ISSUES

- *The mercury captured by PAC, LOI, and ash appears to be very stable and unlikely to reenter the environment.*

- *The presence of PAC will most likely prevent the sale of ash for use in concrete.*

- *Several developing technologies to address the problem:*

    1. *Separation*

    2. *Combustion*

    3. *Chemical treatment*

    4. *Non-carbon sorbents*

5. *Configuration solutions such as EPRI TOXECON™*

Costs of mercury control depend on plant size not on amount removed.

Costs of mercury control are unrelated to the amount of mercury captured.

CONCLUSIONS ON ACI PERFORMANCE

- *AC injection can effectively capture elemental and oxidized mercury from bituminous coals.*
- *There will be difference in site to site performance of ACI due to differences in coal, equipment, and flue gas characteristics.*
- *Fabric filters provide better contact between the sorbent and mercury than ESPs, resulting in higher removal levels at lower sorbent costs.*
- *Long-term results are promising showing consistent mercury removal greater than 85%.*
- *New COHPAC™ fabric filters will have to be designed to handle higher loadings of PAC to insure high (>90%) mercury removal.*

Commercial Status of Technology: Equipment

- *Similar equipment has been used successfully in the waste industry to inject AC into flue gas.*
- *It has successfully been scaled up for full-scale utility applications.*
- *Operating continuously for nearly a year at Gaston.*
- *Three AC injections systems currently operating.*

Supply of Activated Carbon and Other Sorbents:

- *Sufficient supply available to meet several State regulations.*
- *Additional production needed to meet Federal regulations.*
- *Tremendous progress being made with improved sorbents.*

Performance:

- *Will vary with type of equipment (FF vs. ESP).*

- *Will vary from site to site due to flue gas characteristics (temperature, acid gases).*

WET SO_2 SCRUBBERS

Wet scrubbers are similar to dry scrubbers in that both use an alkaline solution to collect SO_2 and both are located downstream of a particulate air pollution control. However, wet scrubbers saturate the flue gas stream with water, as the complete scrubbing process, including by-products, remains liquid or in a slurry form. They are also referred to as wet FGD scrubbers and normally achieve a SO_2 control efficiency of 90+ percent. In this study it was estimated that wet scrubbers downstream of cold-side ESPs would remove almost 80 percent of total mercury emissions and wet scrubbers downstream of hot-side ESPs would remove nearly 40 percent of total mercury emissions. This decrease in mercury control performance in hot-side ESP is due to the relatively lower amount of mercury oxidized at elevated temperatures. Relative to other air pollution controls, wet scrubbers downstream of cold-ESPs show higher mercury removal performance because the gas temperature favors more oxidized mercury, with the oxidized fraction being more effectively removed in the scrubber. The challenge to improve performance of mercury capture in wet FGD is to find a way to oxidize the elemental mercury vapor before it reaches the scrubber or to modify the liquid phase of the scrubber to cause oxidation to occur. Wet FGD scrubbers are installed on about 15 percent of utility boilers nationwide, most of which are on the larger boilers, as these scrubbers control roughly 25 percent of the US power generating capacity. No wet FGDs are currently installed on any NC boilers, but 22 boilers will have their emissions scrubbed by wet FGDs as a result of the CSA.

SELECTIVE CATALYTIC REDUCTION

The SCR process uses a catalyst with ammonia gas to reduce the nitric oxide (NO) and NO_2 in the flue gas to molecular nitrogen and water. Ammonia gas is diluted with air or steam, and this mixture is injected into the flue gas stream upstream of a metallic catalyst bed composed of vanadium, titanium, platinum, or zeolite. In the reactor, the reduction reactions occur at the catalytic surface. The SCR catalyst bed reactor is usually located between the economizer outlet and the air heater inlet, where temperatures range from 450 – 750 °F. Recent data suggests that SCRs tend to promote additional mercury oxidation, thereby enhancing mercury removal with most existing and emerging particulate / SO_2 control technologies. Eleven SCRs are being installed in North Carolina as a result of the NO_x SIP Call and the CSA.

COLD-SIDE ESP RETROFIT OPTIONS

ADD FLUE GAS COOLING

Lowering the flue gas temperature entering the ESP assists natural fly ash sorption of mercury, improves the performance of any sorbents injected upstream for mercury control, and inherently enhances particulate control performance by reducing gas velocity and lengthening residence time. However, the acid dew point temperature limits the

extent of gas cooling when the flue gas has significant formation potential of hydrochloric acid or sulfuric acid that greatly reduces the service life of steel ducts.

POWDERED ACTIVATED CARBON BASED CONTROL[39]

Conventional Powdered Activated Carbon (PAC)

- *Control requires a fabric filter to achieve acceptable mercury removal efficiency.*
- *Bromated powdered activated carbon (bpac) is much more reactive and has to potential to provide acceptable mercury control with an ESP*

Gaseous mercury can be converted to particle–bound mercury by adsorption onto solid particles in the flue gas. Injecting suitable sorbents into the flue gas upstream of the ESP increases the amount of mercury captured. This modification may also require additional ducting between the injection location and the ESP inlet, and adding a gas absorber / humidifier upstream of the ESP. This approach may be limited to ESPs with a wide compliance margin, as boilers with marginally performing ESPs may have difficulty meeting existing particulate-related emission requirements due to the increased loading of sorbent and likely high resistivity levels.

ADD DOWNSTREAM FABRIC FILTER WITH SORBENT INJECTION

Installing a fabric filter after the ESP allows most of the native collected fly ash in the ESP without reacted sorbent and enhances overall particulate control for marginally performing ESPs. Furthermore, due to the low particulate loading, the filter dust cake porosity is reduced, allowing use of a smaller, less expensive fabric filter with long cleaning cycles and high sorbent and bag life performance.

COHPAC OPTION™

There is a patented variation of adding a downstream fabric filter (baghouse) to a cold- or hot-side ESP known as COHPAC™ (Compact Hybrid Particulate Collector) developed by the Electric Power Research Institute. It involves retrofitting a baghouse either in the space of the last field (or section) of an ESP or in a separate housing downstream of an ESP with a precharger located immediately upstream of the baghouse. In either case, the residual or induced charge on the particulate produces a marked effect in lowering the porosity of the filter dust cake. Such an arrangement allows use of a much smaller, less expensive fabric filter with long cleaning cycles and high sorbent and bag life performance. For example, COHPAC™ units are designed with filtration velocities of 8-12 feet per minute (fpm) as compared to the filtration velocities of 3-5 fpm typically used for pulse-jet fabric filters on coal-fired utility boilers.

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[39] Mercury Monitoring, Barrett Parker, EPA Emissions Measurement Center, Workshop on Mercury and CO_2, Raleigh, NC, April 19-21, 2004

HOT-SIDE ESP RETROFIT OPTION.

This entails conversion of a hot-side ESP to a cold-side ESP, and could then include any of the other cold-side ESP retrofit options mentioned above. Several hot-side ESPs in the US, including a few in NC (such as Duke Energy Allen Units 3-5), have been converted to cold-sides to improve particulate collection performance and ESP reliability. Depending on plant layout and design, this may be possible by reconfiguring the ducting, retuning the ESP to operate at lower temperatures, and perhaps installing a SO_3 or NH_3 gas conditioning system to restore performance.

WET FGD SCRUBBER RETROFIT OPTIONS

Previous research has shown that much of the mercury released during coal combustion is either removed with the flyash or can be absorbed in FGD units, if it is in the oxidized form. Oxidation of the gaseous elemental mercury is more readily captured by wet FGDs than gaseous elemental mercury. Several flue gas additives and scrubbing liquid additives are being developed to oxidize more of the gaseous elemental mercury and to prevent any re-conversion of oxidized mercury to gaseous elemental mercury. However, there is the caution that increasing oxidants in the flue gas or in the scrubbing liquid may also oxidize other species such as SO_2 and NO_x to sulfuric acid and nitric acid aerosols. Other options under development include use of oxidizing catalysts upstream of scrubbers, higher scrubber liquid-to-gas ratios, and scrubber tower design changes.

DRY SORBENT INJECTION.

For boilers with dry air pollution controls without FGD, injection of dry sorbents (such as powdered activated carbon [PAC] or less costly alternatives) offer a candidate control technology. Because of the added contact on the filter dust cake, it is estimated that FFs would require 1/10 of the sorbent rate as ESPs. Full scale tests with a small FF downstream of a hot-side ESP showed 90 percent mercury control with PAC injection. Such performance was achieved with a significant increase in bag cleaning frequency (a reliable surrogate indicator for a decrease in bag life and increase in bag replacement cost) with the suggestion of rather high overall cost for the PAC injection system. Further full scale tests have been performed at a Wisconsin electric utility. [Reference: "Full Scale Evaluation of Mercury Control with Sorbent Injection and COHPAC…"] Other tests have/ are being performed with Darco FGD™ carbon injection upstream of ESPs. Results with low sulfur bituminous coal show total mercury capture vary from 20 – 80 percent depending on ESP operating temperature ranging from 220 – 275 °F.

Sorbent collection performance for mercury is expected to depend on 5 key parameters, including sorbent size, sorbent capacity, residence time, type of dry air pollution control, and mercury level. Predicted costs for PAC using representative values for these parameters range from $4-12 million/year for ESPs and from $4-6 million/year for FFs for a 500 MW boiler. (Since these levels are considered prohibitive by some, many other candidate technologies target cost levels as ¼ to ½ of PAC costs.). Title: "Predicted Cost of Mercury Control at Electric Utilities Using Sorbent Injection"

CALCIUM-BASED SORBENT INJECTION

An alternative to PAC is calcium-based sorbent, such as limestone. EPA laboratory tests indicated that injection of calcium-based sorbents into flue gas could result in significant mercury removal and a small amount of SO_2 and SO_3 removal. Further testing by McDermott Technology, Inc. produced results slightly above 50 percent mercury capture. Comparison of these results with PAC results indicate that while PAC is a more effective sorbent than limestone on a mass basis, limestone is a more effective sorbent than PAC on a cost basis.

In summary, there are several emerging potential retrofit mercury control technologies at various stages of investigation and development. Further efforts to study and validate full-scale performance are underway, but it appears premature to obtain a complete set of definitive cost data for performing a robust cost analysis for many/most of the competing mercury control technologies.

IGCC: WHAT IS IT?[40]

INTEGRATED COAL GASIFICATION COMBINED CYCLE (IGCC)

- *Chemical conversion of coal to synthetic gas for combustion in a modified gas turbine.*

- *Inherently cleaner process because coal is not combusted and the relatively small volumes of syngas are easier to clean up than the much larger volumes of flue gases at a coal combustion plant.*

IGCC ENVIRONMENTAL IMPACTS - AIR POLLUTION

- *Commercially available IGCC power plant technologies can have much lower air pollution emissions than new conventional coal plants.*

- *Actual air emissions performance will likely depend, at least in part, on what control technology and performance levels are required by regulators.*

Mercury capture at IGCC plants is quite feasible and much less costly than at conventional coal plants and the potential exists to indefinitely sequester mercury captured at IGCC facilities.

Commercially available IGCC power plant technologies produce substantially smaller volumes (about one half) of solid wastes than do new conventional coal plants using the same coal

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[40] Integrated Coal Gasification Combined Cycle (IGCC) Power Plants and Geologic Carbon Sequestration, Joe Chaisson, April 21, 2004, Revised. Workshop on Mercury and CO_2, Raleigh, NC, April 19-21, 2004

IGCC solid wastes are less likely to cause environmental damage than fly ash from conventional coal plants because IGCC ash melts in the gasification process, resulting in an ash much less subject to leaching pollutants than is conventional coal combustion fly ash.

COAL GASIFICATION AND MERCURY MANAGEMENT

- *Proven, low cost mercury controls can remove most of the mercury from coal syngas produced (14 years experience at Eastman Chemical).*

- *Mercury is captured in a small volume activated carbon bed. Bed contents are currently managed as hazardous wastes (due to other toxics captured), but could be sequestered in a long-term mercury storage facility or the mercury contained could be economically recycled.*

Thus coal IGCC with a carbon bed plant mercury control is today the only technology that can convert coal to power and capture nearly much of the coal mercury in a form and volume suitable for permanent sequestration.

CHAPTER V TWO MERCURY EMISSION ESTIMATING TOOLS

In 1999, the U.S. Environmental Protection Agency (EPA) conducted the Electric Utility Steam Generating Unit Mercury Information Collection Effort (EU/ICE) to gather information about mercury emissions from the coal-fired electric utility industry**.** This effort led to the collection of stack test and coal mercury content reports on 80 furnace or boiler units. Two computer tools have been used in this report to estimate mercury emissions leaving the smokestacks of coal-fired electrical utility boilers. Both tools are based on the same data. For this report, the two tools are differentiated as the EPA tool and the EPRI tool.

The EPA tool, "Electric Power", "*EUCFF*" (Version 3.0.1) was developed for EPA by the Research Triangle Institute in June 2001 for estimating mercury emissions from coal combustion at electrical utilities in the United States. *Electric Power* allows permitting authorities and others to evaluate the impact on mercury emissions if certain parameters including type of coal, boiler, or pollution control device are changed.[41] This program does not account for any additional mercury capture if selective catalytic reduction (SCR) equipment is installed in the flue gas stream. Therefore, if an SCR is installed, the actual mercury emissions may be lower (more captured) than emissions otherwise reported. The EPA tool results are more conservative that the EPRI tool results because the EPRI tool program algorithms incorporates the affects of high chlorine in coal combusted in North Carolina. Chlorine combines with mercury to form inorganic molecules that can be captured.

The EPRI tool was used to develop EPRI's technical Report "An Assessment of Mercury Emissions from U.S. Coal-Fired Power Plants," in October 2000. Due in part to the reason cited above, the EPRI tool normally estimated higher mercury capture rates than the EPA tool. However, in light of data variability and other uncertainties that may exist during the massive data collection and testing effort, DAQ believes it prudent to report estimated mercury capture with a range of values instead of exact numbers.

Information presented at the workshop on Mercury and CO_2 during April 19-21, 2004 is italicized.

A SOFTWARE TOOL FOR ESTIMATING MERCURY EMISSIONS AND REDUCTIONS FROM COAL-FIRED ELECTRIC UTILITIES (EU)[42]

- *Tool for evaluating alternatives for mercury control.*
- *Case-by-case MACT is applicable until nationally applicable MACT standard*

[41] Ref. 21

[42] A Software Tool for Estimating Mercury Emissions and Reductions from Coal-Fired Electric Utilities (EU), Jeffrey D. Cole, C. Clark Allen, Ph.D. Presented at the Mercury and CO_2 Control Options Assessment Workshop Raleigh, NC April 19-21, 2004

- *Tool is not required for a case-by-case analysis.*

Software for Electric Utility Mercury Controls, Sponsored by U.S. EPA.
Coal-burning electric utilities.

- *Predicts the amount of mercury control for conventional electric utility pollution control devices.*
- *Allows the use of site-specific information.*
- *Provides very detailed reports of the results.*

Basis of the Model's Electric Utility Equipment Configurations

- *1999 EPA ICR Part III emission test reports (79 separate units, 80 total [1 tested twice]).*
- *Follow up telephone interviews.*
- *Information provided by the EU company.*
- *Company review and feedback.*

Fuel Usage and Characterization

- *Provided by the EU company throughout 1999.*
- *Fuel characterization.*
- *Fuel type (bituminous, subbituminous, lignite..)*
- *Fuel amount combusted for each unit*
- *Fuel characterization, mercury content, other characteristics*
- *Allows the use of site-specific information.*

Stack Tests for Electric Utility Mercury Controls

- *Sponsored by EU companies.*
- *Different types of conventional pollution controls were evaluated.*
- *Measured mercury rates in coal, in gas going into the control unit, and in the gas leaving the control unit.*

- *Formal reports with quality assurance.*

Types of Furnaces and Conventional Air Pollution Controls Tested

- *Conventional furnace, Fluidized-Bed Combustion (FBC), and Integrated Gasification Combined-Cycle (IGCC).*

- *Particulate controls:*

- *Electrostatic Precipitators (both hot-side and cold-side)*

- *Fabric filters*

Particulate scrubbers

- *Mechanical collectors (multiclone).*

- *Sulfur controls: Wet Flue Gas Desulfurization (FGD), Spray Dryer Absorber.*

- *Nitrogen oxide controls: Selective Catalytic Reduction, Selective Non-Catalytic Reduction.*

Method for Estimating the Effectiveness of the Mercury Controls, II Speciation Method.

- *Evaluate the mercury speciation for the coal type and furnace type: particulate, ionic, and elemental.*

- *Evaluate the control effectiveness of each control type for each mercury species.*

- *Apply these factors to the 1999 site-specific conditions.*

- *Sum the remaining mercury species for the controls you have selected to estimate the total mercury emission rate.*

Uncertainty Analysis for the Result.

- *Expected mercury air emissions from the analysis.*

- *Range of results due to uncertainty.*

- *Detailed report of the statistics.*

ESTIMATED MERCURY EMISSION REDUCTIONS IN NC FROM CSA CO-CONTROL[43]

Mercury Emissions and Control Study for Electric Utilities
Electric Utility Industry Is Primary Mercury Emission Source in NC (75% mercury emissions) Current Statistics

- *48 Utility Boilers with 13,300 MW*
- *Duke Power with 8,200 MW*
- *Progress Energy with 5,100 MW*
- *Variety of Conventional Boilers*
- *No mercury-specific emission controls*

NC Electric Utility Boiler Characteristics:
Current Design and Operation

- *All Eastern Bituminous Low-S Coal*
- *Favorable mercury Controllability Coal*
- *All T-Fired or Wall-Fired Boilers*
- *Most larger units with Cold-side ESPs*
- *Several small Hot-side ESPs*
- *No Wet FGD Scrubbers*

DAQ Estimated Mercury Emissions Based on EPA and EPRI Correlations

- *EPA Estimates*
- *Based on 1999 ICR data (1100 boilers & 80 tests)*
- *Results by category (e.g., bituminous coal, cold-side ESP)*
- *Averaged category data without coal variables*
- *Used Sound Science*

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[43] **Estimated Mercury Emission Reductions in NC from Co-control as a Result of CSA,** Steve Schliesser, NC Division of Air Quality, Workshop on Mercury and CO_2, Raleigh, NC, April 19-21, 2004

- *Results applicable for large data sets*
- *Predict 48 tons mercury emissions in USA*

EPRI Estimates:

- *Based on 1999 ICR data (1100 boilers & 80 tests)*
- *Results by category (e.g., bituminous coal, cold-side ESP)*
- *Correlated category data on key coal variables*
- *Used Sound Science*
- *Results applicable for large data sets*
- *Predict 45 tons mercury emissions in USA*

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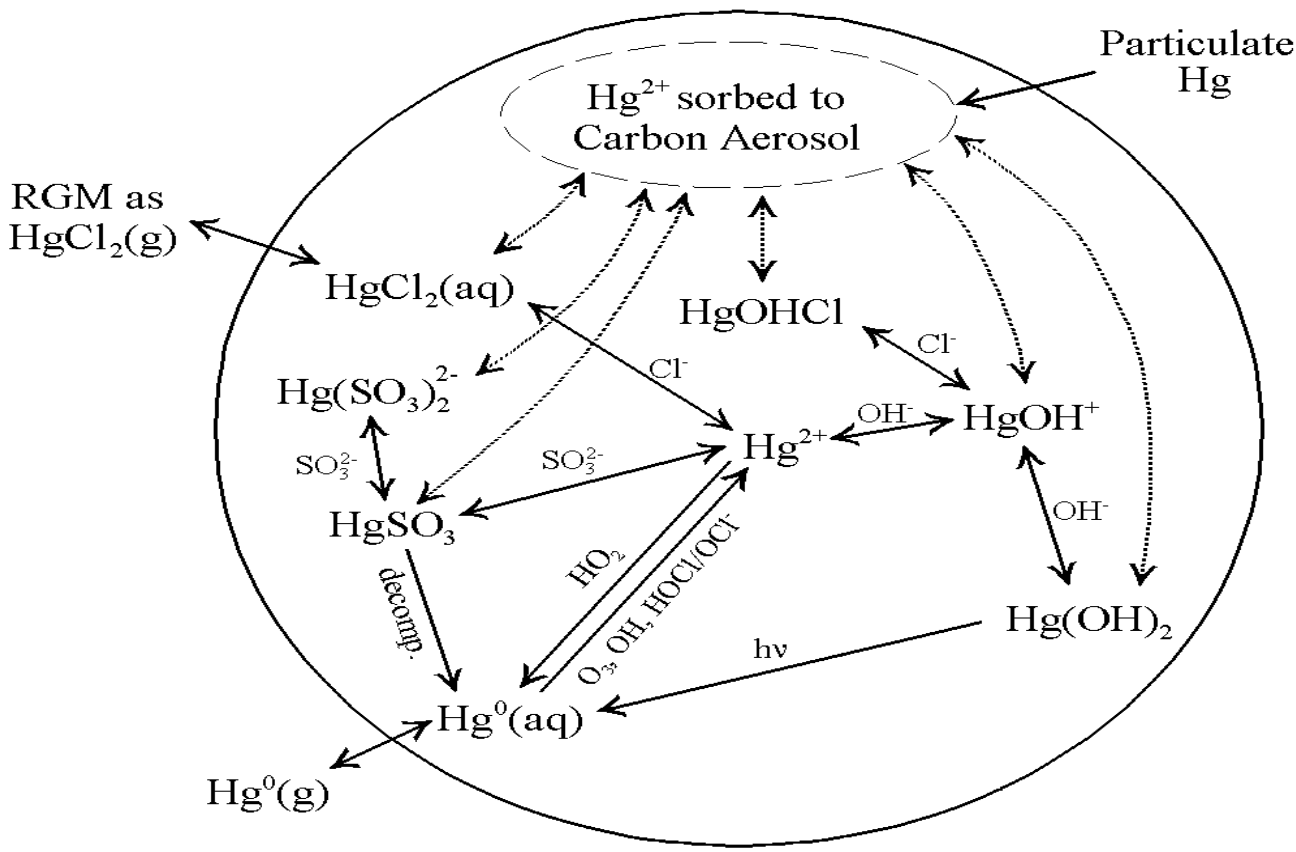
CHAPTER VI LOCAL MERCURY SOURCES AND INFLUENCES

Information presented at the workshop on Mercury and CO_2 during April 19-21, 2004 is italicized.

MODELING ATMOSPHERIC MERCURY DEPOSITION[44]

It is well known that particulate matter deposits from the atmosphere through dry processes, but gaseous constituents also dry deposit. It appears that dry deposition of RGM is especially important near combustion sources. Figure VI-1 graphically illustrates the complex chemical reactions taking place in the atmosphere resulting in dry mercury deposition.

FIGURE VI-1
CLOUD CHEMISTRY MECHANISM FOR THE CMAQ-MERCURY MODEL



[44] Modeling Atmospheric Mercury Deposition to the Sounds and Other Water BodiesO. Russell Bullock, Jr., NOAA Air Resources Laboratory,(On assignment to the U.S. EPA Office of Research and Development), Workshop on Mercury and CO_2, Raleigh, NC, April 19-21, 2004

- *The Florida everglades experience provides the best example so far of the likely importance of dry deposition of mercury to total ecosystem impacts.*

- *Atmospheric mercury models are under development at a number of institutions around the world, and a concerted effort of model inter-comparison is being made to identify important uncertainties.*

- *Sparse and incomplete observational data is hampering model evaluation efforts, especially the lack of closure on the total deposition flux.*

- *Atmospheric mercury models will continue to evolve as our understanding of mercury chemistry in air and cloud water evolves.*

The greatest obstacle to discovery is not ignorance - it is the illusion of knowledge.

Daniel J. Boorstin (1914-2004)

ATMOSPHERIC MERCURY: PANDORA'S BOX?[45]

Comparison of mercury inputs to the Everglades, depicted is the Everglades Protection Area, i.e. the remaining 'natural' portions of the Everglades:

- *Two years' monitoring of surface water inflows of mercury from all of the 'into' structures were 1.8 and 3.2 kg/year, during which atmospheric deposition from 4 years of rainfall mercury collection ranged from 125 to 140 kg/year.*

- *Thus, greater than 95% of the annual mercury budget of the Everglades comes from atmospheric deposition via rainfall.*

- *Atmospheric modeling of sources within southern Fla. indicates that dry deposition adds approximately 30% additional mercury load to WCA-3A, not included in these estimates.*

The Bottom Line

- *Reduction of atmospheric sources of mercury from within Florida has led to ~ 60% declines in mercury in Everglades fish and wildlife in less than 15 years since peak deposition.*

- *To the extent that mercury emissions are in the reactive form (RGM) one can expect to see benefits at local or regional scale within years to decades.*

[45] Atmospheric Mercury: Pandora's Box?, Tom Atkeson, Coordinator Mercury & Applied Science, Workshop on Mercury and CO_2, Raleigh, NC, April 19-21, 2004

- *The main driver of the Everglades mercury problem is mercury load - overwhelmingly from atmospheric deposition.*

- *There is synergy with co-deposition of mercury and sulfate, which combine to exacerbate mercury methylation.*

Figure VI-2 reflects annual mercury deposition rates from approximately 1810 to 1996 that was analyzed from a sedimentary core sample collected in the Everglades. Mercury dropped back to 1980 deposition rates from a high in the early 1990s.

Figure VI-3 shows the reduction of mercury use throughout the world's economy. This decline has been of the order of 80 percent.

Figure VI-2
Mercury Concentrations Over Time
Everglades, Florida

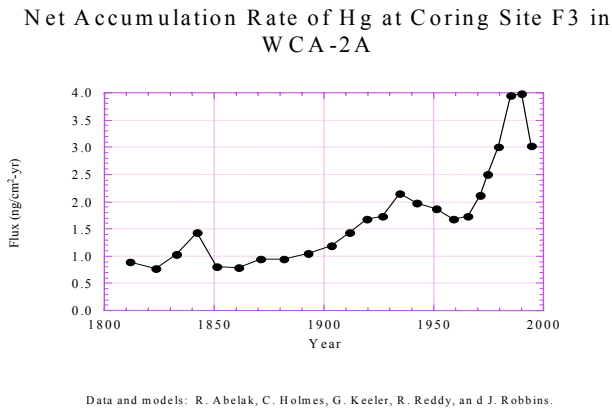
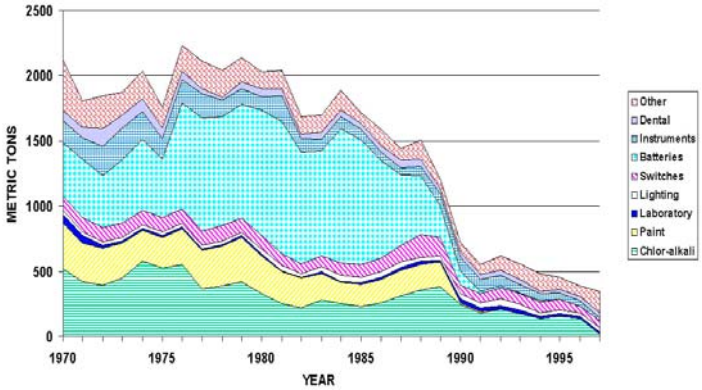


FIGURE VI-3
TRENDS IN WORLD MATERIAL FLOWS OF MERCURY.



Sznopek and Goonan. USGS

THE FLORIDA EVERGLADES STUDY RESULTS[46]

The Florida Everglades study goal was to understand and simulate how changes in local atmospheric mercury emissions in south Florida would influence mercury concentrations in top predator fish, thus demonstrating the potential of combining air and water modeling approaches in Total Maximum Daily Load (TMDL) involving air deposition of mercury. This study focuses on mercury, and incorporates extensive field data into a framework combining atmospheric mercury deposition and aquatic mercury cycling models to demonstrate the feasibility of the approach. The data year studied for this project is from June 22, 1995 to June 21, 1996.

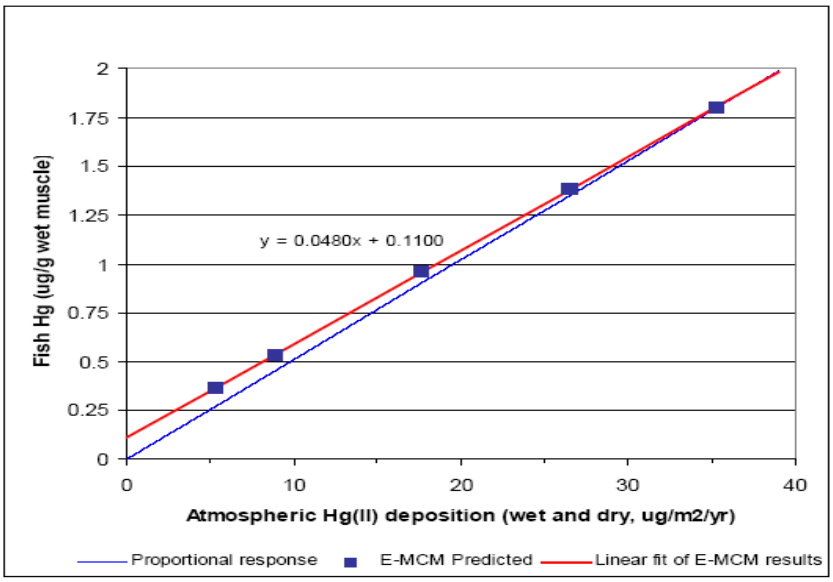
A fundamental question to examine in this pilot TMDL study was the relationship between atmospheric reactive gaseous mercury (RGM) deposition and long term fish mercury concentrations. Once the model was calibrated to the current atmospheric RGM deposition estimate of 35 μg/m2/yr, simulations were also carried out with loadings at 75, 50, 25 and 15percent of current levels. In these simulations, RGM and methylmercury concentrations in inflows were adjusted in proportion to RGM deposition. Atmospheric loadings of methylmercury also were changed proportionally. Predicted fish mercury concentrations were compared after each simulation had run 200 years, producing essentially steady state conditions. Annual cycles of site conditions and mercury deposition were repeated Inorganic mercury throughout the simulation period.

The purpose of including the results of this Florida Department of Environmental Protection study is an attempt to establish a link between airborne mercury emissions and methyl mercury concentrations in top predator fish. The findings point to a linear relationship existing between airborne mercury emissions and methyl mercury concentrations in three-year-old big mouth bass. See Figure VI-4.

A fundamental question to examine in this pilot TMDL study was the relationship between atmospheric inorganic mercury deposition and long term fish mercury concentrations. Once the model was calibrated to the current atmospheric inorganic mercury deposition estimate of 35 μg/m2/yr., simulations were also carried out with loadings at 75, 50, 25 and 15 percent of current levels. In these simulations, Inorganic mercury and methylmercury concentrations in inflows were adjusted in proportion to Inorganic mercury deposition. Atmospheric loadings of methylmercury also were changed proportionally. Predicted fish mercury concentrations were compared after each simulation had run 200 years, producing essentially steady state conditions. Annual cycles of site conditions and mercury deposition were repeated throughout the simulation period. See Figure VI-5

[46] Integrating Atmospheric Mercury Deposition with Aquatic Cycling in South Florida: An approach for conducting a Total Maximum Daily Load analysis for an atmospherically derived pollutant, Florida Department of Environmental Protection, October, 2002, Revised November, 2003

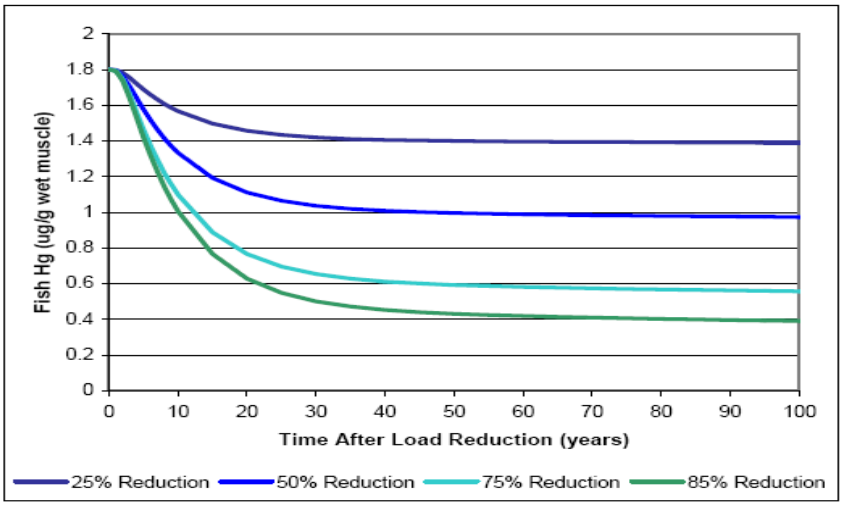
FIGURE VI-4
THREE YEAR OLD LARGEMOUTH BASS PREDICTED MERCURY CONCENTRATIONS (AS A FUNCTION OF DIFFERENT ATMOSPHERIC MERCURY DEPOSITION ANNUAL RATES)



Atmospheric Inorganic mercury deposition (wet and dry, ug/m2/yr)
Fish mercury (ug/g wet muscle)

It is unknown at this time if the results of this study are applicable in North Carolina as a predictive tool. South Florida's metrological experience is very different from that found in this State. There are also major differences in mercury sources, topography, soil structure, and exposure to pollution affects across state borders.

FIGURE VI-5
PREDICTED DYNAMIC RESPONSE OF MERCURY CONCENTRATIONS IN LARGEMOUTH BASS IN WCA 3A-15 FOLLOWING DIFFERENT REDUCTIONS IN RGM DEPOSITION.

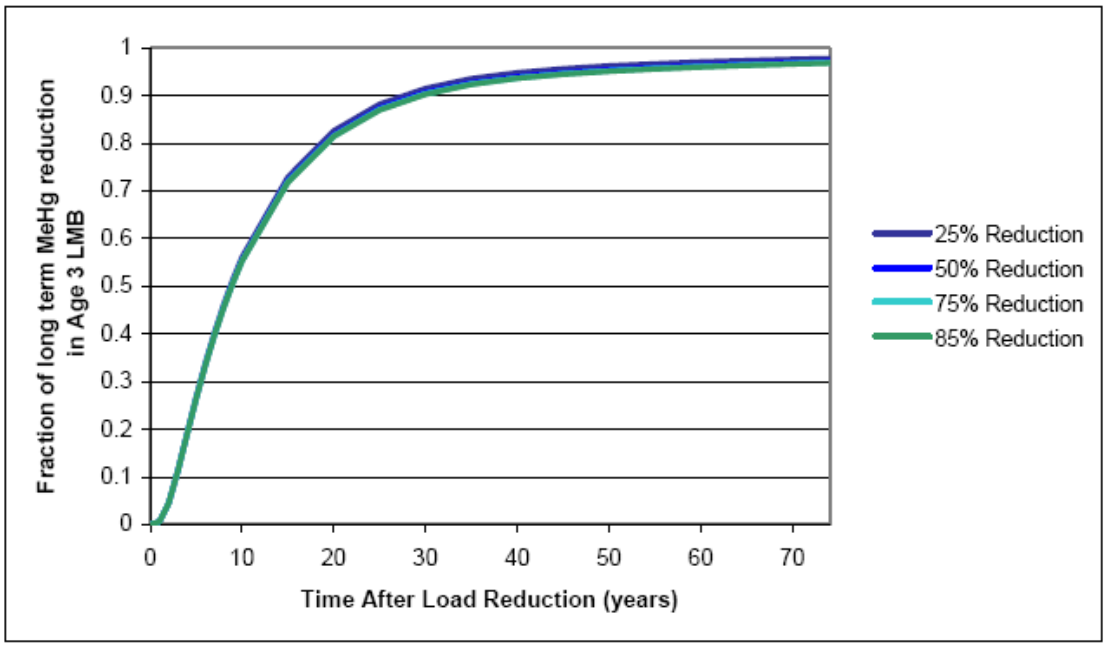


Predictions are based on calibration to current loading of 35 µg/m2/yr.

Figure VI-6 shows that the number of years required for the system to approach a new steady state is effectively independent of the actual magnitude of the change. Two phases are illustrated by the curve: the first is a period of comparatively rapid response driven by the decline of inorganic mercury loading and the hydraulic residence time of the system; the second phase is far slower, and is governed by the turnover rate of labile inorganic mercury in the sediments supporting methylation. Because the simulated concentrations of mercury in largemouth bass ultimately reflect net methylation rates in the sediments, the response of largemouth bass is prolonged. For example, the time required to achieve 50 percent of the ultimate response in fish tissue mercury concentrations is approximately 10 years for all load reduction scenarios tested with the base calibration with atmospheric inorganic mercury deposition at 35 µg/m2/yr. Within 30 years, approximately 90 percent of the ultimate predicted response is projected to occur.

Figure VI-6

Comparison Of The Rate At Which Age 3 Largemouth Bass Concentrations Approach Steady State Following Different Reductions In Inorganic Mercury Deposition



Simulations all based on calibration with current Inorganic mercury deposition = 35 µg/m2/yr.).

The report discusses uncertainties in some detail. Causes of uncertainty are listed to encourage the reader to understand that this report, excellent as it is, may or may not represent the true relationship of atmospheric mercury deposition to methylmercury contamination in fish:

- No simple relationship links mercury concentrations in water and mercury concentrations in fish; the relationship is site specific.

- The average annual precipitation for the study year was 156 cm. The normal precipitation range at the site is 125-140 cm.

- The model indicates a significant seasonal trend in total mercury wet deposition to the area, predicting that over 80 percent of the wet deposition would occur from May through October.

- The program used measured wet deposition (23.1 $\mu g/m^2$/year) and modeled estimate of dry deposition (12.2 $\mu g/m^2$/year). For a total of 35 $\mu g/m^2$/year.

- Assumption that two limiting factors govern methylation and demethylation rates: the supply of available mercury and the rate of activity of the methylating and demethylating microbes.

- Assumption that microbial methylation and demethylation rates were limited only by their respective mercury substrates.

- Assumption that RGM and methylmercury concentrations in inflows would respond linearly to changes in atmospheric deposition.

- Several attempts have been made at construction of global mercury models but all lack key information on the atmospheric reactions of mercury and their rates.

- The understanding of the biogeochemical cycle of mercury has advanced greatly in the past decade but a number of features of that cycle remain obscure. The program was calibrated to a single site in this study.

- Unable to compare model predictions to observations in terms of the effects of different site conditions such as pH, DOC, fish growth rates, sulfate and sulfide levels, and other site conditions that vary systematically across the Everglades.

THE FLORIDA MERCURY REPORT – PUTTING IT IN PERSPECTIVE[47]

EPRI Comments on "Integrating Atmospheric Mercury Deposition With Aquatic Cycling in South Florida"

Recent news coverage of the Florida Mercury Report published on November 6 indicates that the installation of mercury emission control technology on waste incinerators in the early1990s has resulted in a 60-70% decrease in mercury concentrations in fish and birds in the Everglades. Does this mean that placing mercury emission controls on power plants throughout the United States would have a similar effect?

The mercury emissions released by municipal and medical waste incinerators are

[47] *The Florida Mercury Report – Putting it in Perspective,* EPRI • askepri@epri.com • www.epri.com

different from those released by power plants.

- There are two major forms of mercury in emissions – oxidized (or ionic), which is water-soluble, and elemental, which is not water-soluble.

- Most incinerator mercury is in the water-soluble form whereas the form of mercury released from power plants depends upon many factors, such as the type of coal being burned. Recent research has shown that most of the mercury released by utilities (at least 60 percent) is the non-water soluble elemental form, and that a significant amount of the remainder converts to this non-soluble form shortly after leaving the stack.

- The form of mercury emitted is critical as oxidized mercury can be washed into local rivers, lakes, and streams by rainfall whereas elemental mercury is carried away by wind and enters the global mercury cycle.

- Power plant chimneys are typically higher than incinerator chimneys and therefore disperse emissions over a larger area, resulting in less local impact.

The Florida Everglades represents a unique ecological system not typical of, and in fact, strikingly different from other US waterways. Thus, the results from this study are not necessarily applicable to other areas.

- The Everglades are in a tropical zone (no seasons), the water is shallow, and the bottom sediments are much different from those in other water bodies throughout the U.S. Other waterways also have different levels of acidity, biological activity, dissolved oxygen, and turbidity. These differences can dramatically affect mercury cycling and uptake by biological organisms. Thus, it is unlikely that the changes in mercury, both amount and rate of decline, observed in fish would be observed in other US waters.

The claim that changes in mercury emissions result in rapid changes in fish mercury content is not supported by the data or findings.

- The Florida report assumes that mercury deposition in the Everglades originates from local sources (primarily incinerators and power plants). However, while such patterns might be expected, data measurements and long-range transport modeling indicate otherwise.

- In fact, despite decreases in mercury emissions from incinerators, the amount of mercury being deposited in the Everglades overall has not changed significantly.

- Indeed, both EPA and EPRI have modeled mercury transport and concluded that over 60 percent of mercury deposited in Florida originates outside the State.

- Since fish mercury content has apparently fallen, other factors must be involved. Several theories have been suggested involving changing nutrient levels and water flows in the Everglades. Further research is needed to understand this situation.

- An April 2004 researchers' review of the Florida mercury findings concluded that the observed fish mercury trends could not be explained solely by estimated changes in mercury emissions, but needed data on other atmospheric components that might be required to drive such trends.

The atmospheric transport model used by the State of Florida to estimate mercury deposition has limitations.

- The model does not incorporate chemical reactions in the atmosphere. It also does not include global sources of mercury, only local emissions. Thus, it cannot effectively simulate the actual mercury deposition.

EPRI's recent research findings indicate that power plant mercury controls would not significantly change the amount of mercury contained in fish, or the human exposure to it.

- In early 2003, EPRI completed a comprehensive study of US power plant mercury emissions, potential mercury controls, and responses of fish to changes in mercury in their habitat waters. The results showed that reducing mercury emissions from power plants by approximately 50 percent would result in a reduction of mercury in fish of about 1½ percent . This study, combining atmospheric data and models, fish consumption information from US government studies, and an economic model of the US utility industry, relies on more recent information than the two-year-old Florida study report released on November 6.

THE ISSUE OF MERCURY "HOT SPOTS"

MERCURY DEBATE CONCENTRATES ON HOT SPOTS[48]

There's no argument that mercury is a noxious pollutant yet there is widespread disagreement over how or whether to control it. Now the attention is on potential "hot spots," whereby individual power plants could end up not cutting mercury-related emissions under a free market approach espoused by the Bush administration and others. The issue has come to light because of the trading system proposed by the Bush team—the same kind used successfully to help control sulfur dioxide emissions. Simply put, power plants that run afoul of the caps can buy credits from those that exceed their targets. That's the cap-and-trade part of it. The other aspect is that the plan sets a limit of 34 tons of mercury deposits by 2010, or a reduction of 30 percent from today's levels—a number that the Energy Information Administration predicts would be more like 40 percent because of the addition of the trading approach.

[48] http://www.rppi.org/mercurydebate.shtml

But, many environmental groups oppose such tactics, noting that while national mercury levels may drop, specific places will suffer from hot spots unless maximum allowable levels are set by individual plants. A cap-and-trade program raises the possibility that any utility could choose to buy credits rather than implement modern pollution controls. Individual communities could therefore suffer harm.

ENVIRONMENTAL DEFENSE REPORT NAMES TOP 10 U.S. MERCURY 'HOT SPOTS'[49]

"Mercury hot spots sound the alarm for strong national limits on dangerous mercury pollution," said Michael Shore, Environmental Defense senior air policy analyst. "EPA's weak stance on mercury ignores the agency's own scientific assessment and puts profits of the utility industry ahead of children's health. Affordable technology exists to protect our children from toxic mercury pollution and it is the government's legal and moral responsibility to put those tools to work now."

According to the report, the top 10 states for mercury hot spots (ranked by the most severe hot spot in each state) are Indiana, Michigan, Maryland, Florida, Illinois, South Carolina, North Carolina, Pennsylvania, Texas and Tennessee**.**

"America's children can't afford for the EPA to get a failing grade on the cleanup of toxic mercury emissions from coal-fired power plants. Other polluters have already been required to reduce their mercury emissions by 90 percent, and coal-fired power plants should not be let off the hook. States with mercury hot spots should vigorously pursue strong standards to protect water quality, ensure fish are fit to eat, and prevent brain damage in children," said Shore.

Somewhere north of Fort Wayne lies an area of nearly 500 square miles considered to be the most mercury-contaminated spot in the country, according to figures from the U.S. Environmental Protection Agency. Environmental Defense, a private non-profit organization, released the figures compiled earlier by the EPA, but never published, in December, listing the 484-square-mile "hot spot" as leading the country in mercury deposits.

Using data from 1998, the Environmental Defense report is based on a complicated computer model that analyzed weather patterns, mercury emissions from area coal-fired power plants and other information, said Michael Shore, a senior policy analyst for Environmental Defense.

The report from Environmental Defense, a national organization of 400,000 members founded in 1967, does not give a source for the contamination. Nor does it specifically define the hot-spot area by county lines or municipal boundaries. Instead, the report used mapping done by the EPA that divided the country into 22-mile-by-22-mile square grids. The checkerboard square with the most mercury deposits was a grid ambiguously described as being north of Fort Wayne, Shore said. "It's not a precise spot," he said.

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[49] http://www.fortwayne.com/mld/fortwayne/news/local/7685703.htm Laura Johnston / Ft. Wayne Journal Gazette 11 Jan 2004

"When you look at the specific sites, when you look at the states in the Midwest and the East, there are hot spots all over. The places where mercury deposition is highest, local sources dominate." Shore blamed the coal-fired power plants in Indiana, as well as plants in northeast Illinois and western Ohio, for the contamination.

The Indiana Department of Environmental Management is aware of the mercury issue, which it considers a national problem, spokeswoman Laura Pippenger said. The agency is working with the EPA to find out how it gathered and interpreted the data that indicated the northeast Indiana hot spot. "This sort of modeling can have discrepancies that can indicate a hot spot like this," Pippenger said. But the Environmental Defense study shows that mercury pollution is caused by power plants nearby, Shore said. "It travels to some extent, but communities that live around the power plants are most at risk to mercury pollutants," said Jones, of the Indiana Public Interest Group. Shore and Jones hope that information will convince the Bush administration to enact tough regulations on power plants. "If we're going to clean up pollution, we need to reduce mercury from local sources," Shore said.

"HOT SPOTS"—MERCURY EMISSIONS AND DEPOSITION PATTERNS[50]

There are concerns about potential mercury "hot spots" in the United States, particularly those that might be associated with power plant emissions and might not diminish, but actually become more numerous or severe, following proposed power plant regulations. EPRI has addressed this issue using computer modeling and data analyses, and concludes that mercury emissions from power plants will not create or intensify any hot spots under regulations proposed by EPA. Indeed, power plants contribute little to the areas of highest deposition in the United States, either currently or in future regulated scenarios.

In its December 2003 proposals to regulate mercury emissions from power plants, the EPA defined mercury "hot spots" as locations where deposition contributed by power plants alone is enough to raise mercury in fish tissue above the level EPA deems safe to consume. This is also the highest permissible level for waterways not to be classified as mercury impaired. In general, mercury hot spots are areas of excessively high mercury deposition compared to national or regional averages. Widely scattered measurements of the amount of mercury depositing in rainfall and other precipitation show no strong gradient from the Midwest to the East that might reflect the greater number of mercury sources in the eastern United States. However, simulations done with some computer models have led to speculation that some unmeasured U.S. locations may experience elevated mercury deposition compared with nearby areas, meeting the general definition of hot spots. There are concerns that a cap-and-trade regulatory approach, one of the alternatives proposed by EPA, will allow some electric utility sources to increase the amount of mercury they emit—or will not require them to reduce emissions as much as a Maximum Achievable Control Technology (MACT) approach would. Thus, there has been speculation that the cap-and-trade approach may have the potential to create or exacerbate mercury hot spots.

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[50] http://www.epri.com/corporate/discover_epri/news/HotTopics/env_HotSpots.pdf. June 2004

EPRI has applied state-of-the-art modeling to evaluate the potential for hot spots under alternative approaches to regulating utility mercury proposed by EPA.
Because it is impractical to look for "hot spots" by measuring mercury deposition at every location in the country, EPRI has run sophisticated, state-of-the-art computer models to simulate deposition of the mercury released from power plants and other emission sources. EPRI's analysis considered the amount and chemical forms of mercury emitted from every coal-fired power plant in the United States under three scenarios: a 2004 Base Case, for current conditions; and EPA's two proposed regulatory approaches, the MACT rule and the Cap & Trade rule. The model simulations of regulatory scenarios are for year 2020, when all emission reduction measures mandated by either rule will be fully implemented. The Base Case simulates mercury emissions from power plants and all other mercury sources, such as municipal and medical waste incinerators. The two regulatory scenarios lower power plant emissions according to requirements of the proposed MACT or Cap & Trade rules, but keep emissions from other sources constant. Holding emissions from other sources constant while varying emissions only from power plants allows researchers to estimate the impacts of EPA's proposed approaches to regulating utility mercury.

To perform the simulations, EPRI used a national economic model to evaluate the amount and chemical forms of mercury emitted from U.S. power plants under each scenario. These emission results were fed into a fine-scale model of mercury chemistry and physics in the atmosphere, which was used to calculate amounts and patterns of deposition throughout the United States under current conditions, the MACT rule, and the Cap & Trade rule.

EPRI's results show that the highest values of modeled deposition in the United States are produced by mercury emitted from sources other than power plants.
According to EPRI's computer simulations, after regulation, the areas of highest mercury deposition in the United States will continue to be those locations chiefly affected by emissions from sources other than power plants. Even with a liberal definition of utility-influenced deposition locations (i.e., where utility-emitted mercury makes up roughly 30 percent or more of the total deposition), only about 2.5 percent of US surface area falls into this category following MACT or Cap and Trade. The leading non-utility mercury deposition locations receive most of their mercury from municipal and medical waste incinerators. Locations affected by these incinerators would continue as the leading areas of mercury deposition in the mid-Atlantic and southern New England states, even after power plants have fully reduced their emissions. This result holds for either the MACT rule or the Cap & Trade rule. While distant non-U.S. mercury sources are the dominant contributors to deposition in much of the United States, non-utility U.S. sources emit mercury at rates and in forms that dominate deposition in their regions. Even after power plant sources are controlled, incinerators will continue to dominate the mercury contributing to deposition in high-deposition areas. Both regulatory approaches proposed by EPA would play an important role in reducing deposition in locations that have substantial deposits from utility sources in 2004. Power plant dominated locations would subsequently fall below the top 55 locations of highest human-caused deposition under

either regulatory approach. However, the Cap & Trade approach would produce markedly lower deposition at utility-dominated locations than would the MACT approach.

Neither proposed regulatory approach would increase deposition in high-deposition areas or create new high-deposition areas compared to current levels. The Cap & Trade rule produces greater mercury deposition reductions than does the MACT rule.

Modeling results for 2020 show that all states in the country will experience overall reductions in deposition due to the proposed mercury rules. But the reduction in mercury deposition is greater under the Cap & Trade rule (an average drop of 7 percent) than under the MACT rule (an average drop of 5 percent). Reductions in deposition vary somewhat by location, with greater reductions occurring in the mid-Atlantic and Southeastern states. This is because the proposed rules incorporate greater incentives for power plants in these regions to pursue mercury controls. Those power plants tend to burn bituminous coal, which emits a relatively higher proportion of divalent mercury, the chemical form most easily captured by currently available NOx and SOx emission control devices, as well as by mercury specific control devices currently under development. Since it is more cost-effective to reduce mercury emissions at these plants, they are more likely to install controls and therefore will have a greater relative impact on reducing mercury emissions and deposition. Finally, neither the Cap & Trade rule nor the MACT rule substantially lowers the highest deposition values that occur at locations in the Middle Atlantic and southern New England states, because the values at those locations are primarily influenced by emissions from municipal and medical waste incinerators.

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CHAPTER VII NORTH CAROLINA'S TOTAL AND SPECIATED MERCURY EMISSION ESTIMATES

NC UTILITY BOILER CHARACTERISTICS

North Carolina is one of the leading electricity producing states with 46 coal-fired utility boilers with a total capacity of 13,300 megawatts (MW). Duke Energy and Progress Energy companies own and operate a combined total of 46 boilers at 14 power stations, accounting for 97 percent of NC's electrical generating capacity. In addition, there are eight coal-fired cogeneration boilers at four stations producing nearly 500 MW that are not covered under the CSA, but would be subject to proposed federal EPA requirements.

All the Duke Energy and Progress Energy boilers burn pulverized eastern bituminous coal and currently employ electrostatic precipitators (ESPs) as their only particulate matter (PM) controls. Most of these boilers were built before 1977 and are not subject to EPA New Source Performance Standards. As is typical in other states, there are a wide variety of boiler vintages (1950's to 1980s), boiler manufacturers (Combustion Engineering, Babcock & Wilcox, Riley), boiler design types (tangential-fired, wall-fired), and boiler sizes (40 to 1250 MW). Likewise, the existing ESPs reflect a wide variety of vintages (1950's to 1980s), manufacturers (Research Cottrell, Western Precipitation, Buell, and Environmental Elements), design types (cold- and hot-sides), sizes (sectionalization) from 3 to 6 fields; collection plate areas from 80,000 to 980,000 square feet), and some with, and others without, resistivity conditioning systems (sulfur trioxide or ammonia injection) on cold-side ESPs.

The state's two main electrical utility companies are mandated to significantly reduce NO_x and SO_2 emissions to the caps and schedule stipulated in the NC CSA. Each of the two major utility companies submitted their plans identifying the boilers being retrofitted with NO_x and SO_2 control technologies and the corresponding retrofit schedules. In contrast to the definitive CSA provisions with corresponding NO_x and SO_2 technology plans already made by the utilities, the new State law does not mandate any specific requirements or technology choices for mercury emission reductions. Instead, considerable mercury emission reductions from utility boilers are expected as co-benefits from to the specific reductions of NO_x and SO_2 emissions.

Table VII-1 presents a summary-level profile of the current and planned emission control characteristics of the NC coal-fired boiler population. One change in planned emission control occurred since last year: Progress Energy is not planning to install a FGD scrubber on the Lee Unit 3 boiler as previously intended. The characterization highlights include:

- 99 percent with advanced NOx combustion controls based on generating capacity,
- 79 percent with SO_2 scrubbers based on generating capacity; 87 percent with SO_2 scrubbers based on the amount of coal fired in Btu/yr,

- 68 percent with cold-side ESPs based on generating capacity, and

- 32 percent with hot-side ESPs based on generating capacity.

TABLE VII-1.
GENERATING CAPACITY STATISTICS FOR NO_X AND SO_2 CONTROLS ON NC COAL FIRED ELECTRIC UTILITIES

Utility	Advanced NO_x Control [1]	Generating Capacity and Percent Capacity with NO_x Control	SO_2 Control	Generating Capacity and Percent Capacity with SO_2 Control
Duke Energy (28 boilers with 8,192 MW total)	Total MW with Advanced Control	8,192 MW	Total MW with Scrubbers	6,217 MW
	Percent MW with Advanced Control	100 %	Percent MW with Scrubbers	76 % by capacity (87 % by use factor, trillion Btu/yr coal fired)
Progress Energy (18 boilers with 5,111 MW total)	Total MW with Advanced Control	5,013 MW	Total MW with Scrubbers	4,325 MW
	Percent MW with Advanced Control	98 %	Percent MW with Scrubbers	85 % (88 % by use factor, trillion Btu/yr coal fired)
Statewide (45 boilers with 13,303 MW total)	Total MW with Advanced Control	12,756 MW	Total MW with Scrubbers	10,542 MW
	Percent MW with Advanced Control	99 %	Percent MW with Scrubbers	79 % (87 % by use factor, trillion Btu/yr coal fired)

1. Technologies considered as advanced NOx controls include SCR, SNCR, NH_3 injection, or combustion modification.

Table VII-2 summarizes the NOx and SO_2 control technologies and operational schedules selected for each of the 14 power stations by the two utility companies to comply with the CSA requirements. A few rather minor changes in FGD installation schedules were made. Also included in Table VII-2 are the stations' generating capacity and general type of ESP. To the extent possible, the table reflects the tendency in installing:

- SCRs on some of the largest boilers early in the schedule (2002-2004) and SNCRs on the medium sized boilers later in the schedule (2003-2009), and

- FGD wet and dry scrubbers on the medium and large boilers (200-1250 MW) across the schedule (2005-2012).

These trends tend to maximize cost-effectiveness and accelerate air quality improvement for the affected period (2002-2012).

TABLE VII-2.
NC CLEAN SMOKESTACK COMPLIANCE PLAN WITH SCHEDULE [1]

Facility	Rating (MW)	Existing ESP type[2]	Post-combustion NOx Controls		FGD SO_2 Scrubber Controls	
			Technology[2]	Operation Year	Technology[2]	Operation Year
DUKE POWER						
Allen	1160	Cold (1-5)	SNCR (1-5)	2003-07	Wet (1-5)	2011-12
Belews Creek	2490	Cold (1, 2)	SCR (1, 2)	2003-04	Wet (1, 2)	2008
Buck	370	Hot (3-6)	SNCR (3-6)	2006-09	None	
Cliffside	780	Hot (1- 4) Cold (5)	SNCR (1-4) SCR (5)	2002-09	Wet (5)	2009
Dan River	470	Cold (3) Hot (1, 2)	SNCR (1-3)	2007-09	None	
Marshall	2000	Cold (1- 4)	SNCR (1- 4)	2005-08	Wet (1- 4)	2006-07
Riverbend	970	Hot (4-7)	SNCR (4-7)	2007-08	None	
Subtotal	8,240			2002-09		2006-12
PROGRESS ENERGY						
Asheville	390	Cold (1, 2)	SCR (1, 2)	2009	Wet (1, 2)	2005-06
Cape Fear	320	Cold (5, 6)	ROFA /NH_3 (5, 6)		Wet (5, 6)	2011-12
Lee	410	Cold (1,3) Hot (2)	ROFA (2) SCR (3)	2007, 2010	None	
Mayo	750	Hot (1)	SCR (1)		Wet (1)	2008
Roxboro	2460	Cold (1-3) Hot (4)	SCR (1- 4)		Wet (1- 4)	2007, 2009
Sutton	610	Cold (3) Hot (1, 2)	ROFA (2, 3) NH_3 (3)	2006	Wet (No. 3 only)	2012
Weatherspoon	180	Cold (1-3)	None		None	
Subtotal	5,120					2005-2012

1. Data presented in Duke Power and Progress Energy Compliance Plan 2004 Annual Updates.
2. Number in parenthesis identifies boiler unit(s) equipped with corresponding emission control technology.

PRELIMINARY ESTIMATE OF TOTAL MERCURY EMISSIONS FROM NC UTILITY BOILERS

In 1999, the U.S. EPA conducted the Electric Utility Steam Generating Unit Mercury Information Collection Request (EU/ICR) to gather comprehensive information about mercury emissions from the coal-fired electric utility industry**.** This effort included collection of speciated Hg (elemental, oxidized, and particle-bound Hg species) emission control tests using the Ontario Hydro measurement method on 80 utility boilers. Recently validated by EPA and the utility industry, the Ontario Hydro method has become the

official method for measuring speciated Hg emissions from coal-fired utilities. The tests measured Hg rates in the coal feed to the boiler, and speciated Hg concentrations in the gas streams entering and exiting the emission control device. In addition, it also collected data on each of the roughly 1100 boilers in the United States of the important coal characteristics affecting Hg emission control. The coal data involved type, quantity burned, heating value, Hg, chlorine, sulfur, ash, and moisture content for the entire year of 1999. DAQ utilized each of the following tools to estimate Hg emissions from the existing and future planned emission control technology configurations for the NC coal-fired power plants.

EPA HG EMISSION ESTIMATING TOOL

DAQ staff utilized appropriate data to calculate the estimated emissions for each boiler for the corresponding categories of NC utility boilers (see Appendix C). For the case of existing boiler configurations, two categories were utilized: cold-side ESP and hot-side ESP, each with bituminous coal, conventional dry-bottom pulverized boilers (Bins 1 and 4, respectively). For the case of future planned configurations, two additional categories were utilized: cold-side ESP with wet scrubber and hot-side ESP with wet scrubber, likewise each with bituminous coal, conventional pulverized boilers (Bins 10 and 11, respectively). The amount of Hg fed to each boiler was calculated from the 1999 EU/ICR data as the product of the amount of coal burned and the Hg coal content. Then the Hg emission level from each boiler was then calculated as the combined product of the following three factors:

- Amount of Hg fed to each boiler,
- Total Hg collection efficiency, and
- Relative percentage of each Hg species (elemental, oxidized, and PM-bound) in the emissions.

EPRI HG EMISSION ESTIMATING TOOL

A similar engineering tool to develop *preliminary estimates* of speciated mercury emissions using site-specific information from electric utility boilers is available from the Electric Power Research Institute (EPRI).[51] While similar, the EPRI tool has three primary distinctions relative to the EPA tool.

- First, the EPRI tool sub-divides the 80-boiler EU/ICR emission database into only 11 categories. The data sets were grouped largely by emission control technology configurations, not by coal and boiler types.
- Second, EPRI's analysts concluded that the coal chlorine level was the dominant predictor of total and speciated Hg emission collection performance for all but one emission control technology (see third

[51] Electric Power Research Institute, "An Assessment of Mercury Emissions from U.S. Coal-Fired Power Plants," Final Report 1000608, October 2000.

distinction below). Given this correlation, they used regression analysis techniques to describe the relationship between coal chlorine level and Hg collection performance for 10 of the 11 categories of emission control technologies. This relationship predicts higher Hg emission control performance for increasing coal chlorine content. Coal chlorine is expressed in parts per million (ppm).

- Third, additional analysis indicated that for one emission control technology, namely cold-side ESPs, another chlorine-related factor, coal chlorine-to-SO_2 ratio, provided a better correlation with Hg collection performance than just coal chlorine. This relationship predicts higher Hg emission control performance for increasing coal chlorine/SO2 ratio. In this case SO_2 is expressed in lb/million Btu. [Limited copies of the report containing the EPRI tool are available to borrow from DAQ.]

In summary, EPA and EPRI used sound scientific principles in evaluating the EU/ICR database and in developing their respective engineering tools. DAQ considers both the EPA tool and the EPRI tool as viable means to estimate Hg emissions from the existing and future planned emission control technology configurations for the NC coal-fired power plants. Accordingly, DAQ has applied both tools to gain insight and understanding on the relative performance and emissions of existing and future planned emission controls on NC utility boilers.

NC COAL COMPOSITION

Both engineering tools recognize the importance of coal characteristics and emission control technology on the extent and control of mercury emissions. EPA divided up the EU/ICR data into coal types, and accounted for the amount of coal mercury. EPRI took another direction by accounting and correlating mercury control performance on coal chlorine composition or coal chlorine/SO_2 ratio. Table VII-3 presents coal composition data to show the favorable characteristics of the coal burned in NC electric utilities, including:

- Coal mercury content is slightly lower than the national average,
- Coal chlorine content is twice than the national average, and
- Coal chlorine/ SO_2 ratio is over three times more than the national average.

TABLE VII-3.
COMPARISON OF AVERAGE COAL BURNED IN NC AND USA ELECTRIC UTILITIES

Area	Coal Composition		
	Mercury, [1] lb/TBtu	Chlorine, [2] ppm	Cl/SO_2 Ratio [3]
NC	6.5	1400	1000
USA	7.0	700	300

1. Mercury content expressed as pounds of Hg per trillion Btu.
2. Chlorine content expressed as parts per million (ppm).
3. Chlorine to SO_2 ratio expressed as chlorine ppm per SO_2 ppm.

EMISSION ESTIMATES USING THE EPA AND EPRI TOOLS

Based on using input data from the 1999 EU/ICR, DAQ staff calculated the estimated emissions for each boiler for the corresponding categories of NC utility boilers using Excel spreadsheets. Table VII-4 compares the total Hg collection efficiencies delineated by emission control technology produced separately by the EPA and EPRI engineering tools. In three of the four emission control categories for existing and planned configurations, the EPRI tool predicts higher total Hg collection efficiencies than the EPA tool. Only in the case of Cold-side ESP followed by a FGD scrubber did the EPA tool predict a higher total Hg collection efficiency than the EPRI tool. Given the EPA predictions are based on a category average for each coal type, one performance number within a given coal/boiler/emission control type is developed, independent of coal chlorine content. The EPRI predictions are based on coal chlorine content or coal chlorine/SO_2 ratio. Consequently, there is a range of performance numbers developed, depending on the corresponding range of values of these two coal composition factors for the coals combusted in NC. Given that the EPA and EPRI tool developers took different directions in analyzing the available database, it is not surprising that performance levels for comparable control technologies did not turn out exactly the same.

TABLE VII-4.
MERCURY EMISSION CONTROL PERFORMANCE FOR EPA AND EPRI TOOLS

Emission Control Technology	EPA Tool [1]	EPRI Tool [2]
	Percent Total Mercury Removal, percent	
ESP Cold-side	29	40-48
ESP Hot-side	11	22-27
ESP Cold-side / FGD	78	65-70
ESP Hot-side / FGD	40	65

1. EPA prediction based on a category average for each coal type; one performance number within a given coal type is used independent of coal chlorine content.
2. EPRI prediction based on coal chlorine content or coal chlorine/SO2 ratio; a range of performance numbers is used depending on the corresponding values of these two coal composition factors.

Table VII-5 and Figure VII-1 present the results of the statewide mercury emission estimates for the current and future planned emission control configurations produced by using the EPA and EPRI tools. These two graphics show that:

- Nearly the same level of coal mercury feed levels as input to the boiler for both the EPA and EPRI tools of roughly 4,100 lb/yr.

- Modest emission reductions for the current set of emission controls; the EPA tool predicts nearly 3,000 lb/yr Hg emissions and 25 percent emission control, which are considerably higher than the EPRI tool predicting roughly 2,400 lb/yr Hg emissions and 42 percent emission control.

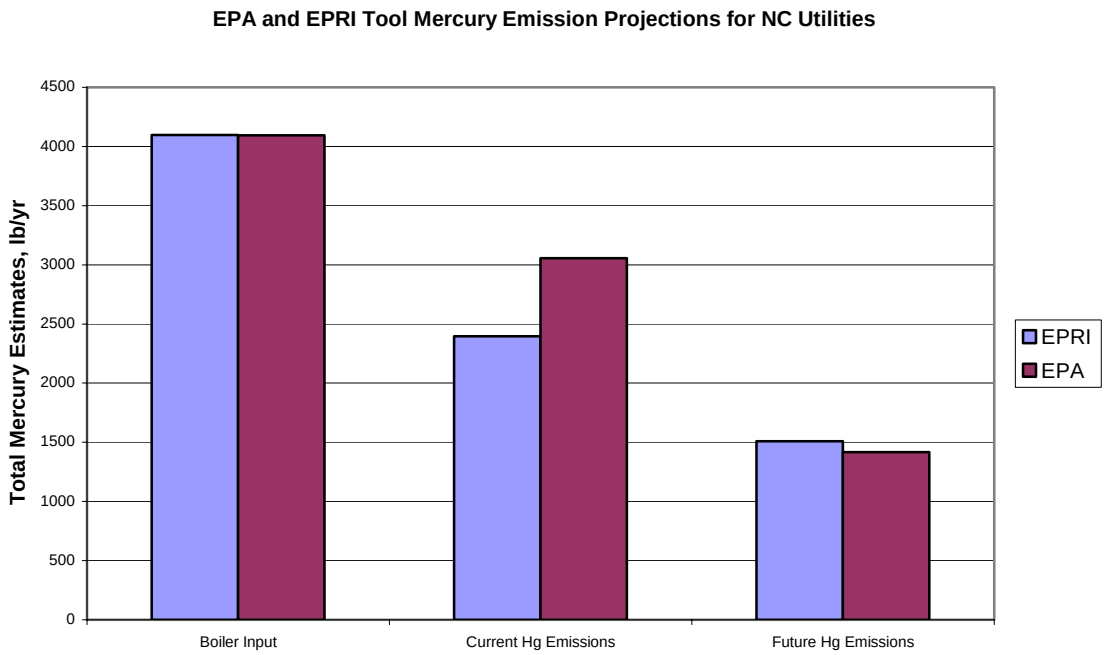
- Significant emission reductions for the future planned set of emission controls; the EPA tool predicts approximately 1,400 lb/yr Hg emissions and 65 percent emission control, comparable to the EPRI tool predictions of approximately 1,500 lb/yr Hg emissions and 64 percent emission control.

TABLE VII-5.
MERCURY EMISSION ESTIMATE PROJECTIONS
USING EPA AND EPRI TOOLS FOR NC ELECTRIC UTILITY BOILERS [1,2]

Tool	Total Mercury Levels				
	Boiler input, lb/yr	Emissions, lb/yr		Removal, %	
		Current	Future	Current	Future
EPA	4094	3057	1417	25	65
EPRI	4096	2397	1487	42	64
Average	4095	2727	1452	34	64

1. Projections assume the same coal supply and electric generation levels as 1999.
2. Estimate reflects average of EPA and EPRI tools.

FIGURE VII-1.
TOTAL MERCURY EMISSION PROJECTIONS FOR NC ELECTRIC UTILITIES USING EPA AND EPRI TOOLS

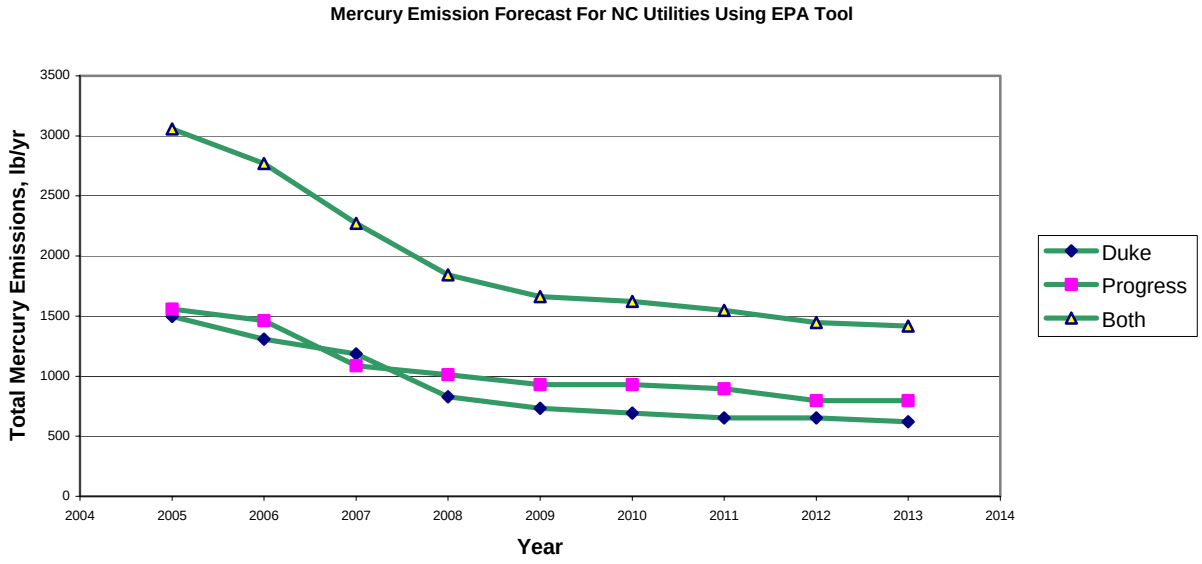


TOTAL MERCURY EMISSION FORECAST

The mercury emission estimate results from utilizing the EPA tool were applied with the SO_2 scrubber operational plans presented in Table VII-2 for forecasting emission reductions from 2005 – 2013. For the purpose of these future projections, it was assumed that the emission reductions from installing scrubbers would be fully effective during the year the utility company planned to install the equipment. This assumption was based on the general prediction that, on balance, the scrubber would become operational near mid-year and the boiler would be non-operational with no emissions for approximately a two-month period during equipment tie-in.

Figure VII-2 shows three graphs illustrating the estimated total mercury emissions for Duke Energy, Progress Energy, and the sum of both utilities. Note there are more emission reductions (reflected by the relatively steeper slope of the emission graphs) during the first half of the period (2005-2009) than in the second half (2009-2013) for all three graphs. Similar to the SO_2 case, this is due to the fact that each utility tends to install scrubbers on their largest units first, thereby achieving the largest emission reductions in the first half of the SO_2 / NOx compliance period.

FIGURE VII-2.
MERCURY EMISSION REDUCTION SCHEDULE FOR
NC ELECTRIC UTILITIES USING EPA TOOL



PRELIMINARY ESTIMATE OF SPECIATED MERCURY EMISSIONS FROM NC UTILITY BOILERS

For the past several years, advancements in the study of mercury have evolved to include examining the three chemical forms or species in which it is released into ambient air. The three species include elemental, oxidized, and particle-bound Hg. Total mercury is the sum of the three species. The term *speciation* is used to denote the relative amounts of these chemical forms of mercury. A related term – *partitioning* -- is similarly used in describing the relative behavior or outcome of the sub-division of these three parts of mercury species. Each mercury species has its unique set of chemical and physical properties leading to distinctive traits in terms of reactivity, toxicity, and collectability in emission controls.

To begin understanding the complex behavior of mercury in and from coal-fired exhaust gas, it is now standard practice to measure the individual mercury species. Given the capture of mercury by emission control equipment is dependent on mercury speciation, virtually all mercury studies for the past 5 years recognize the fundamental importance of focusing on particular mercury species. Research programs now provide information, methods, models, and data to address the key questions dealing with Hg speciation. Studies characterizing collection performance of various emission control technologies, behavior and transport of plumes, and plume deposition entails mercury species. For example, in terms of their contrasting properties and behavior, recent studies show that:

- Bituminous coal produces more oxidized Hg than other coal types;
- Most conventional and emerging control technologies capture oxidized Hg and particle-bound Hg much more effectively than elemental Hg;

- Elemental Hg is relatively stable, stays suspended for long time periods and is the dominant of the three species in ambient airs sheds; whereas

- Oxidized Hg emissions are fairly reactive, become attached to particles or other gases, and tend to be deposited within 25-50 miles of release. Of the three species, it can be argued that oxidized mercury represents the most important species to control from a state perspective because of its tendency to be deposited within a relatively short distance of release.

Given this basic and profound significance, DAQ utilized the available tools to quantify not only total mercury, but also speciated mercury emissions. The additional effort proved worthwhile, as interesting and encouraging information was produced regarding speciated mercury emissions.

Table VII-6 shows average results from the EPA and EPRI tools for the current and future situations delineating total and speciated mercury emission estimates from the NC utility boilers. It depicts the relative collection performance of ESPs in the current case of emission controls. The data in the table confirms that ESPs do not collect any elemental mercury, only collect a small fraction of oxidized mercury, but collect the majority of particle-bound mercury. Similarly, it depicts the relative collection performance of adding wet scrubbers to the majority of the boilers (80 percent by capacity, 87 percent on Btu heat input basis) in the future case of emission controls. The data in the table reflects that scrubbers do not collect any elemental mercury, collect a very high fraction of oxidized mercury, and likewise collect the majority of particle-bound mercury. It also suggests that some of the oxidized mercury collected in the scrubber is converted over to elemental mercury in the scrubber water, and is re-emitted out the stack.

The top half of Table VII-6 reflects a mass balance. For the current case of emission controls, it shows that the:

- Amount of mercury in the coal fed to the boilers is 4,100 lb/yr;

- Total mercury emissions are 2700 lb/yr;

- Oxidized mercury emissions are 1800 lb/yr, comprising most of the total mercury;

- Elemental emissions are 800 lb/yr; and

- Particle-bound emissions are 100 lb/yr.

(In rounded numbers to the nearest 100 for readability purpose and to reflect the nature of estimated numbers)

For the future case of emission controls, it shows some similar and contrasting facts, including:

- The same amount of mercury in the coal fed to the boilers would be 4,100 lb/yr;
- Total mercury emissions would be reduced to 1500 lb/yr;
- Oxidixed mercury emissions would drop to 400 lb/yr;
- Elemental emissions would be expected to *increase* to 1100 lb/yr, accounting for the majority of mercury emissions; and
- Particle-bound emissions would be reduced to 20 lb/yr.

The bottom half of Table VII-6 describes the data in terms of the relative percentage of mercury species for the two time cases. This helps to show how the mercury species are partitioned. In the current case:

- (All percentages presented below are relative to the mercury fed to the boilers):
- Emission controls (ESPs) collect 33 percent of the mercury fed to the boilers;
- The remainding 67 percent are released as emissions:
- Elemental emissions being 20 percent;
- Oxidized emissions being 44 percent, accounting for the majority of mercury emissions and
- Particle-bound emissions account for only 3 percent.

TABLE VII-6.
MERCURY MASS BALANCE AND PARTITIONING FORECAST FOR NC ELECTRIC UTILITY BOILERS [1,2]

Mercury Mass Balance								
Time	Coal Hg, lb/yr		Mercury Emissions, lb/yr					Total
			Total		Elemental	Oxidized	PM	
Current	4095		2727		813	1808	106	
Future	4095		1462		1061	384	17	
Mercury Partitioning [3]								
	Coal Hg, %		Removed in Emission Controls, %		Distribution of Mercury Emissions, %			
					Elemental	Oxidized	PM	
Current	100		33		20	44	3	100
Future	100		64		26	9	0.4	100

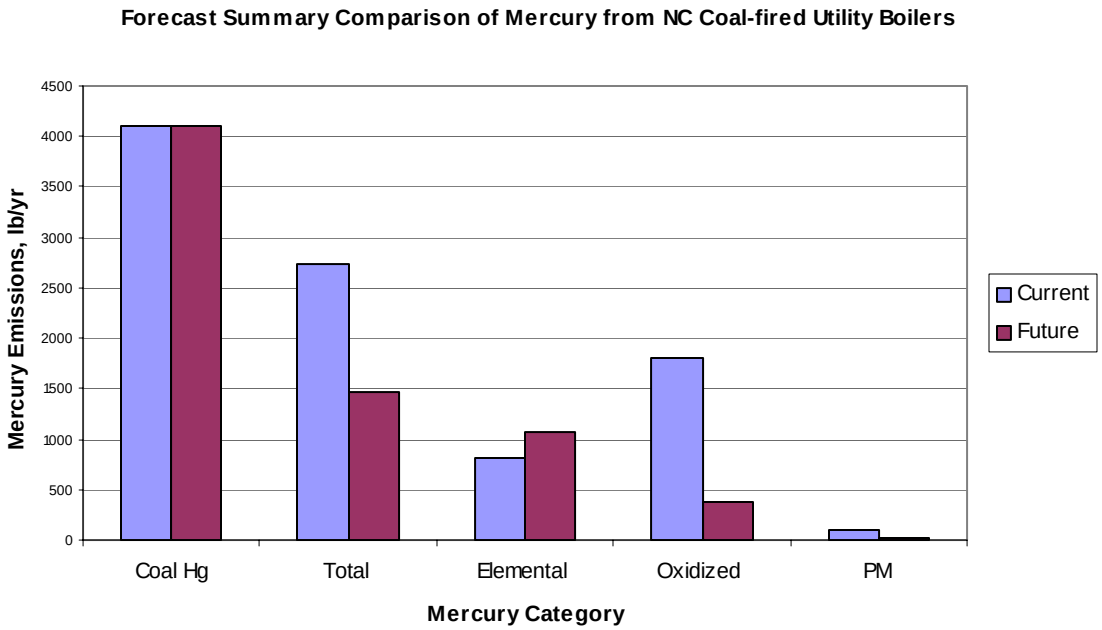
1. Projections assume the same coal supply and electric generation levels as 1999.
2. Estimate reflects average of EPA and EPRI tools.
3. Percentages presented are relative to the mercury fed to the boilers.

For the future case of emission controls, it likewise shows some similar and contrasting facts, including:

- Emission controls (ESPs and scrubbers) collect 64 percent of the mercury fed to the boilers;
- The remaining 36 percent are released as emissions:
- Elemental emissions would be expected to *increase* to 26 percent, accounting for most mercury emissions;
- Oxidixed emissions would drop to only 9 percent, and
- Particle-bound emissions would account for less than 1 percent.
  (All percentages presented above are relative to the mercury fed to the boilers)

Figure VII-3 graphically illustrates the same data as in Table VII-6 and can show the relative trends in total and speciated mercury emissions discussed above more readily for some readers.

FIGURE VII-3.
FORECAST SUMMARY OF TOTAL AND SPECIATED MERCURY EMISSION ESTIMATES FROM NC UTILITY BOILERS (REPRESENTS AVERAGE FROM EPA AND EPRI TOOLS)



Summary

Speciated data adds a new layer of valuable information regarding mercury emissions. Adding SO_2 scrubbers to most of the boiler capacity significantly deceases the amount of total mercury emissions from over 2700 to less than 1500 lb/yr. Of equal or possibly more importance, the addition of scrubbers reduces the amount of *oxidized* mercury emissions from over 1800 to less than 400 lb/yr. This means that only 9 percent of the 4100 lb/yr of mercury fed to the boilers (representing potential *oxidized* mercury emissions) is expected to be emitted in the future, a huge improvement over the current case of nearly 45 percent of boiler-fed mercury being emitted as *oxidized* mercury.

This significant reduction in *oxidized* mercury emissions suggests the possibility of considerable reductions in mercury deposition across NC. The exact amount of reduction in mercury deposition is unknown and considered controversial. The relative contribution of global versus statewide/local mercury emissions to atmospheric mercury deposition is poorly understood and remains an area of scientific debate. In general, there are two conflicting hypotheses:

- Hypothesis A. On one hand, roughly 90% of global mercury emissions come from abroad. Results of simulated modeling indicate that half of the mercury deposited in NC comes from abroad. This would suggest that even if NC could completely eliminate all its mercury emissions, there would only be a 50 percent drop in mercury deposition.

- Hypothesis B. On the other hand, data from the ongoing Florida study indicate a linear relationship between local emission reduction and deposition. This data suggests that any reduction in mercury emissions, especially *oxidized* mercury, will proportionally decrease local deposition and result in local environmental benefits within a few years. Accordingly, there could only be a nearly 2-fold or nearly 5-fold percent drop in mercury deposition, depending on whether the relationship is largely driven by total mercury or *oxidized* mercury.

Given that both engineering tools indicate similar performance levels, there is reasonable level of confidence in the expected emission reductions from adding scrubbers. These tools project emission reductions over current levels by nearly 2-fold for total mercury and nearly 5-fold for *oxidized* mercury. What is uncertain is whether Hypothesis A, B, or something in between applies in NC, and whether the relationship between emission reduction and environmental benefit is largely driven by total mercury or *oxidized* mercury.

CHAPTER VIII MERCURY CONTROL OPTIONS BEYOND CSA

OPTIONS UNDER THE CLEAN SMOKESTACK ACT ON THE DEVELOPMENT AND IMPLEMENTATION OF MERCURY STANDARDS AND PLANS

This report section is in response to Section 12 of the Clean Smokestacks Act (CSA) directing DAQ to study mercury issues. This Second Interim Report section includes a description of options that might be available in terms of standards and plans.

OPTIONS

This chapter discusses the rationale and plans to further study the complex and evolving science on mercury controls and effects. Included are three options with approximate dates for completion. We solicit the input of any and all interested persons concerning these or any other options.

- Option 1. Further study,
- Option 2. Set standards similar to those adopted or being considered by other states, or
- Option 3. Further study and then set standards, or
- Other sugested options.

OPTION 1. FURTHER STUDY; DEFER ANY RULEMAKING ACTION UNTIL A LATER TIME.

RATIONALE FOR FURTHER STUDY

First, as was the case when the CSA was signed in 2002, essentially all scientific information dealing with the benefits and costs of alternative strategies is still evolving, and is expected to continue evolving in the near-term. The federal government, electric power industry, and pollution control industry are advancing the technology and state-of-the-science on the measurement, control, fate, and health effects of mercury emissions.

Second, EPA is scheduled to finalize similar federal standards for controlling mercury emissions from coal-fired power plants in March 2005. The format of the federal requirements may add to the significant mercury emission reductions to be realized from the NC CSA.

Third, the relative impact of mercury deposition from local emission sources versus nearby states and the global "pool" is not fully understood; some data indicate that local sources have a profound effect, while other data suggest that emissions from abroad drive deposition. The different data makes it difficult to accurately predict mercury emission reductions and corresponding deposition from in-state power plants resulting from co-benefits of the NOx and SO_2 control device installations that will result from the CSA. It is also difficult to predict the effects from out-of-state areas from new EPA standards and/or NC's Section 126 petition urging emission reductions in 13 nearby states. In summary, it can be argued that it is too early and untimely at this point in time to

mandate any additional requirements beyond the CSA and the pending EPA standards for controlling mercury emissions from NC coal-fired power plants.

And fourth, NC appears to be the leading, or at least one of the leading, states in reducing mercury emissions from coal-fired power plants. This claim is based on our preliminary conservative projections that total and oxidized mercury emissions will be reduced by 65 percent and 90 percent, respectively, by 2013. These relatively high levels are consistent with the CSA, which stated that "[t]he General Assembly anticipates … significant reductions in the emissions of mercury."

SCOPE FOR STUDY

There are no "hard" data available that clearly and unambiguously establish the relationship between Hg emission reductions from scrubbed coal-fired power plant and the local Hg deposition impact. Given this data gap and the state's apparent mercury-sensitive environmental properties, a comprehensive study is being planned to determine this relationship. DAQ has the experience for such a study, including speciated Hg ambient air monitoring, meteorological monitoring, wet mercury deposition monitoring, and dispersion modeling. Coincidentally, two NC coal-fired utility boiler stations have started constructing FGD scrubbers for operation in 2005-2007, providing opportunity to collect the above- mentioned set of Hg data before and after scrubber operation. The plants are Duke Power's Marshall Station and Progress Energy's Asheville Station. DAQ will collaborate with the stakeholders in preparing a study plan in the summer/fall of 2004.

Concurrently, it would be beneficial for the NC utilities to collect new, or share any already collected, total and speciated mercury emission data from some of the power plants. This would help better establish their current emission levels and provide sets of data to compare and validate the EPA and EPRI emission estimating tools data. It would also provide additional opportunity to evaluate an evolving list of emission control technology options.

Currently three technology options are considered possibly viable for NC utility boilers:

- Wet FGD scrubbers on boilers only equipped with cold-side or hot-side ESPs. Studies show that FGDs following cold-side ESPs have much higher performance and, therefore are more cost-effective, in mercury removal than those following hot-side ESPs.

- Carbon injection on units equipped with cold-side or hot-side ESPs. Currently, conventional activated carbon injection is considered only applicable on cold-side ESPs, even though carbon injection with fabric filters produce much higher performance than cold-side ESPs. Specially-treated carbons, such as brominated carbon, are the only sorbents currently viable on hot-side ESPs. Duke Power conducted a 1-week long brominated-carbon injection feasibility test at its Cliffside station in 2003;

results were encouraging enough that a 1-month long test is scheduled in 2004 at Duke's Buck Station with the same technology.

- Carbon injection with a fabric filter on units equipped with cold-side or hot-side ESPs. A full-scale continuous demonstration with activated carbon injection and fabric filter treating flue gas from a bituminous-fired boiler with hot-side ESP has shown the capabilities and limitations of the technology since July 2003. Mercury capture results show performance in the 70 – 90 percent range.

Several other mercury and multi-pollutant control technologies offer potential, but the promise of their performance has not yet undergone enough performance and reliability testing.

SCHEDULE

A comprehensive study could be completed in 2007 or 2008 by DAQ, pending resource availability.

OPTION 2. SET STANDARDS LIKE OTHER STATES

Option 2. Set standards like other states requiring mercury emission reductions on a percent basis (such as 40, 80, or 90 percent as in CT, IN, and WI), a thermal release basis (such as 0.6 lb/million Btu as in CT, IN, and MA), or a energy production basis (such as 0.0066 lb/MWhr as in NJ).

RATIONALE FOR RULEMAKING

Five states (CT, IN, MA, NJ, and WI) have mercury emission reduction standards in place or are already planning to propose mercury emission reduction standards. These states take the position that, while the science and technology are not fully developed, they are adequately developed to initiate rulemaking requirements. Federal mercury emission standards have been in effect on waste incinerators using carbon injection (the same control technology being successfully demonstrated at power plants) for several years. [For example, the municipal waste incinerator near Wilmington, NC has been using carbon injection for 3 years.] States with mercury standards believe that, since rulemaking has a history of forcing cost-effective technological developments, rulemaking will again be the engine for development. Rulemaking bodies in these states are convinced they have mercury problems with corresponding health effects. To them, common sense dictates that they must reduce mercury emissions from their largest sources. Lacking federal rules, these states have exercised or are planning to exercise their independence while setting an example for other states to follow.

SCHEDULE

DAQ projects that rulemaking in response to directions from the General Assembly could commence as early as 2006, with implementation occurring at least two or more years thereafter.

OPTION 3. STUDY FURTHER AND THEN SET STANDARDS.

Upon completion of the comprehensive study outlined in Option 1, DAQ would initiate a rulemaking development effort, similar to that described in Option 2.

RATIONALE FOR STUDY FOLLOWED BY RULEMAKING

Some argue that it is simply too premature and untimely to mandate additional requirements beyond the CSA now, based on the nature and extent of complex, evolving science, technology, and pending federal regulations. DAQ's conservative estimates indicate that significant mercury emission reductions are already expected as a co-benefit under the CSA. Further study as outlined in Option 1 is expected to improve understanding of the issues, along with results from many ongoing studies by federal agencies and the industry. It could be beneficial for all stakeholders to wait until additional information is available for additional future mercury control than to propose standards soon that may need to be revised (up or down) later.

SCHEDULE

DAQ anticipates that the studies could be completed in 2007 or 2008, allowing rulemaking to occur in 2008 or 2009, with implementation at least two years thereafter.

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12. C. Jean Bustard, *et al*., Full Scale Evaluation of Mercury Control with Sorbent Injection and COHPAC at Alabama Power E. C. Gaston, Journal of the Air & Waste Management Association, Volume 52, August 2002.

13. Ruud Meij, *et al*., The Fate and Behavior of Mercury in Coal-Fired Power Plants, Journal of the Air & Waste Management Association, Volume 52, August 2002.

14. Loreal V. Heebink and David J. Hassett, Release of Mercury Vapor from Coal Combustion Ash, Journal of the Air & Waste Management Association, Volume 52, August 2002.

15. Carl Richardson, *et al*., Effect of NO_x Control Process on Mercury Speciation in Utility Flue Gas, Journal of the Air & Waste Management Association, Volume 52, August 2002.

16. U.S. EPA, Mercury Emissions and Electric Utilities: Fact Sheet (www.epa.gov/ttn/oarpg/t3/fact_sheet/hg17th.pdf)

17. Draft memorandum dated August 28, 2002, from Mr. Jeffery Cole, RTI, to William Maxwell, EPA/OAQPS/ESD/CG, "Statistical Analysis of Mercury Test Data Variability in Support of a Determination of the MACT Floor for the Regulation of Mercury Air Emissions from Coal-Fired Electric Utility Plants."

18. EPRI Journal Online (www.epri.com/journal/details.asp?id=376).

19. Kirk-Othmer, *Concise Encyclopedia of Chemical Technology*, A Wiley-Interscience Publication, (New York 1985), John Wiley and Sons, Inc.

20. EPA Website www.epa.gov/ttn/uatw/combust/utiltox/utoxpg.html.

APPENDIX A
SCHEDULE OF PRESENTATIONS

Due to size of electronic files, these presentations are not included in the printed version of this report, but may be seen at DAQ's website: http://daq.state.nc.us/news/leg/2004-04-hg-co2-agenda.pdf

Monday, April 19

Introduction and Welcome
Keith Overcash, Director, NC Division of Air Quality, DENR

Background and Significance of Clean Smokestacks Act
Brock Nicholson, Deputy Director, NC Division of Air Quality, DENR

Purpose and Charge for this Workshop, Logistics, etc.
Jim Southerland, Environmental Engineer, NC Division of Air Quality, Planning Section

Basis for Issues to be Discussed: CO_2 and Mercury
Moderator, Sheila Holman, Planning Chief, NC Division of Air Quality

Review of the Science and Concerns for Climate Change in North Carolina
Ryan Boyles, Associate State Climatologist, State Climate Office of NC at NCSU

History and Transitions of the Global Warming Program and Policies in the US
Wiley Barbour, Environmental Resources Trust

Development, Components and Status of the NC State Energy Plan
Larry Shirley, Director, NC State Energy Office, NC Department of Administration

Health Effects of Methylmercury and North Carolina's Advice on Eating Fish
Dr. Luanne Williams, Toxicologist, NC Department of Health and Human Services

Recent NC Water Quality Mercury Monitoring Results
Michelle Woolfork, Water Quality Engineer, NC Division of Water Quality

Update on DAQ's Air Quality Measurements and Mercury Studies
Steve Schliesser and Todd Crawford, Toxic Protection Branch, NC Division of Air Quality

Lunch Speaker - Importance and Impacts of CSA Sections 12 and 13 and Your Input for the Future of North Carolina
Secretary William (Bill) Ross, NC Department of Environmental and Natural Resources

General Mercury Topics and Issues Session (Hg-1)
Moderator, Michael Abraczinskas, Environmental Engineer/Meteorologist, NC Division of Air Quality

Voluntary Mercury Reductions: NC Champions
Norma Murphy, NC Division of Pollution Prevention (P2), DENR

State of Science/Ability to Measure Mercury in Smokestack Environments
Barrett Parker, USEPA

Developing a Tool for Estimating Mercury Emissions and Reductions from Coal-Fired Utilities
Jeff Cole and C. Clark Allen, RTI International

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Atmospheric Modeling and Deposition of Mercury from Stack to Sounds and other Water Bodies

O. Russell Bullock, Jr., Meteorologist, NOAA Air Resources Laboratory (on assignment to the EPA Office of Research and Development)

Historical Scientific Examination of Mercury Deposition to the Florida Everglades over the Past 100 Years or Atmospheric Mercury; Pandora's Box Revisited
Dr. Thomas D. Atkeson, FI DEP, Tallassee, FL, Robert K. Stevens, FL DEP (at US EPA, RTP, NC), and Matthew S. Landis, US EPA, RTP, NC

Tuesday, April 20

NC Specific Mercury Topics and Issues – Session 2 – (Hg-2)
Moderator, Steve Schliesser, Senior Environmental Engineer, NC Division of Air Quality

USEPA's Proposed Mercury MACT and Alternate Proposals for Mercury Reduction Trading Options
A Summary of Options and Schedule for Comments and Final Regulations
Bill Maxwell and Dr. Bob Wayland, USEPA

Performance and Costs of Mercury Control Technology for Bituminous Coals
Dr. Michael Durham, President, ADA Environmental Solutions

Achieving CSA System-wide Reductions in (NOx &SO_2) Emissions at Duke Energy Facilities and Reactions to Achieving EPA's MACT/Trading Proposals for Mercury (Including limited comments on options for new technologies, etc.)
Robert A. McMurry, Duke Energy

Achieving CSA System-wide Reductions in (NOx & SO_2) Emissions at Progress Energy Facilities and Reactions to Achieving EPA's MACT/Trading Proposals for Mercury
Ben White, Progress Energy

Estimated Emission Reductions in NC from Co-control as a Result of CSA, Using EPA Tool to Estimate NC Coal-Fired Power Plant Mercury Emissions
Steve Schliesser & Paul Grable, Environmental Engineers, NC Division of Air Quality

Developing Policy Options That Can Result in Integration of CO_2 and Mercury Reductions and State Implementation Plan Credits
Alden Hathaway, Environmental Resources Trust, Inc., Washington, DC

Lunch Speakers – Mercury and CO_2 Emissions from the Power Generation Sector
Dr. *C.V. Mathai, Manager for Environmental Policy, Arizona Public Service Company, Phoenix, AZ*

Insights from Economic Analyses of the Impacts to the Utility Industry from Mercury and CO_2 Controls, *Dr. Anne E. Smith, Vice President, Charles River Associates, Washington, DC*

Mercury Reduction Programs in Other States
Martha Keating, Air Toxics Scientist, Clean Air Task Force

General CO_2 Topics and Issues (CO_2)
Moderator, Phil Besesi, Project Manager, NC State Energy Office

Potential Impacts for the NC State Energy Plan on Emissions of CO_2 with Technical Procedures and Assumptions Upon Which These Plans Were Developed
Jeff Tiller, Appalachian State University

Technology, Energy Efficiency, and Renewable Energy for Emission Reduction
Ward Lenz, Director, Energy Programs and John Morrison, Vice President, Advanced Energy

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The People, the Planet, and the Pocketbook: How a Green Builder Program Can Avoid Emissions Using Solar Energy
Dona Stankus, AIA, NC Solar Center

Potential in NC for Extraction of Wind Energy
Dr. Dennis Scanlin, Professor, Technology Department, Appalachian State University

Past, Present and Projected Participation in Climate Wise by North Carolina Companies
James Haven, Global Warming Initiatives, Inc.

Wednesday, April 21

NC Specific CO_2 Topics and Issues – Session (CO_2-2)
Moderator, Phyllis D. Jones, NC Division of Air Quality

Review of Real/Practical and Projected Options fro CO_2 at a Coal-Fired Generating Unit
Kevin Johnson, URS

Integrated Gasification Combined Cycle (IGCC) Technology; Carbon Sequestration and Cost Implications
Joe Chaisson, (Harpswell, ME), Clean Air Task Force (Boston, MA)

Forestry and Agriculture as Real Options to Increase Carbon Sequestration in Vegetation and Soils
Dr. William H. Schlesinger, Dean, The Nicholas School of the Environment & Earth Sciences, Duke University.

NC Animal Waste as a Potential Resource for Reducing CO_2 and Methane Emissions
Kurt Creamer P.E., Animal and Poultry Waste Management Center, *NC State University*

Industry Experience in Reducing CO2 and GHG Emissions – A Case Study of International Proportions
Bill Bailey, DuPont, Charlotte, NC

What Other States Are Doing or Considering Regarding Reductions of CO2 From Coal-Fired Utilities – With an Update from Milan and Introduction to STAPPA/ALAPCO's Software
Amy Royden, STAPPA/ALAPCO

Lunch speaker – Herding Sheep: The Commons and the Marketplace
Michael Shore, Environmental Defense

Overview of the Southeast Regional Carbon Sequestration Partnership
Gerald R. Hill, Ph.D, Senior Technical Advisor, Southeastern Regional Carbon Sequestration Partnership

Rate Implications Due to Mercury Reductions
Elise Cox, Assistant Director, Public Staff, NC Utilities Commission

Closing Comments by Keith Overcash, Director, NC DAQ

APPENDIX B

LETTERS ADDRESSING PERCEIVED FLAWS IN PROPOSED STANDARDS OF PERFORMANCE FOR NEW AND EXISTING STATIONARY SOURCES: ELECTRIC UTILITY STEAM GENERATING UNITS

STAPPA/ALAPCO Letter

Concerning the "National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units: Proposed Rule,"

June 29, 2004

Docket ID No. OAR-2002-0056
EPA Docket Center (Air Docket)
U.S. Environmental Protection Agency
West (6102T), Room B-108
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

Dear Sir or Madam:

On behalf of the State and Territorial Air Pollution Program Administrators (STAPPA) and the Association of Local Air Pollution Control Officials (ALAPCO), thank you for this opportunity to comment on the "National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units: Proposed Rule," which was published in the *Federal Register* on January 30, 2004 (69 *Federal Register* 4652) and the "Supplemental Notice for the Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units," which was published in the *Federal Register* on March 16, 2004 (69 *Federal Register 1*2398).

It is well known that mercury is a powerful neurotoxin that accumulates in the food chain and can cause damage to the brain and nervous system when ingested. In fact, because of methylmercury contamination, the U.S. Environmental Protection Agency (EPA), the Food and Drug Administration, 45 states throughout the country and other organizations, such as Health Canada, have issued fish consumption advisories to the public due to elevated concentrations of mercury. In January 2003, the Centers for Disease Control and Prevention estimated that nearly 8 percent of women of childbearing age are exposed to mercury levels that are above those considered safe for a developing fetus. More recently, EPA researchers have indicated that, based on examinations of umbilical cord blood, the estimate is closer to 15 percent.

In view of the dangers associated with exposure to mercury and other hazardous air pollutants, STAPPA and ALAPCO believe it is extremely important that EPA take swift and aggressive steps to reduce emissions of these pollutants from utilities and other source categories.

Unfortunately, for the reasons that will be described in these comments, STAPPA and ALAPCO are extremely dismayed with EPA's proposals to regulate hazardous air pollutants from electric utilities. We do not believe the rule will adequately protect public health and the environment, a concern that is shared by many others. For example, the Children's Health Protection Advisory Committee (CHPAC), a panel of experts that EPA formed to advise the agency on issues related to the protection of children's health, has expressed deep concerns with EPA's proposed rule. Specifically, CHPAC stated, "[f]rom our understanding, the unique vulnerabilities of children, infants, and women of child-bearing age were not adequately considered in the development of the EPA's proposed rule." Additionally, CHPAC indicated that the current proposal does not go as far as feasibly possible and "[t]o protect children from mercury exposure, EPA needs to go beyond the minimum required by statute (i.e., the proposed MACT floor)."

In view of our deep concerns and the objections other groups have expressed regarding the proposal, STAPPA and ALAPCO strongly urge the agency to abandon its proposed strategy and, instead, develop final Maximum Achievable Control Technology (MACT) standards, with stringent emission limits and expeditious deadlines, as required by Section 112(d) of the Clean Air Act. We have several major concerns with EPA's proposals, which we will articulate in this comment letter.

Flawed Emission Limits Under Sections 111 and 112

EPA has included several options for addressing emissions of hazardous air pollution from electric utilities, including proposals under Section 111, Section 112(d), and Section 112(n) of the Clean Air Act. We oppose all three options for a variety of reasons; most importantly, each is extremely weak and not sufficiently protective of public health and welfare.

We believe the Clean Air Act clearly calls for emissions of hazardous air pollution from electric utilities to be regulated under Section 112. Therefore, EPA's proposal to regulate those sources under Section 111, instead, is totally inappropriate. Furthermore, the limits contained in the Section 111 proposal are not nearly stringent enough. The proposal calls for an interim emissions cap – expected to be 34 tons per year – to be achieved by 2010 that, in fact, does not require *any* additional control of mercury beyond the co-benefits expected from other programs aimed at reducing emissions of sulfur dioxide and nitrogen oxide, such as the Interstate Air Quality Rule (IAQR). It appears, then, that the interim cap for mercury is wholly dependent upon the IAQR, rather than on any measures specifically designed to address hazardous air pollutant emissions. What would happen if, for some reason, the IAQR does not become final? Would the 2010 cap remain enforceable? Moreover, while EPA specifies a 15-ton final cap to be achieved in 2018, the agency acknowledges in its proposal that mercury

emissions could reach 22 tons (or only a 54-percent reduction from the 48 tons determined in 1999) in 2020, when banking and trading are utilized. Thus, EPA's stated 15-ton cap will not truly be achieved. We believe this does not adequately reflect what is technologically feasible and falls far short of what is needed to provide appropriate public health and environmental protection.

While we support regulating hazardous air pollution emissions from utilities under Section 112, as Congress intended, we believe EPA's proposals under Section 112(d) and 112(n) are seriously flawed. The EPA proposal sets MACT levels that would result in national emissions of 34 tons per year, which is clearly not consistent with the legislative mandate for calculating MACT under Section 112. Astonishingly, these levels are even less stringent than the recommendations made by industry representatives during an EPA-sponsored utility MACT development stakeholder process.

STAPPA and ALAPCO are extremely troubled by the statistical analysis regarding the variability of mercury content that EPA used in developing the proposed MACT standard. We believe the Clean Air Act is clear that EPA should base MACT for existing sources on the average of the top 12 percent of sources. We also believe variability in coal mercury content is adequately addressed in the annual averaging time of the standard. EPA's method for accounting for the variability of mercury content in coal is an inappropriate manipulation of the data. It resulted in emission limits that are far more relaxed than they should have been, based on the appropriate use of available data on well-controlled sources. Several state and local air agencies have conducted a thorough review of EPA's variability analysis and are providing the agency with specific comments regarding its inadequacies. We urge EPA to review those comments carefully. In light of our concern about the inappropriateness of EPA's variability analysis, we strongly urge EPA to develop the final MACT standard *without* the faulty statistical analysis the agency incorporated into the development of the proposal.

In addition to using a flawed variability analysis to develop the MACT standards, EPA failed to consider all available technologies. For example, activated carbon injection is commercially available and is widely recognized as a viable control technology for mercury. It has been demonstrated with pilot and full-scale demonstration projects on coal and has been used for over 10 years on other large combustion sources. Also, states are now requiring that activated carbon injection be installed on new coal-fired units for the control of mercury. In failing to consider available technologies like activated carbon injection, EPA has veered significantly from its past approach for developing mercury emission limits for combustion sources and has provided no justification for this dramatic change in the development of emission limits.

In previous MACT standards, EPA has not required technologies to be in long-term use to be considered "commercially available" and to be evaluated as a potential control method. Specifically, at the time EPA proposed the new source performance standards and emission guidelines for municipal waste combustors, activated carbon injection had been tested at only two facilities in the United States. Nonetheless, EPA justified the proposal to use activated carbon injection to set emission limits for mercury

"beyond the floor" because the tests showed lower mercury emissions to be achievable, and because the incremental costs to control mercury beyond the floor were low (59 *Federal Register* 48198 and 48228). EPA did not indicate that its deliberation was limited to control strategies the agency determined to be in long-term use when developing emission limits. Further, EPA continued to evaluate the applicability and efficacy of activated carbon injection when developing mercury emission limits at hazardous waste and medical waste combustors, even when this technology was rarely used at facilities.

EPA has not provided justification for considering coal-fired power plants in a different light. In fact, EPA has likely significantly frustrated the rapid and wide deployment of mercury control technologies by not considering their use for utility boilers, since the very act of EPA evaluating a technology as a means of developing an emissions limit drives the further development and installation of technologies.

EPA is undoubtedly well aware from its research that sorbent injection technologies, such as activated carbon injection, have been demonstrated to achieve significant mercury emission reductions at coal-fired power plants, regardless of coal-type. For example, a recent study by the Northeast States for Coordinated Air Use Management (*Mercury Emissions from Coal-Fired Power Plants* – October 2003) concludes, based on full-scale demonstration of activated carbon injection technology, that mercury control efficiency of above 90 percent is feasible (at costs similar to those of nitrogen oxide removal).

State and local permitting authorities have been relying on results from these studies to establish mercury emission limits in permits issued for the construction of coal-fired boilers. For example, Wisconsin is preparing to permit a coal-fired electric utility plant, using subbituminous coal, at 83-percent control efficiency.[52] Also, Iowa has issued a permit for a facility that will operate with subbituminous coal. That permit sets a limit of 1.7 lb Hg/TBtu, which is equivalent to an 83-percent reduction for operation with coal from the source with the highest average mercury content.[53]

Clearly, since a coal-fired power boiler operator holding a permit with mercury limits that rely on sorbent injection has commenced construction of a facility under that permit, the technology is clearly in commercial use, and thus must be considered in the development of mercury emission limits.

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[52] Wisconsin Public Service Corporation Weston Unit 4 – 500 MW supercritical pulverized subbituminous coal-fired boiler; 1.7 lb. of Hg./TBtu controlled; 10.0 lb. of Hg./TBtu uncontrolled; 83% mercury control efficiency; sorbent injection/baghouse/dry FGD; sorbent not identified.

[53] MidAmerican Energy Company CBEC (Council Bluffs Energy Center) Unit 4 - 790 MW (estimated net) 7,675 MMBtu/hr heat input supercritical pulverized subbituminous coal-fired boiler; 1.7 lb. of Hg/TBtu (controlled); 10 lb. of Hg/TBtu (uncontrolled); expected control efficiency of 83% on coal with highest average mercury content; activated carbon injection with a minimum feed rate of 10 pounds per million cubic feet of exhaust gas. An optimization study required in which facility is to optimize control and can try other sorbents. Other controls - baghouse/selective catalytic reduction (SCR)/dry flue gas desulfurization (FGD).

Finally, EPA's proposal also includes an alternative MACT scheme that would allow for a cap-and-trade program similar to the proposal under Section 111. The preamble indicates that EPA would institute such a program under the provisions of Section 112(n) of the Clean Air Act. Section 112(n) calls for EPA to conduct a study for Congress describing the public health hazards resulting from utility emissions and describing control alternatives. Section 112(n) also states that "[t]he Administrator shall regulate electric utility steam generating units under this *section…,"* (i.e., Section 112) (emphasis added). It does not indicate that the regulations should be established under that *subsection* (i.e., subsection 112[n]). Sections 112(d), 112(f) and 112(h) of the Clean Air Act are the only subsections of Section 112 under which EPA is authorized to establish National Emission Standards for Hazardous Air Pollutants (see 40 CFR 63.2). Therefore, EPA is not authorized to establish emission standards under Section 112(n).

Recommended MACT Standard

As the Clean Air Act requires, EPA should establish a MACT standard that reflects *at least* "the average emission limitation achieved by the best performing 12 percent of the existing sources" or "the emission control that is achieved in practice by the best controlled similar source." Rather than recommending a specific technology, STAPPA and ALAPCO suggest a performance standard. Also, we prefer a common standard for bituminous and subbituminous coal, but different percent limits can be considered for the coal types, as long as the limits provide for very good controls of mercury emissions and do not promote fuel switching or blending to avoid controls (see discussion below). Accordingly, STAPPA and ALAPCO believe it is reasonable to consider 90-percent control for sources using bituminous coal and 80-percent control for units firing subbituminous coal. These limits would result in a national emission reduction between 85-90 percent, which is much more stringent than the decreases expected from EPA's proposal.

In summary, we do not believe EPA's proposal is appropriate or consistent with the requirements of the Clean Air Act. As we have recommended, the agency should calculate and establish a more stringent MACT level, in accordance with a proper reading of Section 112.

Coal Blending and Switching

We are concerned about the effects of fuel switching and blending under EPA's proposal. The proposed limits for subbituminous coal are so lax – in fact, they are tantamount to no control – that facilities may switch from bituminous to subbituminous coal or blend their fuels simply to obtain a higher allowable limit and escape stricter controls. The result would be higher emission limits and greater emissions of mercury. We recommend that the final rule address this problem by requiring a stricter emission limit for subbituminous coal (i.e., 80 percent). Additionally, EPA should require facilities that blend fuels to meet the most stringent emission limit that applies to whatever types of coal it uses.

Deadlines

We are very concerned that the deadlines in the Section 111 proposal are extremely protracted. While the settlement agreement under which EPA is operating calls for the agency to issue final utility standards for hazardous air pollutants by March 2005 (formerly December 2004), with compliance by December 2007, EPA's proposal postpones final compliance until 2018 and, as mentioned, would allow compliance to be delayed even further, perhaps for many years, due to banking and trading. We believe this extraordinary delay in compliance is inappropriate and counter to the mandate of the Clean Air Act and the settlement agreement.

The Clean Air Act requires that MACT be determined first and be no less stringent than the average of the best 12 percent of sources. The timing of compliance is to be a separate consideration. If, after the MACT determination is complete, it becomes evident that more than three years is required for all facilities to comply, additional time is available under Sections 112(i)(3) and 112(i)(4) of the Clean Air Act. If Congress had intended for EPA to always limit a MACT determination to what could be achieved in three years, it would not have provided these special extensions.

We recognize that the adoption of facility-by-facility controls with the effectiveness we are recommending represents a significant commitment on the part of many sources and may require more time than the traditional three-year compliance time period for MACT sources. Therefore, if needed, EPA can provide the extensions of time for compliance that are already available within the Clean Air Act.

Trading

STAPPA and ALAPCO are extremely concerned that EPA is proposing on a national basis to allow trading of mercury emissions between utilities. Not only do we question the legality of mercury trading, we are also very concerned that trading could lead to serious "hotspot" problems around the country.

While mercury emissions can travel great distances, some of the pollutant can also be deposited near its source. In fact, there is recent evidence that sources of mercury can have significant local impacts. In November 2003, the state of Florida published a study entitled, *Integrating Atmospheric Mercury Deposition with Aquatic Cycling in South Florida*, which estimated how quickly fish tissue levels respond to decreased regional mercury emissions. According to state officials, drastic reductions in the mercury concentrations in fish and wading birds in the Everglades "…are directly linked to the installation of technology that reduced mercury in emissions from industries in South Florida by a 100-fold during the last two decades." Additionally, according to a report of the New Jersey Mercury Task Force, which examined local emissions, models, and other studies, "it is likely that approximately half of the mercury that is deposited in New Jersey comes from relatively nearby sources." Thus, the concern about local sources causing local mercury hotspots must not be dismissed.

In the proposal, EPA has likened the mercury trading proposal to the acid rain trading program that is in place. Such a comparison is not appropriate because of the nature of the pollutants in question. While the acid rain program focused primarily on emissions contributing to welfare effects, the utility proposal focuses on mercury, which is a neurotoxin with serious health impacts. The two programs are not comparable.

EPA has proposed that any hot spots could be addressed through the adoption of more stringent state or local standards. While the adoption of more stringent standards by state and local agencies is a fundamental right that the Clean Air Act provides for almost all of its programs, the reality is not so clear-cut. Implementing more protective air quality measures is often unrealistic, if not impossible, for many areas. According to a survey that STAPPA and ALAPCO conducted, approximately one-half of state air pollution control agencies have restrictions on their ability to adopt programs that are more stringent than those of the federal government. Therefore, there is the very real possibility that EPA's proposal would result in hot spots that would remain unaddressed, endangering the population living in that area and the surrounding environment.

We have reviewed the trading program EPA outlined in both the proposal published in the *Federal Register* on January 30, 2004 and the supplemental notice on March 16, 2004, In light of the concerns we have raised regarding trading of mercury emissions between utilities, we recommend that EPA abandon this approach.

Additional Deficiencies of Proposed Use of Section 111

As stated earlier, STAPPA and ALAPCO believe EPA's choice of Section 111 as the vehicle for regulating emissions of hazardous air pollutants from electric utilities is highly inappropriate. By using Section 111 of the Clean Air Act to regulate mercury and nickel emissions from utilities, EPA has ignored other important statutory obligations under Section 112 of the Clean Air Act. For instance, EPA is disregarding the mandate to examine other hazardous air pollutants including, but not limited to, arsenic, chromium, cadmium, dioxins and hydrogen chloride. We strongly urge EPA to address emissions of other hazardous air pollutants in addition to mercury and nickel and to do so under Section 112.

Furthermore, while Section 112 requires EPA to evaluate and address the risks that remain eight years after a MACT standard is issued, Section 111 circumvents those requirements and does not mandate a future evaluation of residual risk. The Residual Risk program contained in Section 112(f) is a critical element of the Clean Air Act's efforts to protect public health against the dangers of exposure to toxic air pollution and should be applied to utilities, as it is to other sources of hazardous air pollutants.

STAPPA and ALAPCO strongly believe there is no justification for EPA to take such a huge legal risk by regulating mercury under Section 111 of the Clean Air Act when Congress clearly intended that mercury, like other hazardous air pollutants, be regulated under Section 112. Adoption of a Section 111 rule will undoubtedly be the

subject of protracted legal battles, which will further delay the protection of public health and the environment.

Finally, we are concerned that the use of Section 111, rather than Section 112, will result in a process similar to the State Implementation Plan (SIP) system currently used for Criteria Pollutants. That is, each state or local agency will be required to develop a plan, submit it to EPA, and await approval. Rather than a uniform national approach to regulating HAP emissions from utilities, which Section 112 would provide, the result of a Section 111 regulation would be a time-consuming process, a duplication of effort by each state and many local agencies, and an inconsistent set of state-by-state programs.

Process for Developing the Proposals

We feel compelled to comment on the process EPA used to develop these proposed standards. STAPPA and ALAPCO representatives were involved in the formal, one-and-a-half year Federal Advisory Committee Act (FACA) stakeholder process that EPA sponsored to develop the utility MACT. The FACA workgroup consisted of federal, state, local, industry and environmental group representatives, including six members representing state, local and tribal agencies; eight members representing environmental organizations; 14 members representing industry; one member representing control equipment vendors; and two members representing coal interests, producers and unions. This group met 14 times over a period of 18 months and thoroughly analyzed all issues related to the regulation of toxic air pollution from utilities.

In its January 30, 2004, proposal, EPA completely disregarded the stakeholder group's deliberations. For example, during the stakeholder process, the group never considered the possibility of substituting Section 111 for Section 112. In addition, the FACA workgroup dismissed the possibility of trading mercury emissions between utilities. Furthermore, upon completing the process, the workgroup requested that EPA complete integrated planning modeling based on the workgroup's final recommendations. EPA has failed to do this. It is unacceptable that EPA would abandon the efforts of the agency's FACA workgroup and propose a rule that represents such a marked departure from what the stakeholders considered and recommended. In addition to rejecting the expert advice the agency needed, EPA's action undermines and devalues the entire FACA process.

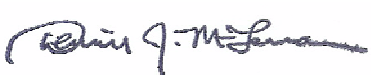
While we were extremely disappointed that the recommendations of the FACA workgroup were ignored, we were absolutely astonished to learn that the proposals EPA issued contained evidence of excessive reliance on industry input. For example, we noted that portions of documents supplied by an industry group and a law firm representing industry clients appeared verbatim or in nearly identical form in the proposals. This does not reflect an open process that takes into account the recommendations of the other stakeholders.

Conclusion

In light of all of these serious concerns with EPA's proposed regulations for limiting hazardous air pollutant emissions from utilities, STAPPA and ALAPCO strongly urge EPA to abandon its proposed strategy, and, instead, develop final MACT standards with stringent limits as required by Section 112(d) of the Clean Air Act. We continue to believe that the adoption of MACT standards for utilities is necessary and appropriate to protect public health and the environment.

Please do not hesitate to contact us if you need additional information.

Sincerely,



James A. Joy, III
President of STAPPA

Dennis J. McLerran
President of ALAPCO

North Carolina Division of Air Quality Letter

June 29, 2004

EPA Docket Center (Air Docket)
U.S. EPA West (6102T)
Room B-108
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460
Attention Docket ID No. OAR-2002-0056

To Whom It May Concern:

On behalf of the North Carolina Division of Air Quality (DAQ), I would like to offer comments on the U.S. Environmental Protection Agency's (EPA's) proposed and supplemental proposed rules addressing national emission standards for hazardous air pollutants (NESHAP) for mercury and nickel which were published in the Federal Register January 30, 2004 and March 16, 2004.

My comments focus on three areas: the health effects of mercury in North Carolina, a comparison of the EPA proposal with existing measures in North Carolina, and a discussion on the relationship between the EPA proposal and future steps required to be taken by North Carolina.

Health Effects of Mercury in North Carolina

Methylmercury levels in fish from eastern North Carolina continue to be elevated above all of the existing toxicological benchmarks provided by the federal government, including benchmarks by the Food and Drug Administration and the Environmental Protection Agency. The North Carolina Department of Health and Human Services has issued fish consumption advisories for three species of freshwater fish that may be caught from waters south and east of Interstate-85; this constitutes more than one half of the state. The Department of Health and Human Services has advised women of childbearing age and small children not to consume these three species of fish when caught from surface waters south and east of Interstate-85. Reduced consumption rates are recommended for the general public. This is a tremendous loss of use of surface waters and natural resources. What makes this all the more important is that the area of greatest concern with respect to methylmercury levels in fish tissue is also the area with the most economic difficulty. Much of eastern North Carolina is economically depressed due to the loss of jobs and many families have resorted to providing their own sustenance through increased fishing and/or hunting.

Studies conducted by the Division of Water Quality suggest that mercury and methylmercury levels in surface waters, and therefore in fish, will not reach benchmark levels without realizing mercury reductions in the atmosphere. Total mercury concentrations in rainwater are at or above levels that water quality agencies would seek

in order to restore the ability to eat locally caught fish without an increased risk of neurological effects. Water quality agencies would typically seek pollutant reductions from wastewater and stormwater when a loss of use occurs. In this case, most municipal wastewater facilities have already installed equipment that would reach the current level of best available technology for mercury removal. This is in spite of the fact that most municipal wastewater facilities also receive and treat rainwater prior to discharging back to surface waters. Clearly this is not a situation to which traditional Clean Water Act controls would apply.

Therefore significant reduction in mercury emissions to the atmosphere is necessary for public health protection. Also, the reduction in a national program must assure that all local problem areas with identified mercury issues benefit from the program.

Comparison of the EPA Proposal with Existing Measures in North Carolina

Recognizing these health concerns, North Carolina is moving forward to control mercury emissions. In 2002, North Carolina passed the Clean Smokestacks Act (CSA), which substantially cuts the state's coal-fired power plants emissions of multiple air pollutants that cause smog, haze and other pollution problems. Under the CSA, North Carolina's 14 coal-fired power plants will reduce their emissions of key pollutants. In particular, the CSA requires power plants to reduce:

> Nitrogen oxide (NOx) emissions from 245,000 tons in 1998 to 56,000 tons by 2009 (78 percent).
>
> Sulfur dioxide (SO2) emissions from 489,000 tons in 1998 to 250,000 tons by 2009 (49 percent) and 130,000 tons by 2013 (74 percent).

The pollution controls required under the CSA are projected, as a co-benefit, to reduce mercury emissions in North Carolina by more than 50 percent by 2012. The EPA proposals will not yield comparable reductions. Under the proposed MACT, the reductions projected are 29 percent until 2018 nationally. In addition, there is no guarantee of site-specific reductions due to EPA's proposed Cap-and-Trade system.

Relationship Between the EPA Proposal and the Future Steps Required to be taken by North Carolina

In addition, the CSA requires the DAQ to conduct a study of mercury emissions in the state, including "the development and implementation of standards and plans to implement programs to control emissions of mercury from coal-fired generating units." Attached to these comments is a copy of the first interim report, "Mercury Emissions and Mercury Controls for Coal-Fired Electrical Utility Boilers", dated September 1, 2003. DAQ's final findings and recommendations are due to the NC legislature no later than September 1, 2005.

We would encourage EPA to consider in its final rule the process North Carolina already has in motion for evaluating the health needs and available technologies for achieving additional mercury reductions. Given the significant early reductions from implementation of the CSA, North Carolina hopes EPA will pass regulations that require similar reductions in other States. Regional reductions in mercury are required to ensure speedy return to safe consumption of local fish by populations at risk.

To summarize my comments: (1) mercury is a significant health problem in North Carolina, (2) the speed and amount of reduction of EPA's proposal are less than those for North Carolina's own requirements, and (3) the EPA rule needs to offer explicit right and authority for States to deal with residual local issues and to avoid preempting State programs.

Thank you for the opportunity to comment and for your consideration of these comments in the development of the final rule. Should you have any questions on the comments, please contact Sheila Holman of my staff at (919) 715-0971.

Sincerely,

B. Keith Overcash, P.E.

Attachment

cc: Secretary Bill Ross
Alan Klimek, P.E.

Appendix C
Electrical Generating Boiler
Mercury Emission Estimates
EPA Emission Estimating Tool Estimates

DUKE POWER	US EPA Mercury Emission Estimating Tool Data			Hg In Combusted Coal	Existing Hg Emissions		Clean Stacks Hg Emissions		Project
Plant	**Unit**	**Plant**	**Location**	**Lbs/year**	**Percent Reduced**	**Lbs/year**	**Percent Reduced**	**Lbs/year**	**Completion Date**
Allen	1	Allen	Belmont	43	29	31	69	10	2011
Allen	2	Allen	Belmont	20	29	14	69	4	2011
Allen	3	Allen	Belmont	80	29	56	69	18	2011
Allen	4	Allen	Belmont	82	29	58	69	18	2012
Allen	5	Allen	Belmont	82	29	58	69	18	2012
			TOTAL	**308**		**218**		**69**	
Belews Creek	1	Belews Creek	Walnut Cove	420	29	298	69	94	2008
Belews Creek	2	Belews Creek	Walnut Cove	314	29	222	69	70	2008
			TOTAL	**734**		**520**		**163**	
Buck	5	Buck	Salisbury	6	11	5	0	5	None
Buck	6	Buck	Salisbury	6	11	5	0	5	None
Buck	7	Buck	Salisbury	7	11	6	0	6	None
Buck	8	Buck	Salisbury	43	11	38	0	38	None
Buck	9	Buck	Salisbury	43	11	39	0	39	None
			TOTAL	**104**		**93**		**93**	
Cliffside	1	Cliffside	Cliffside	3	11	3	0	3	None
Cliffside	2	Cliffside	Cliffside	3	11	3	0	3	None
Cliffside	3	Cliffside	Cliffside	7	11	6	0	6	None
Cliffside	4	Cliffside	Cliffside	7	11	6	0	6	None
Cliffside	5	Cliffside	Cliffside	121	29	86	69	27	2009
			TOTAL	**141**		**104**		**45**	
Dan River	1	Dan River	Eden	9	11	8	0	8	None
Dan River	2	Dan River	Eden	9	11	8	0	8	None
Dan River	3	Dan River	Eden	22	29	16	0	16	None
			TOTAL	**41**		**32**		**32**	
Marshall	1	Marshall	Terrell	119	29	84	69	26	2007
Marshall	2	Marshall	Terrell	132	29	93	69	29	2007
Marshall	3	Marshall	Terrell	172	29	122	69	38	2006
Marshall	4	Marshall	Terrell	219	29	155	69	49	2006
			TOTAL	**642**		**455**		**143**	
Riverbend	4	Riverbend	Mount Holly	32	11	28	0	28	None
Riverbend	5	Riverbend	Mount Holly	11	11	10	0	10	None
Riverbend	6	Riverbend	Mount Holly	11	11	10	0	10	None
Riverbend	7	Riverbend	Mount Holly	30	11	27	0	27	None
			TOTAL	**84**		**75**		**75**	
		Duke Energy	**Total**	**2054**		**1498**		**621**	
		NC State	**Total**	**4,094**		**3,056**		**1,416**	

Appendix C
Electrical Generating Boiler
Mercury Emission Estimates

PROGRESS ENERGY	US EPA Mercury Emission Estimating Tool Data		Hg In Combusted Coal	Existing Hg Emissions		Clean Stacks Hg Emissions		Project
Plant	**Unit**	**Location**	**Lbs/year**	**Percent Reduced**	**Lbs/year**	**Percent Reduced**	**Lbs/year**	**Completion Date**
Ashville	2	Arden	105	29	74	69	23	2006
		TOTAL	**196**		**139**		**44**	
Cape Fear	5	Moncure	53	29	38	69	12	2012
Cape Fear	6	Moncure	73	29	51	69	16	2011
		TOTAL	**126**		**89**		**28**	
Lee	1	Goldsboro	25	29	18	0	18	None
Lee	2	Goldsboro	24	11	21	0	21	None
Lee	3	Goldsboro	89	29	63	0	63	None
		TOTAL	**138**		**102**		**102**	
Mayo	1A	Roxboro	128	11	115	32	78	2008
Mayo	1B	Roxboro	128	11	115	32	78	2008
		TOTAL	**257**		**229**		**156**	
Roxborro	1	Semora	171	29	121	69	38	2009
Roxborro	2	Semora	296	29	210	69	66	2007
Roxborro	3A	Semora	163	29	115	69	36	2007
Roxborro	3B	Semora	163	29	115	69	36	2007
Roxborro	4A	Semora	132	11	118	32	80	2007
Roxborro	4B	Semora	132	11	118	32	80	2007
		TOTAL	**1056**		**797**		**337**	
L V Sutton	1	Wilmington	33	11	30	11	30	None
L V Sutton	2	Wilmington	31	11	28	11	28	None
L V Sutton	3	Wilmington	152	29	108	69	34	2012
		TOTAL	**216**		**165**		**91**	
Wspn	1	Lumberton	15	29	11	0	11	None
Wspn	2	Lumberton	15	29	11	0	11	None
Wspn	3	Lumberton	23	29	16	0	16	None
		TOTAL	**53**		**37**		**37**	
		State Totals lbs/year	**4,094**		**3,056**		**1,416**	

Appendix C
Electrical Generating Boiler
Mercury Emission Estimates
Speciated Mercury Emissions Using EPA Mercury Emission Tool

EPA Mercury Emission Estimating Tool Data													
			Existing						Clean Stacks				
		Hg in Coal	Total Hg		Hg Species Emissions				Total Hg		Hg Species Emissions		
			Percent	Emission	Elemental	PM	Oxidized		Percent	Emission	Elemental	PM	Oxidized
Plant	Unit	Lbs/year	Reduced	Lbs/year	Lbs/year				Reduced	Lbs/year	Lbs/year		
Duke Power **(North Carolina)**													
Allen	1	43.42	29.10	30.77	7.91	1.88	20.99		77.70	9.68	8.91	0.02	0.75
Allen	2	20.01	29.10	14.18	3.65	0.87	9.67		77.70	4.46	4.11	0.01	0.35
Allen	3	79.64	29.10	56.44	14.51	3.45	38.51		77.70	17.76	16.34	0.04	1.38
Allen	4	82.42	29.10	58.41	15.02	3.57	39.85		77.70	18.38	16.91	0.04	1.43
Allen	5	82.16	29.10	58.22	14.97	3.56	39.72		77.70	18.32	16.86	0.04	1.43
Subtotal		307.65		218.02	56.06	13.32	148.75			68.61	63.12	0.15	5.34
Belews Cre	1	419.95	29.10	297.60	76.52	18.18	203.05		77.70	93.65	86.16	0.20	7.28
Belews Cre	2	313.66	29.10	222.28	57.15	13.58	151.66		77.70	69.95	64.35	0.15	5.44
Subtotal		733.61		519.88	133.67	31.76	354.70			163.59	150.51	0.36	12.73
Buck	5	5.68	10.70	5.23	1.89	0.25	2.93		10.70	5.07	1.89	0.25	2.93
Buck	6	5.68	10.70	5.23	1.89	0.25	2.93		10.70	5.07	1.89	0.25	2.93
Buck	7	7.06	10.70	6.31	2.35	0.31	3.65		10.70	6.30	2.35	0.31	3.65
Buck	8	42.54	10.70	38.01	14.15	1.86	21.97		10.70	37.99	14.15	1.86	21.97
Buck	9	43.28	10.70	38.67	14.40	1.89	22.35		10.70	38.65	14.40	1.89	22.35
Subtotal		104.24		93.45	34.68	4.56	53.84			93.09	34.68	4.56	53.84
Cliffside	1	3.22	10.70	2.88	1.07	0.14	1.66		10.70	2.88	1.07	0.14	1.66
Cliffside	2	3.40	10.70	3.04	1.13	0.15	1.76		10.70	3.04	1.13	0.15	1.76
Cliffside	3	6.52	10.70	5.83	2.17	0.29	3.37		10.70	5.82	2.17	0.29	3.37
Cliffside	4	7.24	10.70	6.47	2.41	0.32	3.74		10.70	6.47	2.41	0.32	3.74
Cliffside	5	120.91	29.10	85.69	22.03	5.23	58.46		77.70	26.96	24.81	0.06	2.10
Subtotal		141.29		103.91	28.81	6.13	68.99			45.16	31.59	0.95	12.62
Dan River	1	9.12	10.70	8.15	3.03	0.40	4.71		10.70	8.14	3.03	0.40	4.71
Dan River	2	9.44	10.70	8.43	3.14	0.41	4.88		10.70	8.43	3.14	0.41	4.88
Dan River	3	22.38	29.10	15.86	4.08	0.97	10.82		29.10	15.87	4.08	0.97	10.82
Subtotal		40.94		32.44	10.25	1.78	20.41			32.44	10.25	1.78	20.41
Marshall	1	118.65	29.10	84.08	21.62	5.14	57.37		77.70	26.46	24.34	0.06	2.06
Marshall	2	131.65	29.10	93.29	23.99	5.70	63.65		77.70	29.36	27.01	0.06	2.28
Marshall	3	172.41	29.10	122.18	31.41	7.46	83.36		77.70	38.45	35.37	0.08	2.99
Marshall	4	219.02	29.10	155.21	39.91	9.48	105.90		77.70	48.84	44.94	0.11	3.80
Subtotal		641.73		454.76	116.93	27.78	310.28			143.10	131.66	0.31	11.13
Riverbend	4	31.66	10.70	28.29	10.53	1.39	16.35		10.70	28.27	10.53	1.39	16.35
Riverbend	5	11.04	10.70	9.87	3.67	0.48	5.70		10.70	9.86	3.67	0.48	5.70
Riverbend	6	11.36	10.70	10.15	3.78	0.50	5.87		10.70	10.14	3.78	0.50	5.87
Riverbend	7	30.29	10.70	27.07	10.08	1.33	15.65		10.70	27.05	10.08	1.33	15.65
Subtotal		84.35		75.38	28.07	3.69	43.57			75.32	28.07	3.69	43.57
Duke Energy		2050.01	26.94	1497.84	408.46	89.02	1000.53		69.69	621.32	449.88	11.80	159.64
Progress Energy (North Carolina)													
Asheville	1	91.27	29.10	64.71	16.63	3.95	44.13		77.70	20.35	18.73	0.04	1.58
Asheville	2	104.52	29.10	74.10	19.04	4.52	50.54		77.70	23.31	21.44	0.05	1.81
Subtotal		195.79		138.82	35.67	8.48	94.66			43.66	40.17	0.10	3.40
Cape Fear	5	53.24	29.10	37.75	9.70	2.30	25.74		77.70	11.87	10.92	0.03	0.92
Cape Fear	6	72.51	29.10	51.41	13.21	3.14	35.06		77.70	16.17	14.88	0.04	1.26
Subtotal		125.75		89.16	22.91	5.44	60.80			28.04	25.80	0.06	2.18
Lee	1	25.27	29.10	17.92	4.60	1.09	12.22		29.10	17.92	4.60	1.09	12.22
Lee	2	23.66	11.00	21.13	7.87	1.04	12.22		11.00	21.13	7.87	1.04	12.22
Lee	3	88.67	29.10	62.87	16.16	3.84	42.87		29.10	62.87	16.16	3.84	42.87
Subtotal		137.60		101.91	28.63	5.97	67.31			101.91	28.63	5.97	67.31
Mayo	1A	128.31	11.00	114.58	42.69	5.62	66.27		39.20	78.01	61.39	0.49	16.13
Mayo	1B	128.31	11.00	114.58	42.69	5.62	66.27		39.20	78.01	61.39	0.49	16.13
Subtotal		256.62		229.16	85.38	11.23	132.55			156.02	122.79	0.98	32.26
Roxboro	1	171.03	29.10	121.26	31.16	7.40	82.69		77.70	38.14	35.09	0.08	2.97
Roxboro	2	295.73	29.10	209.67	53.88	12.80	142.99		77.70	65.95	60.67	0.14	5.13
Roxboro	3A	162.62	29.10	115.30	29.63	7.04	78.63		77.70	36.26	33.36	0.08	2.82
Roxboro	3B	162.62	29.10	115.30	29.63	7.04	78.63		77.70	36.26	33.36	0.08	2.82
Roxboro	4A	131.90	11.00	117.79	43.89	5.77	68.13		39.20	80.20	63.11	0.50	16.58
Roxboro	4B	131.90	11.00	117.79	43.89	5.77	68.13		39.20	80.20	63.11	0.50	16.58
Subtotal		1055.80		797.10	232.08	45.83	519.19			337.01	288.71	1.39	46.90
L V Sutton	1	33.08	11.00	29.54	11.01	1.45	17.09		11.00	29.54	11.01	1.45	17.09
L V Sutton	2	30.98	11.00	27.67	10.31	1.36	16.00		11.00	27.67	10.31	1.36	16.00
L V Sutton	3	152.08	29.10	107.82	27.71	6.58	73.53		77.70	33.91	31.20	0.07	2.64
Subtotal		216.14		165.03	49.02	9.39	106.62			91.12	52.52	2.88	35.73
Weather spo	1	15.07	29.10	10.68	2.75	0.65	7.29		29.10	10.68	2.75	0.65	7.29
Weather spo	2	15.29	29.10	10.84	2.79	0.66	7.39		29.10	10.84	2.79	0.66	7.39
Weather spo	3	22.53	29.10	15.97	4.11	0.98	10.89		29.10	15.97	4.11	0.98	10.89
Subtotal		52.89		37.50	9.64	2.29	25.57			37.50	9.64	2.29	25.57
Progress Energy		2040.59		1558.68	463.34	88.63	1006.70			795.27	568.26	13.66	213.35
State Totals		4094.40	25.34	3056.69	871.81	177.65	2007.24		65.40	1416.58	1018.14	25.46	372.98

Appendix C
Electrical Generating Boiler
Mercury Emission Estimates
Speciated Mercury Emissions Using EPRI Mercury Emission Tool
Duke Power

		Hg in Coal	Cl in Coal	Cl/SO2 Ratio	Existing						Clean Stacks				
EPRI Mercury Emission Estimating Tool Data					Total Hg		Hg Species Emissions				Total Hg		Hg Species Emissions		
					Percent Reduced	Emission Lbs/year	Elemental	PM	Oxidized		Percent Reduced	Emission Lbs/year	Elemental	PM	Oxidized
		Lbs/year	ppm				Lbs/year						Lbs/year		
Allen	1	43	1153	904	45	23	8	0	16		67	14	12	0	2
Allen	2	18	1153	904	45	10	3	0	7		67	6	5	0	1
Allen	3	78	1153	904	45	43	14	1	28		67	26	21	0	4
Allen	4	78	1153	904	45	43	14	1	29		67	26	21	0	4
Allen	5	78	1153	904	45	43	14	1	29		67	26	21	0	4
Subtotal		295				162	52	2	108			97	81	0	16
Belews Creek	1	424	1197	965	46	230	73	3	154		68	137	114	1	23
Belews Creek	2	309	1197	965	46	167	53	3	112		68	100	83	0	17
Subtotal		734				397	125	6	266			237	197	1	39
Buck	5	6	823	599	22	4	2	0	2		22	4	2	0	2
Buck	6	6	823	599	22	4	2	0	2		22	4	2	0	2
Buck	7	7	823	599	22	5	2	0	3		22	5	2	0	3
Buck	8	45	823	599	22	35	16	0	19		22	35	16	0	19
Buck	9	46	823	599	22	36	16	0	19		22	36	16	0	19
Subtotal		109				85	38	1	46			85	38	1	46
Cliffside	1	3	1479	1103	27	2	1	0	1		27	2	1	0	1
Cliffside	2	3	1479	1103	27	3	1	0	2		27	3	1	0	2
Cliffside	3	7	1479	1103	27	5	2	0	3		27	5	2	0	3
Cliffside	4	8	1479	1103	27	6	2	0	4		27	6	2	0	4
Cliffside	5	122	1479	1103	48	64	18	1	45		70	37	30	0	6
Subtotal		143				79	24	1	54			52	35	0	16
Dan River	1	11	1183	922	25	8	3	0	5		25	8	3	0	5
Dan River	2	12	1183	922	25	9	3	0	5		25	9	3	0	5
Dan River	3	29	1183	922	45	16	5	0	10		45	16	5	0	10
Subtotal		52				33	12	0	21			33	12	0	21
Marshall	1	119	1062	810	44	67	22	1	44		66	40	34	0	6
Marshall	2	132	1062	810	44	74	25	1	48		66	44	37	0	7
Marshall	3	165	1062	810	44	93	31	1	61		66	56	47	0	9
Marshall	4	218	1062	810	44	123	41	2	80		66	74	62	0	12
Subtotal		634				357	118	5	233			214	179	1	34
Riverbend	4	11	924	626	23	8	4	0	5		23	8	4	0	5
Riverbend	5	11	924	626	23	8	4	0	5		23	8	4	0	5
Riverbend	6	30	924	626	23	23	10	0	13		23	23	10	0	13
Riverbend	7	31	924	626	23	24	10	0	13		23	24	10	0	13
Subtotal		83				64	28	1	36			64	28	1	36
Duke Energy		2050			43	1177	397	17	763		62	782	570	5	208
State Totals		4096			41	2397	29	1	69		63.2	1508	1105	9	394

Appendix C
Electrical Generating Boiler
Mercury Emission Estimates

Speciated Mercury Emissions Using EPRI Mercury Emission Tool

Progress Energy

		Hg in Coal	Cl in Coal	Cl/SO2 Ratio	Existing						Clean Stacks				
EPRI Mercury Emission Estimating Tool Data					Total Hg		Hg Species Emissions				Total Hg		Hg Species Emissions		
					Percent Reduced	Emission Lbs/year	Elemental	PM	Oxidized		Percent Reduced	Emission Lbs/year	Elemental	PM	Oxidized
		Lbs/year	ppm				Lbs/year						Lbs/year		
Asheville	1	91	970	612	40	54	19	1	35		65	32	27	0	5
Asheville	2	106	970	612	40	63	22	1	41		65	37	31	0	6
Subtotal		197				118	40	2	75			69	57	0	11
Cape Fear	5	53	1776	1108	48	28	7	0	20		70	16	13	0	3
Cape Fear	6	73	1776	1108	48	38	10	1	28		70	22	18	0	4
Subtotal		126				66	18	1	48			38	31	0	7
Lee	1	25	1468	954	46	14	4	0	10		46	14	4	0	10
Lee	2	24	1468	954	27	17	6	0	11		27	17	6	0	11
Lee	3	88	1468	954	46	48	14	1	33		46	48	39	0	8
Subtotal		137				79	24	1	54			79	49	1	29
Mayo	1A	127	2186	2124	27	93	27	1	65		65	44	32	0	12
Mayo	1B	127	2186	2124	27	93	27	1	65		65	44	32	0	12
Subtotal		254				185	54	2	129			89	65	1	24
Roxboro	1	171	1482	1022	47	92	26	1	64		70	51	42	0	9
Roxboro	2	297	1482	1022	47	159	46	2	110		70	89	73	0	15
Roxboro	3A	165	1482	1022	47	88	25	1	61		70	49	41	0	9
Roxboro	3B	164	1482	1022	47	88	25	1	61		70	49	40	0	9
Roxboro	4A	134	1482	1022	27	97	28	1	68		65	47	38	0	8
Roxboro	4B	134	1482	1022	27	97	28	1	68		65	47	38	0	8
Subtotal		1064				621	179	9	432			333	273	1	58
L V Sutton	1	33	1818	1240	27	24	8	0	16		27	24	8	0	16
L V Sutton	2	30	1818	1240	27	22	7	0	15		27	22	7	0	15
L V Sutton	3	152	1818	1240	49	78	20	1	56		70	46	37	0	8
Subtotal		215				124	35	2	87			92	52	1	39
Weather spoon	1	15	1717	1105	48	8	2	0	6		48	8	2	0	6
Weather spoon	2	15	1717	1105	48	8	2	0	6		48	8	2	0	6
Weather spoon	3	23	1717	1105	48	12	3	0	8		48	12	3	0	8
Subtotal		53				28	8	0	20			28	8	0	20
Progress Energy		2046			40	1220	357	18	845		65	726	535	4	187
State Totals		4096			41	2397	29	1	69		63.2	1508	1105	9	394

APPENDIX D

2002 REPORTED NC MERCURY EMISSIONS

Location Name	Pounds/Year	Percent
Duke Energy Corp - Belews Creek Steam Station	**730.5448**	**14.04**
Nucor Steel	679.0190	13.05
CP&L - Roxboro Steam Electric Plant	**666.2140**	**12.80**
Duke Energy Corporation - Marshall Steam Station	**620.9031**	**11.93**
PCS Phosphate Company Inc. - Aurora	267.6866	5.14
CP&L - Mayo Facility	**258.0166**	**4.96**
Duke Energy Corporation - Allen Steam Station	**237.6020**	**4.57**
New Hanover County WASTEC	172.2500	3.31
Duke Energy Corporation - Cliffside Steam Station	**136.6129**	**2.62**
L V Sutton Steam Electric Plant	**132.0304**	**2.54**
Duke Energy Corporation - Riverbend Steam Station	**110.6019**	**2.13**
Progress Energy - F Lee Plant	**109.2136**	**2.10**
Duke Energy Corporation - Buck Steam Station	**88.9013**	**1.71**
Progress Energy Carolinas - Cape Fear Plant	**78.7800**	**1.51**
Cleveland Regional Medical Center	61.0000	1.17
University of North Carolina at Chapel Hill	45.4924	0.87
Blue Ridge Paper Products - Canton Mill	45.0843	0.87
DAK Monomers LLC	42.5850	0.82
Progress Energy Carolinas, Inc., W.H. Weatherspoon Plant	**38.0100**	**0.73**
Weyerhaeuser Company - Plymouth	36.5900	0.70
Ecusta Business Development Center LLC	34.2000	0.66
Cogentrix of Rocky Mount	33.2009	0.64
Stericycle Inc	27.7725	0.53
Duke Energy Corp - Dan River Steam Station	**27.7024**	**0.53**
Duracell Global Business Management Group	27.0000	0.52
Invista, Incorporated	24.7900	0.48
Duke University	24.5000	0.47
Marine Corps Air Station	19.5416	0.38
Miller Brewing Company - Eden Plant	19.5000	0.37
Cogentrix of North Carolina Inc - Southport	17.7602	0.34
Union Mem Regl Medcenterinc **inactive**	16.7000	0.32
Carolina Stalite Company	16.2728	0.31
Forest City Tool	16.0000	0.31
Frye Regional Medical Center	15.6720	0.30
International Paper	14.1332	0.27
Elementis Chromium	14.1200	0.27
Leesona Co John Brown Div**inactive**	12.0000	0.23
Cargill Inc - Fayetteville	11.3664	0.22
Tyson Foods Inc Harmony	10.5470	0.20
Cape Fear Valley Med Center	10.2000	0.20
Onslow Memorial Hospital	8.0120	0.15
Cogentrix of North Carolina Inc	7.0902	0.14
Craven County Wood Energy	6.9100	0.13
Total Mercury Emissions in Pounds Per Year	4972.1291	

* List is truncated from original

03/2003

FACT SHEET
THE AIR TOXICS STRATEGY

What are air toxics?

Air toxics, which are also known as hazardous air pollutants (HAP), are those pollutants known or suspected to cause cancer or other serious health problems, or cause adverse environmental and ecological effects. EPA is required by the Clean Air Act to address 188 toxic air pollutants. We are exposed to some of these pollutants often in the form of gasoline, dry cleaning chemicals, cleaning solvents, and paint strippers. A complete listing of the pollutants can be found at http://www.epa.gov/ttn/atw/188polls.html.

What has EPA done about air toxic emissions so far?

To date, EPA has issued 79 air toxic standards (covering 123 source categories) for many of the major industrial and commercial sources, including chemical plants, steel mills, as well as, some categories of smaller sources, like dry cleaners. When fully implemented, these standards should reduce air toxic emissions by almost a million tons per year. In addition, we have developed tighter standards for tailpipe emissions from cars and trucks, for refueling vehicles, and for substantially cleaner gasoline highway diesel fuel. In addition, diesel vehicles and most nonroad engines have been substantially redesigned to reduce emissions. The indoor environments program is of particular relevance to the Strategy because people in urban settings spend as much as 80% of their time indoors. EPA is currently developing an indoor air toxics strategy which will assess indoor air exposures and present next steps in our strategic approach, building upon the current information and relying heavily on voluntary, non-regulatory efforts to reduce risks from air toxics indoors.

What is the Air Toxics Strategy?

Congress instructed EPA to develop a strategy for air toxics in urban areas that includes specific actions to address the large number of smaller, area sources, and that contains broader risk reduction goals encompassing all stationary sources. The Air Toxics Strategy is EPA's ***integrated*** framework for addressing air toxics in those urban areas by looking at stationary, mobile, and indoor source emissions. Air toxics can pose special threats in urban areas because of the large number of people and the variety of sources of toxic air pollutants, such as cars, trucks, large factories, gasoline stations, and dry cleaners. Individually, some of these sources may not emit large amounts of toxic pollutants. However, all of these pollution sources combined can potentially pose significant health threats, particularly to sensitive subgroups such as children and the elderly. We are also concerned about the impact of toxic emissions on minority and low-income communities, which are often located close to industrial and commercial urbanized areas.

What are the goals of the Air Toxics Strategy?

We have three goals for the Strategy: 1) attain a 75% reduction in incidence of cancer attributable to exposure to HAPs emitted by large and small stationary sources nationwide; 2) attain a substantial reduction in public health risks (such as birth defects and reproduction effects) posed by HAP emissions from small industrial/commercial sources known as areas sources; and 3) address disproportionate impacts of air toxics hazards across urban areas such as geographic "hot spots," highly exposed population subgroups, and predominately minority and low-income communities.

What does the Air Toxics Strategy require?

The Clean Air Act required EPA to identify a list of at least 30 air toxics that pose the greatest potential health threat in urban areas. As a result, EPA identified a list of 33 air toxics (see attached list) of the 188 toxic air pollutants. The Act also required EPA to identify and list the area source categories that represent 90% of the emissions of the 30 "listed" air toxics and subject them to standards. To date, we have identified 70 area source categories that contribute to the emissions of these 30 pollutants. Of those 70 categories, 14 have been regulated and the remaining are under development or will be developed in the future. The Strategy also identifies the need for further studies of mobile and indoor sources in urban environments.

What will we do to achieve our goals?

We have and will continue to: 1) develop regulations addressing sources of air toxics at both the national and local levels; 2) initiate projects at both the national and local level to address specific pollutants (such as mercury) and to identify and address specific community risks (through pilot projects; 3) conduct air toxic assessments (including expanded air toxics monitoring and modeling) to identify areas of concern, to prioritize efforts to reduce risks, and to track progress; and 4) perform education and outreach to inform stakeholders about the Strategy and to get input into designing programs to implement it.

Who will be affected by the Air Toxics Strategy?

The Strategy will cover most of our major metropolitan areas. EPA is making every effort to address the unique perspectives of the state, local, and tribal governments, public health groups, environmental justice communities, small business communities, and environmental interest groups. EPA feels that if the goals identified in the Strategy are to be achieved, partnerships and working relationships must be formed with these groups.

As a result, EPA is developing infrastructure and programs to address urban air toxics. To learn more about risks at local levels, we have become involved in community assessment and risk reduction projects by providing technical support, risk assessment tools, and supplemental funding to several existing, regionally led, community projects. In addition, to develop methods to characterize local risks (including indoor, stationary, and mobile sources) and to implement risk reduction measures, an

integrated effort is underway with the City of Cleveland, Ohio and various industry, citizen, and community groups. This project is a case example which we hope can be used for other urban air projects initiated throughout the Nation. EPA is also developing a framework of implementation options for state, local, and tribal air toxics programs to assist in their development.

How can you get involved or find out more information?

You'll find current information about the Air Toxics Strategy on our website at http://www.epa.gov/ttn/atw/urban/urbanpg.html. For more information contact Yvonne W. Johnson with the U.S. EPA, Office of Air Quality Planning and Standards, Emission Standards Division and can be reached at 919-541-2798 or johnson.yvonnew@epa.gov.

List of the 33 Urban Air Toxics HAPs

acetaldehyde	ethylene oxide
acrolein	formaldehyde
acrylonitrile	hexachlorobenzene
arsenic compounds	hydrazine
benzene	lead compounds
beryllium compounds	manganese compounds
1, 3-butadiene	mercury compounds
cadmium compounds	methylene chloride
carbon tetrachloride +	nickel compounds
chloroform	polychlorinated biphenyls (PCBs)
chromium compounds	polycyclic organic matter (POM)
coke oven emissions +	quinoline
dioxin	1, 1, 2, 2-tetrachloroethane
ethylene dibromide +	perchloroethylene
propylene dichloride	trichloroethylene
1, 3-dichloropropene	vinyl chloride
ethylene dichloride	--

NOTE: A list of 33 urban HAPs which pose the greatest threats to public health in urban areas was listed in the 1999 Strategy. This list of HAPs considered the emissions from major, area and mobile sources. A subset of this list, 30 HAPs, represents the HAPs having the greatest emissions contribution from area sources. A cross **(+)** denotes the HAPs with less significant emissions contributions from area sources

70 Area Source Categories Subject to Standards

Acrylic Fibers/Modacrylic Fibers Production	Lead & Acid Battery Manufacturing
Ag Chemicals & Pesticides Manuf.	Medical Waste Incinerators*
Asphalt Processing & Asphalt Roofing Manufacturing	Mercury Cell Chlor-Alkali Plants
Autobody Refinishing Paint Shops	Misc. Organic Chemical Manuf. (MON)
Brick & Structural Clay	Municipal Landfills *
Carbon Black Production	Municipal Waste Combustors*
Chemical Manufacturing: Chromium Compounds	Nonferrous Foundries, nec.
Chemical Preparations	Oil & Natural Gas Production
Chromic Acid Anodizing*	Open Burning of Scrap Tires
Commercial Sterilization Facilities*	Other Solid Waste Incinerators (Human/Animal Cremation)
Copper Foundries	Paint Stripping Operations
Cyclic Crude & Intermediate Production	Paints & Allied Products Manufacturing
Decorative Chromium Electroplating*	Pharmaceutical Production
Dry Cleaning Facilities*	Plastic Parts & Products (surface coatings)
Electrical & Electronic Equipment: Finishing Operations	Plastic Materials and Resins Manufacturing
Fabricated Metal Products, nec.	Plating & Polishing
Fabricated Structural Metal Manuf.	Polyvinyl Chloride & Copolymers Production
Ferroalloys Production: Ferromanganese & Silicomanganese	Portland Cement Manufacturing*
Flexible Polyurethane Foam Fabrication Operations	Prepared Feeds Manufacturing
Flexible Polyurethane Foam Production	Primary Copper (not subject to Primary Copper Smelting MACT)
Fabricated Plate Work	Primary Metals Products Manufacturing

Gasoline Distribution (Stage I)	Primary Nonferrous Metals - Zinc, Cadmium and Beryllium
Halogenated Solvent Cleaners*	Pressed & Blown Glass & Glassware Manufacturing
Hard Chromium Electroplating*	Publicly Owned Treatment Works *
Hazardous Waste Incineration*	Secondary Aluminum Production*
Heating Equipment, except electric	Secondary Copper Smelting
Hospital Sterilizers	Secondary Lead Smelting*
Industrial Boilers	Secondary Nonferrous Metals
Industrial Inorganic Chemical Manufacturing	Sewage Sludge Incineration
Industrial Organic Chemical Manufacturing	Stationary Internal Combustion Engines
Industrial Machinery & Equipment: Finishing Operations	Synthetic Rubber Manufacturing
Inorganic Pigments Manufacturing	Stainless & Non-stainless Steel Manufacturing: Electric Arc Furnaces (EAF)
Institutional/Commerical Boilers	Steel Foundries
Iron Foundries	Valves & Pipe Fittings
Iron & Steel Forging	Wood Preserving

* = 14 area source categories <u>already</u> subject to standards

United States
Environmental Protection
Agency

Air and Radiation

EPA400-F-92-004
August 1994

Office of Transportation and Air Quality

Environmental Fact Sheet

Air Toxics from Motor Vehicles

What are Air Toxics?

Air toxics are air pollutants that cause adverse health effects. The U.S. Environmental Protection Agency (EPA) has focused most of its air toxics efforts to date on carcinogens, which are compounds that cause cancer. Non-cancer health effects such as reproductive and neurological problems are also of concern to EPA.

How dangerous are air toxics?

It's hard to say. Some air toxics have been proven to cause cancer in humans. However, most air toxics are identified through laboratory experiments in which animals receive very high doses of the compound being studied. People almost never breathe such high doses. But lower exposures may still pose risks. One fact is clear: vehicles are such an integral part of our society that virtually everyone is exposed to their emissions.

Air Toxics from Vehicles and Their Fuels

Motor vehicles emit several pollutants that EPA classifies as known or probable human carcinogens. Benzene, for instance, is a known human carcinogen, while formaldehyde, acetaldehyde, 1,3-butadiene and diesel particulate matter are probable human carcinogens. Studies are underway to determine whether other toxic substances are present in mobile source emissions. For example, EPA and industry are investigating

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whether oxygen-containing fuel additives such as methyl tertiary butyl ether (MTBE) cause any adverse health effects. EPA is also working with the vehicle and fuel industries to test motor vehicle emissions for the presence of dioxin.

EPA estimates that mobile (car, truck, and bus) sources of air toxics account for as much as half of all cancers attributed to outdoor sources of air toxics. This estimate is not based on actual cancer cases, but on models that predict the maximum number of cancers that could be expected from current levels of exposure to mobile source emissions.

The models consider available health studies, air quality data, and other information about the types of vehicles and fuels currently in use. Non-road mobile sources (such as tractors and snowmobiles) emit air toxics as well.

How are Air Toxics from Motor Vehicles Formed?

Some toxic compounds are present in gasoline and are emitted to the air when gasoline evaporates or passes through the engine as unburned fuel. Benzene, for example, is a component of gasoline. Cars emit small quantities of benzene in unburned fuel, or as vapor when gasoline evaporates.

A significant amount of automotive benzene comes from the incomplete combustion of compounds in gasoline such as toluene and xylene that are chemically very similar to benzene. Like benzene itself, these compounds occur naturally in petroleum and become more concentrated when petroleum is refined to produce high octane gasoline.

Formaldehyde, acetaldehyde, diesel particulate matter, and 1,3-butadiene are not present in fuel but are by-products of incomplete combustion. Formaldehyde and acetaldehyde are also formed through a secondary process when other mobile source pollutants undergo chemical reactions in the atmosphere.

Reducing Air Toxics from Motor Vehicles

The emissions that come out of a vehicle depend greatly on the fuel that goes into it. Consequently, programs to control air toxics pollution have centered around changing fuel composition as well as around improving vehicle technology or performance. One of the first, and most successful

programs has been the removal of lead from gasoline. The lead phaseout began in the mid-1970s. It will be complete January 1, 1996 when lead is banned from gasoline. The removal of lead from gasoline has essentially eliminated mobile source emissions of this highly toxic substance.

More recent fuel and emission control system changes include:

- Limits on gasoline volatility - Volatility is a measure of how easily a liquid evaporates. As described earlier, some toxics such as benzene are present in gasoline and get into the air when gasoline evaporates. Limits on gasoline volatility have been imposed over the last several years to control evaporative emissions of both hydrocarbon and toxic compounds (most air toxics are hydrocarbons so programs designed to reduce hydrocarbon emissions also reduce air toxics).

- Reformulated gasoline - The 1990 Clean Air Act requires reformulated gasoline to be introduced in the nation's most polluted cities beginning in 1995.

- From 1995-1999, these gasolines must provide a minimum 15% reduction in air toxics emissions over typical 1990 gasolines. This increases to a 20% minimum reduction beginning in the year 2000. The air toxics reductions will be achieved mainly by reducing gasoline volatility and by reducing the benzene content of the gasoline.

- Limits on diesel sulfur - Regulations limiting the amount of sulfur in diesel fuel took effect in 1993. Today's lower-sulfur diesel fuels are important in reducing emissions of particulate matter and other air toxics from diesel-fueled buses and trucks.

- More stringent standards and test procedures - To date, there are no specific standards for air toxics emissions from motor vehicles. However, the 1990 Clean Air Act does set specific emission standards for hydrocarbons and for diesel particulate matter. Air toxics are present in both of these pollutant categories. As vehicle manufacturers develop technologies to comply with the hydrocarbon and/or particulate standards (e.g., more efficient catalytic converters), air toxics are reduced as well.

Requirements under the Act for testing carbon monoxide emissions at cold temperatures will also have an indirect but important effect in reducing air toxics emissions in the critical first moments of vehicle operation.

- Control of emissions in actual customer use - From a pollution perspective, what matters most is not new vehicle emission standards but actual emissions from vehicles on the road. The Clean Air Act establishes several programs to make sure vehicle emission controls are functioning properly in actual use. These include requirements for periodic emission inspections and for computerized diagnostic systems that alert drivers and mechanics to malfunctioning emission controls.

In summary, the many vehicle and fuel changes in the last 25 years have greatly reduced air toxics emissions from highway vehicles. New cars today are capable of emitting 90% less air toxics on a per-mile basis than the uncontrolled models of 1970; new trucks and buses are designed to emit less than half the air toxics of their 1970 counterparts.

Overall air toxics emissions will continue to decrease through the 1990s as older vehicles leave the fleet and as new regulatory programs take effect. However, the number of vehicles on the road and the number of miles they travel is continuing to grow. Without additional controls, growth in vehicle travel will offset progress in reducing air toxics by early in the next century.

What More Can Be Done?

The 1990 Clean Air Act requires EPA to specifically regulate air toxics from motor vehicles in the form of standards for fuels, or vehicles, or both.

Additional hydrocarbon and particulate matter controls such as tightening tailpipe standards even further will reduce air toxics emissions somewhat. California for example, sets tighter hydrocarbon limits for vehicles sold in that state than the federal requirements for vehicles sold elsewhere. Other states can choose to adopt the California standards, which provide some air toxics benefits. Expansion of existing regulatory programs (such as more widespread use of reformulated gasoline or wider requirements for emission inspections) could also help reduce air toxics. Specific vehicle emission standards for one or more toxic compounds are also an option.

Changes in gasoline and diesel fuel composition (such as reducing sulfur, benzene or other aromatic chemical compounds) can also reduce air toxics emissions.

A switch to alternative, non-petroleum fuels that are cleaner than today's gasoline and diesel fuels offers another strategy for reducing air toxics. Choices include alcohols, natural gas, propane, and electricity. These fuels are inherently cleaner than conventional gasoline and diesel because they do not contain toxics such as benzene. In addition, they are made of simpler chemical compounds which yield lower levels of complex combustion by-products such as 1,3-butadiene.

For More Information

You can access documents on air toxics for motor vehicles electronically on the Office of Transportation and Air Quality (OTAQ) Web site at:

http://www.epa.gov/otaq/toxics.htm

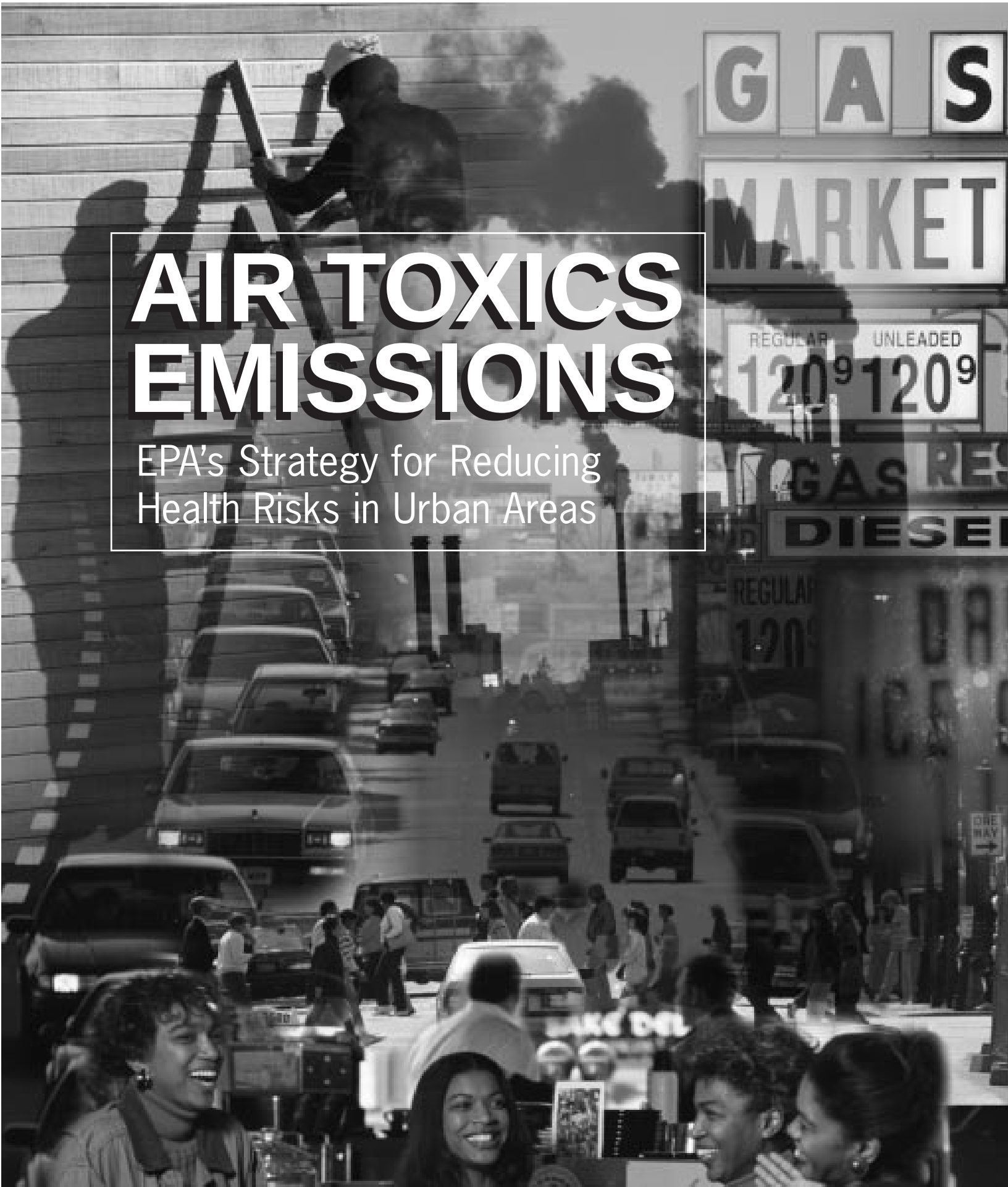
You can also contact us at:

U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Assessment and Standards Division
2000 Traverwood Drive
Ann Arbor, MI 48105
Voicemail: (734) 214-4636
Email: asdinfo@epa.gov

United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park, NC 27711

EPA/453-F-99-002
July 1999



AIR TOXICS EMISSIONS

EPA's Strategy for Reducing Health Risks in Urban Areas

Why is EPA concerned about air toxics?

Millions of people live in areas where toxic air pollutants can potentially pose serious health concerns. Since 1970, the Clean Air Act has provided the principal framework for protecting people and the environment from the harmful effects of air pollution. When Congress passed the Clean Air Act Amendments in 1990, they directed the Environmental Protection Agency (EPA) to address toxic air pollutants coming from sources such as chemical plants, steel mills, cars and trucks.

Progress has been made by EPA, state and local air pollution agencies, and industry in reducing air toxics, but more needs to be done. One component of EPA's efforts focuses on toxic air pollutants in urban areas. Toxic air pollutant emissions in and around urban areas are usually caused by the heavy concentration of factories, the large number of vehicles and other commercial activities in these areas. EPA has developed an urban strategy to target air toxics emissions that potentially pose the greatest health threat.

What are toxic air pollutants?

Under the 1990 Amendments to the Clean Air Act, EPA is required to regulate sources emitting major amounts of 188 toxic air pollutants. Toxic air pollutants include heavy metals (like mercury and lead), volatile chemicals (like benzene), combustion byproducts (like dioxin), and solvents (like carbon tetrachloride and methylene chloride). Exposure to these pollutants under certain conditions causes a wide range of potential human health and environmental effects. For example, benzene is known to cause cancer, while lead is known to cause developmental delays.

Where do toxic air pollutants come from?

There are literally millions of sources, ranging from cars to industrial facilities, that emit toxic air pollutants. Air toxics emissions come from mobile sources, and large and small commercial and industrial sources. Air toxics emissions occur throughout the United States, but the highest concentrations of sources occur primarily in urban areas.

Potential Effects of Toxic Air Pollutants

Human Health

- Cancer
- Birth defects
- Developmental delays
- Reduced immunity
- Difficulty in breathing and respiratory damage
- Headache, dizziness, and nausea

Environmental

- Reproductive effects and developmental delays in wildlife
- Toxicity to aquatic plants and animals
- Accumulation of pollutants in the food chain

What has EPA done about air toxics emissions so far?

As of June 1999, EPA has issued 43 air toxics regulations for many of the larger industrial sources, including chemical plants, steel mills, and lead smelters, as well as some categories of smaller commercial and industrial sources, like dry cleaners. When fully implemented, these regulations will reduce air toxics emissions by more than 1 million tons per year.

- ***Mobile sources*** can include cars, trucks, buses, and non-road vehicles like ships or construction equipment.
- ***Small commercial and industrial sources*** can include dry cleaners, gas stations, and landfills.
- ***Large commercial and industrial sources*** can include chemical plants, oil refineries, and steel mills.

Other regulatory programs targeting mobile sources and large and small commercial and industrial sources have also indirectly helped reduce air toxics emissions. For example:

- Controls to reduce volatile organic compounds (VOC) emissions and small particle emissions from all types of sources (both mobile and stationary) have resulted in reductions of air toxics emissions.
- Eliminating leaded gasoline has resulted in a sharp decline in airborne lead.
- Vehicles designed to meet the next generation of emission standards ("Tier 2" emission levels) will emit approximately 99% less VOC (many of which are toxic pollutants).

What is EPA's Integrated Urban Air Toxics Strategy?

EPA's Integrated Urban Air Toxics Strategy focuses on reducing the human health threats of air toxics in urban areas. Toxic air pollutants are of special concern in urban areas because large concentrations of people live and work near a variety of pollution sources. In this Strategy, EPA outlines future actions that it will take to reduce emissions of air toxics and improve its understanding of the health threats posed by air toxics in urban areas.

Goals

EPA's goals for the Strategy include reduction of cancer and noncancer risks associated with air toxics in urban areas (see Goals). In urban areas, air toxics may threaten the health of some people more than others, depending on factors such as where they live in relation to toxic sources. EPA also has a specific goal to prevent this type of unfair or disproportionate exposure to air toxics.

Pollutants Posing the Greatest Health Threat

As a first step, EPA identified 33 of the 188 toxic air pollutants posing the greatest threat to public health in urban areas (see List). This list is based on the quantity of pollutants released to the air, the harm (or toxicity) caused by these pollutants, and the estimated concentration in the air.

Goals of the Integrated Urban Air Toxics Strategy

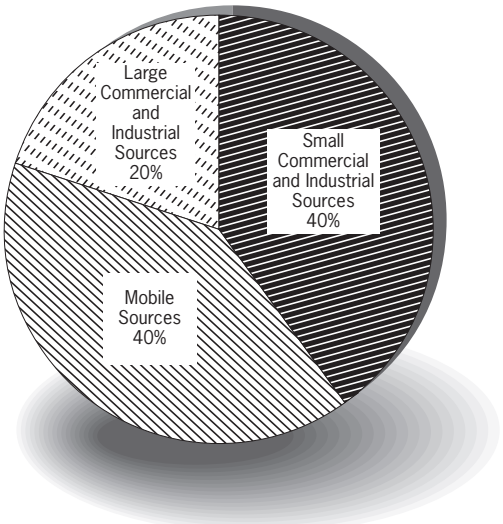
- Reduce by 75% the risk of cancer associated with air toxics from both large and small commercial and industrial sources.
- Substantially reduce noncancer health risks (e.g. birth defects and reproductive effects) associated with air toxics from small commercial and industrial sources.
- Address and prevent disproportionate impacts of air toxics hazards, such as those in areas known as "hot spots," and on sensitive populations in urban areas, including: children, the elderly, minority and low-income communities.

Although diesel emissions are not included as a specific pollutant in this list, many of the hazardous constituents of diesel emissions are included among the 33 urban air toxics. EPA will address diesel emissions specifically as part of an upcoming regulation addressing air toxics emitted from mobile sources. In addition, within the next year, EPA expects to propose a rule lowering sulfur in diesel fuel, which will significantly reduce levels of diesel emissions.

List of 33 Urban Air Toxics

- acetaldehyde
- acrolein
- acrylonitrile
- arsenic compounds
- benzene
- beryllium compounds
- 1,3-butadiene
- cadmium compounds
- carbon tetrachloride
- chloroform
- chromium compounds
- coke oven emissions
- dioxin
- 1,2-dibromoethane
- propylene dichloride
- 1,3-dichloropropene
- ethylene dichloride
- ethylene oxide
- formaldehyde
- hexachlorobenzene
- hydrazine
- lead compounds
- manganese compounds
- mercury compounds
- methylene chloride
- nickel compounds
- polychlorinated biphenyls (PCBs)
- polycyclic organic matter (POM)
- quinoline
- 1,1,2,2-tetrachloroethane
- perchloroethylene
- trichloroethylene
- vinyl chloride

Although these 33 air toxics are estimated to represent approximately 20 percent of national air toxics emissions, they are believed to be the most important air toxics contributing to potential health risks in urban areas. Distribution of the emissions of the 33 urban air toxics among the various source types is shown below.



Distribution of 33 Urban Air Toxics Emissions (represents 1990 baseline)

How will EPA reduce urban air toxics and address risk?

EPA's Strategy outlines the following steps that EPA will take to reduce urban air toxics and address risk:

Achieve reductions through regulatory actions and related projects. As one of the first steps in implementing the Strategy, EPA will focus on reducing emissions from several smaller commercial and industrial operations (referred to as "area" source categories). Collectively, these types of sources can emit large quantities of toxics in urban areas. By 2004, EPA plans to complete regulations to address 13 such sources (see Categories). These are in addition to 16 area source categories for which regulation development is completed or ongoing. EPA will also add to the list of categories in the future as information about air toxics improves.

EPA will also continue to address emissions from all sources. This includes an evaluation of the remaining health and environmental risks from sources subject to existing air toxics standards to determine if further controls are needed. For mobile sources, EPA intends to propose additional regulations addressing toxic emissions from motor vehicles and fuels. EPA will continue efforts that target specific pollutants (e.g., mercury) and expects to initiate a number of pilot projects in the year 2000 to identify and address specific community risks.

New Area Source Categories

- Cyclic Crude and Intermediate Production
- Municipal Landfills
- Flexible Polyurethane Foam Fabrication Operations
- Oil and Natural Gas Production
- Hospital Sterilizers
- Paint Stripping Operations
- Industrial Inorganic Chemical Manufacturing
- Plastic Materials and Resins Manufacturing
- Industrial Organic Chemical Manufacturing
- Publicly Owned Treatment Works
- Mercury Cell Chlor-Alkali Plants
- Synthetic Rubber Manufacturing
- Gasoline Distribution (Stage I)

Collaborate with interested groups. EPA intends to work with state, local, and tribal agencies, environmental groups, environmental justice communities, and affected industries, including small businesses, to assure that any actions under the Strategy are responsive to health concerns while promoting fairness, encouraging urban redevelopment, and minimizing regulatory burden.

Expand knowledge about air toxics emissions and risks. EPA recognizes that people want additional information about air toxics in their community and the potential risk from these emissions. In addition, EPA and state and local air agencies would like this type of information to identify areas of concern, set priorities, communicate risks to communities, and track progress in reducing risks. EPA plans to do several assessments of available air toxics emissions information that will be refined over time as better information becomes available. The information EPA provides to everyone will not only include facts about exposure to air toxics, but also information on the link between water quality and the deposition of air toxics.

As information about risks from air toxics emissions in urban areas continues to improve, EPA will update the Integrated Urban Air Toxics Strategy.

Where can I get more information on urban air toxics?

Visit EPA's Website at www.epa.gov/ttn/uatw/urban/urbanpg.html
or call the U.S. EPA Office of Air Quality Planning and Standards at (919) 541-4487

The Toxics Release Inventory (TRI) and Factors to Consider When Using TRI Data

EXECUTIVE SUMMARY

The Toxics Release Inventory (TRI) contains information about releases of certain chemicals and management of wastes at a wide variety of sources, including manufacturing operations, certain service businesses, and federal facilities. Since its inception, the program has grown in several important ways, including expanding the businesses covered and the chemicals on which they report. Equally important is the number of creative ways the general public, government agencies, and the reporting industries use the information made available. This paper provides an introduction and background on the TRI and identifies a number of important factors that must be considered when reviewing or using the data.

Key factors to consider when using the data, which are discussed in greater detail in the main body of the paper, include:

- Toxicity varies among the covered chemicals; data on amounts of the chemicals alone are inadequate to reach conclusions or formulate policy;
- The presence of a chemical in the environment must be evaluated along with the potential and actual exposures and the route of exposures, the chemical's fate in the environment, and other factors before any statements can be made about potential risks associated with the chemical or a release;
- Many options for managing production-related wastes are subject to stringent technical standards and exacting state and federal regulatory oversight;
- Regulatory controls apply to many of the releases reported that are production related; reporting facilities must comply with environmental standards in addition to reporting residual releases; and
- Some reporters send chemicals off-site in waste to be managed at specialized waste management facilities that are also reporters; adjustments must be made to avoid double counting.

As you read the document you will encounter a variety of specialized terms. Many are further defined in the boxes that appear throughout the document. There are also other sources of additional information that may help you understand the data. The TRI home page (http://www.epa.gov/tri) includes background information on the TRI program and TRI data as well as information on applicable standards, regulations and guidance. The TRI User Support Service (202-566-0250, tri.us@epa.gov) can provide assistance in accessing and using the TRI data.

Introduction and Background

Following a fatal chemical-release accident in Bhopal, India, the Emergency Planning and Community Right-to-Know Act (EPCRA) was enacted to promote emergency planning, to minimize the effects of an accident such as occurred at Bhopal, and to provide the public with information on releases of toxic chemicals in their communities.

Section 313 of EPCRA established the Toxics Release Inventory, which is a database that contains information on the quantities of certain toxic chemicals released into the environment, including the specific sources and locations from which these releases occurred, and to which environmental media (i.e., land, air, water). The U.S. Environmental Protection Agency's (EPA's) Toxics Release Inventory (TRI) Program was also established by section 313 of EPCRA and is responsible for maintaining and updating the TRI database. Specifically, section 313 of EPCRA requires certain facilities within certain industry sectors to file reports of their disposal or other environmental releases as well as other waste management quantities of chemicals listed on the EPCRA section 313 list of toxic chemicals if they manufacture, process, or otherwise use more than established threshold quantities of these chemicals.[1] The TRI Program is responsible for collecting the release and other waste management information and disseminating it to the public. These data inform the public of releases and other waste management quantities of toxic chemicals in their communities, and enable citizens to make informed decisions regarding the consequences of such releases. The releases and other waste management quantities of a listed chemical are filed by completing an EPCRA section 313 release report (Form R) and submitting it to the U.S. EPA, state, and tribal governments.

In 1990, Congress passed the Pollution Prevention Act (PPA). Among its requirements was a mandate to expand TRI to include additional information on toxic chemicals in waste and on source reduction methods. Beginning in 1991, covered facilities were required to report quantities of TRI chemicals treated on-site, recycled, and combusted for energy recovery. Waste management data have strengthened TRI as a tool to provide information on facilities' handling of TRI chemicals in waste as well as to analyze progress in reducing disposal or other releases.

The TRI Program has been tremendously successful. Industries that have reported to TRI since its inception have reduced on-and off-site disposal or other releases of TRI chemicals by 49 percent or 1.59 billion pounds (for chemicals reportable in all years). Governments - federal, state, and local - have used TRI to set priorities, measure progress, and target areas of special and immediate concern. The public has used the TRI data to understand their local environment, to participate in local and national debates about the choices being made that may affect their health and the health of their children and, ultimately, to exert their influence on the outcome of these debates.

Estimated facility releases are one input to considering potential exposures or potential risks to human health and the environment, but by themselves do not represent risk. Given the potential for using TRI data in these ways, it is important for the public to understand the limitations as well as the benefits of

[1] A reporting threshold for a listed chemical is a pre-established annual manufacture, process or otherwise use quantity that, when exceeded within a calendar year by a facility, triggers reporting of disposal or other releases and other waste management quantities of the chemical. Most listed chemicals have two reporting thresholds. These are (1) 25,000 pounds per calendar year for manufacture or processing activities; and (2) 10,000 pounds per calendar year for "otherwise used" activities. Reporting thresholds are also known as activity thresholds because they are related to manufacturing, processing, or otherwise used activities. Certain persistent bioaccumulative and toxic chemicals (PBTs), as explained later, have different thresholds.

TRI data and the factors that should be considered in drawing conclusions from the data about risks to human health or the environment. The determination of potential risk depends on many factors, including toxicity, chemical fate after disposal or other release, location, and population concentrations.

Since TRI began in 1987, the scope of the program has grown. For the reporting year 2000, TRI was expanded to include certain new persistent bioaccumulative toxic (PBT) chemicals. In addition, reporting thresholds were lowered for both the newly-added PBT chemicals and certain PBT chemicals already on the TRI list. The year 1998 marked the first reporting by seven additional industry sectors: metal mining, coal mining, electrical utilities that combust coal and/or oil, hazardous waste treatment and disposal facilities, chemical wholesale distributors, petroleum bulk stations and terminals, and solvent recovery services (see **Who Must Report?** below for specific industry identification). Since 1994, federal facilities have been added to TRI and the number of reportable chemicals has nearly doubled.

Now in the second decade of the TRI Program, many challenges in the Right-to-Know Program remain to be met. The TRI was designed to be a program that would evolve, over time, to meet the changing needs of an informed and involved public. The TRI is not a static program. As new chemicals of concern are identified, they will be added. Sectors that appear to contribute to environmental loadings will be added. Data collection will be modified to meet new information needs and access technologies will be developed over time to assure enhanced public access to the TRI data.

TRI Reporting

Each year, facilities that meet certain thresholds must report their disposal or other releases and other waste management activities for listed toxic chemicals to EPA and to the state or tribal entity in whose jurisdiction the facility is located. The TRI list for 2002 included nearly 600 individually listed chemicals and 30 chemical categories. (Facilities report certain chemical categories as a whole rather than each of the closely related chemicals within the category. For example, if a facility released both benzo(a)anthracene and benzo(a)pyrene, the facility would report the total amount of both of these polycyclic aromatic compounds under the single category called polycyclic aromatic compounds.) Each facility submits a TRI reporting form for each TRI chemical it has manufactured, processed, or otherwise used during 2002 in amounts exceeding the thresholds (see **How Do Facilities Report?** below).

Reports for each calendar year are due by July 1 of the following year. After completion of data entry and data quality assurance activities, the Agency makes the data available to the public via the TRI database and through a variety of other information products. States also make copies of the forms filed by facilities in their jurisdiction available to the public. In addition, some states produce independent reports.

Who Must Report?

Box 1 lists the kinds of facilities that are required to report to TRI.

Box 1. Who is Required to Report Under the Toxics Release Inventory Program?

A facility must report to TRI if it:

- Operates within any of the following industry sectors:
  - Manufacturing (SIC[2] codes 20-39),
  - Metal mining (SIC code 10, except 1011, 1081, and 1094),
  - Coal mining (SIC code 12, except 1241),
  - Electrical utilities that combust coal and/or oil for the purpose of generating power for distribution in commerce (SIC codes 4911, 4931, and 4939),
  - Resource Conservation and Recovery Act (RCRA) Subtitle C hazardous waste treatment and disposal facilities (in SIC code 4953),
  - Chemical wholesalers (SIC code 5169),
  - Petroleum terminals and bulk stations (SIC code 5171),
  - Solvent recovery services (SIC code 7389),
  - A federal facility in any SIC code; and
- Employs 10 or more full-time-equivalent employees; and
- Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year, except for PBT chemicals where the thresholds are 0.1 gram for dioxin and dioxin-like compounds, and 10 or 100 pounds for other PBT chemicals.

Standard Industrial Classification (SIC) codes are used throughout the federal government to classify economic activity by industry. As shown in Box 1, TRI reporting covers facilities in the manufacturing sectors—that is, SIC codes 20 through 39—as well as some additional SIC Codes. On TRI Form Rs and on TRI Form A certification statements, facilities report the four-digit SIC codes that define their

[2] Facilities are often classified by Standard Industry Classification (SIC) codes. As required by law, facilities that are categorized within certain SIC codes may have to file Toxics Release Inventory (TRI) reports if they also meet other reporting criteria. On April 9, 1997, the Office of Management and Budget (OMB) published a Federal Register Notice of final decision to adopt the North American Industry Classification System (NAICS) for the United States. In the near future, EPA plans to publish a rule that will adopt the NAICS coding for TRI reporting purposes. While this rule will effectively replace the SIC codes regarding TRI reporting, it will not affect the universe of facilities now subject to TRI reporting.

operations. A facility might report, for example, SIC code 2873, nitrogenous fertilizers. Industries are grouped into broader categories at the three-digit and two-digit SIC code levels. In our example, at the two-digit level it falls into the chemicals and allied products major group, SIC code 28. Producers of nitrogenous fertilizers have been required to report to TRI since 1987. Facilities that mine silver ore (SIC code 1044, in the gold and silver ores group SIC code 104, in the metal mining major group SIC code 10) were required to report to TRI beginning in 1998. Solvent recovery facilities in SIC code 7389 were also required to report beginning in 1998, although other types of economic activity in that SIC code (e.g., miscellaneous business services) do not report to TRI. Box 2 lists the TRI industries by Standard Industrial Classification (SIC) code.

Industrial facilities may conduct interrelated operations that result in products or services classified in more than one SIC code. Box 3 explains the classification of facilities reporting multiple codes as well as the "no-codes" group.

Box 2. Standard Industrial Classification (SIC) Codes for TRI Industries

10 Metal Mining
Mining of metals ores, including copper, lead, zinc, gold, silver and nickel ores, but not including uranium, radium and vanadium ores or services related to metal mining.

12 Coal Mining
Mining of coal, including bituminous coal and lignite surface mining, bituminous coal underground mining, and anthracite mining, but not including services related to coal mining.

20 Food and kindred products
Manufacture or processing of foods and beverages for human consumption, and related products, such as manufactured ice, chewing gum, vegetable and animal fats and oils, and prepared feeds for animals and fowls.

21 Tobacco products
Manufacture of cigarettes, cigars, smoking and chewing tobacco, snuff, and reconstituted tobacco. Stemming and redrying of tobacco. Manufacture of non-tobacco cigarettes.

22 Textile mill products
Preparation of fiber and subsequent manufacture of yarn, thread, braids, twine, and cordage. Manufacture of broadwoven fabrics, narrow woven fabrics, knit fabrics, and carpets and rugs from yarn. Dyeing and finishing of fiber, yarn, fabrics, and knit apparel. Coating, waterproofing, or otherwise treating fabrics. Integrated manufacture of knit apparel and other finished articles from yarn. Manufacture of felt goods, lace goods, nonwoven fabrics, and miscellaneous textiles.

23 Apparel and other finished products made from fabrics and similar materials
Production of clothing. Fabrication of products by cutting and sewing purchased woven or knit textile fabrics and related materials, such as leather, rubberized fabrics, plastics, and furs. Manufacture of clothing by cutting and joining (e.g., by adhesives) material such as paper and nonwoven textiles.

24 Lumber and wood products, except furniture
Cutting timber and pulpwood. Also, merchant sawmills, lath mills, shingle mills, cooperage stock mills, planing mills, and plywood mills and veneer mills engaged in producing lumber and wood basic materials. Manufacture of finished articles made entirely or mainly of wood or related materials.

25 Furniture and fixtures

Manufacture of household, office, public building, and restaurant furniture, and office and store fixtures.

26 Paper and allied products

Manufacture of pulps from wood and other cellulose fibers and from rags. Manufacture of paper and paperboard. Manufacture of paper and paperboard into converted products, such as paper coated off the paper machine, paper bags, paper boxes, and envelopes. Manufacture of bags from plastic film and sheet.

27 Printing, publishing, and allied industries

Printing by one or more common processes, such as letterpress, lithography (including offset), gravure, or screen. Bookbinding, platemaking, and other services performed for the printing trade. Publishing newspapers, books, and periodicals (whether or not the establishment also prints them).

28 Chemicals and allied products

Production of basic chemicals. Manufacture of products by predominantly chemical processes. There are three general classes of products: 1) basic chemicals, such as acids, alkalis, salts, and organic chemicals; 2) chemical products to be used in further manufacture, such as synthetic fibers, plastics materials, dry colors, and pigments; 3) finished chemical products to be used for ultimate consumption, such as drugs, cosmetics, and soaps, or to be used as materials or supplies in other industries, such as paints, fertilizers, and explosives.

29 Petroleum refining and related industries

Production of gasoline, kerosene, distillate fuel oils, residual fuel oils, and lubricants, through fractionation or straight distillation of crude oil, redistillation of unfinished petroleum derivatives, cracking, or other processes. (Establishments also produce aliphatic and aromatic chemicals as byproducts.)

30 Rubber and miscellaneous plastics products

Manufacture of products, not elsewhere classified, from plastics resins and from natural, synthetic, or reclaimed rubber, gutta percha, balata, or gutta siak. Includes manufacture of tires.

31 Leather and leather products

Tanning, currying, and finishing hides and skins. Converting leather. Manufacture of finished leather and artificial leather products and some similar products made of other materials.

32 Stone, clay, glass, and concrete products

Manufacture of flat glass and other glass products, cement, structural clay products, pottery, concrete and gypsum products, cut stone, abrasive and asbestos products, and other products from materials taken principally from the earth in the form of stone, clay, and sand. (May include mining and quarrying activities operated by manufacturing establishments in this group.)

33 Primary metal industries

Smelting and refining ferrous and nonferrous metals from ore, pig, or scrap. Rolling, drawing, and alloying metals. Manufacture of castings and other basic metal products. Manufacture of nails, spikes, and insulated wire and cable. Includes production of coke.

34 Fabricated metal products, except machinery and transportation equipment

Fabrication of ferrous and nonferrous metal products, such as metal cans, tinware, handtools, cutlery, general hardware, non-electric heating apparatus, fabricated structural metal products, metal forgings, metal stampings, ordnance (except vehicles and guided missiles), and a variety of metal and wire products, not elsewhere classified.

35 Industrial and commercial machinery and computer equipment

Manufacture of industrial and commercial machinery and equipment and computers. Manufacture of engines and turbines; farm and garden machinery; construction, mining, and oil field machinery; elevators and conveying equipment; hoists, cranes, monorails, and industrial trucks and tractors; metalworking machinery; special industry machinery; general industrial machinery; computer and peripheral equipment and office machinery; and refrigeration and service industry machinery.

36 Electronic and other electrical equipment and components, except computer equipment

Manufacture of machinery, apparatus, and supplies for the generation, storage, transmission, transformation, and utilization of electrical energy. Manufacture of electricity distribution equipment, electrical industrial apparatus, household appliances, electrical lighting and wiring equipment, radio and television receiving equipment, communications equipment, electronic components and accessories, and other electrical equipment and supplies.

37 Transportation equipment

Manufacture of equipment for transportation of passengers and cargo by land, air, and water. Includes motor vehicles, aircraft, guided missiles and space vehicles, ships, boats, railroad equipment, and miscellaneous transportation equipment, such as motorcycles, bicycles, and snowmobiles.

38 Measuring, analyzing, and controlling instruments, photographic, medical, and optical goods; watches and clocks

Manufacture of instruments (including professional and scientific) for measuring, testing, analyzing, and controlling, and their associated sensors and accessories; optical instruments and lenses; surveying and drafting instruments; hydrological, hydrographic, meteorological, and geophysical equipment; search, detection, navigation, and guidance systems and equipment; surgical, medical, and dental instruments, equipment, and supplies; ophthalmic goods; photographic equipment and supplies; and watches and clocks.

39 Miscellaneous manufacturing industries

Manufacture of products not classified in any other major manufacturing group. Includes jewelry, silverware, and plated ware; musical instruments; dolls, toys, games, and sporting and athletic goods; pens, pencils, and artists' materials; buttons, costume novelties, and miscellaneous notions; brooms and brushes; caskets; and other miscellaneous products.

4911/4931/4939 Electric, Gas, and Sanitary Services

Electric services, limited to facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce.

5169 Chemical Wholesale Distributors

Wholesale trade of nondurable goods of chemical and allied products.

5171 Petroleum Terminals/Bulk Storage

Wholesale trade of nondurable goods undertaken at petroleum terminals and bulk storage facilities.

4953 Refuse Systems (Hazardous Waste Treatment and Disposal Facilities)

Facilities managing hazardous waste, limited to facilities regulated under RCRA subtitle C, 42 U.S.C. section 6921 *et seq*.

7389 Business Services (Solvent Recovery Facilities)
Facilities engaged in solvent recovery, limited to facilities primarily engaged in solvents recovery services on a contract or fee basis.

Source: Executive Office of the President, Office of Management and Budget, *Standard Industrial Classification Manual*, 1987.

Box 3. Multiple SIC Codes and No SIC Codes in TRI

Multiple Codes 20–39. TRI facilities may report up to six four-digit Standard Industrial Classification (SIC) codes that describe their operations. If all the processes or operations that are associated with a facility's disposal or other releases or other waste management of a TRI chemical can be described by one SIC code, then only one SIC code is reported on the form. If several economic activities, designated by different SIC codes, describe the specific operations at a facility that are associated with disposal or other releases or other waste management of a TRI chemical, then the facility will report those SIC codes (up to six) on the form it submits for that chemical.

Industrial facilities often conduct interrelated operations. They may, for example, manufacture distinct products using common or related feedstocks. Such products may be classified in similar but separate categories in the SIC system. Thus, many forms submitted to TRI contain more than one industrial classification. When TRI data are analyzed by type of industry—that is, by SIC code—forms that report more than one SIC code must be categorized separately because they do not fall into the individual industry groups. They are included in a separate "multiple-codes" category to avoid including them more than once, in more than one industry category.

The "multiple-codes" category represents forms that report in more than one two-digit SIC code within the manufacturing sector (SIC codes 20–39). For example, a facility may refine petroleum (SIC code 29) and then use that feedstock in the manufacture of chemicals (SIC code 28); it will report on its TRI forms SIC codes in both these industries—for example, at the four digit level, SIC codes 2911, petroleum refining, and 2869, industrial organic chemicals. In this event, its forms are included in the "multiple-codes" category.

In addition, on forms with more than one SIC code, any SIC code that is not within manufacturing (that is, not within the SIC code range 20 to 39) is ignored when assigning a form to an industry category. For example, a form with SIC codes 2642 (manufacture of envelopes) and 5112 (wholesale trade—stationery and office supplies) would be included in SIC code 26 and not the "multiple-codes" category.

Forms that have a SIC code within the manufacturing sector as well as a SIC code within the additional industry sectors required to report to TRI beginning with the 1998 reporting year are included in the manufacturing sector SIC code if the facility reported to TRI before 1998. If the facility reported for the first time for 1998 with both manufacturing and other industry codes, it is included in the analyses under the other industry code.

No Codes. Forms that report no SIC code required to report to TRI are included in these tables under the "No codes" category. Such forms may include, for example, submissions by federal facilities, all of which are required to report regardless of the SIC code covering their operations. This group also includes forms with no valid SIC code.

What Must Be Reported?

Each year, facilities report to TRI the amounts of toxic chemicals disposed of or otherwise released on-site to air, water, and land and injected underground (Section 5 of TRI Reporting Form R), and the amounts of chemicals transferred off-site for recycling, energy recovery, treatment, and disposal or release (Section 6 of Form R). They also report production-related waste management information on quantities recycled, combusted for energy recovery, treated, or disposed of or otherwise released, both on- and off-site, and catastrophic or other one-time releases (Section 8 of Form R). To some extent, data in Sections 5 and 6 of Form R and those in Section 8 represent a different view of essentially the same information. While Section 5 and 6 include total amounts disposed of or otherwise released or transferred, the corresponding parts of Section 8 do not include in those amounts the catastrophic or other one-time releases. In addition, Section 8 includes on-site recycling, energy recovery and treatment which are not reported in Sections 5 and 6.

Box 4 summarizes the basic information that facilities must report to TRI.

Box 4. What Must Be Reported?

Information reported by facilities includes:

- Basic information identifying the facility (including name, location, type of business, and name of parent company),
- Name and telephone number of a contact person,
- Environmental permits held,
- Amounts of each listed chemical disposed of or released to the environment at the facility,
- Amounts of each chemical sent from the facility to other locations for recycling, energy recovery, treatment, or disposal or other release,
- Amounts of each chemical recycled, burned for energy recovery, or treated at the facility,
- Maximum amount of chemical present on-site at the facility during year,
- Types of activities conducted at the facility involving the toxic chemical, and
- Source reduction activities.

Facilities also provide general information about the manufacture, process, and otherwise use of the listed chemical at the facility. Facilities provide information about methods used to treat waste streams containing the toxic chemicals at the site and the efficiencies of those treatment methods. In addition to information about the amount of toxic chemicals sent off-site for further waste management, facilities also must specify the destination of these transfers.

Beginning with the 1991 reports, facilities were required to provide information about source reduction and other pollution prevention activities, along with the quantities managed in waste by activities such as recycling. Companies must provide a production index that can help relate changes in reported quantities of toxic chemicals in waste managed to changes in production. These additional data elements facilitate tracking of industry progress in reducing waste generation and moving towards preferred management alternatives. While current TRI data cannot provide an absolute measure of pollution prevention, the data can provide new insight into the complete toxics cycle.

What Are the Benefits and Limitations of the Data?

Benefits

The TRI Program has given the public unprecedented direct access to toxic chemical disposal or other release and other waste management data at the local, state, regional, and national level. Use of this information can enable the public to identify potential concerns, gain a better understanding of potential risks, and work with industry and government to reduce toxic chemical use, disposal or other releases and the risks associated with them. When combined with hazard and exposure data, this information can allow informed environmental priority-setting at the local level.

Federal, state, and local governments can use the data to compare facilities or geographic areas, to identify hot spots, to evaluate existing environmental programs, to more effectively set regulatory priorities, and to track pollution control and waste reduction progress. TRI data, in conjunction with demographic data, can help government agencies and the public identify potential environmental justice concerns.

Industry can use the data to obtain an overview of the disposal or other releases and other waste management of toxic chemicals, to identify and reduce costs associated with toxic chemicals in waste, to identify promising areas of pollution prevention, to establish reduction targets, and to measure and document progress toward reduction goals. Public availability of the data has prompted many facilities to work with communities to develop effective strategies for reducing environmental and potential human health risks posed by disposal or other releases and other waste management of toxic chemicals.

What to Consider When Using TRI Data

Users of TRI information should be aware that TRI data do not reveal whether or to what degree the public is exposed to listed chemicals. TRI data, in conjunction with other information, can be used as a

starting point in evaluating exposures and risks. The determination of potential risk to human health and/or the environment depends upon many factors, including the toxicity of the chemical, the fate of the chemical in the environment, and the amount and duration of human or other exposure to the chemical. Box 5 highlights some of the factors that should be considered when reviewing TRI data.

Box 5. Factors to Consider in Using TRI Data

Toxicity of the Chemical: TRI chemicals vary widely in toxicity. High volume releases of less toxic chemicals may appear to be a more serious problem than lower volume releases of highly toxic chemicals, when just the opposite may be true.

Exposure Considerations: The potential for exposure may be greater the longer the chemical remains unchanged in the environment. Sunlight, heat, or microorganisms may or may not decompose the chemical. For example, microorganisms readily degrade some chemicals, such as methanol, into less toxic chemicals, whereas metals are persistent and will not degrade in the environment.

Bioconcentration of the Chemical in the Food Chain: As a chemical becomes incorporated in the food chain, it may concentrate or disperse.

- Some chemicals, such as mercury, accumulate and magnify in concentration in organisms as they move up the food chain.
- Small amounts of a chemical that bioaccumulate may result in significant exposures to consumers.

Type of Disposal or Release (Environmental Medium): The extent to which chemical exposure of a population occurs depends on the environmental medium (air, water, land) to which a chemical is either disposed of or otherwise released. The medium also affects the types of exposures possible, such as inhalation, dermal exposure, or ingestion. For example, disposal in underground injection wells are regulated by EPA 's Underground Injection Control Program to provide safeguards so that injection wells do not endanger current and future underground sources of drinking water. When wells are properly sited, constructed, and operated, underground injection is an effective and environmentally safe method to dispose of wastes.

Type of Off-Site Facility Receiving the Chemical and the Efficiency of its Waste Management Practices: The amount of a toxic chemical that ultimately enters the environment depends on how the chemical was handled during treatment, energy recovery, or recycling activities. Several factors to keep in mind when considering amounts sent off-site are presented below:

- The efficiency of recycling operations varies depending on the method of recycling and the chemical being recycled.
- Use of a combustible toxic chemical for energy recovery typically results in the destruction of 95% to 99% or more of the toxic chemical. The remaining quantity may be either released to air or disposed of in ash to land.

On-site Waste Management of the Toxic Chemical: As with off-site waste management, the amount of the toxic chemical disposed of or otherwise released to the environment depends on how the chemical was handled during treatment, energy recovery, or recycling activities. However, since the waste management is on-site, any amount of the chemical that enters the environment after waste management is reported to TRI as part of that facility's disposal or other releases.

Assembling this additional information can be challenging, but EPA has developed a tool known as the Risk-Screening Environmental Indicators (RSEI) that systematically addresses many of the factors related to the chronic human health risk associated with TRI activities. Since TRI data reflect total releases over an entire year, RSEI modeling is based on long-term (chromic) exposures to TRI chemicals, not acute exposures of shorter duration. RSEI incorporates detailed facility data from TRI along with toxicity information from EPA's Integrated Risk Information System, population data from the US Census, and other EPA models and databases. Although RSEI does not provide a full risk assessment, it provides additional hazard and risk-related perspectives that may be helpful to users of TRI information. More information on RSEI is available at http://www.epa.gov/oppt/rsei.

Limitations

While TRI provides the public, industry, and state and local governments an invaluable source of key environmental data, it has some limitations that must be considered when using the data. The preceding section, **What to Consider When Using TRI Data**, describes specific information to keep in mind when analyzing TRI data.

TRI data reflect chemical management practices, not exposures of the public to those chemicals. The data are generally not sufficient by themselves to determine exposure or to calculate potential adverse effects on human health and the environment. TRI data can be used to identify areas of potential concern. TRI data, in conjunction with other information, can be used as a starting point in evaluating exposures. The determination of potential risk depends upon many factors, including the toxicity of the chemical, the fate of the chemical in the environment, the locality, and the human and other populations that are exposed to the chemical after its disposal or release. Tools like the Risk-Screening Environmental Indicators (RSEI) (described in the previous section) can be used to address these factors for chronic human health concerns.

Even with expanded industry coverage since the 1998 reporting year, TRI does not address all sources of disposal or other releases and other waste management activities of TRI chemicals. Although the Agency has expanded the number of industries that must report and has added PBT chemicals to the section 313 list of toxic chemicals, the program does not cover all sources of TRI chemicals or any sources of non-TRI chemicals. Although TRI is successful in capturing information on a significant portion of toxic chemicals currently being used by covered industry sectors, it does not cover all toxic chemicals or all industry sectors. In addition, even within covered SIC codes, facilities that manage listed TRI chemicals but do not meet the TRI threshold levels (those with fewer than 10 full-time employees or those not meeting TRI quantity thresholds) are not required to report even though they may release toxic chemicals into the environment. The new PBT chemicals reporting thresholds expand the information TRI collects, but only for a subset of the TRI chemicals. Thus, while the TRI includes 93,380 reports from 24,379 facilities for 2002, the 4.79 billion pounds of on-and off-site disposal or other releases reported represent only a portion of all toxic chemical disposal or other releases nationwide.

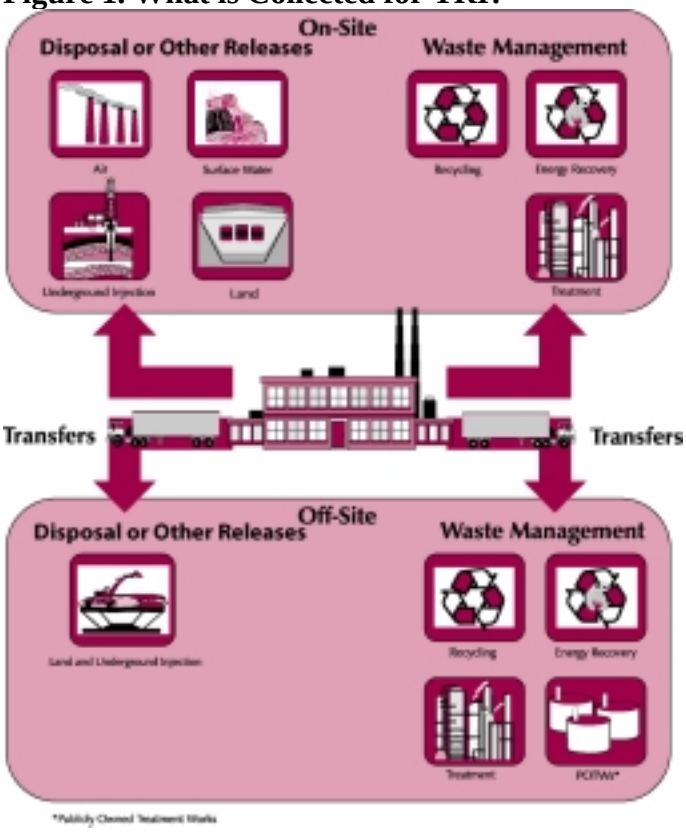
The TRI does not include data on toxic emissions from cars and trucks, nor from the majority of sources of releases of pesticides, volatile organic compounds, fertilizers or from many other non- industrial sources.

Also, while many facilities base their TRI data on monitoring data, others report estimated data to TRI, as the program does not mandate monitoring. Various estimation techniques can be used when monitoring data are not available, and EPA has published estimation guidance for the regulated community. Variations between facilities can result from the use of different estimation methodologies. These factors should be taken into account when considering data accuracy and comparability.

As discussed above, the TRI data summarized in this report reflect chemical disposal or other releases and other waste management activities that occur in a given calendar year. Patterns of disposal or other releases and other waste management activities can change dramatically from one year to the next. Thus, it is important to recognize that current facility activities may be different from those reported for 2001 or prior years.

Figure 1 illustrates these on-site and off-site disposal or other releases, on-site waste management activities, and transfers off- site for further waste management, reportable to TRI.

Figure 1. What is Collected for TRI?



TRI On- and Off-site Disposal or Other Releases

The following section describes the categories of on- and off-site disposal or other releases that are reportable to TRI. Box 6 describes reportable disposal or other releases that may occur on-site at the facility and identifies types of activities that may contribute to the disposal or other releases to various media.

Box 7 describes disposal or other releases that may result from a facility's transferring chemicals off-site. As noted in Box 7, off-site disposal or other releases include additional details about off-site transfers of metals and metal compounds. How metal and metal category compounds are reported to TRI are explained in Box 8.

For analyses that present all on- and off-site disposal or other releases categories together consideration must be given to off-site transfers reported by one facility that are reported as on-site disposal or releases by another facility. To avoid counting the amounts twice, the off-site transfers are omitted in these analyses. The methodology used to avoid duplication of off-site transfers to disposal or other releases is found in Box 9.

Box 6. An Explanation of On-site Disposal or Other Releases

On-site disposal or other releases include emissions to the air, discharges to bodies of water, disposal at the facility to land, and disposal in underground injection wells. Disposal or other releases are reported to TRI by media type. On-site disposal or other releases are reported in Section 5 of Form R.

On-site Disposal in Underground Injection Class I wells (Section 5.4.1) Disposal in Class I wells includes the emplacement of hazardous and nonhazardous fluids (industrial and municipal wastes) into isolated formations beneath the lowermost underground source of drinking water (USDW). Because they may inject hazardous waste, Class I wells are the most strictly regulated under the Safe Drinking Water Act (SDWA) and are further regulated under the Resource Conservation and Recovery Act (RCRA).

RCRA Subtitle C Landfills (Section 5.5.1A). Disposal in RCRA Subtitle C landfills in which wastes are buried. These are landfills that are subject to stringent requirements for liners, leak detection systems, and groundwater monitoring.

Other Landfills (Section 5.5.1B). Disposal of toxic chemicals in landfills other than RCRA Subtitle C landfills. Beginning with the 1996 reporting year, facilities report amounts disposed of in RCRA subtitle C landfills separately from amounts disposed of in other on-site landfills. This change was made to recognize the difference in management and regulatory oversight provided for RCRA subtitle C landfills.

Fugitive Air Emissions (Section 5.1). All releases to air that are not released through a confined air stream. Fugitive air emissions include equipment leaks, evaporative losses from surface impoundments and spills, and releases from building ventilation systems.
Point Source Air Emissions (Section 5.2). Air emissions, also referred to as stack emissions, that occur through confined air streams, such as stacks, vents, ducts, or pipes.
Surface Water Discharges (Section 5.3). Discharges to streams, rivers, lakes, oceans, and other bodies of water. This includes releases from contained sources, such as industrial process outflow pipes or open trenches. Releases due to runoff, including storm water runoff, are also reportable to TRI.
Disposal in Underground Injection Class II-V Wells (Section 5.4.2). The subsurface emplacement of fluids through wells. TRI chemicals associated with manufacturing, the petroleum industry, mining, commercial and service industries, and federal and municipal government-related activities may be injected into Class I, II, III, IV, or V wells, if they do not endanger underground sources of drinking water (USDW), public health, or the environment. Disposal in Class I wells (see above) are reported separately from disposal in Class II-V wells.

- Class II wells are used for injection of brines and other fluids associated with oil and gas production.
- Class III wells are used for injection of fluids associated with solution mining of minerals.
- Class IV wells are used for injection of hazardous or radioactive wastes into or above a USDW and is banned unless authorized under ground water remediation laws.
- Class V wells inject nonhazardous fluids into or above a USDW and are typically shallow, on-site disposal systems, such as floor and sink drains which discharge directly or indirectly to ground water, dry wells, leach fields, and similar types of drainage wells.

Beginning with the 1996 reporting year, facilities report amounts injected into Class I wells separately from amounts injected into all other wells. This change was made to reflect the difference in management standards and regulatory oversight provided by the Underground Injection Control Program for Class I wells as distinguished from other forms of injection reportable to TRI.
Land Treatment/Application Farming (Section 5.5.2). Management techniques in which a waste containing a listed chemical is applied to or incorporated into soil.
Surface Impoundments (Section 5.5.3). Holding areas used to volatilize and/or settle waste materials.
Other Disposal (Section 5.5.4). Other disposal methods including waste piles, spills, or leaks.

Box 7. An Explanation of Off-site Disposal or Other Releases

An off-site disposal or other release is a discharge of a toxic chemical to the environment that occurs as a result of a facility's transferring a waste containing a TRI chemical off-site for disposal or other release, as reported in Section 6 of Form R. Certain other types of transfers are also categorized as off-site disposal or other release because, except for location, the outcome of transferring the chemical off-site is the same as disposing of it or releasing it on-site. For each transfer, the amount of the chemical in the waste, type of management activity (chosen from a list of codes referred to as "M" codes) undertaken by the receiving facility, and the address of the receiving site is reported.

Off-site Disposal to Underground Injection Wells (Section 6.2, M71). Toxic chemicals in waste may be transferred off-site to sites that inject the wastes underground. (See discussion of on-site underground injection for a description of these disposal types in Box 6.) The 2002 reporting year Form R does not collect data that distinguishes off-site transfers to Class I vs. Class II-V Underground Injection Wells. The Form R has been modified starting with reporting year 2003 to collect this information to distinguish between Class I and Class II-V Underground Injection Wells.

Off-site Disposal to RCRA Subtitle C Landfills (Section 6.2, M65). Toxic chemicals in waste may be transferred off-site for disposal in RCRA Subtitle C landfills. (See discussion of on-site disposal to RCRA Subtitle C landfills for a description of these disposal types.) Beginning with the 2002 reporting year, facilities report amounts transferred off-site for disposal in RCRA Subtitle C landfills separately from those sent to other landfills. This change was made to recognize the difference in management and regulatory oversight provided for RCRA Subtitle C landfills as distinguished from other landfills. The Section 6.2 code for off-site disposal in landfills prior to the 2002 reporting year was M72.

Off-site Disposal in Other Landfills (Section 6.2, M64). Toxic chemicals in waste may be transferred off-site for disposal in landfills other than RCRA Subtitle C landfills. (See Box 6 for a discussion of on-site disposal to other landfills for a description of these disposal types.) Prior to the 2002 reporting year, off-site transfers to landfills/disposal surface impoundments were all reported in Section 6.2 under code M72. Any transfers reported erroneously under M72 for 2002 are included in this category.

Storage Only (Section 6.2, M10). On occasion, a toxic chemical is sent off-site for storage if there is no known disposal method. One example is toxic chemicals in mixed hazardous and radioactive waste. EPA considers this an off-site disposal or release because this method is being used as a form of disposal and the toxic chemical will remain there indefinitely.

Solidification/Stabilization (metals only) (Section 6.2, M41 or M40 (metals and metal category compounds only). Waste solidification/stabilization is a physical or chemical process used to either reduce the mobility of the chemical or to eliminate free liquids in a hazardous waste. A waste stabilization process includes mixing the hazardous waste with binders or other materials, and curing the resulting hazardous waste and binder mixture.

Wastewater Treatment (metals only) (Section 6.2, M62 or M61 (metals and metal category compounds only). Transfers to wastewater treatment facilities (excluding to facilities that are publicly-owned treatment works (POTWs)) of metals and metal category compounds only.

Transfers to POTWs (metals only) (Section 6.1, metals and metal category compounds only). Transfers to publicly-owned treatment works (POTWs) of metals and metal category compounds only. Because metals are not destroyed by sewage treatment processes, amounts of metals and metal category compounds reported in Section 6.1 are considered transfers to disposal or other releases.

Surface Impoundments (Section 6.2, M63). Surface impoundments are holding areas used to volatilize and/or settle waste materials.

Land Treatment (Section 6.2, M73). Management techniques in which a waste containing a listed chemical is applied to or incorporated into soil.

Other Land Disposal (Section 6.2, M79). Other land disposal methods include waste piles, spills, or leaks.

Other Off-site Management (Section 6.2 (M90). Chemicals in waste sent to sites where the waste is managed by techniques not specifically listed in Section 6.2.

Transfers to Waste Broker (Section 6.2, M94). Chemicals in waste sent to a broker where the broker sends the waste for disposal, but the facility sending the waste does not know the location of the disposal site and, therefore, reported the name of the waste broker instead. The Section 6.2 code for transfers to waste broker prior to the 1991 reporting year was M91.
Unknown (Section 6.2, M99). The "unknown" category of disposal indicates that a facility is not aware of the type of waste management used for the toxic chemical that is sent off-site. Therefore, EPA has categorized this method as the least desirable type of waste management (environmentally least desirable) and has included it as a type of disposal or other release for reporting purposes.

How Metals and Metal Category Compounds Should be Reported to TRI

Transfers of metals and metal category compounds to solidification/stabilization, to wastewater treatment (excluding POTWs), and to publicly owned treatment works (POTWs, or municipal sewage treatment) also result in disposal or other releases and are classified as off-site disposal or other releases. How such transfers should be reported to TRI is described in Box 8.

Box 8. How Metals and Metal Category Compounds Should be Reported to TRI

In Section 6.2 of the Form R, facilities report the amounts sent to each off-site location to which the facility transfers wastes containing the reported toxic chemical for the purposes of recycling, energy recovery, treatment, or disposal or other release. Metals and metal category compounds are managed in waste either by being disposed of or otherwise released or by being recycled. The metal has no heat value and thus cannot be combusted for energy recovery and cannot be treated because it cannot be destroyed regardless of whether the stream containing the metal is sent for energy recovery or treatment. Thus, transfers of metals and metal category compounds for further waste management should be reported as either a transfer for recycling or a transfer for disposal or other release. The applicable waste management codes for transfers of metals and metal category compounds for recycling are M24, M26 or M93. Applicable codes for transfers for disposal or other releases include M10, M41, M62, M63, M64, M65, M71, M73, M79, M90, M94, and M99.

Two codes, M41 and M62, were new for the 1997 reporting year. These codes are for transfers to waste management in which the wastestream may be treated but the metal contained in the wastestream is not treated and is ultimately disposed of or otherwise released. For example, M41 would be used for a metal or metal category compound which is stabilized in preparation for disposal. Prior to the 1997 reporting year, some facilities reported transfers of metals and metal category compounds for further waste management using two waste treatment codes, M40 and M61. Beginning in reporting year 1997, metals and metal category compounds must be reported under Section 6.2 using one of the disposal or other release codes or the applicable recycling code (M24 for metals recovery, M26 for other reuse or recovery or M93 for transfers to waste broker - recycling).

The code M72 was used for transfers to landfill/disposal surface impoundment prior to reporting year 2002. Three new codes, M63 (surface impoundments), M64 (other landfills) and M65 (RCRA Subtitle C landfills) have replaced M72 starting with reporting year 2002. Any amounts erroneously reported under M72 for 2002 are included as other landfills (equivalent to the M64 code for 2002).

In Section 8.1 of the Form R, facilities report quantities of listed chemicals disposed of or otherwise released on- and off-site (excluding one-time catastrophic or remedial releases). Except for those quantities recycled, metals and metal category compounds should be reported in Section 8.1 of the Form R. This includes those quantities of metals and metal category compounds reported in:

- Section 5 as on-site disposal or other releases,
- Section 6.2 as sent off-site for stabilization/solidification (M41) or wastewater treatment (excluding POTWs) (M62) and/or,
- Section 6.1 as discharges to POTWs.

These quantities should not be reported in Section 8.7 of the Form R.

Duplication of Off-site Transfers to Disposal or Other Releases

TRI facilities transfer chemicals in waste off-site to other facilities for disposal or other releases. These recipient facilities can place the wastes in on-site landfills, disposal surface impoundments, in land treatment facilities, or use other types of land disposal methods. They may also dispose of wastes in underground injection wells or, if metals and metal category compounds are sent to a wastewater treatment facility, they may be discharged to surface waters. The recipient facilities generally are treatment, storage and disposal (TSD) facilities regulated under the federal Resources Conservation and Recovery Act (RCRA). Such facilities are one of the added industries that must, beginning with the 1998 reporting year, report their disposal and other releases, transfers, and other waste management to TRI. Thus, the facility that sends these transfers would report to TRI the amounts as transfers to disposal or other releases and the TSD facility that receives the material would report the amounts as on-site disposal or other releases to underground injection, land, or surface waters. Box 9 describes EPA's methodology for avoiding duplication of amounts reported in off-site transfers that are also reported as on-site disposal or other releases by facilities that received such transfers.

Box 9. Duplication of Off-site Transfers to Disposal or Other Releases

To avoid double counting the transfers off-site to the TSD facilities that are also reported to TRI as on-site disposal or other releases by the TSD facilities, the off-site transfer quantities must be omitted from tables that compare or summarize on-site and off-site disposal or other releases for all industries. Only the on-site disposal or other releases from the TSD facilities are included in analyses. The RCRA ID number that facilities report was used to identify such transfers and match them to on-site disposal or other releases reported by TSD facilities. A TRI facility must report its own RCRA ID number as well as the RCRA ID number of the TSD facility receiving the transfer.

Each amount of off-site transfer to TSDs should have the RCRA ID number of the receiving facility.

If this RCRA ID number matches the RCRA ID number of a TRI facility and the TRI facility receiving the waste reported on-site disposal or other releases of the same chemical (or the metal and its compounds in the case of metals) that were greater than or equal to the sum of the off-site transfers reported as transferred, then the amount of chemicals transferred from other TRI facilities are omitted from the analysis. If the TRI facility receiving the waste reported an amount of on-site disposal or other releases of the chemical less than the total amount reported as transferred to the facility, then the amount omitted from the analysis is reduced proportionally. For example, if Facility A reported 20,000 pounds transferred to Facility C and Facility B reported 80,000 pounds transferred to Facility C, but Facility C only reported 90,000 pounds disposed of or otherwise released on-site (which is 90 percent of the total amount of 100,000 pounds reported as transferred), then the amount of transfers omitted from the analysis for Facility A is 18,000 pounds (or 90 percent of 20,000 pounds) and for Facility B is 72,000 pounds (or 90 percent of 80,000 pounds).

In analyses that present off-site transfers but not on-site disposal or other releases, these amounts are not omitted in order to present complete data on off-site transfers for analysis. Also, analyses that present data on waste managed do not omit any reported data in order to present complete data on how waste is being managed. In addition, analyses that do not include all TRI facilities (for example, data for one state or one industry sector) do not omit any reported data because the transfers may be sent to facilities not included in the analysis.

The following shows which types of off-site transfers to disposal or other releases are matched with which types of on-site disposal or other releases to determine if the transfers should be omitted.

Off-site Transfer M Code (Section 6.2)	**Section 5 Checked for Recipient TRI Facilities Based on Matching Chemical or, if Metal, Metal plus Metal Category Compounds**
M10	5.5.4
M41*	5.5.1 A and B
M62*	5.5.1 A and B, 5.5.3 and 5.3
M63	5.5.3
M64	5.5.1B
M65	5.5.1A
M71	5.4
M72	5.5.1 A and B, 5.5.3 (reporting years 1998-2001)
M73	5.5.2
M79	5.5.4
M90	All Section 5
M99	All Section 5

*Includes metals and metal category compounds reported under codes M40 and M61.

M94 (transfer to waste broker) is not included since a waste broker does not dispose of or release the chemical.

TRI Transfers Off-site for Further Waste Management, including Transfers for Disposal or Other Release

Off-site transfers of TRI chemicals in waste include, in addition to transfers to disposal or other releases described above, transfers to treatment, publicly-owned treatment works (POTWs), recycling, and energy recovery. These transfers are reported in Section 6.1 and 6.2 of Form R. Analyses that focus specifically on types of off-site transfers include transfers to disposal or other releases as well as the other types of transfers. Box 10 describes the various categories of transfers off-site for further waste management including for disposal or other releases.

Box 10. An Explanation of Transfers Off-site for Further Waste Management, including Transfers for Disposal or Other Release

An off-site transfer, reported in Section 6 of Form R, is the transfer of toxic chemicals in waste to a facility that is geographically or physically separate from the facility reporting under TRI. Chemicals reported to TRI as transferred are sent to off-site facilities for purposes categorized as recycling, energy recovery, treatment, or disposal or other release. The amounts reported represent a movement of the chemical away from the reporting facility. Except for off-site transfers to disposal or other release, these amounts do not necessarily represent entry of the chemical into the environment.

Transfers Off-site to Recycling (Section 6.2, M20, M24, M26, M28, M93). Toxic chemicals in waste that are sent off-site for the purposes of recycling are generally recovered by a variety of recycling methods, including solvent recovery and metals recovery. The choice of the recycling method depends on the toxic chemical being sent for recycling. Once they have been recycled, these chemicals may be returned to the originating facility for further processing or made available for use in commerce.

Transfers Off-site to Energy Recovery (Section 6.2, M56, M92). Toxic chemicals in waste sent off-site for purposes of energy recovery are combusted off-site in industrial furnaces (including kilns) or boilers that generate heat or energy for use at that location. Treatment of a chemical by incineration is not considered to be energy recovery.

Transfers Off-site to Treatment. (Section 6.2, M40 (except metals and metal category compounds), M50, M54, M61 (except metals and metal category compounds), M69, M95) Toxic chemicals in waste that are transferred off-site may be treated through a variety of methods, including biological treatment, neutralization, incineration, and physical separation. These methods typically result in varying degrees of destruction of the toxic chemical.

Transfers to Publicly Owned Treatment Works (POTWs) (Section 6.1). A POTW is a wastewater treatment facility that is owned by a state or municipality. Wastewaters from facilities reporting under TRI are transferred through pipes or sewers to a POTW. Treatment or removal of a chemical from the wastewater depends upon the nature of the chemical, as well as the treatment methods present at the POTW. In general, chemicals that are easily utilized as nutrients by microorganisms, or have a low solubility in water, are likely to be removed to some extent. Chemicals that are volatile and have a low solubility in water may evaporate into the atmosphere. Not all TRI chemicals can be treated or removed by a POTW. Some chemicals, such as metals, may be removed, but are not destroyed and may be

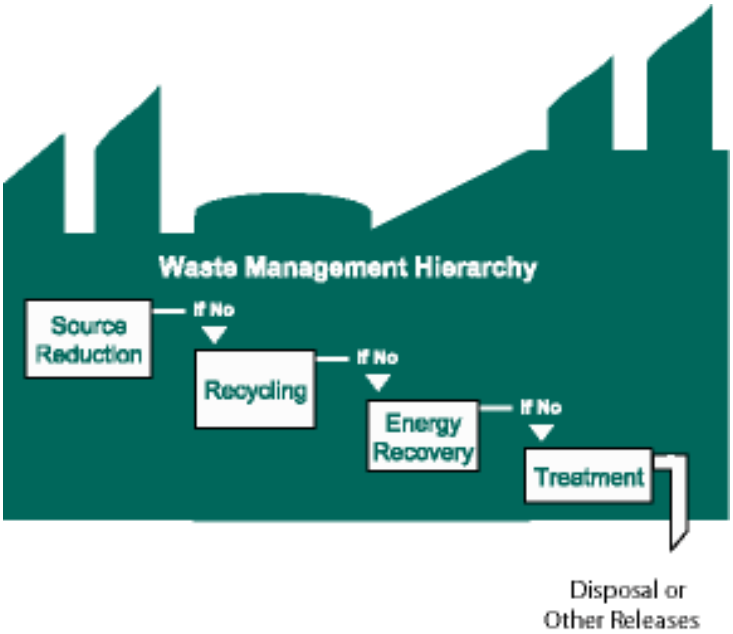
disposed of in landfills or discharged to receiving waters; transfers of metals and metal category compounds to POTWs are categorized as off-site disposal or other releases, as explained in Box 7.
Other Off-site Transfers (Section 6.2, invalid or no codes). In this report, toxic chemicals in waste that were reported as transferred off-site but for which the off-site activity (i.e., recycling, energy recovery, treatment, or disposal) was not specified or was not an accepted code have been classified as "other off-site transfers."
Other Transfers Off-site for Disposal or Other Releases. See Box 7, except does not include metals and metal category compounds sent to POTWs.

TRI Chemicals Managed in Waste

The Pollution Prevention Act of 1990 (PPA) requires facilities to report information about the quantities of TRI chemicals they manage in waste, both on-and off-site. The PPA established as national policy that source reduction is the preferred approach to managing waste. Source reduction is defined as an activity that prevents the generation of waste. The PPA also established as national policy a hierarchy of waste management options, illustrated in Figure 2, for situations where source reduction cannot be implemented feasibly.

Although source reduction is the preferred method of reducing risk, environmentally sound recycling shares many of its advantages. Like source reduction, recycling reduces the need for treatment or disposal of waste and helps conserve energy and natural resources. Where source reduction and recycling are not feasible, waste can be treated. Disposal or other releases of a chemical is viewed as a last resort, to be employed only if the preferred methods of waste management cannot be implemented. The PPA did not specifically address the combustion of waste for energy recovery as a waste management option. However, because energy recovery shares aspects of recycling and treatment, EPA chose to list this activity separately in the waste management hierarchy.

Figure 2. Waste Management Hierarchy



Box 11 describes the waste management information facilities must report to TRI. The amount of TRI chemicals in waste reported includes both waste generated by the facility and waste received by the facility for the purpose of waste management. Facilities report these data in Section 8 of the Form R as estimates for the reporting year (2002), the previous year (2001), and as projections for the two following years (2003 and 2004). The PPA requires this data projection to encourage facilities to consider their future waste generation, opportunities for source reduction, and potential improvement in waste management options as presented in the hierarchy. Future-year estimates are not commitments that facilities reporting to TRI must meet.

Box 11. An Explanation of On- and Off-site Waste Management Information

On-site and off-site waste management activities are reported in Section 8 of Form R. In this section, amounts due to one-time events such as accidental releases or remediation (clean-up) are reported separately and not included in the amounts reported as recycled, burned for energy recovery, treated or disposed of or otherwise released on- or off-site.

Recycled On-site (Section 8.4). This is the quantity of the toxic chemical recovered at the facility and made available for further use. To avoid double-counting, the amount reported represents the amount exiting the recycling unit. It is not the quantity that entered an on-site recycling or recovery operation. For example, 3,000 pounds of a listed chemical enters a recycling operation. Of this, 500 pounds of the chemical are in residues from the recycling operation that are subsequently sent off-site for disposal. The quantity reported as recycled on-site would be 2,500 pounds.

Recycled Off-site (Section 8.5). This is the quantity of the toxic chemical that left the facility boundary for recycling, not the amount recovered at the off-site location. This quantity includes the amount(s)reported in Section 6 of Form R as transferred off-site for recycling, less any amount(s)associated with non-routine events.

Used for Energy Recovery On-site (Section 8.2). This is the quantity of the toxic chemical that was combusted in some form of energy recovery device, such as a furnace (including kilns) or boiler. The toxic chemical should have a heating value high enough to sustain combustion. To avoid double-counting, the amount reported represents the amount destroyed in the combustion process, not the amount that entered the energy recovery unit. For example, 100,000 pounds of toluene entered a boiler that, on average, combusted 98% of the toluene. Any remaining toluene was discharged to air. A total of 98,000 pounds is reported as combusted for energy recovery (the remaining 2,000 pounds is reported as disposed of or otherwise released).

Used for Energy Recovery Off-site (Section 8.3). This is the quantity of the toxic chemical that left the facility boundary for energy recovery, not the amount combusted at the off-site location. The toxic chemical must have a significant heating value, and the off-site location must have some form of energy recovery unit in place. This quantity includes the amount(s) reported in Section 6 of Form R as transferred off-site for energy recovery, less any amount(s) associated with non-routine events.

Treated On-site (Section 8.6). This is the quantity of the toxic chemical destroyed in on-site waste treatment operations, not the amount that entered a treatment operation. For example, if 100,000 pounds of benzene were combusted in an incinerator that destroyed 99% of the benzene, the facility

would report 99,000 pounds as treated on-site (the remaining 1,000 pounds would be reported as disposed of or otherwise released).

Treated Off-site (Section 8.7). This is the quantity of the toxic chemical that left the facility boundary and was sent to POTWs or other off-site locations for treatment, not the amount that was destroyed at the off-site location(s). This quantity includes the amount(s) reported in Section 6 of Form R as transferred to POTWs or other off-site locations for treatment, less any amount(s) associated with non-routine events and not including quantities of metals and metal category compounds.

Quantity Disposed of or Otherwise Released On-and Off-site (Section 8.1). This is the total quantity of the toxic chemical that was released to the environment or disposed of at the facility (discharged to air, land, and water, and injected underground on-site) or sent off-site for disposal or other release. This quantity is the sum of the amounts reported in Sections 5 and 6 of Form R (on-site disposal or other releases plus off-site transfers to disposal or other releases and transfers to POTWs of metals and metal category compounds) less any amount(s) associated with non-routine events. The Form R has been modified to collect information starting with reporting year 2003 on disposal to Class I underground injection wells, RCRA Subtitle C landfills and other landfills separately from other disposal or other releases, both on-site and off-site.

Non-production-related Waste Managed - Released to the Environment Due to One-time Events (Section 8.8). This amount is referred to as non-production-related waste and is the quantity disposed of or otherwise released to the environment or sent off-site for recycling, energy recovery, treatment, or disposal or other release due to one-time events not associated with routine production practices. Such events include catastrophic events, such as accidental releases, as well as remedial actions (clean-up). This quantity is separated from the quantities recycled, used for energy recovery, treated, and disposed of or released, to distinguish between quantities that are routinely associated with production operations and are more amenable to source reduction and those that are not routinely associated with production processes and are not so amenable to source reduction because they are not readily anticipated (e.g., releases due to damage from a tornado). This separation is important in assessing progress in source reduction at facilities.

The individual waste management quantities reported in Sections 8.1 through 8.8 are mutually exclusive to avoid double-counting. For example, an incinerator may destroy 99% of the chemical in the waste; in this case, the amount reported as treated on-site would be the amount destroyed by the incinerator, not the amount that entered the incinerator. The amount not destroyed in incineration (1%) would be reported as disposed of or otherwise released. The sum of the individual quantities in a given year equals the total quantity of TRI chemicals in waste resulting from routine production operations at a facility during that year.

For the reporting year only, facilities must also report the quantity of waste disposed of or otherwise released as a result of activities other than routine production operations. This quantity appears in data tables as “non-production-related waste managed.” It includes waste disposed of or otherwise released to the environment at the facility or transferred off-site because of catastrophic events or remedial (clean-up) actions at the facility. Non-production-related waste is considered less amenable to source reduction because facilities cannot reasonably anticipate these quantities.

It is important to note that facilities may vary in how they interpret some of the reporting requirements under the PPA. Differences in estimation or calculation techniques may cause a difference in the amount reported without a corresponding difference in actual quantities of the chemical reported.

Box 12 explains the differences between “total on- and off-site disposal or other releases” and “quantity disposed of or otherwise released on- and off-site.”

Box 12. Differences between Amounts Reported in Sections 5 and 6 and in Section 8 of Form R

"Total on- and off-site disposal or other releases" (amounts reported in Sections 5 and 6) and "quantity disposed of or otherwise released on- and off-site" (amounts reported in Section 8) are not the same. This difference arises primarily from the types of disposal or other releases reported on different sections of the Form R.

- "Total on- and off-site disposal or other releases" reflects all on-site disposal or other releases as collected in Section 5 of the Form R and transfers off-site for disposal or other releases as reported in Section 6. The amounts included from Section 6.2 are for codes M10, M41, M63, M62, M65, M64, M71, M72, M73, M79, M90, M94, and M99 and from Section 6.1 for metals and metal category compounds only.
- "Quantity disposed of or otherwise released on- and off-site" is limited to production-related on- and off-site disposal or other releases as collected in Section 8.1 of the Form R. This quantity is the sum of the amounts included from Section 6.2 for codes M10, M41, M63, M62, M65, M64, M71, M72, M73, M79, M90, M94, and M99 and from Section 6.1 for metals and metal category compounds only minus the amount for one-time events not related to production as reported in Section 8.8 and reported under each of these parts of Sections 5 and 6.

Although total amounts analyzed in these two categories are often the same, they may differ to the extent that disposal or other releases associated with catastrophic events, remedial actions, or other one-time events not related to production occur. That is, Production-related disposal or other releases reported in Section 8.1 do not include the amounts associated with the one-time events while disposal and other releases in Section 5 and Section 6 (those codes listed above) do include them.

For the same reason, the quantity used for energy recovery offsite (Section 8.3), quantity recycled offsite (Section 8.5) and quantity treated offsite (Section 8.7) do not include transfers for recycling, energy recovery, and treatment (including POTWs for non-metals) reported in Section 6 to the extent that amounts from one-time events are reported. Once again, the relevant parts in Section 8 include only production-related wastes and not amounts from one-time events whereas Section 6 includes all off-site waste management amounts.

- The amounts in Section 8.3 (quantity used for energy recovery offsite) correspond to the amounts reported in Section 6.2 under codes M56 and M92 minus amounts for one-time events not related to production as reported in Section 8.8.

- The amounts in Section 8.5 (quantity recycled offsite) correspond to the amounts reported in Section 6.2 under codes M20, M24, M26, M28 and M93 minus amounts for one-time events not related to production as reported in Section 8.8.
- The amounts in Section 8.7 (quantity treated off-site) correspond to the amounts reported in Section 6.2 under codes M40, M50, M54, M61, M69 and M95 and in Section 6.1 for chemicals other than metals and metal category compounds minus amounts for one-time events not related to production as reported in Section 8.8.

The amounts from one-time events not related to production are reported in Section 8.8.

Other reasons also contribute to the different quantities reported in different sections of the Form R. For example, an amount of less than 1,000 pounds may be reported in ranges in Section 5 and 6 whereas an exact amount must be included in Section 8. Furthermore, facilities may round off amounts, except those for PBT chemicals, to two significant digits.

What is Source Reduction?

As noted above, the PPA of 1990 requires facilities to report the quantities of TRI chemicals they manage in waste, both on- and off-site. The PPA also requires facilities to provide information about the efforts they have made to reduce or eliminate those quantities. With the 1991 reporting year, facilities began reporting to TRI information about any source reduction activities they implemented during the year.

Source reduction activities are undertaken to reduce the amount of a toxic chemical which enters a wastestream or is otherwise released to the environment. By reducing the generation of toxic chemicals in waste, source reduction activities reduce the need to recycle, treat, or dispose of toxic chemicals. Box 13 explains source reduction as defined by the PPA.

Box 13. What Is Source Reduction?

Through source reduction, risks to people and the environment can be reduced, financial and natural resources can be saved that would otherwise have to be expended on environmental clean-up or pollution control, and industrial processes can become more efficient. Source reduction is defined in the Pollution Prevention Act of 1990 as any practice that:

- reduces the amount of any hazardous substance, pollutant, or contaminant entering any wastestream or otherwise disposed of or released into the environment (including fugitive emissions); and
- reduces the hazards to public health and the environment associated with the disposal or release of such substances, pollutants, or contaminants.

Source reduction practices can include modifications in equipment, process, procedure, or technology, reformulation or redesign of products, substitution of raw materials, and improvements in maintenance and inventory controls. Under this definition, waste management activities, including recycling, treatment, and disposal or other releases, are not considered forms of source reduction.

Making Year-to-Year Comparisons

Year-to-year comparisons must be based on a consistent set of reporting requirements to assure that any changes in the data do not simply reflect expansion of TRI's chemical and industry coverage or other modifications in reporting requirements over the course of the years. Therefore, trend analyses have been undertaken using various baseline years, as described below. Chemicals that have been removed from the TRI list ("delisted" chemicals) are excluded from all of the year-to-year comparisons.

2000-2002
For 2000, EPA made changes to the list of chemicals that must be reported and to reporting thresholds for some chemicals. EPA has the authority both to add chemicals to the TRI reporting list if they meet the statutory toxicity criteria and to delete chemicals from the list if EPA determines that they do not meet the toxicity criteria. For the 2000 reporting year, PBT chemicals already on the list had the reporting thresholds lowered and other PBT chemicals were added to the list. In addition, vanadium compounds were added to the list and the qualifier for vanadium was changed to exclude vanadium when contained in alloys starting with the reporting year 2000. These chemicals are included for analyses covering the 2000-2002 period, but not for periods covering years prior to 2000. The reporting thresholds for the PBTs lead and lead compounds were lowered starting with the reporting year 2001. Lead and lead compounds are not included for analyses covering the 2000-2002 period or for periods covering years prior to 2001.

Additional considerations also apply to analyses of TRI data for 2000-2002. Beginning with reporting year 2002, amounts sent off-site to landfills/disposal surface impoundments are reported in three separate categories (RCRA Subtitle C landfills, other landfills, and surface impoundments). These types of transfers to disposal or other releases cannot be analyzed separately for years prior to 2002.

1998-2002
Chemicals whose reporting requirements changed starting with the 2000 or 2001 reporting year (see above) are excluded for analyses covering the 1998-2002 period. Seven industry sectors were required to report starting with the 1998 reporting year, including metal mining, coal mining, electric utilities, chemical wholesale distributors, petroleum bulk storage/terminals, hazardous waste management facilities and solvent recovery facilities. These industries are included for analyses covering the 1998-2002 period, but not for periods covering years prior to 1998.

1995-2002
Chemicals added to TRI in EPA's chemical expansion initiative were first reportable in 1995. These chemicals are included for analyses covering the 1995-2002 period, but not for periods covering years prior to 1995. PBT chemicals whose reporting requirements changed starting with the 2000 or 2001 reporting year (see above) are excluded for analyses covering the 1995-2002 period. Since 1995, EPA has deleted three chemicals from the TRI list, including phosphoric acid in 1999. These chemicals are excluded from all analyses of multi-year data. Also, reporting by the seven industries added to the TRI starting with the 1998 reporting year is excluded from the 1998, 1999, 2000, 2001 and 2002 data for analyses covering the 1995-2002 period.

Additional considerations also apply to analyses of TRI data for 1995 to 2002: Beginning with reporting year 1996, the amounts injected underground into Class I wells are reported separately from amounts injected into underground wells of other classes (II-V), and on-site land disposal in RCRA Subtitle C landfills separately from other types of on-site landfills. These types of disposal or other releases cannot be analyzed separately for years prior to 1996.

1991-2002
Reporting requirements for ammonia, hydrochloric acid, and sulfuric acid have changed since 1991. Analyses for the period 1991-2002 exclude chemicals added to TRI since 1991 and those for which reporting requirements have changed over that time. Also, reporting by the seven industries added to the TRI starting with the 1998 reporting year is excluded from the 1998, 1999, 2000, 2001 and 2002 data for analyses covering the 1991-2002 period.

Waste management information added to TRI by the Pollution Prevention Act of 1990 has been collected since 1991. In addition, reporting on off-site transfers to recycling and on off-site transfers to energy recovery were added in 1991. Therefore, waste quantity reports are available only for analyses covering the years 1991-2002, but not for periods covering years prior to 1991. Also, waste transfer reports that include transfers to recycling and energy recovery are available for analyses covering years 1991-2002, but not for periods covering years prior to 1991.

1988-2002
Analyses for the period 1988 to 2002 exclude chemicals added to TRI since 1988 and those for which reporting requirements have changed over that time. This includes chemicals described above as well as aluminum oxide whose qualifier changed to "fibrous forms" for the 1989 reporting year. Also, reporting by industries required to report starting with the 1998 reporting year is excluded from the 1998, 1999, 2000, 2001 and 2002 data for analyses covering the 1988-2002 period.

Waste management information added to TRI by the Pollution Prevention Act of 1990 has been collected since 1991. In addition, reporting on off-site transfers to recycling and on off-site transfers to energy recovery were added in 1991. Therefore, waste quantity reports are not available for analyses covering the

years 1988-2002, and waste transfer reports do not include transfers to recycling and energy recovery for analyses covering the years 1988-2002.

Other Changes

Apparent increases and decreases among industries can also result when facilities change the SIC codes they report from one year to another, reflecting new or discontinued facility operations or indicating a different understanding of how SIC codes relate to the facility's business.

Reporting of amounts sent offsite to RCRA Subtitle C landfills separately from amounts sent off-site to other types of landfills began in 2002. These off-site transfers types cannot be analyzed separately for years 1988 through 2001.

Reasons for Change

Box 14 provides reasons that a facility's reported amounts may change from one year to another. Explanations for changes in reported amounts include actual source reduction projects undertaken to reduce a facility's generation of waste of a particular chemical, increases or decreases in production levels, changes in a facility's methods of estimating or calculating reportable amounts (which does not indicate a corresponding change in actual disposal or other releases and waste management), reporting errors in previous years for which the facility has not filed a revised submission, and others.

Box 14. Reasons Facility Reported Amounts May Change

Some reported increases and decreases are real—that is, they reflect changes in the amounts of TRI chemicals actually disposed of or released or otherwise managed in waste. Other reported increases and decreases are accounting or "paper" changes that do not reflect change in disposal or releases or other waste management. Some examples follow.

Real Changes

Source reduction activities, such as process changes, elimination of spills and leaks, inventory control, improved maintenance, chemical substitution, and alternative methods of cleaning and degreasing can cause real reduction in the amount of waste generated and/or managed.

The installation of pollution control equipment does not reduce the amount of waste generated, but may lead to real reductions in TRI chemicals disposed of or released. However, if the pollution control does not destroy the reported chemical, it may merely shift the chemical from one type of waste management to another.

Production changes can cause real changes in the quantities of TRI chemicals disposed of or released or otherwise managed as waste by facilities. Production-related waste is likely to increase when production increases and decrease when production decreases, although the relationship is not necessarily linear.

One-time events unrelated to normal production processes, such as accidental releases or clean-up operations, can cause a real but anomalous increase in the reporting year in which they occur and then a decrease from that abnormally high level the following year.

"Paper" Changes
Changes in estimation or calculation techniques can cause a change in the amount reported without a corresponding change in actual quantities of the chemical disposed of or released or otherwise managed as waste.

Clarifications of reporting instructions or changes in the way a facility interprets those instructions may cause a change in reported amounts without an actual change in quantities of the chemical disposed of or released or otherwise managed as waste.

Changes in the reporting definition of a particular chemical may cause a change in the reported amounts without an actual change in quantities disposed of or released or otherwise managed as waste. For example, revising the definitions of sulfuric acid and hydrochloric acid to include only aerosol forms, as occurred in reporting years 1994 and 1995, resulted in lower reports of releases, when non-aerosol forms were no longer reported.

Similarly, a facility's use of the alternate threshold may result in a reported decrease without an actual reduction in disposal or releases if the facility begins to take advantage of an alternate manufacture, process, or otherwise use threshold of more than 1 million pounds. Beginning in the 1995 reporting year, some facilities whose "total annual reportable amount" for a reportable chemical does not exceed 500 pounds may use an alternate manufacture, process, or otherwise use threshold of 1 million pounds of the chemical. If they do not exceed this alternate threshold, they no longer need to report amounts of disposal or releases or other waste management activities.

Apparent increases or decreases can occur if a facility makes a reporting error one year and does not submit a revision for that year, but does not repeat the error the following year.

Summary

The information collected under The Emergency Planning and Community Right-to-Know Act of 1986 and the Pollution Prevention Act of 1990 can be used by the public to identify facilities and chemical disposal or other releases and other waste management patterns that warrant further study and analysis. Keeping in mind its limitations, TRI data, when combined with hazard and exposure information, has been proven to be a valuable tool for risk identification in communities.

Frequent Questions About Mercury

What is mercury?
How does mercury occur in the environment?
How do people and wildlife become exposed to mercury?
How does mercury affect human health?
- Is any exposure to mercury harmful to people?
- How are people exposed to methylmercury and what are the health effects?
- What are the sources of exposure to other forms of mercury and what are their health effects?

How should I handle mercury?
- What should I do if I spill mercury?
- What should I do to dispose of mercury?
- What should I do if I have elemental mercury in my home?

What can I do to reduce the amount of mercury in the environment?
What is EPA doing to reduce mercury exposure?
What is EPA doing about mercury air emissions?
- What are the biggest sources of mercury air emissions in the U.S.?
- How will EPA reduce mercury emissions from power plants?
- What else is EPA doing to reduce mercury emissions?

What is mercury?

Mercury is a naturally occurring element that is found in air, water and soil. It exists in several forms: elemental or metallic mercury, inorganic mercury compounds, and organic mercury compounds. Elemental or metallic mercury is a shiny, silver-white metal and is liquid at room temperature. It is used in thermometers, fluorescent light bulbs and some electrical switches. When dropped, elemental mercury breaks into smaller droplets which can go through small cracks or become strongly attached to certain materials. At room temperature, exposed elemental mercury can evaporate to become an invisible, odorless toxic vapor. People can be exposed to elemental mercury vapor when products that contain mercury break and expose mercury to the air, particularly in poorly-ventilated spaces.

Inorganic mercury compounds take the form of mercury salts and are generally white powder or crystals, with the exception of mercuric sulfide (cinnabar) which is red. Inorganic mercury compounds have been included in products such as fungicides, antiseptics or disinfectants. Some skin lightening and freckle creams, as well as some traditional medicines, can contain mercury compounds.

Organic mercury compounds, such as methylmercury, are formed when mercury combines with carbon. Microscopic organisms convert inorganic mercury into methylmercury, which is the most common organic mercury compound found in the environment. Methylmercury accumulates up the food chain.

The Food and Drug Administration (FDA) maintains a list of medicines that contain mercury. EXIT disclaimer

How does mercury occur in the environment?

Mercury is a naturally occurring element that can be found throughout the environment. Human activities, such as burning coal and using mercury to manufacture certain products, have increased the amount of mercury in many parts of the environment including the atmosphere, lakes and streams. People and animals are exposed to mercury by eating organisms that live in places where microbes have converted some of the natural and human mercury to a more toxic form, methylmercury.

How do people and wildlife become exposed to mercury?

The primary way people in the U.S. are exposed to mercury is by eating fish containing methylmercury.

Mercury in the atmosphere is eventually deposited to the earth's surface, either through dry or wet deposition (rain or snow). When mercury falls from the air or runs off the ground into the water, certain microorganisms in soils and sediments convert some part of it into methylmercury, a highly toxic form of mercury.

Small organisms take up methylmercury as they feed. When animals higher up the food chain eat the smaller ones, they also take in the methylmercury. As this process, (known as bioaccumulation), continues, levels of methylmercury increase up the food chain. Fish that are higher in the food chain, such as sharks and swordfish, have much greater methylmercury concentrations than fish that are lower on the food chain. This is true for both saltwater and freshwater fish. People and fish-eating wildlife become exposed when they eat fish and shellfish that contain methylmercury. There are ways in which people are exposed to other forms of mercury as well. See the Human Exposure page for more information

How does mercury affect human health?

Is any exposure to mercury harmful to people?

High levels of mercury in the bloodstream of unborn babies and young children may harm the developing nervous system. Whether an exposure to mercury will harm a person's health depends on a number of factors. Almost all people have at least trace amounts of mercury in their tissues, reflecting mercury's widespread presence in the environment. People may be exposed to mercury in any of its forms under different situations. The factors that determine how severe the health effects are from mercury exposure include:

- the chemical form of mercury - elemental (metallic), inorganic compounds, or organic compounds
- the dose -- how much
- the duration of exposure -- how long
- the route of exposure -- eating, breathing, injecting, touching
- other chemical exposures
- the specific characteristics of the person - age, health

Anyone who has concerns about mercury exposure should consult a doctor. Doctors may be able to identify exposure and health risks by measuring the amounts of mercury in blood, urine, breast milk, finger and toenails, and hair. Over time, the body can rid itself of some mercury. Methylmercury is removed from the body naturally, but it may take months to a year for the levels to drop significantly.

The effects of mercury exposure can be very severe, subtle, or may not occur at all, depending on the factors above. Mercury can affect the nervous system. Because fetuses, infants, and children are still developing, they are particularly sensitive to the effects of methylmercury on the nervous system. People are mainly exposed to methylmercury, an organic compound, when they eat fish and shellfish that contain methylmercury.

You can find more detailed information about health effects that may result from exposure to mercury and methylmercury by visiting the Health Effects section of the EPA Mercury Web site and the Integrated Risk Information System (IRIS) database. You can also visit the Agency for Toxic Substances and Disease Registry (ATSDR) toxicological profile for mercury. EXIT disclaimer For further information on the EPA/FDA fish advisory, visit our Fish Consumption Advisory page.

How are people exposed to methylmercury and what are methylmercury's health effects?

Nearly all methylmercury exposures occur through eating fish and shellfish. Microscopic organisms convert inorganic mercury into methylmercury, which accumulates up the food chain in fish, other fish-eating animals, and people.

Some fish contain more methylmercury than others. Big fish that eat smaller fish tend to contain more methylmercury. Both EPA and the Food and Drug Administration have issued advice to pregnant women about how often they should eat certain types of fish. States issue fish advisories that tell consumers about how often they should eat certain types and quantities of locally caught fish. Certain species of commercially available saltwater fish, such as shark, swordfish, kingfish and tilefish, can contain high levels of methylmercury. You can find more detailed information about locally-caught, non-commercial fish by visiting our Fish Consumption Advisory page.

Outbreaks of methylmercury poisonings have made it clear that adults, children, and developing fetuses are at risk from ingestion exposure to mercury. During these poisoning outbreaks some mothers with no symptoms of nervous system damage gave birth to infants with severe disabilities, it became clear that the developing nervous system of the fetus may be more vulnerable to methylmercury than is the adult nervous system. Mothers who are exposed to methylmercury and breast-feed their babies may also expose their infant children through their milk. Research shows that most people's fish consumption does not cause a health concern. However, high levels of methylmercury in unborn babies and young children may harm the developing nervous system. With this in mind, FDA and EPA designed an advisory that if followed should keep an individual's mercury consumption below levels that have been shown to cause harm. By following the advisory, parents can reduce their unborn or young child's exposure to the harmful effects of methylmercury, while at the same time maintaining a healthy diet that includes the nutritional benefits of fish and shellfish.

You can find more detailed information about human health effects that may result from exposure to mercury and methylmercury by visiting the Health Effects section of the EPA Mercury Web site and the Integrated Risk Information System (IRIS) database. You can also visit the Agency for Toxic Substances and Disease Registry (ATSDR) toxicological profile for mercury. EXIT disclaimer For further information on the EPA/FDA fish advisory, you can visit http://www.epa.gov/waterscience/fishadvice/advice.html

What are the sources of exposure to other forms of mercury and what are their health effects?

Elemental or metallic mercury is the liquid metal used in thermometers, button cell batteries (standard household batteries do not contain mercury), electrical switches, and some folk remedies and religious practices. In household products, where elemental mercury generally is contained in glass or metal, it does not pose a risk unless the product is damaged or broken and mercury vapors are released. At room temperature, some uncontained mercury can evaporate and become an invisible, odorless toxic vapor. At higher temperatures, these concentrations increase. Very small amounts of elemental mercury (even a few drops) can raise air concentrations of mercury to harmful levels particularly in poorly-ventilated spaces. The longer people breathe the contaminated air, the greater the risk to their health. At high exposures, through inhalation, elemental mercury vapors can produce severe lung, gastrointestinal, and nervous system damage.

Inorganic mercury compounds take the form of mercury salts. They are generally white powders or crystals, with the exception of mercuric sulfide (cinnabar) which is red. Inorganic compounds, and organic compounds, such as phenylmercury acetate and ethylmercury, have been commonly used as fungicides, antiseptics or disinfectants. They also have been used in a variety of products. Most of these uses have been discontinued, but small amounts of these compounds can still be found as preservatives in some medicines. The U.S. Food and Drug Administration maintains a list of medicines that contain mercury EXIT disclaimer. Inorganic mercury may still be found in some skin-lightening and freckle creams.

Excessive exposure to inorganic and organic mercury compounds can result from misuse or overuse of mercury-containing products. Exposure to mercury compounds is primarily through ingestion, but can occur through other pathways. Organic mercury compounds are more readily absorbed through the gastrointestinal tract and skin than are inorganic compounds. High exposures to mercury compounds can damage the gastrointestinal tract, the nervous system, and the kidneys.

You can find more detailed information about human health effects that may result from exposure to mercury and methylmercury by visiting the Health Effects section of the EPA Mercury Web site and Integrated Risk Information System (IRIS) database. You can also visit the Agency for Toxic Substances and Disease Registry (ATSDR) toxicological profile for mercury. EXIT disclaimer

How should I handle mercury?

What should I do if I spill mercury?

It is important to clean up mercury spills properly and promptly and to report them to the proper authorities when necessary. There are three different procedures to address mercury spills.

Spills less than or equal to the amount in a thermometer

Spills greater than the amount in a thermometer

Spills greater than one pound (two tablespoons)

What should I do to dispose of mercury?

Proper disposal of used mercury-containing items is important to protect health and the environment. If you improperly dispose of containers with mercury in them, they may break and release mercury vapors which are harmful to human health and the environment. You can find out about ways to safely dispose of mercury-containing products by visiting Spills, Disposal and Site Cleanup.

What should I do if I have elemental mercury in my home?

Many people have containers of elemental mercury in their homes left over from science projects or other sources. Elemental mercury is a shiny, silver-gray metal that is liquid at room temperature. If you have elemental mercury in your home, you should exercise extreme caution with it and package and dispose of mercury to prevent any leaks or spills.

What can I do to reduce the amount of mercury in the environment?

You can buy and use products that are mercury- free. You can make sure that you properly dispose of any mercury-containing items that you have. U.S. demand for mercury in products dropped 75 percent from 1988 to 1997 for several reasons, including: federal bans on mercury additives in paint and pesticides, industry efforts to reduce mercury in batteries, increasing state regulation of mercury emissions and mercury in products, and state recycling programs. Both the business community and the public can further contribute to reduce mercury releases to the environment by making or purchasing mercury-free products. They can also participate in state/local collection programs rather than throwing away mercury-containing products.

What is EPA doing to reduce mercury exposure?

Fish Consumption Advisories
The primary way people in the U.S. are exposed to mercury is by eating fish contaminated with methylmercury. Federal, state and local governments can issue fish consumption advisories about which fish are unsafe to eat or which waterbodies are not safe to fish. In 2004, EPA and FDA issued the first ever joint consumer advice about methylmercury in fish and shellfish. This was for women who might become pregnant; women who are pregnant; nursing mothers; and young children. The advisory provides three recommendations for selecting and eating fish or shellfish to ensure that women and young children will receive the benefits of eating fish and shellfish and be confident that they have reduced their exposure to the harmful effects of mercury. EPA also hosts a web-based compilation of fish advisories issued by States, tribes, territories and local governments.

Regulations
EPA issues regulations to reduce certain mercury releases.

Voluntary Partnerships
EPA works with several industries, such as waste management and health care, to encourage voluntary efforts to reduce or eliminate mercury pollution. Examples include:

Hospitals for a Healthy Environment EXIT disclaimer
EPA's National Partnership for Environmental Priorities

Research About Mercury
EPA scientists study how mercury behaves in the environment and how it affects people's health. In addition, we provide grants to other researchers.

International Actions
EPA works with other countries to reduce mercury pollution.

What is EPA doing about mercury air emissions?

What are the biggest sources of mercury air emissions in the U.S.?

According to EPA's 1999 National Emissions Inventory, coal-fired electric power plants are the largest source of human-caused mercury air emissions in the U.S. These power plants account for about 40% of total U.S. manmade mercury emissions. Other large sources are industrial boilers (about 10% of U.S. mercury emissions), burning hazardous waste (about 5%), and chlorine production (also about 5%). Burning municipal waste and medical waste was once a larger source of emissions. Today, in response to EPA and state regulations and reductions in mercury use, emissions from these sources have declined 85-90 percent.

How will EPA reduce mercury emissions from power plants?

Clean Air Mercury Rule: On January 30, 2004, EPA proposed a rule with two basic approaches for controlling mercury from power plants. One approach would require power plants to meet emissions standards reflecting the application of the "maximum achievable control technology" (MACT) determined according to the procedure set forth in section 112(d) of the Clean Air Act. If implemented, this proposal would reduce nationwide mercury by 14 tons or about 30 percent by early 2008. A second approach proposed by EPA would create a market-based "cap and trade" program that, if implemented, would reduce nationwide utility emissions of mercury in two phases. When fully implemented mercury emissions would be reduced by 33 tons (nearly 70 percent). EPA proposed to pursue the cap and trade approach either under Section 111 or Section 112 of the Clean Air Act.

The January 30, 2004 EPA proposed rule also proposed to revise the Agency's December 2000 finding that is "appropriate and necessary" to regulate utility hazardous air emissions using the MACT standards provisions (section 112) of the Clean Air Act. This action would give EPA the flexibility to consider a more efficient and more cost effective way to control mercury emissions.

On December 3, 2004, EPA issued a Notice of Data Availability (NODA) supporting EPA's proposed Clean Air Mercury Rule. The NODA summarizes the modeling analyses presented by EPA and the commenters, and solicits comment on the inputs and assumptions underlying those analyses. The NODA also seeks comment on EPA's benefits assessment.

EPA also proposed to revise its December 2000 finding that it is "appropriate and necessary" to regulate utility hazardous air emissions using the MACT standards provisions (section 112) of the Clean Air Act. This action would give EPA the flexibility to consider a more cost effective way to control mercury emissions.
URL: http://www.epa.gov/air/mercuryrule/rule.htm

Additionally, the Administration's proposed Clear Skies legislation would cap emissions of mercury at 26 tons in 2010 and 15 tons in 2018, down from a current total of 48 tons.

Please see "Controlling Power Plant Emissions" box on the right side of the Mercury Homepage.

What else is EPA doing to reduce mercury emissions?

EPA has taken a number of actions to reduce mercury pollution, including issuing stringent regulations for industries that contribute to U.S. mercury emissions. These regulations eventually will reduce nationwide mercury emissions significantly. EPA's actions include:

Municipal waste combustors (MWCs), emitted about 57 tons of mercury emissions to the air in 1990. EPA issued final regulations for large MWCs on October 31, 1995. Implementation of large MWC regulations has reduced mercury emissions by 88 percent from 1990 emission levels. EPA finalized regulations for small MWCs on December 6, 2000 and full compliance is required by 2005. In 2005, these two regulations are projected to reduce MWC emissions by 91 percent from 1990 emission levels.

Medical waste incinerators (MWIs) emitted about 50 tons per year of the total national mercury emissions into the air in 1990. EPA issued emission standards for MWIs on August 15, 1997 and these incinerators must now comply. Compliance information indicates that mercury emissions from MWIs are 95 percent less than in 1990.

EPA issued final standards for mercury from chlor-alkali production on December 19, 2003. EPA expects that these standards, when fully implemented by the end of 2006, will cut mercury emissions from point sources at these facilities by 74% and they will cut total mercury reductions from these facilities by about 11% from emissions 1999 levels.

EPA has also issued regulations to reduce mercury emissions from industrial boilers. This regulation, when fully implemented in 2007, will reduce emissions by 17% from 12 tons to 10 tons per year.

In addition, other factors that have influenced mercury emissions include:

Federal bans on mercury in paints and batteries,
Efforts to encourage removal of mercury switches from metal scrap going to iron and steel foundries,
State-required recycling programs, and
Voluntary actions by industry. **Source: http://www.epa.gov/mercury/faq.htm**

List of Hazardous Air Pollutants

CAS Number	Chemical Name
75070	Acetaldehyde
60355	Acetamide
75058	Acetonitrile
98862	Acetophenone
53963	2-Acetylaminofluorene
107028	Acrolein
79061	Acrylamide
79107	Acrylic acid
107131	Acrylonitrile
107051	Allyl chloride
92671	4-Aminobiphenyl
62533	Aniline
90040	o-Anisidine
1332214	Asbestos
71432	Benzene (including benzene from gasoline)
92875	Benzidine
98077	Benzotrichloride
100447	Benzyl chloride
92524	Biphenyl
117817	Bis(2-ethylhexyl)phthalate (DEHP)
542881	Bis(chloromethyl)ether
75252	Bromoform
106990	1,3-Butadiene
156627	Calcium cyanamide
105602	Caprolactam(See Modification)
133062	Captan
63252	Carbaryl
75150	Carbon disulfide
56235	Carbon tetrachloride
463581	Carbonyl sulfide
120809	Catechol
133904	Chloramben
57749	Chlordane
7782505	Chlorine
79118	Chloroacetic acid
532274	2-Chloroacetophenone
108907	Chlorobenzene
510156	Chlorobenzilate
67663	Chloroform
107302	Chloromethyl methyl ether

126998	Chloroprene
1319773	Cresols/Cresylic acid (isomers and mixture)
95487	o-Cresol
108394	m-Cresol
106445	p-Cresol
98828	Cumene
94757	2,4-D, salts and esters
3547044	DDE
334883	Diazomethane
132649	Dibenzofurans
96128	1,2-Dibromo-3-chloropropane
84742	Dibutylphthalate
106467	1,4-Dichlorobenzene(p)
91941	3,3-Dichlorobenzidene
111444	Dichloroethyl ether (Bis(2-chloroethyl)ether)
542756	1,3-Dichloropropene
62737	Dichlorvos
111422	Diethanolamine
121697	N,N-Diethyl aniline (N,N-Dimethylaniline)
64675	Diethyl sulfate
119904	3,3-Dimethoxybenzidine
60117	Dimethyl aminoazobenzene
119937	3,3'-Dimethyl benzidine
79447	Dimethyl carbamoyl chloride
68122	Dimethyl formamide
57147	1,1-Dimethyl hydrazine
131113	Dimethyl phthalate
77781	Dimethyl sulfate
534521	4,6-Dinitro-o-cresol, and salts
51285	2,4-Dinitrophenol
121142	2,4-Dinitrotoluene
123911	1,4-Dioxane (1,4-Diethyleneoxide)
122667	1,2-Diphenylhydrazine
106898	Epichlorohydrin (l-Chloro-2,3-epoxypropane)
106887	1,2-Epoxybutane
140885	Ethyl acrylate
100414	Ethyl benzene
51796	Ethyl carbamate (Urethane)
75003	Ethyl chloride (Chloroethane)
106934	Ethylene dibromide (Dibromoethane)
107062	Ethylene dichloride (1,2-Dichloroethane)
107211	Ethylene glycol
151564	Ethylene imine (Aziridine)
75218	Ethylene oxide

96457	Ethylene thiourea
75343	Ethylidene dichloride (1,1-Dichloroethane)
50000	Formaldehyde
76448	Heptachlor
118741	Hexachlorobenzene
87683	Hexachlorobutadiene
77474	Hexachlorocyclopentadiene
67721	Hexachloroethane
822060	Hexamethylene-1,6-diisocyanate
680319	Hexamethylphosphoramide
110543	Hexane
302012	Hydrazine
7647010	Hydrochloric acid
7664393	Hydrogen fluoride (Hydrofluoric acid)
7783064	Hydrogen sulfide(See Modification)
123319	Hydroquinone
78591	Isophorone
58899	Lindane (all isomers)
108316	Maleic anhydride
67561	Methanol
72435	Methoxychlor
74839	Methyl bromide (Bromomethane)
74873	Methyl chloride (Chloromethane)
71556	Methyl chloroform (1,1,1-Trichloroethane)
78933	Methyl ethyl ketone (2-Butanone)
60344	Methyl hydrazine
74884	Methyl iodide (Iodomethane)
108101	Methyl isobutyl ketone (Hexone)
624839	Methyl isocyanate
80626	Methyl methacrylate
1634044	Methyl tert butyl ether
101144	4,4-Methylene bis(2-chloroaniline)
75092	Methylene chloride (Dichloromethane)
101688	Methylene diphenyl diisocyanate (MDI)
101779	4,4¬-Methylenedianiline
91203	Naphthalene
98953	Nitrobenzene
92933	4-Nitrobiphenyl
100027	4-Nitrophenol
79469	2-Nitropropane
684935	N-Nitroso-N-methylurea
62759	N-Nitrosodimethylamine
59892	N-Nitrosomorpholine
56382	Parathion

82688	Pentachloronitrobenzene (Quintobenzene)
87865	Pentachlorophenol
108952	Phenol
106503	p-Phenylenediamine
75445	Phosgene
7803512	Phosphine
7723140	Phosphorus
85449	Phthalic anhydride
1336363	Polychlorinated biphenyls (Aroclors)
1120714	1,3-Propane sultone
57578	beta-Propiolactone
123386	Propionaldehyde
114261	Propoxur (Baygon)
78875	Propylene dichloride (1,2-Dichloropropane)
75569	Propylene oxide
75558	1,2-Propylenimine (2-Methyl aziridine)
91225	Quinoline
106514	Quinone
100425	Styrene
96093	Styrene oxide
1746016	2,3,7,8-Tetrachlorodibenzo-p-dioxin
79345	1,1,2,2-Tetrachloroethane
127184	Tetrachloroethylene (Perchloroethylene)
7550450	Titanium tetrachloride
108883	Toluene
95807	2,4-Toluene diamine
584849	2,4-Toluene diisocyanate
95534	o-Toluidine
8001352	Toxaphene (chlorinated camphene)
120821	1,2,4-Trichlorobenzene
79005	1,1,2-Trichloroethane
79016	Trichloroethylene
95954	2,4,5-Trichlorophenol
88062	2,4,6-Trichlorophenol
121448	Triethylamine
1582098	Trifluralin
540841	2,2,4-Trimethylpentane
108054	Vinyl acetate
593602	Vinyl bromide
75014	Vinyl chloride
75354	Vinylidene chloride (1,1-Dichloroethylene)
1330207	Xylenes (isomers and mixture)
95476	o-Xylenes
108383	m-Xylenes

106423	p-Xylenes
0	Antimony Compounds
0	Arsenic Compounds (inorganic including arsine)
0	Beryllium Compounds
0	Cadmium Compounds
0	Chromium Compounds
0	Cobalt Compounds
0	Coke Oven Emissions
0	Cyanide Compounds1
0	Glycol ethers2
0	Lead Compounds
0	Manganese Compounds
0	Mercury Compounds
0	Fine mineral fibers3
0	Nickel Compounds
0	Polycylic Organic Matter4
0	Radionuclides (including radon)5
0	Selenium Compounds

NOTE: For all listings above which contain the word "compounds" and for glycol ethers, the following applies: Unless otherwise specified, these listings are defined as including any unique chemical substance that contains the named chemical (i.e., antimony, arsenic, etc.) as part of that chemical's infrastructure.
1 X'CN where X = H' or any other group where a formal dissociation may occur. For example KCN or Ca(CN)2
2 Includes mono- and di- ethers of ethylene glycol, diethylene glycol, and triethylene glycol R-(OCH2CH2)n -OR' where
n = 1, 2, or 3
R = alkyl or aryl groups
R' = R, H, or groups which, when removed, yield glycol ethers with the structure: R-(OCH2CH)n-OH. Polymers are excluded from the glycol category.(See Modification)
3 Includes mineral fiber emissions from facilities manufacturing or processing glass, rock, or slag fibers (or other mineral derived fibers) of average diameter 1 micrometer or less.
4 Includes organic compounds with more than one benzene ring, and which have a boiling point greater than or equal to 100 º C.
5 A type of atom which spontaneously undergoes radioactive decay.

Date: 1990

Source: http://www.epa.gov/ttn/atw/188polls.html

Common Questions on the Asbestos NESHAP

INTRODUCTION

The Clean Air Act (CAA) requires the U. S. Environmental Protection Agency (EPA) to develop and enforce regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health. In accordance with Section 112 of the CAA, EPA established National Emissions Standards for Hazardous Air Pollutants (NESHAP) to protect the public. Asbestos was one of the first hazardous air pollutants regulated under Section 112. On March 31, 1971, EPA identified asbestos as a hazardous pollutant, and on April 6, 1973, EPA first promulgated the Asbestos NESHAP in 40 CFR Part 61.

In 1990, a revised NESHAP regulation was promulgated by EPA. Information contained in this pamphlet is consistent with the amended regulation. This pamphlet answers the most commonly asked questions about the Asbestos NESHAP for demolitions and renovations. Many of the questions included in this pamphlet have been raised by demolition and renovation contractors in recent years. Most questions relate to how a demolition or renovation contractor or building owner can best comply with the regulation. The responses assume that the questioner has a basic understanding of the Asbestos NESHAP and demolition and renovation practices. A brief glossary of terms is also included at the back of the pamphlet.

The Asbestos NESHAP regulations protect the public by minimizing the release of asbestos fibers during activities involving the processing, handling, and disposal of asbestos-containing material. Accordingly, the Asbestos NESHAP specifies work practices to be followed during demolitions and renovations of all structures, installations, and buildings (excluding residential buildings that have four or fewer dwelling units). In addition, the regulations require the owner of the building and/or the contractor to notify applicable State and local agencies and/or EPA Regional Offices before all demolitions, or before renovations of buildings that contain a certain threshold amount of asbestos.

For more information about the Asbestos NESHAP or for answers to questions not covered in this pamphlet, contact the delegated State or local agency or the appropriate EPA Regional Office.

GENERAL INFORMATION

Q: What is the purpose of the Asbestos NESHAP regulation?

A: The purpose is to protect the public health by minimizing the release of asbestos when facilities which contain asbestos-containing materials (ACMs) are demolished or renovated.

Q: How much regulated asbestos-containing material (RACM) is disposed of annually from demolition/renovation operations?

A: Approximately 5.7 million cubic feet of RACM is disposed of annually. In accordance with the regulation, most RACM is taken to landfills, where it is covered by soil or other debris in order to keep it from releasing asbestos fibers.

Q: What is the difference between demolishing a facility and renovating it?

A: "Demolition" and "renovation" are defined in the regulation. You "demolish" a facility when you remove or wreck any load-supporting structural member of that facility or perform any related operations; you also "demolish" a facility when you burn it. You "renovate" a facility when you alter any part of that facility in any other manner. Renovation includes stripping or removing asbestos from the facility.

Q: What percentage of asbestos related activities involve demolitions?

A: Demolitions comprise approximately 10% of all reported asbestos-related activities.

Q: Is there a numeric emission limit for the release of asbestos fibers during renovations or demolitions in the asbestos NESHAP regulation?

A: No, the Asbestos NESHAP relating to demolitions or renovations is a work practice standard. This means that it does not place specific numerical emission limitations for asbestos fibers on asbestos demolitions and removals. Instead, it requires specific actions be taken to control emissions. However, the Asbestos NESHAP does specify zero visible emissions to the outside air from activity relating to the transport and disposal of asbestos waste.

Q: Who is responsible for enforcing the Asbestos NESHAP standards?

A: Under Section 112 of the Clean Air Act, Congress gave EPA the responsibility for enforcing regulations relating to asbestos renovations and demolitions. The CAA allows EPA to delegate this authority to State and local agencies. Even after EPA delegates responsibility to a State or local agency, EPA retains the authority to oversee agency performance and to enforce NESHAP regulations as appropriate.

Q: How many States have primary responsibility for implementing the Asbestos NESHAP regulations?

A: As of October 1990, approximately 45 states.

NESHAP JURISDICTION

Q: What is a "facility?"

A: As defined in the regulation, a "facility" is any institutional, commercial, public, industrial or residential structure, installation or building (including any structure, installation or building containing condominiums, or individual dwelling units operated as a residential cooperative, but excluding residential buildings having four or fewer dwelling units); any ship; or any active or inactive waste disposal site. Any building, structure or installation that contains a loft used as a dwelling is not considered residential. Any structure, installation, or building that was previously subject to the Asbestos NESHAP is not excluded, regardless of its current use or function.

Q: If I renovate several two-family units, are the units defined as a "facility?"

A: Residential buildings which have four or fewer dwelling units are not considered "facilities" unless they are part of a larger installation (for example, an army base, company housing, apartment or housing complex, part of a group of houses subject to condemnation for a highway right-of-way, an apartment which is an integral part of a commercial facility, etc.).

Q: Are mobile homes or mobile structures regulated by the Asbestos NESHAP?

A: Mobile homes used as single-family dwellings are not subject to Asbestos NESHAP. Mobile structures used for non-residential purposes are subject to NESHAP.

Q: Are Federal facilities regulated by the Asbestos NESHAP?

A: Yes.

Q: Are single-family private residences regulated by the Asbestos NESHAP?

A: No.

Q: How much asbestos must be present before the Asbestos NESHAP work practice standards apply to renovation projects?

A: Asbestos NESHAP regulations must be followed for all renovations of facilities with at least 80 linear meters (260 linear feet) of regulated asbestos-containing materials (RACM) on pipes, or 15 square meters (160 square feet) of regulated asbestos-containing materials on other facility components, or at least one cubic meter (35 cubic feet) off facility components where the amount of RACM previously removed from pipes and other facility components could not be measured before stripping. These amounts are known as the "threshold" amounts.

Q: How much asbestos must be present before the Asbestos NESHAP work practice standards apply to demolition projects?

A: Asbestos NESHAP regulations must be followed for demolitions of facilities with at least 80 linear meters (260 linear feet) of regulated asbestos-containing materials (RACM) on pipes, 15 square meters (160 square feet) of regulated asbestos-containing materials on other facility components, or at least one cubic meter (35 cubic feet) off facility components where the amount of RACM previously removed from pipes and other facility components could not be measured before stripping.

However, all demolitions must notify the appropriate regulatory agency, even if no asbestos is present at the site, and all demolitions and renovations are "subject" to the Asbestos NESHAP insofar as owners and operators must determine if and how much asbestos is present at the site.

Q: Are homes that are demolished or renovated to build non-residential structures regulated by the Asbestos NESHAP?

A: Yes. For example, homes which are demolished as part of an urban renewal project, a highway construction project, or a project to develop a shopping mall are regulated by the Asbestos NESHAP.

A single home which is converted into a non-residential structure is also regulated by the Asbestos NESHAP. For example, if someone buys a house and converts it into a store, the renovation is subject to the Asbestos NESHAP.

Q: If a renovation site is abandoned, is the site still regulated by the Asbestos NESHAP?

A: Yes. Even after a renovation site is abandoned, it is still regulated by the Asbestos NESHAP.

Q: What is encapsulation, and is it regulated by the Asbestos NESHAP?

A: Encapsulation is the application of a material with a sealant to stop it from releasing fibers. Normally, encapsulation is not regulated by the Asbestos NESHAP unless it involves removing or stripping asbestos. However, if encapsulation is done using methods that damage asbestos and release fibers it would be covered. For example, high pressure spraying to apply encapsulant could damage asbestos. Also, if friable RACM is encapsulated, the RACM is still covered by the Asbestos NESHAP if renovation or demolition occurs.

Q: Are offshore oil rigs regulated in terms of asbestos removal and demolition?

A: Yes. Federal jurisdiction extends to the continental shelf (100 miles). When EPA delegates authority to State or local agencies, the State and local agencies are usually considered to have authority only in territorial waters (12 miles). The Department of the Interior is still evaluating whether States may extend their jurisdiction beyond territorial waters. EPA currently enforces the NESHAP between territorial waters and the continental shelf.

NOTIFICATIONS

Q: What is a notification?

A: A notification is a written notice of intent to renovate or demolish. Notifications must contain certain specified information, including but not limited to, the scheduled starting and completion date of the work, the location of the site, the names of operators or asbestos removal contractors, methods of removal and the amount of asbestos, and whether the operation is a demolition or renovation. See Section 61.145(b) of the Asbestos NESHAP regulation.

Q: Whom do I notify?

A: You should notify the delegated State/Local Pollution Control Agency in your area and/or the EPA Regional Office of the demolition or renovation operations subject to NESHAP. Some EPA Regions require that both the EPA Regional Office and the local delegated agency be notified, while some require notice only to the delegated State or local agency. If the program is not delegated, notify the EPA Regional Office.

Q: How do I notify?

A: Mail or hand-deliver the notification to the appropriate agency.

Q: Are telefaxed or telephone notifications acceptable?

A: No. Telefaxed notifications are not accepted. Telephone notifications are only acceptable in emergency situations at the discretion of the EPA Regional Office or delegated agency and must be followed with a written copy by the following working day.

Q: Who is responsible for submitting a notification -- the owner of the building which is being demolished or renovated, or the contractor?

A: The NESHAP regulation states that either the owner of the building or operator of the demolition or renovation operation can submit the notification. Usually, the two parties decide together who will notify. If neither provide adequate notice, EPA can hold either or both parties liable.

Q: When a condominium complex is being renovated, who as owner, is responsible for submitting a notification?

A: While owners and operators share responsibility for proper notification, the condominium or co-op board is responsible as the owner. The board should ensure that they are told when work takes place on individual units, so that they can comply with notification (and other EPA) requirements, especially if multiple operators are involved.

Q: Is there a form or format for notifications?

A: Yes, there is a suggested form for notifications. You can obtain a form, and instructions on how to fill it out, from your delegated State or local agency or from your EPA Regional Office.

Q: Do demolitions of facilities in which no asbestos is present require notification?

A: Yes. All demolitions that meet the definition of facility must notify.

Q: When I notify regarding a renovation, what date do I consider the start date?

A: For a renovation, the start date is the day that the removal of asbestos-containing material, or any other asbestos-handling activities, including precleaning, construction of containment, or other activities that could disturb the asbestos, will begin.

Q: When I notify regarding a demolition, do I give the start date of the demolition or of the asbestos removal? Which date do I use to determine whether I've met the 10-day waiting period?

A: For a demolition, the start date is the date that the removal or related activity begins. The date the demolition starts also must be reported. The waiting period should be calculated based on the start date of the removal or the demolition, if no removal is required. The waiting period is necessary to give inspectors time to visit the site before activity begins.

Q: Does the 10-day notification requirement refer to "calendar" days or "working" days?

A: The Asbestos NESHAP regulation specifies "working days." Holidays that fall between Monday and Friday count as "working days."

Q: What is a "non-scheduled renovation operation"?

A: A "non-scheduled renovation operation" is a renovation operation that is caused by the routine failure of equipment which is expected to occur based on past operating experience, but for which an exact date cannot be predicted.

Q: Do I have to notify for non-scheduled operations? When?

A: Yes, if you can predict based on past experience that renovations will be necessary during the calendar year and the amount of asbestos is likely to exceed the jurisdictional amount, notification is required. This notification must be submitted at least 10 working days before the end of the calendar year preceding the year for which notice is being given.

Note: Single renovation projects which exceed the threshold amount are not covered by this type of notice. A separate notification is required for these projects.

Q: Must I notify the agency again if I know that a specific renovation project involving more than the threshold amount (including the work covered by the calendar year notice for non- scheduled operations) is about to occur at a specific time?

A: Yes.

Q: What constitutes an emergency renovation?

A: An emergency renovation is a renovation that was not planned, but results from a sudden, unexpected event that either immediately produces unsafe conditions, or that, if not quickly remedied, could be reasonably foreseen to result in an unsafe or detrimental effect on health or is necessary to protect equipment and avoid unreasonable financial burden. The term includes renovations necessitated by non-routine equipment failures.

For example, the explosion of a boiler in a chemical plant might require emergency renovations, since such an explosion would disrupt normal operations. However, renovations involving routine repairs are not emergencies.

Q: Under what conditions must I notify for emergency renovations? When must I notify?

A: First, inspect the facility and determine the amount of RACM that may have to be removed or disturbed to repair the facility. (If you don't have the time to have samples analyzed, you should assume that all insulation is RACM.) Then, if the amount of RACM is in excess of the threshold amount, you should mail or deliver a notification as soon as possible, but certainly no later than the following workday. A notification which is postmarked more than one working day after the emergency will be considered in violation of the notification requirements. EPA recommends that you send the notice by overnight express mail, and that you phone in a notification as well to the delegated agency and/or EPA Regional Office.

Q: When does a notification need to be revised?

A: A notification must be revised if information contained in the original notice has changed. For example, you must revise the notification if you change the start date of an operation. If the change relates to the amount of RACM involved, you need only revise the notification if the amount changes by more than 20 percent.

Q: When do I submit a revised notification?

A: You should telephone EPA as soon as possible after you realize the revision is necessary, and should then mail or hand deliver a written notice. If you delay the start date of a project, EPA must receive the revised notification no later than the original start date. If you plan to begin work before the date specified in the original notice, EPA must receive the revised notice at least 10 working days before the revised start date.

REMOVAL

Q: Does the Asbestos NESHAP require a building owner or operator to remove damaged or deteriorating asbestos-containing material?

A: No. Not unless a renovation of the facility is planned which would disturb the ACM and it exceeds the threshold amount.

Q: What does "adequately wet" mean?

A: To "adequately wet" ACM means to sufficiently mix or penetrate the material with liquid to prevent the release of particulates. If visible emissions are observed coming from ACM, then the material has not been adequately wetted. However, the absence of visible emissions is not evidence of being adequately wet.

Q: If a contractor puts water in the bottom of a bag, then strips the friable asbestos material dry and lets it fall into the water, is this a violation of the Asbestos NESHAP standards?

A: Yes. The regulation states that friable asbestos-containingmaterial must be "adequately wet" during stripping operations. The material must remain wet until disposal.

Q: Section 61.145(c)(6)(iii) states that the operator must "transport the materials to the ground via dust tight chutes or containers if it has been removed or stripped more than 50 feet above ground level." Can a room sealed with plastic and a negative air system be considered a dust tight chute?

A: No, the area in which removal is being conducted (the containment area) cannot be considered a dust tight chute in order to comply with 61.145(c)(6)(iii).

ORDERED DEMOLITIONS

Q: If a facility is being demolished under an order of a State or local government because the facility is structurally unsound, and therefore unsafe, do all the normal regulations covering demolitions apply?

A: No. The regulations which do apply are specified in 61.145 (a)(3) of the regulation.

Q: If a facility is being demolished under an order of a State or local government, must all the debris be treated as asbestos-contaminated waste?

A: If, for safety reasons, the RACM in the facility is not removed prior to demolition, the RACM must be kept adequately wet during the wrecking operations. After wrecking, all the contaminated debris must be kept adequately wet until disposal. All contaminated debris which cannot be segregated and cleaned should be disposed of as asbestos waste.

FRIABLE AND NON-FRIABLE ASBESTOS

Q: What is friable asbestos-containing material?

A: Friable ACM is any material containing more than one percent asbestos (as determined by Polarized Light Microscopy) that, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure.

Q: What is non-friable ACM?

A: Non-friable ACM is any material containing more than one percent asbestos (as determined by Polarized Light Microscopy) that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. Under the Asbestos NESHAP, non-friable ACM is divided into two categories. Category I non-friable ACM are asbestos-containing resilient floor coverings (commonly known as vinyl asbestos tile (VAT)), asphalt roofing products, packings and gaskets. These materials rarely become friable. All other non-friable ACM are considered category II non-friable ACM.

Q: Must I remove category I non-friable material prior to demolition or renovation?

A: Under normal circumstances, category I non-friable materials need not be removed prior to demolition or renovation, because generally these materials do not release significant amounts of asbestos fibers, even when damaged. This is not, however, a hard and fast rule. If category I materials have become friable or are in poor condition, they must be removed. Also, if you sand, grind, abrade, drill, cut or chip any non-friable materials, including category I materials, you must treat the material as friable, if more than the jurisdictional amount is involved.

Q: Must I remove category II non-friable materials prior to demolition or renovation?

A: These materials should be evaluated on a case-by-case basis. If category II non-friable materials are likely to become crushed, pulverized or reduced to powder during demolition or renovation, they should be removed before demolition or renovation begin. For example, A/C (asbestos cement) siding on a building that is going to be demolished with a wrecking ball should be removed, because it is likely that the siding will be pulverized by the wrecking ball.

Q: Does non-friable waste, if broken, damaged, etc., have to be wetted and contained?

A: Non-friable ACM that has been damaged during a demolition or renovation operation such that some portions of the material are crumbled, pulverized or reduced to powder is covered by the Asbestos NESHAP if the facility contains more than the threshold amount of RACM. However, category II non-friable ACM that has a high probability of being damaged by the demolition or renovation forces expected to act on the materials such that it will be crumbled, pulverized, or reduced to powder must be removed prior to the demolition or renovation operation. It is the owner's or operator's responsibility to make these determinations.

TRANSPORT AND DISPOSAL

Q: How should I handle bulk waste from a facility that contained RACM and that was not found until after demolition began?

A: The demolition debris must be treated as asbestos-containing waste. Adequately wet the demolition debris until collected for disposal and during loading, transport it in covered vehicles and emit no visible emissions to the outside air as required by 61.150. The waste must be deposited at an acceptable waste disposal site.

Q: Can I transport bulk asbestos waste without placing it in containers as long as I keep the waste pile wet?

A: No. After wetting, seal all asbestos-containing waste material in leak-tight containers while wet and label with the appropriate signs and labels. If the waste will not fit into containers, it must be placed in leak-tight wrapping.

However, for facilities that are demolished without removing the RACM and for ordered demolitions, the material must be adequately wet after the demolition has occurred and again when loading the material for transport to a disposal site. RACM covered by this paragraph may be transported in bulk without being placed in leak-tight containers or wrapping.

Q: How should I label asbestos-containing waste that is being taken away from the facility?

A: You should label the containers or wrapped materials with the name of the waste generator and the location at which the waste was generated. An OSHA warning label must also be used.

Q: Does EPA license landfills for asbestos waste?

A: The EPA does not license asbestos landfills under the Clean Air Act.. However, it has established asbestos disposal requirements for active and inactive disposal sites under the NESHAP, and general requirements for solid waste disposal under the Resource Conservation and Recovery Act (RCRA). In addition, State and/or local agencies usually require asbestos landfills to be approved or licensed.

Q: Where can I obtain a list of licensed landfills?

A: State and local agencies which require handling or licensing procedures can supply a list of "approved" or licensed asbestos disposal sites upon request. Solid waste control agencies are listed in local telephone directories under State, county or city headings.

Q: What should the owner or operator of a waste disposal site do if it is determined that there is a discrepancy between the amount of waste that left the facility and the amount of waste that was delivered to the site?

A: The waste site owner or operator must contact the demolition/renovation owner or operator, and attempt to reconcile the discrepancy. If they cannot do so within 15 days after the waste was received, the waste site owner or operator must notify both the delegated agency responsible for the facility from which the waste was removed, and the delegated agency responsible for the area in which the waste was disposed.

Q: Can water be considered "six-inch compacted non-asbestos cover"? In other words, could asbestos covered components be dropped in the ocean?

A: No.

MONITORING AND SAMPLING

Q: Does the NESHAP regulation require air monitoring during renovation or removal?

A: No.

Q: Does the Asbestos NESHAP regulation require me to inspect my property for asbestos?

A: No, not unless demolition or renovation is planned. The only Federal regulation which requires general inspections are the AHERA regulations, which mandate that schools must be inspected for asbestos. The NESHAP regulation requires that you inspect for asbestos before demolition or renovation.

Q: What is the acceptable exposure/ambient air standard for asbestos?

A: EPA does not specify an acceptable exposure/ambient air standard.

Q: What is a bulk sample?

A: A bulk sample is a solid quantity of insulation, floor tile, building material, etc., that is suspected of containing asbestos fibers that will be analyzed for the presence and quantity of asbestos.

Q: Will EPA test my building for asbestos for me?

A: No. Owners and operators are responsible for getting their buildings tested.

Q: Does EPA accredit laboratories that test for asbestos?

A: No. EPA, under 40 CFR Part 763, requires local education agencies to use laboratories accredited by the National Institute of Standards and Technology (NIST) in its National Voluntary Laboratory Accreditation Program (NVLAP). It is recommended for NESHAP related projects that NIST accredited laboratories be used.

Q: How can I find someone to do the testing?

A: NIST publishes a yearly listing of accredited laboratories enrolled in the NVLAP. Then, on a quaterly basis NIST publishes updates to the master list detailing labs newly accredited, labs which have had their accreditation suspended, etc. Contact NIST NVLAP for a current listing of accredited labs. The NIST NVLAP number is listed at the end of this pamphlet, along with other contact numbers.

Q: How do laboratories analyze bulk samples?

A: Laboratories analyze bulk samples a number of ways. Most laboratories use Polarized Light Microscopy (PLM). Some laboratories use Transmission Electron Microscopy (TEM). However, there is currently no published method for bulk analysis using TEM.

Q: How much does it cost to have a bulk sample analyzed?

A: The cost varies with the method. The cost of PLM analysis ranges from $20.00 to $100.00. The average cost is $30.00. TEM analysis is more expensive.

INSPECTIONS

Q: Does an inspector have the right to enter any facility and the containment area?

A: Yes. All inspectors have the right under the Clean Air Act to inspect any facility and the containment area. Inspectors are trained and equipped to do this safely.

Q: If I can see ACM dust inside the containment area or inside a glovebag, is this a violation of the Asbestos NESHAP?

A: The observation of ACM dust will be used as evidence of a violation of the "adequately wet" requirement. This is consistent with the definition of adequately wet that requires enough wetting "to prevent the release of particulates."

Q: Is visible asbestos-containing debris on the ground outside a removal job considered a "visible emission," and a violation of the NESHAP?

A: Yes. Dry friable asbestos insulation on the ground violates the "adequately wet" requirement, and can be considered evidence of a visible emission.

Q: Is it appropriate for an inspector to open any bags outside the designated contaminated area?

A: Yes. The inspector may open any bags outside the designated contaminated area to inspect them. The inspector may use a glovebag or other control techniques. The inspector will then properly reseal the bag, or request that the operator do so.

Q: Must an inspector witness improper removal of more than 160 square feet or 260 linear feet of asbestos-containing material to prove a violation of the NESHAP regulation?

A: No. First, the inspector must gather information about the quantity of asbestos to prove that the project is subject to the NESHAP standards. Second, the inspector must prove that there has been improper removal. The two tasks are distinct from each other.

Q: Are inspectors required to have medical examinations to ensure that they are medically fit to wear respirators?

A: Yes. Several Federal provisions under OSHA, EHSD, and NIOSH require people to be examined by a doctor and pronounced physically fit before they are permitted to wear respirators.

Q: Must inspectors have personnel monitoring conducted on them during inspections to comply with OSHA requirements for workers?

A: No. The inspectors do not have to comply with the work practice safety standards required by OSHA for personnel monitoring.

Q: Do inspectors need to follow facility training requirements including fit testing?

A: No.

TRAINING

Q: Do contractors and employees need to be accredited?

A: As of November, 1991 the Asbestos NESHAP requires a person trained in the provisions of this rule and the means of complying with them to be on-site when asbestos-containing material is stripped, removed or disturbed. Under AHERA, all contractors and employees involved in the removal and disposal of asbestos-containing material from schools must be accredited. Additionally, many States require that all workers be accredited before they remove asbestos from any facility.

Q: How can I qualify as an asbestos contractor/worker/consultant under AHERA?

A: You must attend and pass an EPA accredited training course. A list of training courses approved by EPA is published quarterly in the Federal Register, and is available through the

TSCA hotline. The TSCA number is printed at the end of this pamphlet, along with other contact numbers. Contact your State or local agency for more information.

Q: Do supervisors need to be trained?

A: Beginning on November 20, 1991, the Asbestos NESHAP requires at least one trained supervisor to be present at any site at which RACM is stripped, removed, or otherwise disturbed at any facility which is being demolished or renovated and is regulated by NESHAP. Evidence of the training must be posted and made available for inspection at the demolition or renovation site. Training includes, at a minimum: applicability, notification, material identification, control procedures, waste disposal, reporting and record keeping, asbestos hazards and worker protection.

Completion of an AHERA accredited course constitutes adequate training. Every 2 years the trained individual is required to receive refresher training. Information about both the training and refresher courses is available through EPA or delegated State or local agencies.

VIOLATIONS AND PENALTIES

Q: What will happen if I violate the Asbestos NESHAP?

A: Sanctions vary. In some cases, Notices of Deficiency (NOD) -- written warnings -- or Notices of Violation (NOV's) are issued to owners or operators who violate notification requirements. Or, depending upon the offense, EPA recommends fines up to $25,000 per day per violation.

Violators of the work practice or disposal standards may be subject to either written warnings, administrative orders or civil penalties up to $25,000 per day per violation, depending upon the seriousness of the violation. EPA may also bring criminal charges against violators. Some owners and operators who have knowingly violated the Asbestos NESHAP have been sentenced to prison terms.

For more information on penalties and enforcement, see the EPA Public Information Document entitled "Asbestos NESHAP Enforcement."

Q: What is the maximum penalty which can be assessed for NESHAP violations?

A: $25,000 per day, per violation, with no absolute maximum. However, some NESHAP violators may also be liable under CERCLA, and if so, the maximum penalty may be much higher.

Q: How are penalties calculated?

A: Penalties are computed on a case-by-case basis. The amount of asbestos involved, the number of previous violations, the duration of the offense, the economic benefit that accrued to the owner or operator as a result of the violation, and similar considerations are taken into account.

Q: What is "contractor listing?"

A: Contractors who have shown a pattern of violation, or who have been convicted of a criminal violation, may be placed on a list of violators who are prohibited from contracting for any jobs involving Federal money (grants, contracts, sub-grants, etc.).

Q: Can a corporation that has changed its name, but is owned by an individual who has been listed be subject to contractor listing?

A: Yes.

NARS

Q: What is NARS?

A: NARS stands for "National Asbestos Registry System." NARS is a computerized database established by EPA in April, 1989. NARS stores data on the compliance history of firms doing demolition or renovation work subject to the Asbestos NESHAP.

Q: What is the purpose of NARS?

A: NARS is used by EPA Regional Offices as well as State and local agencies to "target" inspections of contractors with poor compliance histories, and to monitor activity subject to the NESHAP regulations.

Q: Can I get NARS information?

A: Yes. NARS information is available through EPA Regional Offices under the provisions of the Freedom of Information Act.

Q: Are there any penalties for being listed in NARS as a violator?

A: No. NARS is only an information system. Contractors who have violations listed in NARS may, however, be inspected more frequently than contractors who have no violations.

Q: Why does EPA recommend inspection targeting?

A: Delegated agencies receive over 60,000 notifications of planned renovation or demolition projects each year. Because all projects cannot be inspected, EPA recommends targeting inspections so that agencies can make better use of their inspection resources.

Q: Can firms avoid future inspections based on past good performance?

A: Past performance is an important criterion for targeting inspections; however, other criteria are also used. As a result of EPA guidance to State and local air pollution agencies, many

asbestos removal contractors will be inspected at least once per year.

Q: How many contractors and owners are currently listed in NARS?

A: As of October 1990, there were approximately 7,000 contractors and owners in NARS.

Q: How does information get into NARS?

A: Information on the number of notifications, inspections, and violations for each contractor or owner is submitted by delegated State and local air pollution agencies and is reported through the EPA Regional NARS Coordinators to EPA Headquarters where the report is compiled.

ADDITIONAL INFORMATION

You can obtain more information about the Asbestos NESHAP by contacting your EPA Regional Office's NESHAP coordinator. You can obtain more information about AHERA by contacting your Regional Asbestos Coordinator (RAC).

You may also call the EPA Toxic Substances Control Act (TSCA) Hotline to ask general questions about asbestos, or to request asbestos guidance documents. The Hotline number is (202) 554-1404. The EPA Public Information Center can send you information on EPA regulations. You can reach the Center at (202) 382-2080 or (202) 475-7751.

The EPA has an Asbestos Ombudsman to provide information on the handling and abatement of asbestos in schools, the workplace and the home. Also, the EPA Asbestos Ombudsman can help citizens with asbestos-in-school complaints. The Ombudsman can be reached toll- free at (800) 368-5888, direct at (703) 557-1938 or 557-1939.

To obtain a current listing of accredited labs contact NIST NVLAP at (301) 975-4016.

GLOSSARY OF TERMS

AHERA - The Asbestos Hazard Emergency Response Act, passed by Congress in 1986

CAA - Clean Air Act

CERCLA - The Comprehensive Environmental Response Compensation and Liability Act. Also known as the "Superfund."

EPA - The United States Environmental Protection Agency

EHSD - Environmental Health and Safety Division, U.S. EPA

Friable Asbesots Material - Any material containing more than one percent asbestos, as determined using the method specified in Appendix A, subpart F 40 CFR part 763, section 1, Polarized Light Microscopy, that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. If the asbestos content is less than 10 percent as determined by a method other than point counting by polarized light microscopy (PLM), verify the asbestos by point counting using PLM.

Glovebag - A sealed compartment with attached inner gloves used for the handling of asbestos-containing materials.

NARS - National Asbestos Registry System

NESHAP - The National Emission Standard for Hazardous Air Pollutants found in Title 40 CFR Part 61 promulgated under Section 112 of the Clean Air Act.

NIOSH - National Institute for Occupational Safety and Health

NIST - National Institute of Standards and Technology

NVLAP - National Voluntary Laboratory Accreditation Program

OSHA - Occupational Safety & Health Administration

Particulate Asbestos Material - Finely divided particles of asbestos or material containing asbestos.

PLM - Polarized light microscopy, as defined in Appendix A, subpart F, 40 CFR part 763, section 1

RACM - Regulated Asbestos-Containing Material. RACM means (a) Friable asbestos material, (b) Category I nonfriable ACM that has become friable, (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II nonfriable

ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by the Asbestos

NESHAP - National Emission Standards for Hazardous Air Pollutants

RCRA - Resource Conservation and Recovery Act

TSCA - Toxic Substances Control Act

Visible Emissions - Any emissions, which are visually detectable without the aid of instruments, coming from RACM or asbestos- containing waste material, or from any asbestos milling, manufacturing, or fabricating operation.

DISCLAIMER

This manual was prepared by Entropy Environmentalists, Inc., for the Stationary Source Compliance Division of the U.S. Environmental Protection Agency. This document is intended for information purposes ONLY, and may not in any way be interpreted to alter or replace the coverage or requirements of the asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 61, Subpart M. Any mention of product names does not constitute endorsement by the U.S. Environmental Protection Agency.

United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park, NC 27711

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http://www.epa.gov/air

EPA

progress

Taking Toxics Out of the Air

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Department of Public Health and Environment

Taking Toxics Out of the Air

Progress in Setting "Maximum Achievable Control Technology" Standards Under the Clean Air Act

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Air toxics are those air pollutants that are known or suspected to cause cancer or other serious health problems. Each year, millions of tons of air toxics are released into the air, mostly from manmade sources. This document describes what air toxics are, where they come from, and how they can impact people and the environment. It also describes the steps being taken by the U.S. Environmental Protection Agency to reduce emissions of air toxics from major industrial sources such as chemical manufacturing plants, petroleum refineries, and steel manufacturing plants.

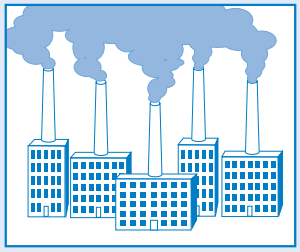
The technology- and performance-based standards issued by EPA over the past 10 years have proven extremely successful. Once fully implemented, these standards will cut emissions of toxic air pollutants by nearly 1.5 million tons per year–almost 15 times greater reductions than EPA was able to achieve in 20 years prior to 1990.

Introduction

The air we breathe can be contaminated with pollutants from factories, vehicles, power plants, and many other sources. These pollutants have long been a major concern because of the harmful effects they sometimes have on people's health and the environment. Their impact depends on many factors, including the quantity of air pollution to which people are exposed, the duration of the exposures, and the potency of the pollutants. The effects of air pollutants can be minor and reversible (such as eye irritation) or debilitating (such as aggravation of asthma) and even fatal (such as cancer).

Since 1970, the Clean Air Act has provided the primary framework for protecting people and the environment from the harmful effects of air pollution. A key component of the Clean Air Act is a requirement that the U.S. Environmental Protection Agency (EPA) significantly reduce daily, so-called "routine" emissions of the most potent air pollutants: those that are known or suspected to cause serious health problems such as cancer or birth defects. The Clean Air Act refers to these pollutants as **"hazardous air pollutants,"** but they are also commonly known as **toxic air pollutants** or, simply, **air toxics**.

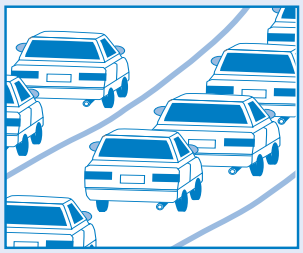
Sources of Air Toxics



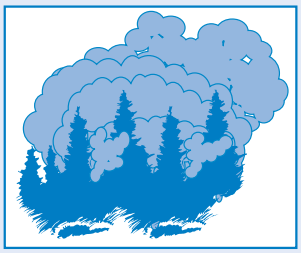
Routine Emissions From Stationary Sources

Accidental Releases

Each year, millions of tons of toxic pollutants are released into the air from both natural and manmade sources.



Mobile Sources



Forest Fires

Prior to 1990, the Clean Air Act required EPA to set standards for each toxic air pollutant individually, based on its particular health risks. This approach proved difficult and minimally effective at reducing emissions. As a result, when amending the Clean Air Act in 1990, Congress directed EPA to use a "technology-based" and performance-based approach to significantly reduce emissions of air toxics from major sources of air pollution, followed by a risk-based approach to address any remaining, or residual, risks.

Under the "technology-based" approach, EPA develops standards for controlling the "routine" emissions of air toxics from each major type of facility within an industry group (or "source category"). These standards—known as "maximum achievable control technology (MACT) standards"—are based on emissions levels that are already being achieved by the better-controlled and lower-emitting sources in an industry. This approach assures citizens nationwide that each major source of toxic air pollution will be required to employ effective measures to limit its emissions. Also, this approach provides a level economic playing field by ensuring that facilities that employ cleaner processes and good emission controls are not disadvantaged relative to competitors with poorer controls.

In setting MACT standards, EPA does not generally prescribe a specific control technology. Instead, whenever feasible, the Agency sets a performance level based on technology or other practices already used by the industry. Facilities are free to achieve these performance levels in whatever way is most cost-effective for them. The MACT standards issued by EPA over the past 10 years have proven extremely successful. Once fully implemented, these standards will cut emissions of toxic air pollutants by nearly 1.5 million tons per year.

Eight years after each MACT standard is issued, EPA must assess the remaining health risks from source categories. If necessary, EPA may implement additional standards that address any significant remaining risk.

What Are Toxic Air Pollutants?

Toxic (also called hazardous) air pollutants are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or to cause adverse environmental effects. The degree to which a toxic air pollutant affects a person's health depends on many factors, including the quantity of pollutant the person is exposed to, the duration and frequency of exposures, the toxicity of the chemical, and the person's state of health and susceptibility.

The 1990 Clean Air Act Amendments list 188 toxic air pollutants that EPA is required to control.[1] Examples of toxic air pollutants include benzene, which is found in

[1] The list originally included 189 chemicals. Based on new scientific information, EPA removed caprolactam from the list in 1996; thus, the current list includes 188 pollutants.

Mobile Sources and Accidental Releases

While this document focuses on EPA's efforts to reduce routine emissions from stationary sources, EPA also is working to reduce toxic emissions from:

- **Mobile sources,** such as cars and trucks. For example, EPA and state governments (e.g., California) have reduced emissions of benzene, toluene, and other toxic pollutants from mobile sources by requiring the use of reformulated gasoline and placing limits on tailpipe emissions. For more information, contact EPA's Office of Transportation and Air Quality at www.epa.gov/OMSWWW/toxics.htm or call (202) 564-1682.
- **Accidental releases,** including leaks and spills. For example, EPA has established regulations under the Clean Air Act requiring certain facilities to implement risk management programs that will help prevent accidental releases of toxic chemicals. For more information, contact EPA's Office of Chemical Emergency Preparedness and Prevention at www.epa.gov/swercepp or call (800) 424-9346.

gasoline; perchloroethylene, which is emitted from some dry cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper by a number of industries. Examples of other listed air toxics include dioxin, asbestos, toluene, and metals such as cadmium, mercury, chromium, and lead compounds.

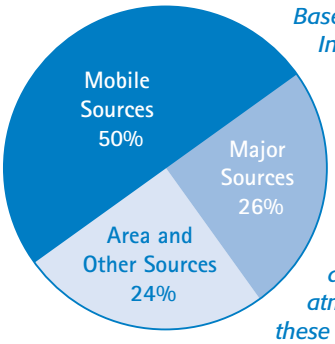
Where Do Air Toxics Come From?

Scientists estimate that millions of tons of toxic pollutants are released into the air each year. Most air toxics originate from manmade sources, including both mobile sources (e.g., cars, buses, trucks) and stationary sources (e.g., factories, refineries, power plants). However, some are released in major amounts from natural sources such as forest fires. This document focuses on EPA's efforts, as of August 2000, to reduce *routine* (as opposed to accidental) emissions of toxic air pollutants from stationary sources. Routine emissions from stationary sources constitute almost one-half of all manmade air toxics emissions.

There are two types of stationary sources that generate routine emissions of air toxics:

- **"Major" sources** are defined as sources that emit 10 tons per year of any of the listed toxic air pollutants, or 25 tons per year of a mixture of air toxics. Examples include chemical plants, steel mills, oil refineries, and hazardous waste incinerators. These sources may release air toxics from equipment leaks, when materials are transferred from one location to another, or during discharge through emissions stacks or vents. One key public health concern regarding major sources is the health effects on populations located downwind from them.

- **"Area" sources** consist of smaller sources, each releasing smaller amounts of toxic pollutants into the air. Area sources are defined as sources that emit less than 10 tons per year of a single air toxic, or less than 25 tons per year of a mixture of air toxics. Examples include neighborhood dry cleaners and gas stations. Though emissions from individual area sources are often relatively small, collectively their emissions can be of concern—particularly where large numbers of sources are located in heavily populated areas.



Based on 1996 National Toxics Inventory data, major sources account for about 26 percent of air toxics emissions, smaller area sources and other sources (such as forest fires) for 24 percent, and mobile sources for 50 percent. Accidental releases, which also contribute air toxics to the atmosphere, are not included in these estimates.

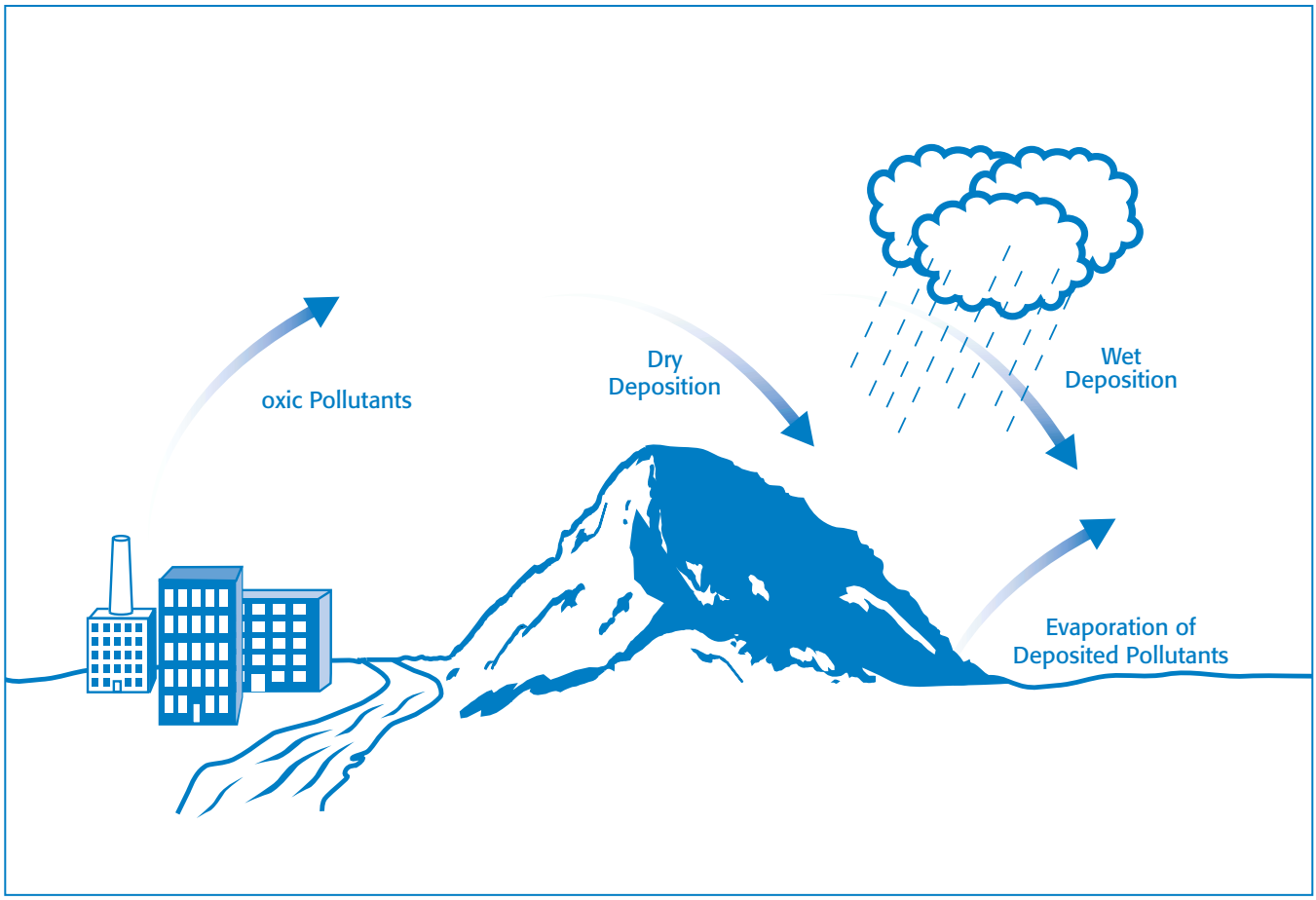
EPA's published list of "source categories" now contains 175 categories of industrial and commercial sources that emit one or more toxic air pollutants. For each of these source categories, EPA indicated whether the sources are considered to be "major" sources or "area" sources. The 1990 Clean Air Act Amendments direct EPA to set standards requiring all major sources of air toxics (and some area sources that are of particular concern) to significantly reduce their air toxics emissions.

Where Do Air Toxics Go?

Once released, toxic pollutants can be carried by the wind, away from their sources, to other locations. Factors such as weather, the terrain (i.e., mountains, plains, valleys), and the chemical and physical properties of a pollutant determine how far it is transported, its concentration at various distances from the source, what kind of physical and chemical changes it undergoes, and whether it will degrade, remain airborne, or deposit to land or water.

Some pollutants remain airborne and contribute to air pollution problems far from the pollution source. Other pollutants released into the air can be deposited to land and water bodies through precipitation, or by settling directly out of the air onto land or water. Eventually, a large portion of those pollutants deposited near water bodies or small tributaries will reach the water bodies via stormwater runoff or inflow from the tributary streams.

Some toxic air pollutants are of particular concern because they degrade very slowly or not at all, as in the case of metals such as mercury or lead. These persistent air toxics (as they are called) can remain in the environment for a long time (or forever, in the case of metals) and can be transported great distances.



Toxic air pollutants can be deposited to land and water bodies through precipitation (wet deposition) or by settling directly out of the air (dry deposition). Repeated cycles of transport, deposition, and evaporation can move toxic air pollutants very long distances.

Often, persistent air toxics reach the ground, evaporate back into the atmosphere, and are then transported further until they are deposited on the ground again. Repeated cycles of transport, deposition, and evaporation can move toxic air pollutants very long distances. For example, toxic pollutants such as toxaphene, a pesticide used primarily in the cotton belt, have been found in the Antarctic, thousands of miles from their likely emissions sources.

How Are People Exposed to Air Toxics?

People are exposed to toxic air pollutants in many ways that can pose health risks, such as by:

- Breathing contaminated air.
- Eating contaminated food products, such as fish from contaminated waters; meat, milk, or eggs from animals that fed on contaminated plants; and fruits and vegetables grown in contaminated soil on which air toxics have been deposited.
- Drinking water contaminated by toxic air pollutants.
- Eating contaminated soil. Young children are especially vulnerable because they may ingest contaminated soil from their hands or from objects they place in their mouths.
- Touching (skin contact) contaminated soil, dust, or water (for example, during recreational use of contaminated water bodies).

Once toxic air pollutants enter the body, some persistent toxic air pollutants accumulate in body tissues. Also, through a phenomenon called **biomagnification**, predators typically accumulate even greater pollutant concentrations than their contaminated

prey. As a result, people and other animals at the "top" of the food chain who eat contaminated fish or meat are exposed to concentrations that are much higher than the concentrations in the water, air, or soil.

Fish consumption advisories have been issued for thousands of water bodies nationwide, including over 52,000 lakes and over 238,000 miles of rivers. As of December 1999, 40 states have consumption advisories about mercury-contaminated fish for specific water bodies. Eleven of those states have issued state-wide advisories for freshwater lakes and rivers. Many of these water bodies were once thought to be relatively pristine. However, EPA is now finding that deposition from the air may be a major source of the pollution in these water bodies.

Health Effects

People who are exposed to toxic air pollutants at sufficient concentrations and for sufficient durations may increase their chances of getting cancer or experiencing other serious health effects. Depending on which air toxics an individual is exposed to, these health effects can include damage to the immune system, as well as neurological, reproductive (e.g., reduced fertility), developmental, and respiratory problems. A growing body of evidence indicates that some air toxics (e.g., DDT, dioxins, and mercury) may disturb hormonal (or endocrine) systems. In some cases this happens by pollutants either mimicking or blocking the action of natural hormones. Health effects associated with endocrine disruption include reduced male fertility, birth defects, and breast cancer.

How Do Air Toxics Affect the Environment?

Toxic pollutants in the air, or deposited on soils or surface waters, can have a number of environmental impacts. Like humans, animals can experience health problems if they are exposed to sufficient concentrations of air toxics over time. Numerous studies conclude that deposited air toxics are contributing to birth defects, reproductive failure, and disease in animals. Persistent toxic air pollutants are of particular concern in aquatic ecosystems because the pollutants accumulate in sediments and may biomagnify in tissues of animals at the top of the food chain to concentrations many times higher than in the water or air.

Toxic pollutants that mimic hormones also pose a threat to the environment. In some wildlife (e.g., birds, shellfish, fish, and mammals), exposures to pollutants such as DDT, dioxins, and mercury have been associated with decreased fertility, decreased hatching success, damaged reproductive organs, and altered immune systems.

What Has EPA Done to Reduce Air Toxics?

The Pre-1990 "Risk-Only" Approach

Prior to 1990, the Clean Air Act directed EPA to regulate toxic air pollutants based on the risks each pollutant posed to human health. Specifically, the Act directed EPA to:

- Identify all pollutants that caused "serious and irreversible illness or death."
- Develop standards to reduce emissions of these pollutants to levels that provided an "ample margin of safety" for the public.

While attempting to control air toxics during the 1970s and 1980s, EPA became involved in many legal, scientific, and policy debates over which pollutants to regulate and how stringently to regulate them. Debates focused on risk assessment methods and assumptions, the amount of health risk data needed to justify regulation, analyses of the costs to industry and benefits to human health and the environment, and decisions about "how safe is safe."

During this time, EPA was still developing methods to assess risk. These methods were essential tools that would be needed to establish the scientific basis for making risk-based decisions about air toxics. While EPA and the scientific community gained valuable knowledge about risk assessment methods through this work, the chemical-by-chemical regulatory approach—an approach based solely on risk—proved difficult. In fact, in 20 years, EPA regulated only seven pollutants (asbestos, benzene, beryllium, inorganic arsenic, mercury, radionuclides, and vinyl chloride). Collectively, these standards cut annual air toxics emissions by an estimated 125,000 tons.

Maximum Achievable Control Technology—MACT

EPA's MACT standards are based on the emissions levels already achieved by the best-performing similar facilities. This straightforward, performance-based approach yields standards that are both reasonable and effective in reducing toxic emissions. This approach also provides a level economic playing field by ensuring that facilities with good controls are not disadvantaged relative to competitors with poorer controls.

When developing a MACT standard for a particular source category, EPA looks at the level of emissions currently being achieved by the best-performing similar sources through clean processes, control devices, work practices, or other methods. These emissions levels set a baseline (often referred to as the "MACT floor") for the new standard. At a minimum, a MACT standard must achieve, throughout the industry, a level of emissions control that is at least equivalent to the MACT floor. EPA can establish a more stringent standard when this makes economic, environmental, and public health sense.

The MACT floor is established differently for existing sources and new sources:

- For **existing sources**, the MACT floor must equal the average emissions limitations currently achieved by the best-performing 12 percent of sources in that source category, if there are 30 or more existing sources. If there are fewer than 30 existing sources, then the MACT floor must equal the average emissions limitation achieved by the best-performing five sources in the category.
- For **new sources**, the MACT floor must equal the level of emissions control currently achieved by the best-controlled similar source.

Wherever feasible, EPA writes the final MACT standard as an emissions limit (i.e., as a percent reduction in emissions or a concentration limit that regulated sources must achieve). Emissions limits provide flexibility for industry to determine the most effective way to comply with the standard.

The 1990 Clean Air Act Amendments: A "Technology First, Then Risk" Approach

Realizing the limitations of a chemical-by-chemical decision framework based solely on risk, and acknowledging the gaps in scientific and analytical information, Congress adopted a new strategy in 1990, when the Clean Air Act was amended. Specifically, Congress revised Section 112 of the Clean Air Act to mandate a more practical approach to reducing emissions of toxic air pollutants.

This approach has two components. In the first phase, EPA develops regulations—MACT standards—requiring sources to meet specific emissions limits that are based on emissions levels already being achieved by many similar sources in the country. Even in its earliest stages, this new "technology-based" approach clearly produced real, measurable reductions. In the second phase, EPA applies a risk-based approach to assess how these technology-based emissions limits are reducing health and environmental risks. Based on this assessment, EPA may implement additional standards to address any significant remaining, or residual, health or environmental risks. EPA completed development of its strategy for addressing residual risks from air toxics in March of 1999.

What Progress Has Been Made in Reducing Toxic Air Pollution?

As of August 2000, EPA has issued 45 air toxics MACT standards under Section 112 of the Clean Air Act Amendments. These standards affect 82 categories of major industrial sources, such as chemical plants, oil refineries, aerospace manufacturers, and steel mills, as well as eight categories of smaller sources, such as dry cleaners, commercial sterilizers, secondary lead smelters, and chromium electroplating facilities. EPA

has also issued two standards under Section 129 of the Clean Air Act to control emissions, including certain toxic pollutants, from solid waste combustion facilities (one standard for municipal waste combustors and the other for medical waste incinerators). Together, these standards reduce emissions of over 100 different air toxics. When fully implemented, all of these standards will reduce air toxics emissions by about 1.5 million tons per year—almost 15 times the reductions achieved prior to 1990. Each of the final rules developed since 1990 is summarized in an appendix to this document (pages 9 to 31). These summaries describe the sources for which final rules have been issued as of August 2000, the types of pollutants the sources emit, and how EPA's rules are reducing their emissions.

Some of these air toxics rules have the added benefit of reducing ground-level ozone (urban smog) and particulate matter. This occurs because some air toxics are also smog-causing volatile organic compounds (VOCs) (e.g., toluene) or particulate matter (e.g., chromium). In addition, some of the technologies and practices designed to control air toxics also reduce VOCs or types of particulate matter that are not currently among the 188 listed air toxics. Reductions of smog-causing pollutants and particulate matter are important because of the health and environmental problems they can cause. Most notably, urban smog can cause respiratory problems and can damage vegetation, and particulate matter can cause many detrimental impacts on human health, such as bronchitis, lung damage, increased infection, aggravation of asthma, and premature death. In addition many of these pollutants can contribute significantly to impaired visibility in places, such as national parks, that are valued for their scenic views and recreational opportunities.

EPA has consistently worked to develop air toxics standards that achieve the required reductions in air pollution while providing regulated communities with as much flexibility as possible in deciding how to comply with the standards. For example, under a flexible regulation, industries may reduce their emissions by redesigning their processes, capturing and recycling emissions, changing work practices, or installing any of a variety of control technologies. Flexibility helps industries minimize the cost of compliance and encourages pollution prevention. To provide flexibility, EPA makes every effort to develop standards that are based on performance measures rather than specific control devices, and that allow for equivalent alternative control measures.

Looking Ahead

To date, EPA has primarily focused efforts to reduce emissions of toxic air pollutants on technology-based or MACT emission standards. Over the next few years, EPA will continue to work with industry; environmental groups; state, local, and tribal agencies; and other interested groups to develop standards for the remaining source categories that will reduce air toxics emissions even further. By 2002, EPA is scheduled to issue 62 technology-based standards covering 96 remaining source categories.

EPA anticipates that its technology-based approach will continue to prove successful at reducing air toxics. Additional air toxics reductions are also expected to continue as a result of mobile and other stationary source control programs (e.g., controls to reduce particulate and volatile organic compound emissions) that indirectly reduce toxics. To identify additional measures beyond the technology standards that may be needed to protect the public health and the environment from toxic air pollutants, EPA will use a more risk-based focus. EPA's efforts underway include national air toxics assessment activities, residual risk standards, evaluation of the impacts of air toxics deposition, data-gathering on mercury emissions from coal-fired electric utilities, and implementation of an urban air toxics strategy. These efforts are explained below.

National Air Toxics Assessment

The National Air Toxics Assessment is an ongoing comprehensive evaluation by EPA of air toxics in the United States. EPA, states, and others are working to improve the national toxics inventory of emissions and to expand air toxics monitoring networks to obtain more air toxics data. This work is expected to help focus future efforts to reduce air toxics and resultant health effects.

Residual Risk Standards

After EPA develops technology-based standards, the 1990 Clean Air Act Amendments require EPA to assess

their effectiveness at reducing the health and environmental risks posed by air toxics. Based on this assessment, the Agency may implement additional standards that address any significant remaining, or "residual," risk. After setting a MACT standard, EPA has 8 years (9 years for the earliest standards) to examine the risk posed by continued emissions from regulated facilities and issue requirements for additional controls if necessary to reduce unacceptable residual risk. EPA has begun to assess residual risk for several source categories, including coke ovens, dry cleaning, gasoline distribution, commercial ethylene oxide sterilizers, halogenated solvent cleaning, industrial cooling towers, and magnetic tape manufacturing. The first residual risk evaluation is scheduled to be completed by EPA in 2001 for the coke oven industry.

Air Toxics Deposition to the Great Waters

Since 1990, EPA has issued three reports to Congress on the deposition of air toxics and their detrimental effects on the Great Waters (i.e., the Great Lakes, Chesapeake Bay, Lake Champlain, and coastal waters). In these reports, EPA lists 15 pollutants of greatest concern, most of which have a tendency to persist in the environment and accumulate in organisms such as fish. The pollutants of concern are: metals (mercury, cadmium, lead), dioxins, furans, polycyclic organic matter, polychlorinated biphenyls (PCBs), pesticides (such as chlordane and DDT/DDE), and nitrogen compounds. Nitrogen compounds from the deposition of air toxics can intensify nutrient enrichment (or eutrophication) of coastal waterbodies. EPA's most recent report, issued in 2000, provides an update on atmospheric deposition of pollutants to the Great Waters and identifies activities that will reduce these pollutants. Several of the MACT standards described on pages 9 through 31 are expected to substantially cut emissions of mercury, dioxins, and other pollutants of concern to the Great Waters from sources such as municipal waste combustors and medical waste incinerators, which alone account for almost 30 percent of the mercury emissions and over 70 percent of the dioxin emissions nationwide (1990 baselines).

Mercury Emissions from Coal-Fired Electric Utilities

Mercury is one of the 188 listed toxic air pollutants. It is of concern because it does not degrade but persists in the environment. The largest emitter of mercury is electric utility plants (primarily coal-fired plants), which are estimated to emit approximately one-third of all manmade mercury in the United States. EPA is currently gathering monitoring data on mercury emissions from coal-fired electric utility plants and expects to complete its evaluation no later than December 2000 on the need to reduce mercury from electric utilities.

Integrated Urban Air Toxics Strategy

A key component of future efforts to reduce air toxics is the Integrated Urban Air Toxics Strategy released by EPA in July 1999. The Strategy presents a framework to address air toxics in urban areas and builds on the substantial emission reductions already achieved from cars, trucks, fuels, and industries such as chemical plants and oil refineries. The Strategy outlines actions to further reduce emissions of air toxics and to improve EPA's understanding of the health risks posed by air toxics in urban areas. The goals of the Strategy are to reduce the risk of cancer by 75 percent and to substantially reduce non-cancer risks associated with air toxics from commercial and industrial sources. The Strategy also reflects the need to address any disproportionate impacts on sensitive populations including children, the elderly, and minority and low-income communities.

For Further Information

EPA Air Toxics Website
Internet: www.epa.gov/ttn/uatw

EPA Office of Air and Radiation
Internet: www.epa.gov/air/
(202) 564-7400

EPA Office of Transportation and Air Quality
Internet: www.epa.gov/OMSWWW/omshome.htm
(202) 564-1682

EPA Office of Chemical Emergency Preparedness and Prevention
Internet: www.epa.gov/swercepp
(800) 424-9346

Summaries of EPA's Final Air Toxics MACT Rules

Over the past 10 years, EPA has issued 45 air toxics MACT standards under Section 112 of the 1990 Clean Air Act Amendments. These standards, listed below, are summarized on the following pages. Compliance is required within 3 years unless otherwise specified in the rule.

Page	Standard
10	Dry Cleaners
10	Coke Oven Batteries at Steel Plants
11	Organic Chemical Production Plants (two rules)
11	Industrial Process Cooling Towers
12	Halogenated Solvent Cleaning Machines
12	Commercial Sterilization and Fumigation Operations
13	Gasoline Distribution Facilities
13	Magnetic Tape Manufacturing
14	Chromium Electroplating and Anodizing Operations
14	Basic Liquid Epoxy Resins and Non-Nylon Polyamide Resins Manufacture
15	Secondary Lead Smelter Industry
15	Petroleum Refining Industry
16	Aerospace Manufacturing and Rework Industry
16	Marine Tank Vessel Loading Operations
17	Wood Furniture Manufacturing
17	Shipbuilding and Ship Repair Industry
18	Printing and Publishing
18	Off-Site Waste Operations
19	Elastomer Production
19	Polyethylene Terephthalate Polymer and Styrene-Based Thermoplastic Polymers Production
20	Primary Aluminum Reduction Industry
21	Pulp and Paper Mills (two rules)
22	Pharmaceutical Production
22	Flexible Polyurethane Foam Production
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29	Generic Rule (four rules: acetal resin production, acrylic and modacrylic fiber production, hydrogen fluoride production, and polycarbonate production)
29	Publicly Owned Treatment Works
30	Amino Resins and Phenolic Resins Production
30	Secondary Aluminum Production

Final rule published September 22, 1993

- Dry cleaning facilities are the largest source of perchloroethylene (also called perc) emissions in the United States. Because dry cleaners are located in many communities across the country, perc emissions from dry cleaners are often released in close proximity to large numbers of people.
- Perc can cause dizziness, nausea, and headaches and is suspected to cause cancer in humans.
- EPA's rule requires all dry cleaners that use perc to implement pollution prevention measures. It also contains specific control requirements that vary depending on the type of machinery and the amount of perc a facility uses.
- The rule affects approximately 30,000 dry cleaners and will reduce perc emissions at these facilities by about 7,300 tons per year.

Final rule published October 27, 1993

- Coke oven batteries (a group of ovens connected by common walls) are used to convert coal into coke, which is then used in blast furnaces to convert iron ore to iron.
- Coke oven emissions contain benzene (a known carcinogen) and other chemicals that can cause cancer of the respiratory tract, kidney, and prostate. Exposure to coke oven emissions can also cause conjunctivitis, severe dermatitis, and lesions of the respiratory and digestive systems.
- EPA's rule provides guidelines for day-to-day operations and sets emissions limits for existing sources and even tighter limits for new sources. The rule was developed through a formal regulatory negotiation process that involved extensive industry participation. It provides industry with a menu of compliance options—this flexibility should significantly reduce compliance costs.
- The coke oven rule affects 29 existing facilities and reduces air toxics by approximately 1,500 tons per year.

Final rule published April 22, 1994; additional final rule published May 12, 1998, for Tetrahydrobenzaldehyde Production

- EPA's April 22, 1994 rule reduces emissions of 131 organic air toxics from chemical manufacturing processes in the Synthetic Organic Chemical Manufacturing Industry and from several other chemical production processes. The rule applies to production of about 385 chemicals.
- The rule requires reductions in toxic organic air pollutants emitted from process vents, storage vessels, transfer racks, equipment leaks, and wastewater treatment systems.
- Emissions averaging is allowed in the rule as a compliance option to give industry flexibility in meeting the emissions reduction limits.

- The rule affects an estimated 310 facilities and will reduce air toxics emissions by 510,000 tons per year, a 90 percent reduction from the preregulated levels emitted by these facilities. The rule will also reduce VOCs by about 1 million tons per year, an 80 percent reduction from the preregulated levels emitted by these facilities, and equivalent to taking approximately 38 million cars off the road.
- The May 12, 1998 rule added tetrahydrobenzaldehyde (THBA) to the list of Synthetic Organic Chemical Manufacturing Industry processes. THBA is used in the manufacture of paint additives.
- Acrolein (a possible human carcinogen) and 1,3-butadiene (a probable human carcinogen) are released during the THBA production process.
- Currently, only one facility in the nation manufactures THBA and would have to comply with this rule.

Final rule published September 8, 1994

- Industrial process cooling towers are used to remove heat from industrial processes. In the past, chromium was added to cooling tower waters to prevent equipment corrosion and control algae growth.
- Chromium (Chromium VI, the most toxic form, is known to cause lung cancer) is ultimately released from the cooling towers into the air. Most individual industrial process cooling towers do not qualify as major sources of air toxics; however, almost all cooling towers are part of large production facilities (e.g., petroleum refineries, chemical manufacturing plants, and primary metal producers) that do qualify.
- EPA's rule prohibits the use of chromium-based water treatment chemicals and suggests that facilities substitute phosphate-based chemicals.
- The rule affects an estimated 800 cooling towers at about 400 major sources nationwide and will reduce chromium emissions by 25 tons per year, a 100 percent reduction from the preregulated levels emitted by these facilities.

Final rule published December 2, 1994

- Halogenated solvent cleaning machines (also known as degreasers) are used to clean oil and residues in the manufacturing and assembly of metal parts. Halogenated solvent cleaning is not a distinct industry, but it is an integral part of many industries, such as the aerospace and motor vehicle manufacturing industries. There are three basic types of solvent cleaning equipment:
  - Batch vapor cleaners, which heat the solvent to create a solvent vapor zone within which the parts are cleaned.
  - In-line cleaners, which are enclosed devices distinguished by a conveyor system used to supply a continuous stream of parts for cleaning. In-line cleaners include continuous web cleaning machines, which can clean parts such as film, coils, wire, and metal strips.
  - Batch cold cleaners, which use liquid solvent to remove soils from part surfaces.
- The rule applies to cleaning machines that use methylene chloride, perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, chloroform, or any combination of these solvents in a total concentration that is greater than 5 percent by weight.
- EPA's rule combines equipment and work practice standards that emphasize pollution prevention. As an alternative to complying with the equipment standards option, facilities using batch vapor or in-line cleaning machines may demonstrate that each solvent cleaning machine emits less than an overall solvent emissions limit.
- The rule affects an estimated 9,000 facilities that use solvent cleaning machines and will reduce air toxics emissions at these facilities by 85,300 tons per year and VOC emissions by 81,700 tons per year.

Final rule published December 6, 1994

- A number of industries (including medical equipment suppliers; pharmaceutical companies; cosmetics manufacturers; spice manufacturers; libraries, museums, and archives; and contact sterilizers) use ethylene oxide as a sterilant for heat- or moisture-sensitive materials or as a fumigant to control microorganisms or insects.
- Ethylene oxide (a probable human carcinogen that also can cause adverse reproductive and developmental effects) is released during these operations.
- EPA's rule sets ethylene oxide emissions limits for sterilization chamber vents, chamber exhaust vents, and aeration rooms.
- The rule affects an estimated 114 sources and will reduce ethylene oxide emissions by about 1,000 tons per year, a 94 percent reduction from the preregulated levels emitted by these sources.

Final rule published December 14, 1994

- The gasoline distribution standard regulates bulk terminals and pipeline breakout stations, which transfer and store gasoline as it goes from petroleum refineries to service stations and gasoline bulk plants.
- Approximately 10 toxic air pollutants, including benzene and toluene, are present in gasoline vapor. These pollutants are released from gasoline distribution facilities during tank truck and rail car loading operations, gasoline storage, and equipment leaks.
- EPA's rule requires the use of pollution prevention methods (such as improving seals on storage tanks and inspecting equipment for leaks) and the use of controls (such as vapor processors to collect and treat gas vapors displaced during cargo tank loading operations).

- The rule affects an estimated 240 gasoline bulk terminals and 20 pipeline breakout stations. It will reduce air toxics emissions from these facilities by 2,300 tons per year and VOC emissions by over 38,000 tons per year. In addition, the collection and/or prevention of gasoline evaporation under the final rule is expected to result in energy savings of an estimated 10 million gallons of gasoline per year.

Final rule published December 15, 1994

- Magnetic tape manufacturers make products such as audio and video cassettes and computer diskettes.
- Toxic air pollutants are released when solvent mixtures are used during coating and equipment cleaning operations. In addition, particulate air toxics may be released when magnetic particles are transferred to the coating mixture.
- EPA's rule requires 95 percent control for most types of emission points, including the coating operations. For some of these emission points, EPA has developed alternative emissions standards, such as one that allows facilities the flexibility to commit to more stringent control of their coating operations in lieu of controlling certain storage tanks.
- The rule affects an estimated 14 of the 25 facilities that manufacture magnetic tape. It will reduce emissions of air toxics, most of which are VOCs, by 2,300 tons per year.

Final rule published January 25, 1995

- Chromium electroplating and anodizing operations coat metal parts and tools with a thin layer of chromium to protect them from corrosion and wear. Examples of electroplated parts include appliances, automotive parts, and large cylinders used in construction equipment and printing presses. Anodized parts include miscellaneous aircraft components such as wings and landing gears.
- Hexavalent chromium (known to cause lung cancer) is released during the electroplating and anodizing processes.
- EPA's rule sets specific emissions limits for new and existing chromium electroplating and anodizing operations that fall into specific size categories. The rule requires facilities to meet emissions limits through the use of pollution prevention practices and controls.
- The rule affects an estimated 1,500 hard chromium electroplating facilities, 2,800 decorative chromium electroplating facilities, and 700 chromium anodizing facilities. It will reduce chromium emissions by 173 tons per year, a 99 percent reduction from the preregulated levels emitted by these facilities.

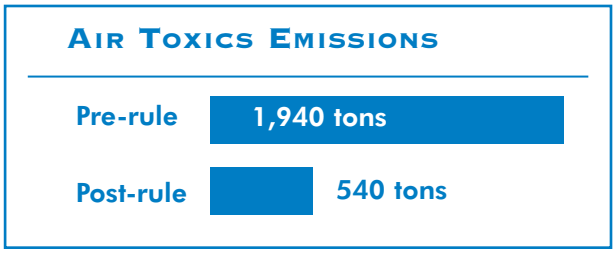
Basic Liquid Epoxy Resins and Non-Nylon Polyamide Resins Manufacture

Final rule published March 8, 1995

- Basic liquid epoxy resins are used in the production of glues, adhesives, plastic parts, and surface coatings. Non-nylon polyamide or wet strength resins are used to improve the strength of paper.
- Epichlorohydrin (strongly suspected of causing cancer and known to cause respiratory problems) is released during the resin manufacturing process.
- EPA's rule is based on an epichlorohydrin emissions limit, which provides facilities with the flexibility to meet the regulation's requirements with a variety of compliance options. The rule also requires facilities to implement leak detection and repair programs.
- The rule affects all three basic liquid epoxy resins manufacturing facilities and all nine non-nylon polyamide manufacturing facilities. It will reduce epichlorohydrin emissions by 110 tons per year.

Final rule published June 23, 1995

- Secondary lead smelters produce lead from scrap and provide the primary means for recycling lead-acid automotive batteries. The basic operations performed at these facilities include battery breaking, smelting, refining and alloying.
- Secondary lead smelter facilities emit a number of toxic air pollutants, including 1,3-butadiene (a known human carcinogen) and lead compounds.
- EPA's rule requires facilities to reduce emissions from a number of sources, including smelting furnaces, kettles, dryers, and fugitive sources such as material handling.
- The rule affects all 23 secondary lead smelters in the United States. It will reduce emissions of air toxics from these facilities by 1,400 tons per year, a 72 percent reduction from the preregulated levels emitted by these facilities. In addition, the rule is expected to reduce emissions of particulate matter (which can cause serious respiratory problems) from these facilities by 150 tons per year, and carbon monoxide (which can cause adverse health effects, including fatigue, nausea, and respiratory problems) by 88,000 tons per year.

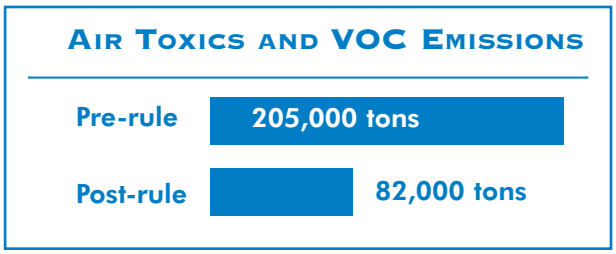


Final rule published August 18, 1995

- Petroleum refineries process crude oil to produce automotive gasoline, diesel fuel, lubricants, and other petroleum-based products.
- Toxic air pollutants, including benzene (a known human carcinogen) and toluene (known to affect the central nervous system and cause developmental problems), are released from storage tanks, equipment leaks, process vents, and wastewater collection and treatment systems at these facilities.
- EPA's rule requires facilities to control emissions from these sources. The rule allows emissions averaging within the petroleum refining facility, and provides additional flexibility by permitting the use of emissions averaging among emission points at petroleum refineries, marine terminal loading operations, and gasoline distribution facilities located at the same site.
- The rule affects all petroleum refineries in the United States and will reduce emissions of 11 air toxics by 53,000 tons per year, a 59 percent reduction from the pre-regulated levels emitted by these facilities. In addition, the rule is expected to reduce VOC emissions by over 277,000 tons per year, a 60 percent reduction from preregulated levels emitted by these facilities.

Final rule published September 1, 1995

- Aerospace manufacturing and rework facilities produce and/or repair aerospace vehicles and vehicle parts, such as airplanes, helicopters, space vehicles, and missiles.
- Toxic air pollutants such as methylene chloride (a probable human carcinogen) and chromium (Chromium VI, the most toxic form, is known to cause lung cancer) are released from these facilities during paint stripping, cleaning, priming, top-coat application, and chemical milling maskant operations.
- EPA's rule requires facilities to eliminate most emissions of toxic air pollutants (particularly methylene chloride) from paint stripping operations and to implement controls that will reduce emissions of air toxics resulting from other operations. In addition, many reductions will be achieved through housekeeping actions. The final rule provides a variety of options for meeting these requirements.
- The rule provides industry the flexibility to meet the required reductions in the most cost-effective way, which should yield cost savings for industry sources. For example, the rule contains a market-based emissions averaging provision, which allows facilities to overcontrol some emission points while undercontrolling others.
- The rule affects an estimated 2,800 aerospace manufacturing facilities and will reduce emissions of air toxics and VOCs by 123,000 tons per year, a 60 percent reduction from the preregulated levels emitted by these facilities.

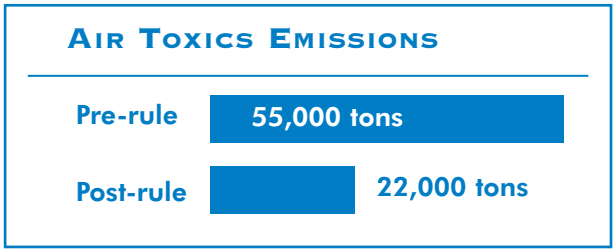


Final rule published September 19, 1995

- Marine tank vessels are used to transport crude oil, gasoline, and toxic chemicals among refineries, bulk terminals, chemical plants, and pipeline terminals.
- These vessels release toxic air pollutants (including benzene, toluene, hexane, xylene, and ethyl benzene) into the air during loading and unloading operations.
- EPA's rule sets limits for both air toxic pollutants and VOCs. It requires large marine loading terminals (i.e., terminals that load either 200 million barrels per year of crude oil, or 10 million barrels per year of gasoline) to reduce emissions of VOCs by at least 95 percent. It also requires all other major sources to reduce air toxic emissions by 97 percent.
- The rule affects an estimated 30 marine tank vessel loading facilities. It will reduce VOC emissions from these facilities by approximately 43,000 tons per year, of which 4,500 tons are air toxics.

Final rule published December 7, 1995

- The wood furniture manufacturing industry includes cabinet shops and facilities that make residential and industrial furniture.
- Toxic air pollutants, including toluene, xylene, methanol, and formaldehyde, are released from these facilities during finishing, gluing, and cleaning operations. These air toxics can cause eye, nose, throat, and skin irritation; damage to the heart, liver, and kidneys; and reproductive effects.
- EPA's rule limits the amount of hazardous air pollutants that can be contained in the coatings used for finishing, gluing, and cleaning operations (substitutes are available that contain lower quantities of hazardous air pollutants). In addition, the rule contains work practice standards such as keeping containers closed, training workers, and periodically inspecting equipment to locate and repair leaks.
- The rule affects an estimated 750 wood furniture manufacturing facilities and will reduce air toxics emissions by 33,000 tons per year (a 60 percent reduction from preregulated levels) and VOC emissions by an additional 8,400 tons per year.



Final rule published December 15, 1995

- The shipbuilding and repair industry includes shipyards that construct and/or repair commercial or military vessels, such as barges and tankers.
- Toxic air pollutants such as xylene and toluene are released during painting and associated cleaning operations.
- EPA's rule, which is based on pollution prevention measures, requires that containers of paint and cleansers be kept closed, and that facilities use low-VOC coatings for painting and coating operations and handle solvent and paint wastes in a manner that minimizes spills and evaporation. The rule does not apply to major source facilities that use less than 1,000 liters (approximately 264 gallons) of marine coatings per year, or to boatyards that only build or repair recreational vessels (marine or freshwater) less than 20 meters (about 66 feet) long.
- The rule affects an estimated 35 shipbuilding and repair facilities and will reduce emissions of air toxics from these facilities by 350 tons per year, a 24 percent reduction from the preregulated levels emitted by these facilities.

Final rule published May 30, 1996

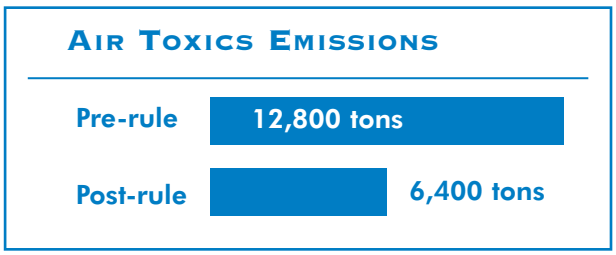
- EPA's rule covers two distinct segments of the printing and publishing industry:
  - Publication rotogravure printers, which produce paper products such as catalogues, magazines, newspaper inserts, and telephone directories.
  - Package-product rotogravure and wide-web flexographic facilities that print on paper, plastic film, metal foil, and vinyl for use in products such as flexible packaging, labels, and gift wrap.
- Toxic air pollutants (including toluene, xylene, methanol, and hexane) are released from the ink systems used by both types of printers.
- For publication rotogravure facilities, EPA's rule limits air toxics emissions to 8 percent of the total amount used (for example, facilities that use only hazardous-air-pollutant-based solvents would be required to recover 92 percent of the air toxics). For package-product rotogravure and wide-web flexographic facilities, the rule requires 95 percent overall control of all organic hazardous air pollutant emissions from their presses.
- EPA's rule incorporates flexible compliance options into its emissions control requirements. Facilities may use pollution prevention methods (which allow printers to eliminate the use of toxic chemicals or to substitute nontoxic chemicals for toxic ones), traditional emissions capture and control equipment, or a combination of the two.
- The rule affects an estimated 27 publication rotogravure facilities and 100 package-product rotogravure and wide-web flexographic facilities. It will reduce air toxics emissions from publication rotogravure printers by about 5,500 tons per year, and those from package-product rotogravure and wide-web flexographic printers by about 2,100 tons per year.

Final rule published July 1, 1996

- Off-site waste facilities include hazardous waste treatment, storage, and disposal facilities; industrial wastewater treatment facilities; solvent recycling facilities; and used-oil recovery facilities that manage hazardous air pollutant-containing materials generated at other facilities.
- A number of toxic air pollutants (including chloroform, toluene, formaldehyde, and xylene) are released from tanks, process vents, equipment leaks, containers, surface impoundments, and transfer systems at these facilities.
- EPA's rule combines equipment, operations, and work practice standards. For example, the rule requires that containers be covered and that process vents meet 95 percent organic emission controls.
- The rule affects an estimated 250 off-site waste operation facilities. It will reduce air toxics emissions by 43,000 tons per year and VOC emissions by 52,000 tons per year.

Final rule published September 5, 1996

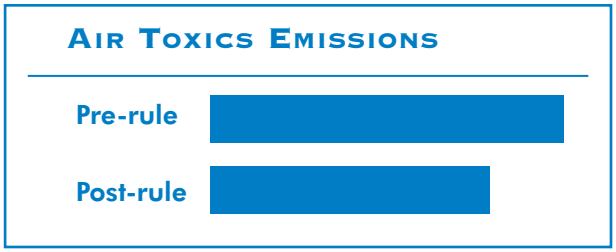
- Elastomers are used in the production of many synthetic rubber products, including tires, hoses, footwear, adhesives, wire insulation, floor tiles, and latexes.
- A number of toxic air pollutants (such as styrene, hexane, and toluene) are released during the initial stages of the elastomer manufacturing process.
- EPA's rule encourages the use of pollution prevention techniques to reduce the amount of air toxics released during elastomer production. The rule sets emissions limits for several specific emission points—storage tanks, process vents, equipment leaks, and wastewater systems. It also contains a market-based emissions averaging provision that allows facilities to overcontrol some emissions points while undercontrolling others, thus achieving the required reductions in the most cost-effective manner possible.
- The rule affects 36 facilities nationwide and will reduce air toxics emissions by approximately 6,400 tons annually, a 50 percent reduction from current levels.



Polyethylene Terephthalate Polymer and Styrene-Based Thermoplastic Polymers Production

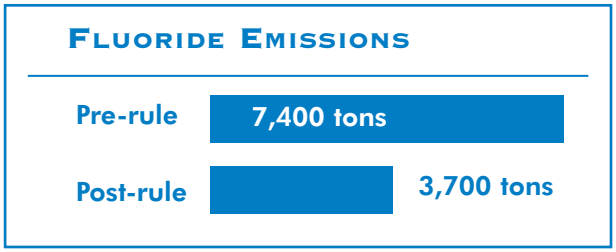
Final rule published September 12, 1996

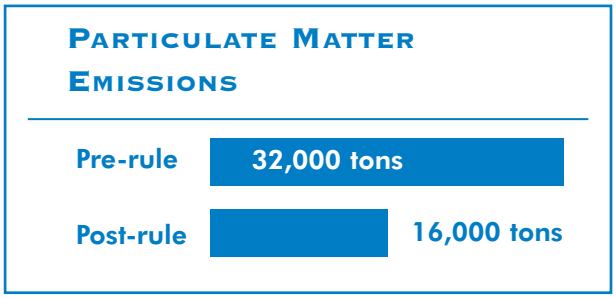
- Polyethylene terephthalate polymers and styrene-based thermoplastics are used in the manufacture of such products as polyester fibers, soft drink bottles, plastic automotive parts, packing materials, and plastic toys.
- A number of toxic pollutants (including styrene, butadiene, and methanol) are released into the air during polymer production.
- To reduce the amount of air toxics released from polymer production facilities, EPA's rule sets emissions limits for several emissions points: storage vessels, process vents, equipment leaks, and wastewater operations. The rule also limits releases from process contact cooling towers at some existing and new facilities.
- EPA developed the rule in partnership with industry representatives and other major stakeholders. The Agency estimates that new facilities will experience annual cost savings of about $5 million under the rule, due to pollution prevention measures.
- The rule affects 66 facilities nationwide and will reduce emissions by approximately 3,880 tons annually, a 20 percent reduction from current levels.

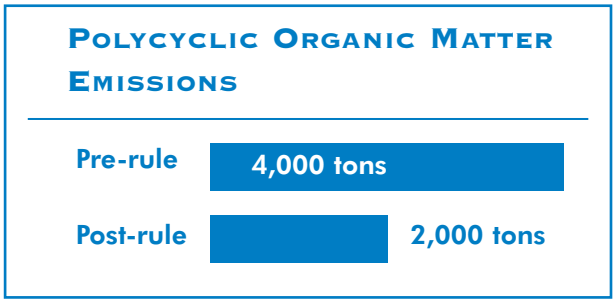


Final rule published October 7, 1997

- Primary aluminum reduction plants produce molten aluminum metal (virgin aluminum) from alumina ore. Typically, primary aluminum plants are components of larger facilities that prepare a variety of finished products. These larger facilities also typically include secondary aluminum plant operations, which use aluminum metal to make products such as cans, aircraft and automotive products, and construction materials. Standards for secondary aluminum production are covered under a separate rule, summarized on page 30.
- Air toxics released during the production of molten aluminum metal include hydrogen fluoride (which can cause serious respiratory damage) and polycyclic organic matter (which is strongly suspected of causing cancer and other serious health effects).
- Developed in partnership with state regulators, industry stakeholders, and tribal governments, EPA's final rule contains an emissions averaging provision that allows facilities to overcontrol some emissions points while undercontrolling others, thus achieving the required reductions in the most cost-effective manner possible. As a further cost-saving incentive, facilities that consistently perform below the levels set in the standard will be allowed to reduce the frequency of sampling or emissions testing.
- To achieve the required reductions, the final rule relies on a combination of pollution prevention measures, including work practices, equipment modifications, operating practices, housekeeping measures, and in-process recycling.
- The rule affects 24 facilities nationwide. It will reduce fluoride emissions by about 3,700 tons per year, polycyclic organic matter emissions by about 2,000 tons per year, and particulate matter emissions by 16,000 tons per year. These emission levels represent a reduction of approximately 50 percent from preregulated levels.





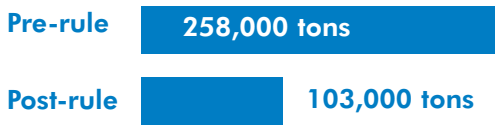


Two final rules published April 15, 1998

- Wood and non-wood fiber sources such as cotton, linen, and straw are turned into pulp either though cooking via chemicals (known as digestion), mechanical grinding, or a combination of both. Following digestion or grinding, the resulting fibrous mass is washed, screened, and (depending on the final product) sometimes bleached.
- A number of toxic air pollutants (including chloroform, chlorine, formaldehyde, methanol, acetaldehyde, methyl ethyl ketone, and metals) are released during cooking, washing, bleaching, and chemical recovery processes at these facilities.

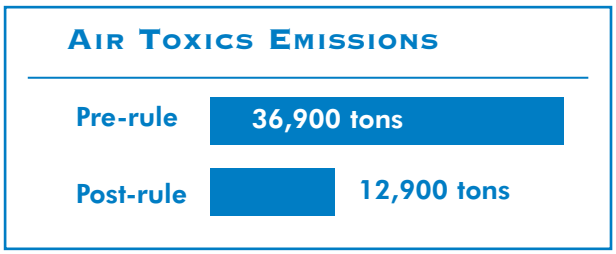
- EPA's air toxics rules are part of an integrated, multimedia regulation designed to control pollutant releases to the water and air. The integrated rules allow the pulp and paper industry to consider all regulatory requirements at one time in order to select the most effective pollution prevention and control technologies.
- EPA has issued two final air toxics standards for the pulp and paper industry that cover emissions from pulping and bleaching processes at mills that chemically pulp wood, and certain bleaching processes at non-wood, mechanical, and secondary fiber mills. These standards do not require controls on paper machines at any mills and on pulping operations at non-wood, mechanical, and secondary fiber mills.
- The final rules will affect approximately 155 mills and will reduce air toxics emissions by 155,000 tons per year, a 60 percent reduction from current levels. The rules will also reduce VOC emissions by 450,000 tons per year and total sulfur emissions by 86,000 tons per year.

Air Toxics Emissions (Final Rules)



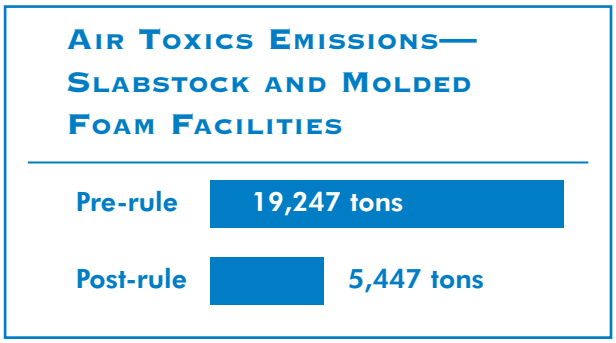
Final rule published September 21, 1998

- Pharmaceutical production includes operations such as chemical synthesis, formulation, and natural extraction, used to produce drugs and medications.
- The production of pharmaceuticals results in the release of a number of air toxics, including methylene chloride, methanol, toluene, and hydrogen chloride.
- This rule, developed in partnership with representatives from industry and states, provides a variety of compliance options. Facility operators may choose to meet either emission limits or control efficiency requirements for storage tanks and process vents. Operators may elect to comply with the pollution prevention alternative in lieu of the standards for process vents, storage tanks, equipment leaks, and wastewater where the operator has reduced the hazardous air pollutant usage for a product process.
- Approximately 100 pharmaceutical production facilities nationwide will be affected by this rule. When fully implemented, the rule will reduce air toxics emissions by 24,000 tons annually, a 65 percent reduction from current levels.



Final rule published October 7, 1998

- This rulemaking affects only flexible polyurethane foam that is manufactured at slabstock, molded, and rebond polyurethane production facilities. These segments of the industry manufacture cushions, bedding materials, and other speciality products.
- The production of flexible polyurethane foam results in the release of air toxics, primarily methylene chloride, which is a probable human carcinogen that can adversely affect the central nervous system.
- This rule is based on pollution prevention techniques and flexible requirements. A variety of compliance options are available to facility operators. As a result of the rule, the use of methylene chloride at molded foam production facilities will be eliminated.
- Approximately 78 slabstock, 98 molded, and 21 rebond foam facilities nationwide will be affected by this rule. When fully implemented, the rule will reduce air toxics emissions by 11,500 tons annually at slabstock foam facilities (a 68 percent reduction from current levels), and by 2,300 tons annually at molded foam facilities (a 98 percent reduction from current levels). All rebond foam facilities are believed to be in compliance with this rule; therefore, no further reductions are expected.



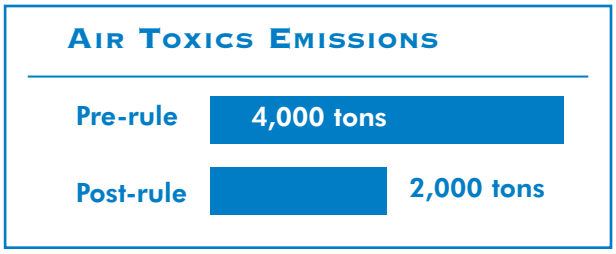
Ferroalloys Production: Ferromanganese and Silicomanganese

Final rule published May 20, 1999

- A ferroalloy is a mixture of iron and one or more other elements, such as chromium, manganese, or silicon. Ferroalloys are primarily used in the manufacturing of steel and cast iron products with enhanced or special properties.
- The production of ferroalloys results in the release of a number of metallic air toxics, including manganese. The variety and quantity of pollutants emitted are related to the amount of metals present in the raw materials. Manganese can adversely affect human health. For example, chronic exposure to high levels of manganese primarily affects the central nervous system.
- This final rule sets limits for particulate emissions from one ferromanganese and silicomanganese production plant. Particulate matter is used as a surrogate for the air toxic manganese emitted from this facility. Particulate control devices are known to remove metallic pollutants with essentially the same efficiency as they remove particulates.
- The facility already has control equipment in place to comply with EPA's rule. This equipment reduces air toxics emissions by 99 percent from uncontrolled levels. The rule is not expected to bring about additional reductions, but will ensure continued use and good operation of existing control equipment.

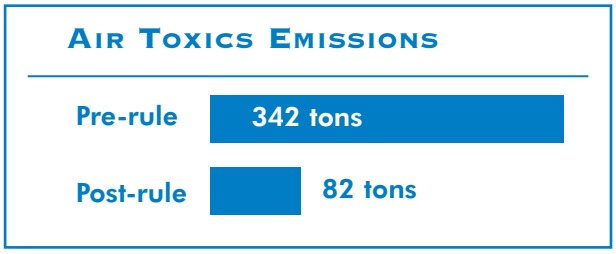
Final rule published June 1, 1999

- Polyether polyols are used as an ingredient in lubricants, adhesives, cosmetics, soaps, and polymers for urethane production.
- A number of air toxics are released during the production of polyether polyols. These include ethylene oxide, propylene oxide, toluene, and hexane, all of which can cause cancer or other adverse health effects.
- EPA's rule establishes emission limits and control efficiency requirements for storage tanks, process vents, equipment leaks, and wastewater treatment systems. For several of the emission units, industry can choose from a number of compliance approaches.
- Of the 80 facilities affected by this rule, roughly half have already installed emission control devices. When fully implemented, the rule will reduce air toxic emissions by approximately 2,000 tons annually, a reduction of 50 percent from current levels.



Final rule published June 1, 1999

- Mineral wool is made by melting natural rock, blast furnace slag, and other materials in a furnace known as a cupola, and then forming the molten material into a fiber. Depending on the final product, an oil or a phenol/formaldehyde-based binder is applied. Fiber to which oil has been applied is then sized and bagged or baled. Fiber to which a phenol/formaldehyde-based binder has been applied is thermoset in a curing oven and cooled.
- Mineral wool is used as an industrial and structural insulator. It is also added to other products to provide structural strength, sound absorbency, or fire protection.
- Production of mineral wool can lead to releases of a variety of air toxics, including arsenic (a known human carcinogen) and beryllium, cadmium, lead, and formaldehyde (probable human carcinogens).
- EPA's rule requires facilities to reduce air toxics emissions from existing and new cupolas, using particulate matter as a surrogate for the metallic toxics (e.g., arsenic, beryllium, cadmium, lead). Additionally, facilities must reduce emissions of carbonyl sulfide from new cupolas, using carbon monoxide as a surrogate for carbonyl sulfide. The rule also requires reduction of phenol and formaldehyde emissions from curing ovens.
- The rule allows flexibility by offering a choice of compliance options (emission limits or percent reduction standards). The rule's use of surrogate pollutants will also help reduce monitoring and emission testing costs.
- The rule will affect 15 mineral wool production facilities nationwide. When fully implemented, it will reduce air toxics and particulate matter emissions from cupolas, and formaldehyde and phenol emissions from curing ovens, by 260 tons annually, a reduction of 76 percent.



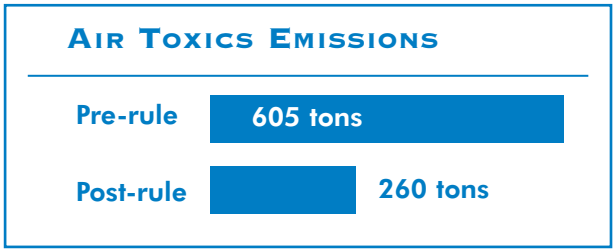
Final rule published June 4, 1999

- Primary lead smelters process lead ore to produce lead metal. The majority of this lead is then used to manufacture lead-acid batteries.
- A variety of air toxics are released during primary lead smelting operations. These include lead, arsenic, antimony, and cadmium.
- EPA's rule will control emissions by setting plant-wide lead emission limits. These limits are based on pre-existing limits established by the states in which affected facilities are located. The rule gives owners and operators the flexibility to determine how and to what extent each source is controlled to achieve the required emission limits. The rule also details several work practice requirements for the control of fugitive dust, and the operation and maintenance of air pollution control equipment.
- Three manufacturing facilities will be affected by this rule. The emissions limits are based on pre-existing state emissions limits. As such, no direct emissions reduction can be estimated based solely on the emissions limits. EPA expects that as a result of following the fugitive dust work practice and monitoring requirements, facilities will achieve air toxics emission reductions by improving equipment performance and reducing the potential for fugitive dust emissions.

Phosphoric Acid Manufacturing and Phosphate Fertilizer Production

Two final rules published June 10, 1999

- Phosphoric acid is used in the production of phosphate-based fertilizers, which are used for farming and other agricultural purposes.
- A variety of air toxics can be released to the atmosphere during the production of phosphoric acid and phosphate fertilizers.
- EPA's rules require facilities to reduce emissions of air toxics from the following emissions points: wet process phosphoric acid plants, superphosphoric acid plants, purified phosphoric acid plants, phosphate rock dryers, phosphate rock calciners, mono- and di-ammonium phosphate fertilizer plants, and granular triple superphosphate fertilizer plants and storage buildings. The rules are structured to limit emissions across process lines that include several different emissions points. The rules establish a single limit for each process line, allowing facilities the flexibility to operate and control each line in the most efficient manner while still achieving specific emission reductions.
- The rules affect an estimated 21 facilities. The rules will reduce emissions of toxic air pollutants (primarily hydrogen fluoride) by approximately 345 tons per year, a 57 percent reduction from current levels. They will also reduce emissions of total fluorides by 1,035 tons per year, and will yield small reductions in emissions of heavy metals. Total fluorides are known to damage vegetation and have other adverse effects on the environment.

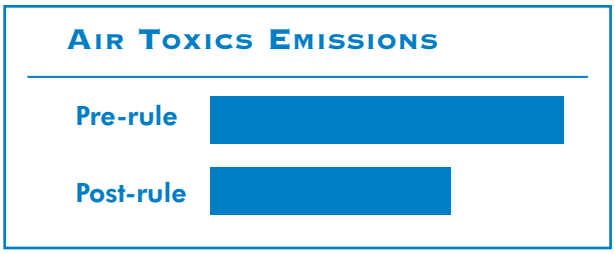


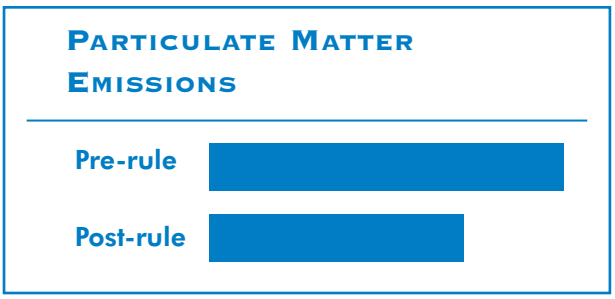
Final rule published June 14, 1999

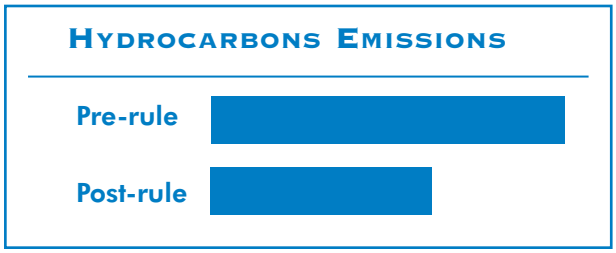
- Wool fiberglass is a constituent of a variety of insulation products, including building and pipe insulation. It is produced from sand, feldspar, sodium sulfate, anhydrous borax, boric acid, and other materials.
- A variety of air toxics are released to the atmosphere during the production of wool fiberglass. These include arsenic (a known human carcinogen), and lead and formaldehyde (probable human carcinogens).
- EPA's rule applies to the following types of facilities: glass manufacturing furnaces, rotary spin manufacturing lines producing building insulation, flame attenuation (FA) manufacturing lines producing pipe products, and FA manufacturing lines producing heavy-density insulation products. The rule also contains new emission test methods for measuring formaldehyde.
- The rule provides owners and operators flexibility in meeting the emission limits by encouraging process modifications and pollution prevention techniques, instead of more costly add-on controls.
- Of the 27 facilities currently manufacturing wool fiberglass nationwide, 21 will be affected by this rule. The rule will reduce emissions of formaldehyde by 580 tons annually, a reduction of 30 percent. The rule will also reduce particulate matter emissions by 840 tons per year and emissions of toxic metals (including arsenic, chromium, and lead) by 20 pounds per year—a reduction of 30 percent from current levels.

Final rule published June 14, 1999

- Portland cement is manufactured by grinding and heating a mixture of raw materials (e.g., limestone, clay, iron ore) in a rotary kiln. The kiln is fired by a variety of fuels, including coal, oil, gas, coke, and/or various waste materials. After firing, the product (called clinker) is cooled and then mixed with gypsum to produce portland cement.
- A number of harmful air pollutants, including air toxics, particulate matter, and hydrocarbons, are released during portland cement manufacturing. Most of these result from fuel combustion in the kiln and from heating and handling of raw materials. The health impacts of these pollutants include an increased risk of respiratory and cardiovascular diseases and cancer.
- This rule sets emission limits for kilns, clinker coolers, and materials handling facilities, and includes new emission measurement methods. In complying with this rule, facility owners and operators have the flexibility to determine how emission limits will be met.
- Approximately 110 portland cement manufacturing facilities nationwide will be regulated under this rule. The rule will reduce air toxics emissions by approximately 90 tons per year (a 31 percent reduction), particulate matter emissions by 4,200 tons annually (a 17 percent reduction), and hydrocarbons emissions by 220 tons annually (a 38 percent reduction).



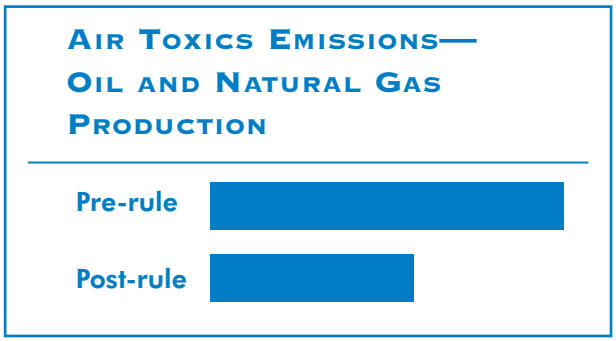


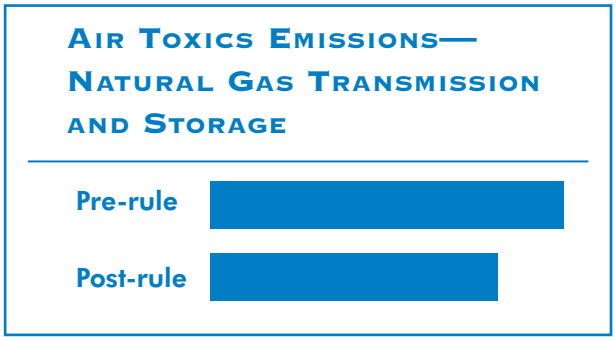


Oil and Natural Gas Production and Natural Gas Transmission and Storage

Two final rules published June 17, 1999

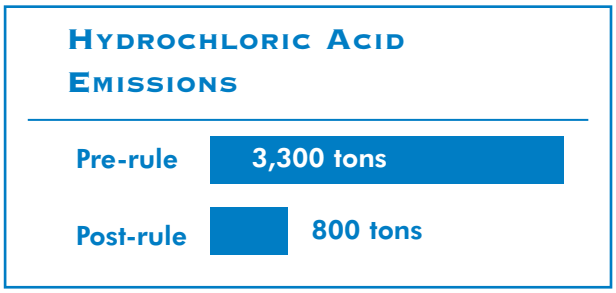
- Emissions of air toxics from oil and natural gas production and natural gas transmission and storage occur during separation, upgrade, transport, and storage of crude oil, condensate, natural gas, and related products. Emissions also occur as a result of vapor leaks from pumps, compressors, valves, flanges, and other equipment.
- The affected facilities can release a variety of air toxics, including benzene (a known human carcinogen) and other volatile organic compounds (VOCs) suspected to cause cancer or other serious health effects such as birth defects or reproductive effects. VOCs also contribute to the formation of ground-level ozone, the primary constituent of smog. In addition, the affected facilities can release methane, a potent greenhouse gas.
- EPA's rules require controls for the following emission points at oil and natural gas production facilities: process vents at some glycol dehydration units, tanks with flashing emission potential, and some fugitive emission sources. Natural gas transmission and storage facilities will be required to control emissions from process vents at some glycol dehydration units.
- In an effort to increase flexibility, EPA is encouraging facility owners and operators to use pollution prevention techniques to reduce emissions from process vents at glycol dehydration systems—the largest single air pollutant emission point at oil and natural gas production facilities.
- The oil and natural gas production rule will affect approximately 440 facilities nationwide. It will reduce air toxics emissions by an estimated 31,000 tons annually (a 43 percent reduction), VOC emissions by 67,000 tons annually (a 45 percent reduction), and methane emissions by 7,700 tons annually (a 33 percent reduction).
- The natural gas transmission and storage rule will affect approximately seven facilities nationwide. It will reduce air toxics emissions by an estimated 430 tons annually (an 18 percent reduction), VOC emissions by 610 tons annually (a 19 percent reduction), and methane emissions by 250 tons annually (a 19 percent reduction).





Final rule published June 22, 1999

- Steel pickling is a process in which an acid solution is used to remove the oxide scale that forms on steel as it cools from a molten state.
- Hydrochloric acid and chlorine can be released to the atmosphere during the steel pickling process. Hydrochloric acid is emitted from processing tanks used in continuous and batch pickling lines, from acid regeneration plants, and from storage tanks containing virgin or regenerated acid. Chlorine is emitted from acid regeneration plants.
- Chronic exposure to hydrochloric acid can cause inflammation of the stomach, respiratory system, and skin, as well as sensitivity to sunlight. Acute exposure to high levels of chlorine can result in vomiting, chest pain, lung problems, and even death. At lower levels, chlorine is a potent irritant to the eyes, the upper respiratory tract, and the lungs.
- EPA's rule establishes limits for hydrochloric acid emissions from pickling lines, acid regeneration plants, and acid storage tanks. It also establishes limits for chlorine emissions from acid regeneration plants. The rule offers flexibility to facility operators by providing cost-effective options for both emissions control and monitoring.
- This rule will affect approximately 62 steel pickling plants and 8 acid regeneration plants. When fully implemented, the rule will reduce hydrochloric acid emissions by approximately 2,500 tons per year (a 76 percent reduction from current levels) and chlorine emissions by 8.2 tons per year (a 30 percent reduction from current levels). The controls required by this rule will also reduce particulate matter emissions.



Final rule published June 23, 1999

- Pesticide active ingredients (PAIs) are used in the manufacture of insecticide, herbicide, and fungicide products. These products are typically used in the agricultural industry for treating insects, rodents, weeds, and other pests.
- A variety of air toxics, including toluene, methanol, and hydrochloric acid, can be released to the atmosphere during production of PAIs.
- EPA's rule affects the following points in the PAI production process: process vents, storage vessels, wastewater and associated treatment residuals, heat exchange systems, and certain types of equipment. The rule allows facilities the flexibility to meet emissions limits for process vents by using either an add-on control device or a pollution-prevention alternative.
- Currently, there are approximately 78 PAI production facilities that will be affected by this rule. When fully implemented, the rule will reduce emissions of air toxics by approximately 2,755 tons per year, a 65 percent reduction from current levels.

Generic Rule
for Acetal Resin Production, Acrylic and Modacrylic Fiber Production, Hydrogen Fluoride Production, and Polycarbonate Production

Four final rules published June 29, 1999

- These rules set technology-based emission limits for several categories that have five or fewer facilities nationwide.
- The facilities regulated by these rules manufacture a variety of components, including thermoplastics used in industrial applications and commercial articles; synthetic fibers used in the textile, sporting goods, and aviation industries; polycarbonates used in electrical components and automotive parts; and fluoride compounds.
- A variety of air toxics are sometimes released to the atmosphere during the manufacture of these products. These air toxics include formaldehyde, methanol, and the volatile organic compounds methylene chloride, ethyl chloride, and phosgene.
- EPA's rules will control emissions for all of the categories at similar phases of the manufacturing process. These phases include storage tanks, process vents, equipment leaks, and wastewater.
- The rules will ensure that the nine affected facilities maintain or develop emission controls.

Final rule published October 26, 1999

- Publicly owned treatment works (POTW) treat wastewater received from residential, commercial, and industrial sources. POTW can release air toxics in the form of volatile organic compounds in wastewater.
- The primary air toxics emitted by POTW include xylenes, methylene chloride, toluene, ethyl benzene, chloroform, tetrachloroethylene, benzene, and naphthalene. Each of these air toxics can cause adverse health effects provided sufficient exposure. For example, exposure to methylene chloride (a probable human carcinogen) can adversely affect the central nervous system, while benzene is known to cause cancer in humans.
- EPA's rule will reduce air toxics emissions from new or reconstructed POTW that are major sources of air emissions. EPA is not requiring additional controls on existing POTW.
- Some POTW treat wastewater from industrial sources whose waste streams are already regulated by industrial air toxics rules. By treating their regulated waste streams at a POTW, these industrial sources are able to comply with these other air toxics rules. Under the new POTW rule, plants that treat regulated waste streams from industrial sources are classified as *industrial POTW*. All other treatment plants are classified as *non-industrial POTW*.
- Under EPA's rule, new or reconstructed non-industrial POTW will need to either include air pollution controls on certain wastewater treatment units or demonstrate through pollution prevention techniques an equivalent reduction in emissions. New or reconstructed industrial POTW must comply with the non-industrial standards, or with all other air toxics regulations applicable to the industrial sources whose wastewater they are treating, whichever is more stringent.
- EPA estimates that 20 to 30 non-industrial POTW would need to control air toxics emissions if they elected to reconstruct their existing facilities or build a new facility. EPA estimates that fewer than five POTW currently meet the definition of industrial POTW. The rule is not expected to require additional reductions from these sources.

Final rule published January 20, 2000

- Amino/phenolic resins are primarily used in the manufacture of plywood, particle board, adhesives, wood furniture, and plastic parts.
- A number of toxic air pollutants, including formaldehyde (a probable human carcinogen), phenol, methanol, xylene, and toluene, are released during the resin manufacturing process.
- EPA's rule establishes emission limits or control efficiency requirements for several emission points: reactor batch process vents, non-reactor batch process vents, continuous process vents, storage tanks, equipment leaks, and heat exchange systems. The rule encourages the use of pollution prevention measures and provides flexibility by allowing the use of a variety of control strategies rather than specific control devices.
- The rule affects new and existing amino/phenolic resin manufacturing facilities. EPA has identified 100 existing facilities that may be affected. The rule will reduce air toxics emissions by approximately 360 tons per year, a 51 percent reduction from 1992 levels.

Final rule published March 23, 2000

- Secondary aluminum plants recover aluminum from beverage cans, foundry returns, and other aluminum scrap. These facilities release air toxics during both preprocessing operations (such as aluminum scrap shredding, drying, and decoating) and furnace operations (such as aluminum melting, refining, and alloying).
- Secondary aluminum plants emit a variety of toxic air pollutants. These air toxics may include up to 11 metals, organic compounds, and acid gases such as hydrogen chloride and chlorine. The health effects associated with exposure to these air toxics can include cancer, respiratory irritation, and damage to the nervous system.
- EPA's rule establishes emission standards for metals, dioxin/furans, organic hazardous air pollutants, and acid gases for larger secondary aluminum plants. The rule also establishes standards for dioxin/furan emissions from smaller secondary aluminum plants.
- Affected sources can achieve the emission reductions required by the rule through the use of pollution-control equipment and/or through a variety of pollution-prevention measures, including work practices and operating practices. The rule provides flexibility to the industry by offering alternative compliance and monitoring options. To reduce monitoring and emissions testing costs, the rule uses particulate matter as a surrogate for metals, total hydrocarbons as a surrogate for organics, and hydrogen chloride as a surrogate for total emissions of hydrogen chloride, chlorine, and hydrogen fluoride.
- The rule will affect 80 large secondary aluminum plants. Hundreds of smaller plants may be subject to limitations on emissions of dioxin/furans. The rule will reduce nationwide emissions of air toxics by about 12,420 tons per year, a reduction of nearly 70 percent from current levels. In particular, hydrogen chloride emissions will be reduced by about 12,370 tons per year or by 73 percent, and emissions of metals will be reduced by about 40 tons per year, a reduction of over 60 percent from current levels.

Summaries of Related Solid Waste Incineration Rules

EPA has also issued final rules to control emissions of certain air toxics from solid waste combustion facilities. These rules set emissions limits for new solid waste combustion facilities and provide emissions guidelines for existing solid waste combustion facilities under Section 129 of the Clean Air Act.

Final rule published December 19, 1995; amended August 25, 1997

- Municipal waste combustors include incinerators that burn waste and waste-to-energy plants that generate energy from garbage. EPA's final rule applies to all municipal waste combustion units with the capacity to burn more than 250 tons of garbage per day (known as large municipal waste combustion units; EPA has initiated development of rules for small municipal waste combustion units).
- Municipal waste combustors release a number of pollutants, including cadmium, lead, mercury, dioxin, sulfur dioxide, hydrogen chloride, nitrogen dioxide, and particulate matter. Dioxin and mercury are of particular concern because they are toxic, persist in the environment, and bioaccumulate.
- EPA's rule contains strict MACT-based standards for new incinerators and emissions limits for existing incinerators.
- The rule affects an estimated 164 municipal waste combustion units and will significantly reduce air toxics emissions (dioxins, lead, cadmium, and mercury). The rule will reduce dioxin emissions by 99 percent and mercury emissions by 90 percent, compared with 1990 emissions levels from these sources. Overall emissions of other air pollutants (including sulfur dioxide, particulate matter, nitrogen oxides, and hydrogen chloride) will be reduced by more than 90,000 tons per year.

Final rule published September 15, 1997

- Hospital, medical, and infectious waste is solid waste produced in the diagnosis, treatment, or immunization of humans or animals; it includes needles, gauzes, boxes, and packaging materials. Fewer than half of all hospitals and a small number of nursing homes, pharmaceutical research laboratories, and veterinary clinics use incinerators to dispose of their waste.
- A number of toxic air pollutants, including dioxins, mercury, lead, and cadmium, are released into the air during the incineration process.
- EPA's rule contains one set of emission requirements for new incinerators and another set for existing incinerators. The rule establishes emissions limits for nine pollutants (including dioxin, lead, cadmium, and mercury). It requires training of incinerator operators and establishes requirements for appropriate siting of new incinerators.
- The rule affects an estimated 2,400 existing incinerators and will reduce air toxics emissions (dioxins, lead, cadmium, and mercury) by more than 25 tons per year. Dioxins will be reduced by over 90 percent from the current levels emitted by these incinerators. The rule will also reduce other air pollutant emissions (particulate matter, carbon monoxide, and hydrogen chloride) by over 7,000 tons per year.

What are Hazardous Air Pollutants?

Hazardous air pollutants (HAPs) (also commonly referred to as air toxics or toxic air pollutants) are substances in the air that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects. Hazardous air pollutants can also damage the environment.

In the 1990 amendments to the Clean Air Act, Congress identified 188 specific chemical substances and classes of compounds as HAPs. The law also requires the U.S. Environmental Protection Agency (U.S. EPA) to review the list periodically and add or delete substances or compounds. The law further requires the U.S. EPA to review the sources of HAPs emissions and to develop emission standards for those sources.

The Clean Air Act's list of HAPs contains the following substances:

Benzene is a colorless, highly flammable liquid that is commonly found as an "anti-knock" additive to gasoline. Motor vehicle exhausts and gasoline vapors (released mostly during fill-ups or transfers of gasoline) are primary sources of benzene emissions. Benzene is a cancer-causing agent, but can also have negative impacts on the central nervous system and reproduction and child development.

Perchlorethlyene (perc) is a colorless liquid with a strong odor. Perc is a solvent that is commonly used at dry cleaning facilities, in metal parts degreasing, paints/coatings and adhesives. The substance is a probable human carcinogen, but may also have negative non-cancerous effects on the liver, kidney, and central nervous system.

Asbestos is a solid material composed of thin filaments that look like fiberglass. Asbestos was used as an insulator/heat-resistant cover and in adhesives. Asbestos is known to cause cancer, primarily in the lungs due to inhalation of fibers.

Mercury compounds are a class of chemicals. Within that class are three common substances, elemental (metallic) mercury, mercuric chloride, and methyl mercury. Elemental mercury is a silver, liquid metal used in thermometers and fluorescent lights. Mercuric chloride is white crystalline powder used in the manufacture of certain metals. Methyl mercury salts are sometimes used as pesticides. Health impacts associated with mercury compounds include kidney damage, brain damage, central nervous system effects, and developmental delays.

In 2005, the U.S. EPA began a new program to help communities work at the local level to address the risks from multiple sources of toxics in their environment.. The Community Action for a Renewed Environment (CARE) program allows local organizations to create collaborative partnerships to address toxics in their local environment.. The program provides technical support and federal funding directly to the collaborative partnerships working at the local level. For more information, see http://cfpub.epa.gov/care/.

For More Information:

- About Air Toxics, U.S. EPA, http://www.epa.gov/ttn/atw/allabout.html
- Toxic Release Inventory, U.S. EPA, http://www.epa.gov/tri/
- National Air Toxics Assessment, U.S. EPA, http://www.epa.gov/ttn/atw/nata/index.html
- Taking Toxics Out of the Air, U.S. EPA, http://www.epa.gov/oar/oaqps/takingtoxics/airtox.pdf
- Environmental Topics, State and Territorial Air Pollution Program Administrators (STAPPA) / Association of Local Air Pollution Control Officials (ALAPCO), http://www.cleanairworld.org/scripts/topics.asp

The Toxics Release Inventory (TRI) and Factors to Consider When Using TRI Data

EXECUTIVE SUMMARY

The Toxics Release Inventory (TRI) contains information about releases of certain chemicals and management of wastes at a wide variety of sources, including manufacturing operations, certain service businesses, and federal facilities. Since its inception, the program has grown in several important ways, including expanding the businesses covered and the chemicals on which they report. Equally important is the number of creative ways the general public, government agencies, and the reporting industries use the information made available. This paper provides an introduction and background on the TRI and identifies a number of important factors that must be considered when reviewing or using the data.

Key factors to consider when using the data, which are discussed in greater detail in the main body of the paper, include:

- Toxicity varies among the covered chemicals; data on amounts of the chemicals alone are inadequate to reach conclusions or formulate policy;
- The presence of a chemical in the environment must be evaluated along with the potential and actual exposures and the route of exposures, the chemical's fate in the environment, and other factors before any statements can be made about potential risks associated with the chemical or a release;
- Many options for managing production-related wastes are subject to stringent technical standards and exacting state and federal regulatory oversight;
- Regulatory controls apply to many of the releases reported that are production related; reporting facilities must comply with environmental standards in addition to reporting residual releases; and
- Some reporters send chemicals off-site in waste to be managed at specialized waste management facilities that are also reporters; adjustments must be made to avoid double counting.

As you read the document you will encounter a variety of specialized terms. Many are further defined in the boxes that appear throughout the document. There are also other sources of additional information that may help you understand the data. The TRI home page (http://www.epa.gov/tri) includes background information on the TRI program and TRI data as well as information on applicable standards, regulations and guidance. The TRI User Support Service (202-566-0250, tri.us@epa.gov) can provide assistance in accessing and using the TRI data.

Introduction and Background

Following a fatal chemical-release accident in Bhopal, India, the Emergency Planning and Community Right-to-Know Act (EPCRA) was enacted to promote emergency planning, to minimize the effects of an accident such as occurred at Bhopal, and to provide the public with information on releases of toxic chemicals in their communities.

Section 313 of EPCRA established the Toxics Release Inventory, which is a database that contains information on the quantities of certain toxic chemicals released into the environment, including the specific sources and locations from which these releases occurred, and to which environmental media (i.e., land, air, water). The U.S. Environmental Protection Agency's (EPA's) Toxics Release Inventory (TRI) Program was also established by section 313 of EPCRA and is responsible for maintaining and updating the TRI database. Specifically, section 313 of EPCRA requires certain facilities within certain industry sectors to file reports of their disposal or other environmental releases as well as other waste management quantities of chemicals listed on the EPCRA section 313 list of toxic chemicals if they manufacture, process, or otherwise use more than established threshold quantities of these chemicals.[1] The TRI Program is responsible for collecting the release and other waste management information and disseminating it to the public. These data inform the public of releases and other waste management quantities of toxic chemicals in their communities, and enable citizens to make informed decisions regarding the consequences of such releases. The releases and other waste management quantities of a listed chemical are filed by completing an EPCRA section 313 release report (Form R) and submitting it to the U.S. EPA, state, and tribal governments.

In 1990, Congress passed the Pollution Prevention Act (PPA). Among its requirements was a mandate to expand TRI to include additional information on toxic chemicals in waste and on source reduction methods. Beginning in 1991, covered facilities were required to report quantities of TRI chemicals treated on-site, recycled, and combusted for energy recovery. Waste management data have strengthened TRI as a tool to provide information on facilities' handling of TRI chemicals in waste as well as to analyze progress in reducing disposal or other releases.

The TRI Program has been tremendously successful. Industries that have reported to TRI since its inception have reduced on-and off-site disposal or other releases of TRI chemicals by 49 percent or 1.59 billion pounds (for chemicals reportable in all years). Governments - federal, state, and local - have used TRI to set priorities, measure progress, and target areas of special and immediate concern. The public has used the TRI data to understand their local environment, to participate in local and national debates about the choices being made that may affect their health and the health of their children and, ultimately, to exert their influence on the outcome of these debates.

Estimated facility releases are one input to considering potential exposures or potential risks to human health and the environment, but by themselves do not represent risk. Given the potential for using TRI data in these ways, it is important for the public to understand the limitations as well as the benefits of

[1] A reporting threshold for a listed chemical is a pre-established annual manufacture, process or otherwise use quantity that, when exceeded within a calendar year by a facility, triggers reporting of disposal or other releases and other waste management quantities of the chemical. Most listed chemicals have two reporting thresholds. These are (1) 25,000 pounds per calendar year for manufacture or processing activities; and (2) 10,000 pounds per calendar year for "otherwise used" activities. Reporting thresholds are also known as activity thresholds because they are related to manufacturing, processing, or otherwise used activities. Certain persistent bioaccumulative and toxic chemicals (PBTs), as explained later, have different thresholds.

TRI data and the factors that should be considered in drawing conclusions from the data about risks to human health or the environment. The determination of potential risk depends on many factors, including toxicity, chemical fate after disposal or other release, location, and population concentrations.

Since TRI began in 1987, the scope of the program has grown. For the reporting year 2000, TRI was expanded to include certain new persistent bioaccumulative toxic (PBT) chemicals. In addition, reporting thresholds were lowered for both the newly-added PBT chemicals and certain PBT chemicals already on the TRI list. The year 1998 marked the first reporting by seven additional industry sectors: metal mining, coal mining, electrical utilities that combust coal and/or oil, hazardous waste treatment and disposal facilities, chemical wholesale distributors, petroleum bulk stations and terminals, and solvent recovery services (see **Who Must Report?** below for specific industry identification). Since 1994, federal facilities have been added to TRI and the number of reportable chemicals has nearly doubled.

Now in the second decade of the TRI Program, many challenges in the Right-to-Know Program remain to be met. The TRI was designed to be a program that would evolve, over time, to meet the changing needs of an informed and involved public. The TRI is not a static program. As new chemicals of concern are identified, they will be added. Sectors that appear to contribute to environmental loadings will be added. Data collection will be modified to meet new information needs and access technologies will be developed over time to assure enhanced public access to the TRI data.

TRI Reporting

Each year, facilities that meet certain thresholds must report their disposal or other releases and other waste management activities for listed toxic chemicals to EPA and to the state or tribal entity in whose jurisdiction the facility is located. The TRI list for 2002 included nearly 600 individually listed chemicals and 30 chemical categories. (Facilities report certain chemical categories as a whole rather than each of the closely related chemicals within the category. For example, if a facility released both benzo(a)anthracene and benzo(a)pyrene, the facility would report the total amount of both of these polycyclic aromatic compounds under the single category called polycyclic aromatic compounds.) Each facility submits a TRI reporting form for each TRI chemical it has manufactured, processed, or otherwise used during 2002 in amounts exceeding the thresholds (see **How Do Facilities Report?** below).

Reports for each calendar year are due by July 1 of the following year. After completion of data entry and data quality assurance activities, the Agency makes the data available to the public via the TRI database and through a variety of other information products. States also make copies of the forms filed by facilities in their jurisdiction available to the public. In addition, some states produce independent reports.

Who Must Report?

Box 1 lists the kinds of facilities that are required to report to TRI.

Box 1. Who is Required to Report Under the Toxics Release Inventory Program?

A facility must report to TRI if it:

- Operates within any of the following industry sectors:
  - Manufacturing (SIC[2] codes 20-39),
  - Metal mining (SIC code 10, except 1011, 1081, and 1094),
  - Coal mining (SIC code 12, except 1241),
  - Electrical utilities that combust coal and/or oil for the purpose of generating power for distribution in commerce (SIC codes 4911, 4931, and 4939),
  - Resource Conservation and Recovery Act (RCRA) Subtitle C hazardous waste treatment and disposal facilities (in SIC code 4953),
  - Chemical wholesalers (SIC code 5169),
  - Petroleum terminals and bulk stations (SIC code 5171),
  - Solvent recovery services (SIC code 7389),
  - A federal facility in any SIC code; and
- Employs 10 or more full-time-equivalent employees; and
- Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year, except for PBT chemicals where the thresholds are 0.1 gram for dioxin and dioxin-like compounds, and 10 or 100 pounds for other PBT chemicals.

Standard Industrial Classification (SIC) codes are used throughout the federal government to classify economic activity by industry. As shown in Box 1, TRI reporting covers facilities in the manufacturing sectors—that is, SIC codes 20 through 39—as well as some additional SIC Codes. On TRI Form Rs and on TRI Form A certification statements, facilities report the four-digit SIC codes that define their

[2] Facilities are often classified by Standard Industry Classification (SIC) codes. As required by law, facilities that are categorized within certain SIC codes may have to file Toxics Release Inventory (TRI) reports if they also meet other reporting criteria. On April 9, 1997, the Office of Management and Budget (OMB) published a Federal Register Notice of final decision to adopt the North American Industry Classification System (NAICS) for the United States. In the near future, EPA plans to publish a rule that will adopt the NAICS coding for TRI reporting purposes. While this rule will effectively replace the SIC codes regarding TRI reporting, it will not affect the universe of facilities now subject to TRI reporting.

operations. A facility might report, for example, SIC code 2873, nitrogenous fertilizers. Industries are grouped into broader categories at the three-digit and two-digit SIC code levels. In our example, at the two-digit level it falls into the chemicals and allied products major group, SIC code 28. Producers of nitrogenous fertilizers have been required to report to TRI since 1987. Facilities that mine silver ore (SIC code 1044, in the gold and silver ores group SIC code 104, in the metal mining major group SIC code 10) were required to report to TRI beginning in 1998. Solvent recovery facilities in SIC code 7389 were also required to report beginning in 1998, although other types of economic activity in that SIC code (e.g., miscellaneous business services) do not report to TRI. Box 2 lists the TRI industries by Standard Industrial Classification (SIC) code.

Industrial facilities may conduct interrelated operations that result in products or services classified in more than one SIC code. Box 3 explains the classification of facilities reporting multiple codes as well as the "no-codes" group.

Box 2. Standard Industrial Classification (SIC) Codes for TRI Industries

10 Metal Mining
Mining of metals ores, including copper, lead, zinc, gold, silver and nickel ores, but not including uranium, radium and vanadium ores or services related to metal mining.

12 Coal Mining
Mining of coal, including bituminous coal and lignite surface mining, bituminous coal underground mining, and anthracite mining, but not including services related to coal mining.

20 Food and kindred products
Manufacture or processing of foods and beverages for human consumption, and related products, such as manufactured ice, chewing gum, vegetable and animal fats and oils, and prepared feeds for animals and fowls.

21 Tobacco products
Manufacture of cigarettes, cigars, smoking and chewing tobacco, snuff, and reconstituted tobacco. Stemming and redrying of tobacco. Manufacture of non-tobacco cigarettes.

22 Textile mill products
Preparation of fiber and subsequent manufacture of yarn, thread, braids, twine, and cordage. Manufacture of broadwoven fabrics, narrow woven fabrics, knit fabrics, and carpets and rugs from yarn. Dyeing and finishing of fiber, yarn, fabrics, and knit apparel. Coating, waterproofing, or otherwise treating fabrics. Integrated manufacture of knit apparel and other finished articles from yarn. Manufacture of felt goods, lace goods, nonwoven fabrics, and miscellaneous textiles.

23 Apparel and other finished products made from fabrics and similar materials
Production of clothing. Fabrication of products by cutting and sewing purchased woven or knit textile fabrics and related materials, such as leather, rubberized fabrics, plastics, and furs. Manufacture of clothing by cutting and joining (e.g., by adhesives) material such as paper and nonwoven textiles.

24 Lumber and wood products, except furniture
Cutting timber and pulpwood. Also, merchant sawmills, lath mills, shingle mills, cooperage stock mills, planing mills, and plywood mills and veneer mills engaged in producing lumber and wood basic materials. Manufacture of finished articles made entirely or mainly of wood or related materials.

25 Furniture and fixtures

Manufacture of household, office, public building, and restaurant furniture, and office and store fixtures.

26 Paper and allied products

Manufacture of pulps from wood and other cellulose fibers and from rags. Manufacture of paper and paperboard. Manufacture of paper and paperboard into converted products, such as paper coated off the paper machine, paper bags, paper boxes, and envelopes. Manufacture of bags from plastic film and sheet.

27 Printing, publishing, and allied industries

Printing by one or more common processes, such as letterpress, lithography (including offset), gravure, or screen. Bookbinding, platemaking, and other services performed for the printing trade. Publishing newspapers, books, and periodicals (whether or not the establishment also prints them).

28 Chemicals and allied products

Production of basic chemicals. Manufacture of products by predominantly chemical processes. There are three general classes of products: 1) basic chemicals, such as acids, alkalis, salts, and organic chemicals; 2) chemical products to be used in further manufacture, such as synthetic fibers, plastics materials, dry colors, and pigments; 3) finished chemical products to be used for ultimate consumption, such as drugs, cosmetics, and soaps, or to be used as materials or supplies in other industries, such as paints, fertilizers, and explosives.

29 Petroleum refining and related industries

Production of gasoline, kerosene, distillate fuel oils, residual fuel oils, and lubricants, through fractionation or straight distillation of crude oil, redistillation of unfinished petroleum derivatives, cracking, or other processes. (Establishments also produce aliphatic and aromatic chemicals as byproducts.)

30 Rubber and miscellaneous plastics products

Manufacture of products, not elsewhere classified, from plastics resins and from natural, synthetic, or reclaimed rubber, gutta percha, balata, or gutta siak. Includes manufacture of tires.

31 Leather and leather products

Tanning, currying, and finishing hides and skins. Converting leather. Manufacture of finished leather and artificial leather products and some similar products made of other materials.

32 Stone, clay, glass, and concrete products

Manufacture of flat glass and other glass products, cement, structural clay products, pottery, concrete and gypsum products, cut stone, abrasive and asbestos products, and other products from materials taken principally from the earth in the form of stone, clay, and sand. (May include mining and quarrying activities operated by manufacturing establishments in this group.)

33 Primary metal industries

Smelting and refining ferrous and nonferrous metals from ore, pig, or scrap. Rolling, drawing, and alloying metals. Manufacture of castings and other basic metal products. Manufacture of nails, spikes, and insulated wire and cable. Includes production of coke.

34 Fabricated metal products, except machinery and transportation equipment

Fabrication of ferrous and nonferrous metal products, such as metal cans, tinware, handtools, cutlery, general hardware, non-electric heating apparatus, fabricated structural metal products, metal forgings, metal stampings, ordnance (except vehicles and guided missiles), and a variety of metal and wire products, not elsewhere classified.

35 Industrial and commercial machinery and computer equipment

Manufacture of industrial and commercial machinery and equipment and computers. Manufacture of engines and turbines; farm and garden machinery; construction, mining, and oil field machinery; elevators and conveying equipment; hoists, cranes, monorails, and industrial trucks and tractors; metalworking machinery; special industry machinery; general industrial machinery; computer and peripheral equipment and office machinery; and refrigeration and service industry machinery.

36 Electronic and other electrical equipment and components, except computer equipment

Manufacture of machinery, apparatus, and supplies for the generation, storage, transmission, transformation, and utilization of electrical energy. Manufacture of electricity distribution equipment, electrical industrial apparatus, household appliances, electrical lighting and wiring equipment, radio and television receiving equipment, communications equipment, electronic components and accessories, and other electrical equipment and supplies.

37 Transportation equipment

Manufacture of equipment for transportation of passengers and cargo by land, air, and water. Includes motor vehicles, aircraft, guided missiles and space vehicles, ships, boats, railroad equipment, and miscellaneous transportation equipment, such as motorcycles, bicycles, and snowmobiles.

38 Measuring, analyzing, and controlling instruments, photographic, medical, and optical goods; watches and clocks

Manufacture of instruments (including professional and scientific) for measuring, testing, analyzing, and controlling, and their associated sensors and accessories; optical instruments and lenses; surveying and drafting instruments; hydrological, hydrographic, meteorological, and geophysical equipment; search, detection, navigation, and guidance systems and equipment; surgical, medical, and dental instruments, equipment, and supplies; ophthalmic goods; photographic equipment and supplies; and watches and clocks.

39 Miscellaneous manufacturing industries

Manufacture of products not classified in any other major manufacturing group. Includes jewelry, silverware, and plated ware; musical instruments; dolls, toys, games, and sporting and athletic goods; pens, pencils, and artists' materials; buttons, costume novelties, and miscellaneous notions; brooms and brushes; caskets; and other miscellaneous products.

4911/4931/4939 Electric, Gas, and Sanitary Services

Electric services, limited to facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce.

5169 Chemical Wholesale Distributors

Wholesale trade of nondurable goods of chemical and allied products.

5171 Petroleum Terminals/Bulk Storage

Wholesale trade of nondurable goods undertaken at petroleum terminals and bulk storage facilities.

4953 Refuse Systems (Hazardous Waste Treatment and Disposal Facilities)

Facilities managing hazardous waste, limited to facilities regulated under RCRA subtitle C, 42 U.S.C. section 6921 *et seq*.

7389 Business Services (Solvent Recovery Facilities)
Facilities engaged in solvent recovery, limited to facilities primarily engaged in solvents recovery services on a contract or fee basis.

Source: Executive Office of the President, Office of Management and Budget, *Standard Industrial Classification Manual*, 1987.

Box 3. Multiple SIC Codes and No SIC Codes in TRI

Multiple Codes 20–39. TRI facilities may report up to six four-digit Standard Industrial Classification (SIC) codes that describe their operations. If all the processes or operations that are associated with a facility's disposal or other releases or other waste management of a TRI chemical can be described by one SIC code, then only one SIC code is reported on the form. If several economic activities, designated by different SIC codes, describe the specific operations at a facility that are associated with disposal or other releases or other waste management of a TRI chemical, then the facility will report those SIC codes (up to six) on the form it submits for that chemical.

Industrial facilities often conduct interrelated operations. They may, for example, manufacture distinct products using common or related feedstocks. Such products may be classified in similar but separate categories in the SIC system. Thus, many forms submitted to TRI contain more than one industrial classification. When TRI data are analyzed by type of industry—that is, by SIC code—forms that report more than one SIC code must be categorized separately because they do not fall into the individual industry groups. They are included in a separate "multiple-codes" category to avoid including them more than once, in more than one industry category.

The "multiple-codes" category represents forms that report in more than one two-digit SIC code within the manufacturing sector (SIC codes 20–39). For example, a facility may refine petroleum (SIC code 29) and then use that feedstock in the manufacture of chemicals (SIC code 28); it will report on its TRI forms SIC codes in both these industries—for example, at the four digit level, SIC codes 2911, petroleum refining, and 2869, industrial organic chemicals. In this event, its forms are included in the "multiple-codes" category.

In addition, on forms with more than one SIC code, any SIC code that is not within manufacturing (that is, not within the SIC code range 20 to 39) is ignored when assigning a form to an industry category. For example, a form with SIC codes 2642 (manufacture of envelopes) and 5112 (wholesale trade—stationery and office supplies) would be included in SIC code 26 and not the "multiple-codes" category.

Forms that have a SIC code within the manufacturing sector as well as a SIC code within the additional industry sectors required to report to TRI beginning with the 1998 reporting year are included in the manufacturing sector SIC code if the facility reported to TRI before 1998. If the facility reported for the first time for 1998 with both manufacturing and other industry codes, it is included in the analyses under the other industry code.

No Codes. Forms that report no SIC code required to report to TRI are included in these tables under the "No codes" category. Such forms may include, for example, submissions by federal facilities, all of which are required to report regardless of the SIC code covering their operations. This group also includes forms with no valid SIC code.

What Must Be Reported?

Each year, facilities report to TRI the amounts of toxic chemicals disposed of or otherwise released on-site to air, water, and land and injected underground (Section 5 of TRI Reporting Form R), and the amounts of chemicals transferred off-site for recycling, energy recovery, treatment, and disposal or release (Section 6 of Form R). They also report production-related waste management information on quantities recycled, combusted for energy recovery, treated, or disposed of or otherwise released, both on- and off-site, and catastrophic or other one-time releases (Section 8 of Form R). To some extent, data in Sections 5 and 6 of Form R and those in Section 8 represent a different view of essentially the same information. While Section 5 and 6 include total amounts disposed of or otherwise released or transferred, the corresponding parts of Section 8 do not include in those amounts the catastrophic or other one-time releases. In addition, Section 8 includes on-site recycling, energy recovery and treatment which are not reported in Sections 5 and 6.

Box 4 summarizes the basic information that facilities must report to TRI.

Box 4. What Must Be Reported?

Information reported by facilities includes:

- Basic information identifying the facility (including name, location, type of business, and name of parent company),
- Name and telephone number of a contact person,
- Environmental permits held,
- Amounts of each listed chemical disposed of or released to the environment at the facility,
- Amounts of each chemical sent from the facility to other locations for recycling, energy recovery, treatment, or disposal or other release,
- Amounts of each chemical recycled, burned for energy recovery, or treated at the facility,
- Maximum amount of chemical present on-site at the facility during year,
- Types of activities conducted at the facility involving the toxic chemical, and
- Source reduction activities.

Facilities also provide general information about the manufacture, process, and otherwise use of the listed chemical at the facility. Facilities provide information about methods used to treat waste streams containing the toxic chemicals at the site and the efficiencies of those treatment methods. In addition to information about the amount of toxic chemicals sent off-site for further waste management, facilities also must specify the destination of these transfers.

Beginning with the 1991 reports, facilities were required to provide information about source reduction and other pollution prevention activities, along with the quantities managed in waste by activities such as recycling. Companies must provide a production index that can help relate changes in reported quantities of toxic chemicals in waste managed to changes in production. These additional data elements facilitate tracking of industry progress in reducing waste generation and moving towards preferred management alternatives. While current TRI data cannot provide an absolute measure of pollution prevention, the data can provide new insight into the complete toxics cycle.

What Are the Benefits and Limitations of the Data?

Benefits

The TRI Program has given the public unprecedented direct access to toxic chemical disposal or other release and other waste management data at the local, state, regional, and national level. Use of this information can enable the public to identify potential concerns, gain a better understanding of potential risks, and work with industry and government to reduce toxic chemical use, disposal or other releases and the risks associated with them. When combined with hazard and exposure data, this information can allow informed environmental priority-setting at the local level.

Federal, state, and local governments can use the data to compare facilities or geographic areas, to identify hot spots, to evaluate existing environmental programs, to more effectively set regulatory priorities, and to track pollution control and waste reduction progress. TRI data, in conjunction with demographic data, can help government agencies and the public identify potential environmental justice concerns.

Industry can use the data to obtain an overview of the disposal or other releases and other waste management of toxic chemicals, to identify and reduce costs associated with toxic chemicals in waste, to identify promising areas of pollution prevention, to establish reduction targets, and to measure and document progress toward reduction goals. Public availability of the data has prompted many facilities to work with communities to develop effective strategies for reducing environmental and potential human health risks posed by disposal or other releases and other waste management of toxic chemicals.

What to Consider When Using TRI Data

Users of TRI information should be aware that TRI data do not reveal whether or to what degree the public is exposed to listed chemicals. TRI data, in conjunction with other information, can be used as a

starting point in evaluating exposures and risks. The determination of potential risk to human health and/or the environment depends upon many factors, including the toxicity of the chemical, the fate of the chemical in the environment, and the amount and duration of human or other exposure to the chemical. Box 5 highlights some of the factors that should be considered when reviewing TRI data.

Box 5. Factors to Consider in Using TRI Data

Toxicity of the Chemical: TRI chemicals vary widely in toxicity. High volume releases of less toxic chemicals may appear to be a more serious problem than lower volume releases of highly toxic chemicals, when just the opposite may be true.

Exposure Considerations: The potential for exposure may be greater the longer the chemical remains unchanged in the environment. Sunlight, heat, or microorganisms may or may not decompose the chemical. For example, microorganisms readily degrade some chemicals, such as methanol, into less toxic chemicals, whereas metals are persistent and will not degrade in the environment.

Bioconcentration of the Chemical in the Food Chain: As a chemical becomes incorporated in the food chain, it may concentrate or disperse.

- Some chemicals, such as mercury, accumulate and magnify in concentration in organisms as they move up the food chain.
- Small amounts of a chemical that bioaccumulate may result in significant exposures to consumers.

Type of Disposal or Release (Environmental Medium): The extent to which chemical exposure of a population occurs depends on the environmental medium (air, water, land) to which a chemical is either disposed of or otherwise released. The medium also affects the types of exposures possible, such as inhalation, dermal exposure, or ingestion. For example, disposal in underground injection wells are regulated by EPA 's Underground Injection Control Program to provide safeguards so that injection wells do not endanger current and future underground sources of drinking water. When wells are properly sited, constructed, and operated, underground injection is an effective and environmentally safe method to dispose of wastes.

Type of Off-Site Facility Receiving the Chemical and the Efficiency of its Waste Management Practices: The amount of a toxic chemical that ultimately enters the environment depends on how the chemical was handled during treatment, energy recovery, or recycling activities. Several factors to keep in mind when considering amounts sent off-site are presented below:

- The efficiency of recycling operations varies depending on the method of recycling and the chemical being recycled.
- Use of a combustible toxic chemical for energy recovery typically results in the destruction of 95% to 99% or more of the toxic chemical. The remaining quantity may be either released to air or disposed of in ash to land.

On-site Waste Management of the Toxic Chemical: As with off-site waste management, the amount of the toxic chemical disposed of or otherwise released to the environment depends on how the chemical was handled during treatment, energy recovery, or recycling activities. However, since the waste management is on-site, any amount of the chemical that enters the environment after waste management is reported to TRI as part of that facility's disposal or other releases.

Assembling this additional information can be challenging, but EPA has developed a tool known as the Risk-Screening Environmental Indicators (RSEI) that systematically addresses many of the factors related to the chronic human health risk associated with TRI activities. Since TRI data reflect total releases over an entire year, RSEI modeling is based on long-term (chromic) exposures to TRI chemicals, not acute exposures of shorter duration. RSEI incorporates detailed facility data from TRI along with toxicity information from EPA's Integrated Risk Information System, population data from the US Census, and other EPA models and databases. Although RSEI does not provide a full risk assessment, it provides additional hazard and risk-related perspectives that may be helpful to users of TRI information. More information on RSEI is available at http://www.epa.gov/oppt/rsei.

Limitations

While TRI provides the public, industry, and state and local governments an invaluable source of key environmental data, it has some limitations that must be considered when using the data. The preceding section, **What to Consider When Using TRI Data**, describes specific information to keep in mind when analyzing TRI data.

TRI data reflect chemical management practices, not exposures of the public to those chemicals. The data are generally not sufficient by themselves to determine exposure or to calculate potential adverse effects on human health and the environment. TRI data can be used to identify areas of potential concern. TRI data, in conjunction with other information, can be used as a starting point in evaluating exposures. The determination of potential risk depends upon many factors, including the toxicity of the chemical, the fate of the chemical in the environment, the locality, and the human and other populations that are exposed to the chemical after its disposal or release. Tools like the Risk-Screening Environmental Indicators (RSEI) (described in the previous section) can be used to address these factors for chronic human health concerns.

Even with expanded industry coverage since the 1998 reporting year, TRI does not address all sources of disposal or other releases and other waste management activities of TRI chemicals. Although the Agency has expanded the number of industries that must report and has added PBT chemicals to the section 313 list of toxic chemicals, the program does not cover all sources of TRI chemicals or any sources of non-TRI chemicals. Although TRI is successful in capturing information on a significant portion of toxic chemicals currently being used by covered industry sectors, it does not cover all toxic chemicals or all industry sectors. In addition, even within covered SIC codes, facilities that manage listed TRI chemicals but do not meet the TRI threshold levels (those with fewer than 10 full-time employees or those not meeting TRI quantity thresholds) are not required to report even though they may release toxic chemicals into the environment. The new PBT chemicals reporting thresholds expand the information TRI collects, but only for a subset of the TRI chemicals. Thus, while the TRI includes 93,380 reports from 24,379 facilities for 2002, the 4.79 billion pounds of on-and off-site disposal or other releases reported represent only a portion of all toxic chemical disposal or other releases nationwide.

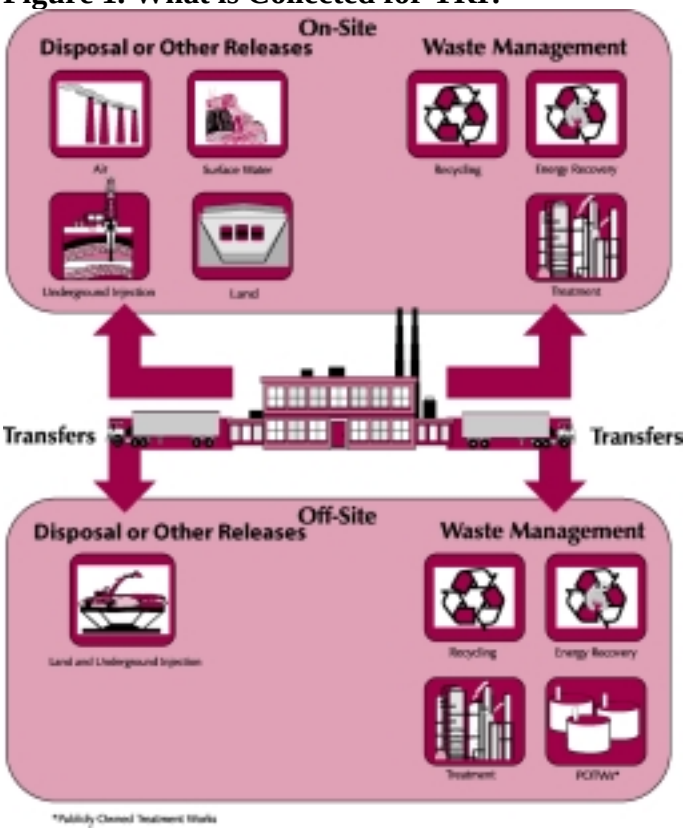
The TRI does not include data on toxic emissions from cars and trucks, nor from the majority of sources of releases of pesticides, volatile organic compounds, fertilizers or from many other non- industrial sources.

Also, while many facilities base their TRI data on monitoring data, others report estimated data to TRI, as the program does not mandate monitoring. Various estimation techniques can be used when monitoring data are not available, and EPA has published estimation guidance for the regulated community. Variations between facilities can result from the use of different estimation methodologies. These factors should be taken into account when considering data accuracy and comparability.

As discussed above, the TRI data summarized in this report reflect chemical disposal or other releases and other waste management activities that occur in a given calendar year. Patterns of disposal or other releases and other waste management activities can change dramatically from one year to the next. Thus, it is important to recognize that current facility activities may be different from those reported for 2001 or prior years.

Figure 1 illustrates these on-site and off-site disposal or other releases, on-site waste management activities, and transfers off- site for further waste management, reportable to TRI.

Figure 1. What is Collected for TRI?



TRI On- and Off-site Disposal or Other Releases

The following section describes the categories of on- and off-site disposal or other releases that are reportable to TRI. Box 6 describes reportable disposal or other releases that may occur on-site at the facility and identifies types of activities that may contribute to the disposal or other releases to various media.

Box 7 describes disposal or other releases that may result from a facility's transferring chemicals off-site. As noted in Box 7, off-site disposal or other releases include additional details about off-site transfers of metals and metal compounds. How metal and metal category compounds are reported to TRI are explained in Box 8.

For analyses that present all on- and off-site disposal or other releases categories together consideration must be given to off-site transfers reported by one facility that are reported as on-site disposal or releases by another facility. To avoid counting the amounts twice, the off-site transfers are omitted in these analyses. The methodology used to avoid duplication of off-site transfers to disposal or other releases is found in Box 9.

Box 6. An Explanation of On-site Disposal or Other Releases

On-site disposal or other releases include emissions to the air, discharges to bodies of water, disposal at the facility to land, and disposal in underground injection wells. Disposal or other releases are reported to TRI by media type. On-site disposal or other releases are reported in Section 5 of Form R.

On-site Disposal in Underground Injection Class I wells (Section 5.4.1) Disposal in Class I wells includes the emplacement of hazardous and nonhazardous fluids (industrial and municipal wastes) into isolated formations beneath the lowermost underground source of drinking water (USDW). Because they may inject hazardous waste, Class I wells are the most strictly regulated under the Safe Drinking Water Act (SDWA) and are further regulated under the Resource Conservation and Recovery Act (RCRA).

RCRA Subtitle C Landfills (Section 5.5.1A). Disposal in RCRA Subtitle C landfills in which wastes are buried. These are landfills that are subject to stringent requirements for liners, leak detection systems, and groundwater monitoring.

Other Landfills (Section 5.5.1B). Disposal of toxic chemicals in landfills other than RCRA Subtitle C landfills. Beginning with the 1996 reporting year, facilities report amounts disposed of in RCRA subtitle C landfills separately from amounts disposed of in other on-site landfills. This change was made to recognize the difference in management and regulatory oversight provided for RCRA subtitle C landfills.

Fugitive Air Emissions (Section 5.1). All releases to air that are not released through a confined air stream. Fugitive air emissions include equipment leaks, evaporative losses from surface impoundments and spills, and releases from building ventilation systems.
Point Source Air Emissions (Section 5.2). Air emissions, also referred to as stack emissions, that occur through confined air streams, such as stacks, vents, ducts, or pipes.
Surface Water Discharges (Section 5.3). Discharges to streams, rivers, lakes, oceans, and other bodies of water. This includes releases from contained sources, such as industrial process outflow pipes or open trenches. Releases due to runoff, including storm water runoff, are also reportable to TRI.
Disposal in Underground Injection Class II-V Wells (Section 5.4.2). The subsurface emplacement of fluids through wells. TRI chemicals associated with manufacturing, the petroleum industry, mining, commercial and service industries, and federal and municipal government-related activities may be injected into Class I, II, III, IV, or V wells, if they do not endanger underground sources of drinking water (USDW), public health, or the environment. Disposal in Class I wells (see above) are reported separately from disposal in Class II-V wells.

- Class II wells are used for injection of brines and other fluids associated with oil and gas production.
- Class III wells are used for injection of fluids associated with solution mining of minerals.
- Class IV wells are used for injection of hazardous or radioactive wastes into or above a USDW and is banned unless authorized under ground water remediation laws.
- Class V wells inject nonhazardous fluids into or above a USDW and are typically shallow, on-site disposal systems, such as floor and sink drains which discharge directly or indirectly to ground water, dry wells, leach fields, and similar types of drainage wells.

Beginning with the 1996 reporting year, facilities report amounts injected into Class I wells separately from amounts injected into all other wells. This change was made to reflect the difference in management standards and regulatory oversight provided by the Underground Injection Control Program for Class I wells as distinguished from other forms of injection reportable to TRI.
Land Treatment/Application Farming (Section 5.5.2). Management techniques in which a waste containing a listed chemical is applied to or incorporated into soil.
Surface Impoundments (Section 5.5.3). Holding areas used to volatilize and/or settle waste materials.
Other Disposal (Section 5.5.4). Other disposal methods including waste piles, spills, or leaks.

Box 7. An Explanation of Off-site Disposal or Other Releases

An off-site disposal or other release is a discharge of a toxic chemical to the environment that occurs as a result of a facility's transferring a waste containing a TRI chemical off-site for disposal or other release, as reported in Section 6 of Form R. Certain other types of transfers are also categorized as off-site disposal or other release because, except for location, the outcome of transferring the chemical off-site is the same as disposing of it or releasing it on-site. For each transfer, the amount of the chemical in the waste, type of management activity (chosen from a list of codes referred to as "M" codes) undertaken by the receiving facility, and the address of the receiving site is reported.

Off-site Disposal to Underground Injection Wells (Section 6.2, M71). Toxic chemicals in waste may be transferred off-site to sites that inject the wastes underground. (See discussion of on-site underground injection for a description of these disposal types in Box 6.) The 2002 reporting year Form R does not collect data that distinguishes off-site transfers to Class I vs. Class II-V Underground Injection Wells. The Form R has been modified starting with reporting year 2003 to collect this information to distinguish between Class I and Class II-V Underground Injection Wells.

Off-site Disposal to RCRA Subtitle C Landfills (Section 6.2, M65). Toxic chemicals in waste may be transferred off-site for disposal in RCRA Subtitle C landfills. (See discussion of on-site disposal to RCRA Subtitle C landfills for a description of these disposal types.) Beginning with the 2002 reporting year, facilities report amounts transferred off-site for disposal in RCRA Subtitle C landfills separately from those sent to other landfills. This change was made to recognize the difference in management and regulatory oversight provided for RCRA Subtitle C landfills as distinguished from other landfills. The Section 6.2 code for off-site disposal in landfills prior to the 2002 reporting year was M72.

Off-site Disposal in Other Landfills (Section 6.2, M64). Toxic chemicals in waste may be transferred off-site for disposal in landfills other than RCRA Subtitle C landfills. (See Box 6 for a discussion of on-site disposal to other landfills for a description of these disposal types.) Prior to the 2002 reporting year, off-site transfers to landfills/disposal surface impoundments were all reported in Section 6.2 under code M72. Any transfers reported erroneously under M72 for 2002 are included in this category.

Storage Only (Section 6.2, M10). On occasion, a toxic chemical is sent off-site for storage if there is no known disposal method. One example is toxic chemicals in mixed hazardous and radioactive waste. EPA considers this an off-site disposal or release because this method is being used as a form of disposal and the toxic chemical will remain there indefinitely.

Solidification/Stabilization (metals only) (Section 6.2, M41 or M40 (metals and metal category compounds only). Waste solidification/stabilization is a physical or chemical process used to either reduce the mobility of the chemical or to eliminate free liquids in a hazardous waste. A waste stabilization process includes mixing the hazardous waste with binders or other materials, and curing the resulting hazardous waste and binder mixture.

Wastewater Treatment (metals only) (Section 6.2, M62 or M61 (metals and metal category compounds only). Transfers to wastewater treatment facilities (excluding to facilities that are publicly-owned treatment works (POTWs)) of metals and metal category compounds only.

Transfers to POTWs (metals only) (Section 6.1, metals and metal category compounds only). Transfers to publicly-owned treatment works (POTWs) of metals and metal category compounds only. Because metals are not destroyed by sewage treatment processes, amounts of metals and metal category compounds reported in Section 6.1 are considered transfers to disposal or other releases.

Surface Impoundments (Section 6.2, M63). Surface impoundments are holding areas used to volatilize and/or settle waste materials.

Land Treatment (Section 6.2, M73). Management techniques in which a waste containing a listed chemical is applied to or incorporated into soil.

Other Land Disposal (Section 6.2, M79). Other land disposal methods include waste piles, spills, or leaks.

Other Off-site Management (Section 6.2 (M90). Chemicals in waste sent to sites where the waste is managed by techniques not specifically listed in Section 6.2.

Transfers to Waste Broker (Section 6.2, M94). Chemicals in waste sent to a broker where the broker sends the waste for disposal, but the facility sending the waste does not know the location of the disposal site and, therefore, reported the name of the waste broker instead. The Section 6.2 code for transfers to waste broker prior to the 1991 reporting year was M91.
Unknown (Section 6.2, M99). The "unknown" category of disposal indicates that a facility is not aware of the type of waste management used for the toxic chemical that is sent off-site. Therefore, EPA has categorized this method as the least desirable type of waste management (environmentally least desirable) and has included it as a type of disposal or other release for reporting purposes.

How Metals and Metal Category Compounds Should be Reported to TRI

Transfers of metals and metal category compounds to solidification/stabilization, to wastewater treatment (excluding POTWs), and to publicly owned treatment works (POTWs, or municipal sewage treatment) also result in disposal or other releases and are classified as off-site disposal or other releases. How such transfers should be reported to TRI is described in Box 8.

Box 8. How Metals and Metal Category Compounds Should be Reported to TRI

In Section 6.2 of the Form R, facilities report the amounts sent to each off-site location to which the facility transfers wastes containing the reported toxic chemical for the purposes of recycling, energy recovery, treatment, or disposal or other release. Metals and metal category compounds are managed in waste either by being disposed of or otherwise released or by being recycled. The metal has no heat value and thus cannot be combusted for energy recovery and cannot be treated because it cannot be destroyed regardless of whether the stream containing the metal is sent for energy recovery or treatment. Thus, transfers of metals and metal category compounds for further waste management should be reported as either a transfer for recycling or a transfer for disposal or other release. The applicable waste management codes for transfers of metals and metal category compounds for recycling are M24, M26 or M93. Applicable codes for transfers for disposal or other releases include M10, M41, M62, M63, M64, M65, M71, M73, M79, M90, M94, and M99.

Two codes, M41 and M62, were new for the 1997 reporting year. These codes are for transfers to waste management in which the wastestream may be treated but the metal contained in the wastestream is not treated and is ultimately disposed of or otherwise released. For example, M41 would be used for a metal or metal category compound which is stabilized in preparation for disposal. Prior to the 1997 reporting year, some facilities reported transfers of metals and metal category compounds for further waste management using two waste treatment codes, M40 and M61. Beginning in reporting year 1997, metals and metal category compounds must be reported under Section 6.2 using one of the disposal or other release codes or the applicable recycling code (M24 for metals recovery, M26 for other reuse or recovery or M93 for transfers to waste broker - recycling).

The code M72 was used for transfers to landfill/disposal surface impoundment prior to reporting year 2002. Three new codes, M63 (surface impoundments), M64 (other landfills) and M65 (RCRA Subtitle C landfills) have replaced M72 starting with reporting year 2002. Any amounts erroneously reported under M72 for 2002 are included as other landfills (equivalent to the M64 code for 2002).

In Section 8.1 of the Form R, facilities report quantities of listed chemicals disposed of or otherwise released on- and off-site (excluding one-time catastrophic or remedial releases). Except for those quantities recycled, metals and metal category compounds should be reported in Section 8.1 of the Form R. This includes those quantities of metals and metal category compounds reported in:

- Section 5 as on-site disposal or other releases,
- Section 6.2 as sent off-site for stabilization/solidification (M41) or wastewater treatment (excluding POTWs) (M62) and/or,
- Section 6.1 as discharges to POTWs.

These quantities should not be reported in Section 8.7 of the Form R.

Duplication of Off-site Transfers to Disposal or Other Releases

TRI facilities transfer chemicals in waste off-site to other facilities for disposal or other releases. These recipient facilities can place the wastes in on-site landfills, disposal surface impoundments, in land treatment facilities, or use other types of land disposal methods. They may also dispose of wastes in underground injection wells or, if metals and metal category compounds are sent to a wastewater treatment facility, they may be discharged to surface waters. The recipient facilities generally are treatment, storage and disposal (TSD) facilities regulated under the federal Resources Conservation and Recovery Act (RCRA). Such facilities are one of the added industries that must, beginning with the 1998 reporting year, report their disposal and other releases, transfers, and other waste management to TRI. Thus, the facility that sends these transfers would report to TRI the amounts as transfers to disposal or other releases and the TSD facility that receives the material would report the amounts as on-site disposal or other releases to underground injection, land, or surface waters. Box 9 describes EPA's methodology for avoiding duplication of amounts reported in off-site transfers that are also reported as on-site disposal or other releases by facilities that received such transfers.

Box 9. Duplication of Off-site Transfers to Disposal or Other Releases

To avoid double counting the transfers off-site to the TSD facilities that are also reported to TRI as on-site disposal or other releases by the TSD facilities, the off-site transfer quantities must be omitted from tables that compare or summarize on-site and off-site disposal or other releases for all industries. Only the on-site disposal or other releases from the TSD facilities are included in analyses. The RCRA ID number that facilities report was used to identify such transfers and match them to on-site disposal or other releases reported by TSD facilities. A TRI facility must report its own RCRA ID number as well as the RCRA ID number of the TSD facility receiving the transfer.

Each amount of off-site transfer to TSDs should have the RCRA ID number of the receiving facility.

If this RCRA ID number matches the RCRA ID number of a TRI facility and the TRI facility receiving the waste reported on-site disposal or other releases of the same chemical (or the metal and its compounds in the case of metals) that were greater than or equal to the sum of the off-site transfers reported as transferred, then the amount of chemicals transferred from other TRI facilities are omitted from the analysis. If the TRI facility receiving the waste reported an amount of on-site disposal or other releases of the chemical less than the total amount reported as transferred to the facility, then the amount omitted from the analysis is reduced proportionally. For example, if Facility A reported 20,000 pounds transferred to Facility C and Facility B reported 80,000 pounds transferred to Facility C, but Facility C only reported 90,000 pounds disposed of or otherwise released on-site (which is 90 percent of the total amount of 100,000 pounds reported as transferred), then the amount of transfers omitted from the analysis for Facility A is 18,000 pounds (or 90 percent of 20,000 pounds) and for Facility B is 72,000 pounds (or 90 percent of 80,000 pounds).

In analyses that present off-site transfers but not on-site disposal or other releases, these amounts are not omitted in order to present complete data on off-site transfers for analysis. Also, analyses that present data on waste managed do not omit any reported data in order to present complete data on how waste is being managed. In addition, analyses that do not include all TRI facilities (for example, data for one state or one industry sector) do not omit any reported data because the transfers may be sent to facilities not included in the analysis.

The following shows which types of off-site transfers to disposal or other releases are matched with which types of on-site disposal or other releases to determine if the transfers should be omitted.

Off-site Transfer M Code (Section 6.2)	**Section 5 Checked for Recipient TRI Facilities Based on Matching Chemical or, if Metal, Metal plus Metal Category Compounds**
M10	5.5.4
M41*	5.5.1 A and B
M62*	5.5.1 A and B, 5.5.3 and 5.3
M63	5.5.3
M64	5.5.1B
M65	5.5.1A
M71	5.4
M72	5.5.1 A and B, 5.5.3 (reporting years 1998-2001)
M73	5.5.2
M79	5.5.4
M90	All Section 5
M99	All Section 5

*Includes metals and metal category compounds reported under codes M40 and M61.

M94 (transfer to waste broker) is not included since a waste broker does not dispose of or release the chemical.

TRI Transfers Off-site for Further Waste Management, including Transfers for Disposal or Other Release

Off-site transfers of TRI chemicals in waste include, in addition to transfers to disposal or other releases described above, transfers to treatment, publicly-owned treatment works (POTWs), recycling, and energy recovery. These transfers are reported in Section 6.1 and 6.2 of Form R. Analyses that focus specifically on types of off-site transfers include transfers to disposal or other releases as well as the other types of transfers. Box 10 describes the various categories of transfers off-site for further waste management including for disposal or other releases.

Box 10. An Explanation of Transfers Off-site for Further Waste Management, including Transfers for Disposal or Other Release

An off-site transfer, reported in Section 6 of Form R, is the transfer of toxic chemicals in waste to a facility that is geographically or physically separate from the facility reporting under TRI. Chemicals reported to TRI as transferred are sent to off-site facilities for purposes categorized as recycling, energy recovery, treatment, or disposal or other release. The amounts reported represent a movement of the chemical away from the reporting facility. Except for off-site transfers to disposal or other release, these amounts do not necessarily represent entry of the chemical into the environment.

Transfers Off-site to Recycling (Section 6.2, M20, M24, M26, M28, M93). Toxic chemicals in waste that are sent off-site for the purposes of recycling are generally recovered by a variety of recycling methods, including solvent recovery and metals recovery. The choice of the recycling method depends on the toxic chemical being sent for recycling. Once they have been recycled, these chemicals may be returned to the originating facility for further processing or made available for use in commerce.

Transfers Off-site to Energy Recovery (Section 6.2, M56, M92). Toxic chemicals in waste sent off-site for purposes of energy recovery are combusted off-site in industrial furnaces (including kilns) or boilers that generate heat or energy for use at that location. Treatment of a chemical by incineration is not considered to be energy recovery.

Transfers Off-site to Treatment. (Section 6.2, M40 (except metals and metal category compounds), M50, M54, M61 (except metals and metal category compounds), M69, M95) Toxic chemicals in waste that are transferred off-site may be treated through a variety of methods, including biological treatment, neutralization, incineration, and physical separation. These methods typically result in varying degrees of destruction of the toxic chemical.

Transfers to Publicly Owned Treatment Works (POTWs) (Section 6.1). A POTW is a wastewater treatment facility that is owned by a state or municipality. Wastewaters from facilities reporting under TRI are transferred through pipes or sewers to a POTW. Treatment or removal of a chemical from the wastewater depends upon the nature of the chemical, as well as the treatment methods present at the POTW. In general, chemicals that are easily utilized as nutrients by microorganisms, or have a low solubility in water, are likely to be removed to some extent. Chemicals that are volatile and have a low solubility in water may evaporate into the atmosphere. Not all TRI chemicals can be treated or removed by a POTW. Some chemicals, such as metals, may be removed, but are not destroyed and may be

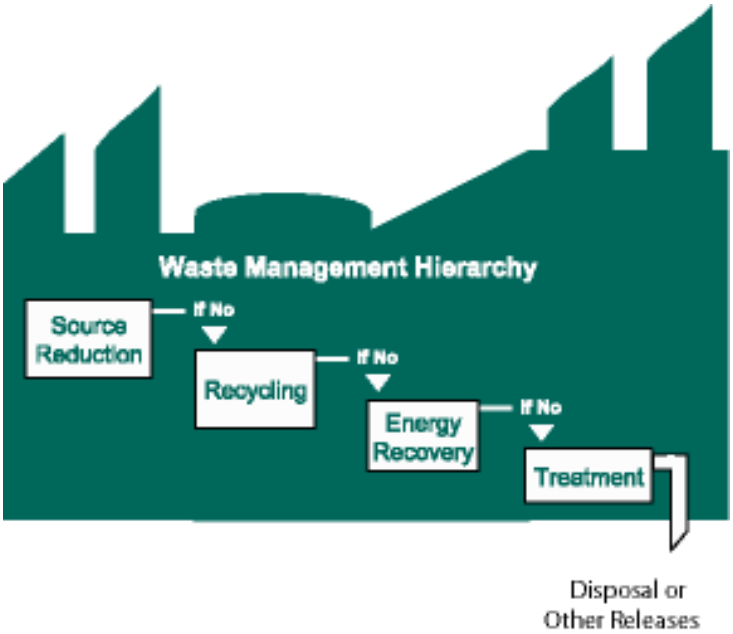
disposed of in landfills or discharged to receiving waters; transfers of metals and metal category compounds to POTWs are categorized as off-site disposal or other releases, as explained in Box 7.
Other Off-site Transfers (Section 6.2, invalid or no codes). In this report, toxic chemicals in waste that were reported as transferred off-site but for which the off-site activity (i.e., recycling, energy recovery, treatment, or disposal) was not specified or was not an accepted code have been classified as "other off-site transfers."
Other Transfers Off-site for Disposal or Other Releases. See Box 7, except does not include metals and metal category compounds sent to POTWs.

TRI Chemicals Managed in Waste

The Pollution Prevention Act of 1990 (PPA) requires facilities to report information about the quantities of TRI chemicals they manage in waste, both on-and off-site. The PPA established as national policy that source reduction is the preferred approach to managing waste. Source reduction is defined as an activity that prevents the generation of waste. The PPA also established as national policy a hierarchy of waste management options, illustrated in Figure 2, for situations where source reduction cannot be implemented feasibly.

Although source reduction is the preferred method of reducing risk, environmentally sound recycling shares many of its advantages. Like source reduction, recycling reduces the need for treatment or disposal of waste and helps conserve energy and natural resources. Where source reduction and recycling are not feasible, waste can be treated. Disposal or other releases of a chemical is viewed as a last resort, to be employed only if the preferred methods of waste management cannot be implemented. The PPA did not specifically address the combustion of waste for energy recovery as a waste management option. However, because energy recovery shares aspects of recycling and treatment, EPA chose to list this activity separately in the waste management hierarchy.

Figure 2. Waste Management Hierarchy



Box 11 describes the waste management information facilities must report to TRI. The amount of TRI chemicals in waste reported includes both waste generated by the facility and waste received by the facility for the purpose of waste management. Facilities report these data in Section 8 of the Form R as estimates for the reporting year (2002), the previous year (2001), and as projections for the two following years (2003 and 2004). The PPA requires this data projection to encourage facilities to consider their future waste generation, opportunities for source reduction, and potential improvement in waste management options as presented in the hierarchy. Future-year estimates are not commitments that facilities reporting to TRI must meet.

Box 11. An Explanation of On- and Off-site Waste Management Information

On-site and off-site waste management activities are reported in Section 8 of Form R. In this section, amounts due to one-time events such as accidental releases or remediation (clean-up) are reported separately and not included in the amounts reported as recycled, burned for energy recovery, treated or disposed of or otherwise released on- or off-site.

Recycled On-site (Section 8.4). This is the quantity of the toxic chemical recovered at the facility and made available for further use. To avoid double-counting, the amount reported represents the amount exiting the recycling unit. It is not the quantity that entered an on-site recycling or recovery operation. For example, 3,000 pounds of a listed chemical enters a recycling operation. Of this, 500 pounds of the chemical are in residues from the recycling operation that are subsequently sent off-site for disposal. The quantity reported as recycled on-site would be 2,500 pounds.

Recycled Off-site (Section 8.5). This is the quantity of the toxic chemical that left the facility boundary for recycling, not the amount recovered at the off-site location. This quantity includes the amount(s)reported in Section 6 of Form R as transferred off-site for recycling, less any amount(s)associated with non-routine events.

Used for Energy Recovery On-site (Section 8.2). This is the quantity of the toxic chemical that was combusted in some form of energy recovery device, such as a furnace (including kilns) or boiler. The toxic chemical should have a heating value high enough to sustain combustion. To avoid double-counting, the amount reported represents the amount destroyed in the combustion process, not the amount that entered the energy recovery unit. For example, 100,000 pounds of toluene entered a boiler that, on average, combusted 98% of the toluene. Any remaining toluene was discharged to air. A total of 98,000 pounds is reported as combusted for energy recovery (the remaining 2,000 pounds is reported as disposed of or otherwise released).

Used for Energy Recovery Off-site (Section 8.3). This is the quantity of the toxic chemical that left the facility boundary for energy recovery, not the amount combusted at the off-site location. The toxic chemical must have a significant heating value, and the off-site location must have some form of energy recovery unit in place. This quantity includes the amount(s) reported in Section 6 of Form R as transferred off-site for energy recovery, less any amount(s) associated with non-routine events.

Treated On-site (Section 8.6). This is the quantity of the toxic chemical destroyed in on-site waste treatment operations, not the amount that entered a treatment operation. For example, if 100,000 pounds of benzene were combusted in an incinerator that destroyed 99% of the benzene, the facility

would report 99,000 pounds as treated on-site (the remaining 1,000 pounds would be reported as disposed of or otherwise released).

Treated Off-site (Section 8.7). This is the quantity of the toxic chemical that left the facility boundary and was sent to POTWs or other off-site locations for treatment, not the amount that was destroyed at the off-site location(s). This quantity includes the amount(s) reported in Section 6 of Form R as transferred to POTWs or other off-site locations for treatment, less any amount(s) associated with non-routine events and not including quantities of metals and metal category compounds.

Quantity Disposed of or Otherwise Released On-and Off-site (Section 8.1). This is the total quantity of the toxic chemical that was released to the environment or disposed of at the facility (discharged to air, land, and water, and injected underground on-site) or sent off-site for disposal or other release. This quantity is the sum of the amounts reported in Sections 5 and 6 of Form R (on-site disposal or other releases plus off-site transfers to disposal or other releases and transfers to POTWs of metals and metal category compounds) less any amount(s) associated with non-routine events. The Form R has been modified to collect information starting with reporting year 2003 on disposal to Class I underground injection wells, RCRA Subtitle C landfills and other landfills separately from other disposal or other releases, both on-site and off-site.

Non-production-related Waste Managed - Released to the Environment Due to One-time Events (Section 8.8). This amount is referred to as non-production-related waste and is the quantity disposed of or otherwise released to the environment or sent off-site for recycling, energy recovery, treatment, or disposal or other release due to one-time events not associated with routine production practices. Such events include catastrophic events, such as accidental releases, as well as remedial actions (clean-up). This quantity is separated from the quantities recycled, used for energy recovery, treated, and disposed of or released, to distinguish between quantities that are routinely associated with production operations and are more amenable to source reduction and those that are not routinely associated with production processes and are not so amenable to source reduction because they are not readily anticipated (e.g., releases due to damage from a tornado). This separation is important in assessing progress in source reduction at facilities.

The individual waste management quantities reported in Sections 8.1 through 8.8 are mutually exclusive to avoid double-counting. For example, an incinerator may destroy 99% of the chemical in the waste; in this case, the amount reported as treated on-site would be the amount destroyed by the incinerator, not the amount that entered the incinerator. The amount not destroyed in incineration (1%) would be reported as disposed of or otherwise released. The sum of the individual quantities in a given year equals the total quantity of TRI chemicals in waste resulting from routine production operations at a facility during that year.

For the reporting year only, facilities must also report the quantity of waste disposed of or otherwise released as a result of activities other than routine production operations. This quantity appears in data tables as “non-production-related waste managed.” It includes waste disposed of or otherwise released to the environment at the facility or transferred off-site because of catastrophic events or remedial (clean-up) actions at the facility. Non-production-related waste is considered less amenable to source reduction because facilities cannot reasonably anticipate these quantities.

It is important to note that facilities may vary in how they interpret some of the reporting requirements under the PPA. Differences in estimation or calculation techniques may cause a difference in the amount reported without a corresponding difference in actual quantities of the chemical reported.

Box 12 explains the differences between “total on- and off-site disposal or other releases” and “quantity disposed of or otherwise released on- and off-site.”

Box 12. Differences between Amounts Reported in Sections 5 and 6 and in Section 8 of Form R

"Total on- and off-site disposal or other releases" (amounts reported in Sections 5 and 6) and "quantity disposed of or otherwise released on- and off-site" (amounts reported in Section 8) are not the same. This difference arises primarily from the types of disposal or other releases reported on different sections of the Form R.

- "Total on- and off-site disposal or other releases" reflects all on-site disposal or other releases as collected in Section 5 of the Form R and transfers off-site for disposal or other releases as reported in Section 6. The amounts included from Section 6.2 are for codes M10, M41, M63, M62, M65, M64, M71, M72, M73, M79, M90, M94, and M99 and from Section 6.1 for metals and metal category compounds only.
- "Quantity disposed of or otherwise released on- and off-site" is limited to production-related on- and off-site disposal or other releases as collected in Section 8.1 of the Form R. This quantity is the sum of the amounts included from Section 6.2 for codes M10, M41, M63, M62, M65, M64, M71, M72, M73, M79, M90, M94, and M99 and from Section 6.1 for metals and metal category compounds only minus the amount for one-time events not related to production as reported in Section 8.8 and reported under each of these parts of Sections 5 and 6.

Although total amounts analyzed in these two categories are often the same, they may differ to the extent that disposal or other releases associated with catastrophic events, remedial actions, or other one-time events not related to production occur. That is, Production-related disposal or other releases reported in Section 8.1 do not include the amounts associated with the one-time events while disposal and other releases in Section 5 and Section 6 (those codes listed above) do include them.

For the same reason, the quantity used for energy recovery offsite (Section 8.3), quantity recycled offsite (Section 8.5) and quantity treated offsite (Section 8.7) do not include transfers for recycling, energy recovery, and treatment (including POTWs for non-metals) reported in Section 6 to the extent that amounts from one-time events are reported. Once again, the relevant parts in Section 8 include only production-related wastes and not amounts from one-time events whereas Section 6 includes all off-site waste management amounts.

- The amounts in Section 8.3 (quantity used for energy recovery offsite) correspond to the amounts reported in Section 6.2 under codes M56 and M92 minus amounts for one-time events not related to production as reported in Section 8.8.

- The amounts in Section 8.5 (quantity recycled offsite) correspond to the amounts reported in Section 6.2 under codes M20, M24, M26, M28 and M93 minus amounts for one-time events not related to production as reported in Section 8.8.
- The amounts in Section 8.7 (quantity treated off-site) correspond to the amounts reported in Section 6.2 under codes M40, M50, M54, M61, M69 and M95 and in Section 6.1 for chemicals other than metals and metal category compounds minus amounts for one-time events not related to production as reported in Section 8.8.

The amounts from one-time events not related to production are reported in Section 8.8.

Other reasons also contribute to the different quantities reported in different sections of the Form R. For example, an amount of less than 1,000 pounds may be reported in ranges in Section 5 and 6 whereas an exact amount must be included in Section 8. Furthermore, facilities may round off amounts, except those for PBT chemicals, to two significant digits.

What is Source Reduction?

As noted above, the PPA of 1990 requires facilities to report the quantities of TRI chemicals they manage in waste, both on- and off-site. The PPA also requires facilities to provide information about the efforts they have made to reduce or eliminate those quantities. With the 1991 reporting year, facilities began reporting to TRI information about any source reduction activities they implemented during the year.

Source reduction activities are undertaken to reduce the amount of a toxic chemical which enters a wastestream or is otherwise released to the environment. By reducing the generation of toxic chemicals in waste, source reduction activities reduce the need to recycle, treat, or dispose of toxic chemicals. Box 13 explains source reduction as defined by the PPA.

Box 13. What Is Source Reduction?

Through source reduction, risks to people and the environment can be reduced, financial and natural resources can be saved that would otherwise have to be expended on environmental clean-up or pollution control, and industrial processes can become more efficient. Source reduction is defined in the Pollution Prevention Act of 1990 as any practice that:

- reduces the amount of any hazardous substance, pollutant, or contaminant entering any wastestream or otherwise disposed of or released into the environment (including fugitive emissions); and
- reduces the hazards to public health and the environment associated with the disposal or release of such substances, pollutants, or contaminants.

Source reduction practices can include modifications in equipment, process, procedure, or technology, reformulation or redesign of products, substitution of raw materials, and improvements in maintenance and inventory controls. Under this definition, waste management activities, including recycling, treatment, and disposal or other releases, are not considered forms of source reduction.

Making Year-to-Year Comparisons

Year-to-year comparisons must be based on a consistent set of reporting requirements to assure that any changes in the data do not simply reflect expansion of TRI's chemical and industry coverage or other modifications in reporting requirements over the course of the years. Therefore, trend analyses have been undertaken using various baseline years, as described below. Chemicals that have been removed from the TRI list ("delisted" chemicals) are excluded from all of the year-to-year comparisons.

2000-2002
For 2000, EPA made changes to the list of chemicals that must be reported and to reporting thresholds for some chemicals. EPA has the authority both to add chemicals to the TRI reporting list if they meet the statutory toxicity criteria and to delete chemicals from the list if EPA determines that they do not meet the toxicity criteria. For the 2000 reporting year, PBT chemicals already on the list had the reporting thresholds lowered and other PBT chemicals were added to the list. In addition, vanadium compounds were added to the list and the qualifier for vanadium was changed to exclude vanadium when contained in alloys starting with the reporting year 2000. These chemicals are included for analyses covering the 2000-2002 period, but not for periods covering years prior to 2000. The reporting thresholds for the PBTs lead and lead compounds were lowered starting with the reporting year 2001. Lead and lead compounds are not included for analyses covering the 2000-2002 period or for periods covering years prior to 2001.

Additional considerations also apply to analyses of TRI data for 2000-2002. Beginning with reporting year 2002, amounts sent off-site to landfills/disposal surface impoundments are reported in three separate categories (RCRA Subtitle C landfills, other landfills, and surface impoundments). These types of transfers to disposal or other releases cannot be analyzed separately for years prior to 2002.

1998-2002
Chemicals whose reporting requirements changed starting with the 2000 or 2001 reporting year (see above) are excluded for analyses covering the 1998-2002 period. Seven industry sectors were required to report starting with the 1998 reporting year, including metal mining, coal mining, electric utilities, chemical wholesale distributors, petroleum bulk storage/terminals, hazardous waste management facilities and solvent recovery facilities. These industries are included for analyses covering the 1998-2002 period, but not for periods covering years prior to 1998.

1995-2002
Chemicals added to TRI in EPA's chemical expansion initiative were first reportable in 1995. These chemicals are included for analyses covering the 1995-2002 period, but not for periods covering years prior to 1995. PBT chemicals whose reporting requirements changed starting with the 2000 or 2001 reporting year (see above) are excluded for analyses covering the 1995-2002 period. Since 1995, EPA has deleted three chemicals from the TRI list, including phosphoric acid in 1999. These chemicals are excluded from all analyses of multi-year data. Also, reporting by the seven industries added to the TRI starting with the 1998 reporting year is excluded from the 1998, 1999, 2000, 2001 and 2002 data for analyses covering the 1995-2002 period.

Additional considerations also apply to analyses of TRI data for 1995 to 2002: Beginning with reporting year 1996, the amounts injected underground into Class I wells are reported separately from amounts injected into underground wells of other classes (II-V), and on-site land disposal in RCRA Subtitle C landfills separately from other types of on-site landfills. These types of disposal or other releases cannot be analyzed separately for years prior to 1996.

1991-2002
Reporting requirements for ammonia, hydrochloric acid, and sulfuric acid have changed since 1991. Analyses for the period 1991-2002 exclude chemicals added to TRI since 1991 and those for which reporting requirements have changed over that time. Also, reporting by the seven industries added to the TRI starting with the 1998 reporting year is excluded from the 1998, 1999, 2000, 2001 and 2002 data for analyses covering the 1991-2002 period.

Waste management information added to TRI by the Pollution Prevention Act of 1990 has been collected since 1991. In addition, reporting on off-site transfers to recycling and on off-site transfers to energy recovery were added in 1991. Therefore, waste quantity reports are available only for analyses covering the years 1991-2002, but not for periods covering years prior to 1991. Also, waste transfer reports that include transfers to recycling and energy recovery are available for analyses covering years 1991-2002, but not for periods covering years prior to 1991.

1988-2002
Analyses for the period 1988 to 2002 exclude chemicals added to TRI since 1988 and those for which reporting requirements have changed over that time. This includes chemicals described above as well as aluminum oxide whose qualifier changed to "fibrous forms" for the 1989 reporting year. Also, reporting by industries required to report starting with the 1998 reporting year is excluded from the 1998, 1999, 2000, 2001 and 2002 data for analyses covering the 1988-2002 period.

Waste management information added to TRI by the Pollution Prevention Act of 1990 has been collected since 1991. In addition, reporting on off-site transfers to recycling and on off-site transfers to energy recovery were added in 1991. Therefore, waste quantity reports are not available for analyses covering the

years 1988-2002, and waste transfer reports do not include transfers to recycling and energy recovery for analyses covering the years 1988-2002.

Other Changes

Apparent increases and decreases among industries can also result when facilities change the SIC codes they report from one year to another, reflecting new or discontinued facility operations or indicating a different understanding of how SIC codes relate to the facility's business.

Reporting of amounts sent offsite to RCRA Subtitle C landfills separately from amounts sent off-site to other types of landfills began in 2002. These off-site transfers types cannot be analyzed separately for years 1988 through 2001.

Reasons for Change

Box 14 provides reasons that a facility's reported amounts may change from one year to another. Explanations for changes in reported amounts include actual source reduction projects undertaken to reduce a facility's generation of waste of a particular chemical, increases or decreases in production levels, changes in a facility's methods of estimating or calculating reportable amounts (which does not indicate a corresponding change in actual disposal or other releases and waste management), reporting errors in previous years for which the facility has not filed a revised submission, and others.

Box 14. Reasons Facility Reported Amounts May Change

Some reported increases and decreases are real—that is, they reflect changes in the amounts of TRI chemicals actually disposed of or released or otherwise managed in waste. Other reported increases and decreases are accounting or "paper" changes that do not reflect change in disposal or releases or other waste management. Some examples follow.

Real Changes

Source reduction activities, such as process changes, elimination of spills and leaks, inventory control, improved maintenance, chemical substitution, and alternative methods of cleaning and degreasing can cause real reduction in the amount of waste generated and/or managed.

The installation of pollution control equipment does not reduce the amount of waste generated, but may lead to real reductions in TRI chemicals disposed of or released. However, if the pollution control does not destroy the reported chemical, it may merely shift the chemical from one type of waste management to another.

Production changes can cause real changes in the quantities of TRI chemicals disposed of or released or otherwise managed as waste by facilities. Production-related waste is likely to increase when production increases and decrease when production decreases, although the relationship is not necessarily linear.

One-time events unrelated to normal production processes, such as accidental releases or clean-up operations, can cause a real but anomalous increase in the reporting year in which they occur and then a decrease from that abnormally high level the following year.

"Paper" Changes
Changes in estimation or calculation techniques can cause a change in the amount reported without a corresponding change in actual quantities of the chemical disposed of or released or otherwise managed as waste.

Clarifications of reporting instructions or changes in the way a facility interprets those instructions may cause a change in reported amounts without an actual change in quantities of the chemical disposed of or released or otherwise managed as waste.

Changes in the reporting definition of a particular chemical may cause a change in the reported amounts without an actual change in quantities disposed of or released or otherwise managed as waste. For example, revising the definitions of sulfuric acid and hydrochloric acid to include only aerosol forms, as occurred in reporting years 1994 and 1995, resulted in lower reports of releases, when non-aerosol forms were no longer reported.

Similarly, a facility's use of the alternate threshold may result in a reported decrease without an actual reduction in disposal or releases if the facility begins to take advantage of an alternate manufacture, process, or otherwise use threshold of more than 1 million pounds. Beginning in the 1995 reporting year, some facilities whose "total annual reportable amount" for a reportable chemical does not exceed 500 pounds may use an alternate manufacture, process, or otherwise use threshold of 1 million pounds of the chemical. If they do not exceed this alternate threshold, they no longer need to report amounts of disposal or releases or other waste management activities.

Apparent increases or decreases can occur if a facility makes a reporting error one year and does not submit a revision for that year, but does not repeat the error the following year.

Summary

The information collected under The Emergency Planning and Community Right-to-Know Act of 1986 and the Pollution Prevention Act of 1990 can be used by the public to identify facilities and chemical disposal or other releases and other waste management patterns that warrant further study and analysis. Keeping in mind its limitations, TRI data, when combined with hazard and exposure information, has been proven to be a valuable tool for risk identification in communities.

EPA-260-R-002-004
May, 2003

How Are the Toxics Release Inventory Data Used?

-- government, business, academic and citizen uses

Toxics Release Inventory Program Division
Office of Environmental Information
Office of Information Analysis and Access
U.S. Environmental Protection Agency
Washington, DC
May 2003

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Foreword

The Toxics Release Inventory (TRI) data are used in myriad ways. There are many uses of the TRI data that the authors of the legislation (the Emergency Planning and Community Right-to Know Act) mandating the TRI envisioned and many that they did not foresee. The Pollution Prevention Act of 1990 increased the types of data required to be reported to the TRI, which expanded the potential uses of the TRI. The combination of the types of data collected under TRI and the fact that they are made available to the public under EPCRA 313 makes TRI a powerful tool for many environmental analyses and understanding the many factors that contribute to human health and environmental conditions.

The intent of this report is to provide the reader with an overview of the different ways in which the TRI data are used, and as such does not include a description of all programs, activities, and analyses that use the TRI data. The case studies that are presented in this report were gathered through literature searches and phone interviews. EPA does not support or condone any of the uses of the TRI data presented here; nor does it endorse any of the organizations that are discussed in the case studies. To learn more about TRI data and about EPA's annual Toxics Release Inventory Public Data Release (PDR), consult EPA's TRI website at <www.epa.gov/tri>.

EPA is interested in learning of new uses of the TRI data. If you know of uses of the TRI data, particularly types of uses not covered in this document, and wish to share them, please send them to:

Toxics Release Inventory Program Division (2844T)
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

or via e-mail to: tri.us@epa.gov

Introduction

A chemical accident killed more than 2,000 people and injured hundreds of thousands of others in Bhopal, India, in December 1984. Coupled with similar, though less devastating, chemical accidents in the United States, the Bhopal incident greatly increased the public's awareness of and concern about the dangers of chemicals used and released into communities. Consequently, in 1986, Congress passed the Emergency Planning and Community Right-to-Know Act (EPCRA) as a part of the Superfund reauthorization. EPCRA's mandate is twofold:

- promote contingency planning for chemical emergencies, and
- provide the public with previously unavailable information about toxic and hazardous chemicals in their communities.

Section 313 of EPCRA created the Toxics Release Inventory (TRI), which requires companies within the manufacturing sector and federal facilities to report specified quantities of certain chemicals released from their facilities. In 1990, Congress passed the Pollution Prevention Act (PPA), which requires that facilities report to the TRI the quantities of toxic chemicals that they manage in waste and the types of pollution prevention (source reduction) activities they undertake. In 1998, the public gained access to data from additional industrial sectors. The other industries now required to report under EPCRA and the PPA include metal mining, coal mining, coal and oil burning electrical utilities, hazardous waste treatment and disposal facilities, chemicals distributors, petroleum bulk plants terminals, and solvent recycling operations.

Under Section 313(h) of EPCRA, Congress clearly provides for the wide distribution of the industry information gathered:

"The release forms required under this section are intended to provide information to the federal, state, and local governments and the public, including citizens of communities surrounding covered facilities. The release form shall inform persons about releases of toxic chemicals to the environment; to assist governmental agencies, researchers, and other persons in the conduct of research and data gathering; to aid in the development of appropriate regulations, guidelines, and standards; and for other similar purposes." Through their availability, TRI data have become a useful resource for many different organizations:

- Communities use TRI data to begin dialogues with local facilities and to encourage them to reduce their emissions, develop pollution prevention (P2) plans, and improve safety measures.
- Public interest groups, government, academicians, and others use TRI data to educate the public about toxic chemical emissions and potential risk.
- Industry uses TRI data to identify P2 opportunities, set goals for toxic chemical release reductions, and demonstrate its commitment to and progress in reducing emissions.

- Federal, state, and local governments use TRI data to set priorities and allocate environmental protection resources to the most pressing problems.
- Regulators use TRI data to set permit limits, measure compliance with those limits, and target facilities for enforcement activities.
- Public interest groups use TRI data to demonstrate the need for new environmental regulations or improved implementation and enforcement of existing regulations.
- Investment analysts use TRI data to provide recommendations to clients seeking to make environmentally sound investments.
- Insurance companies use TRI data as one indication of potential environmental liabilities.
- Governments use TRI data to assess or modify taxes and fees based on toxic emissions or overall environmental performance.
- Consultants and others use TRI data to identify business opportunities, such as marketing P2 and control technologies to TRI reporting facilities.[1]

This document presents uses of TRI data in the following categories: public, industry, government, international, investment, and academic. Case studies were found primarily by consulting with EPA/TRI program representatives in the state and EPA regional offices, researching numerous literature sources, conducting internet searches and following up leads with phone interviews, mail and email correspondences with TRI data users. This document does not describe all of the many people, programs, and activities that use TRI data, but instead presents examples in each category. Appendix A provides additional examples. More case studies were found of TRI data use by individuals, community groups and environmental organizations than by private industries.

Public Use

Each year, the EPA makes TRI data available to the public on two Internet sites: TRI Explorer <www.epa.gov/triexplorer> and Envirofacts <www.epa.gov/enviro>. The EPA also provides summary national and state data in the annual publications *Toxics Release Inventory: Public Data Release* and *Toxics Release Inventory: Public Data Release: State Fact Sheets*. States also release their own reports. Community organizations, universities, local public interest organizations, national non-governmental organizations (NGOs), and workers and labor unions also conduct analyses and risk assessments based on TRI data. Some of these organizations also make data and analyses available to the public.

The public can use TRI data to:

- *learn about their local environment and potential exposures to toxic chemicals*
- *participate in environmental decision-making*
- *learn more about the environmental behavior of companies in communities to which they might consider moving.*

Citizens and Community Organizations

Citizen activists and community organizations educate their citizens or residents about toxic chemical releases using TRI data, often combining education with a call to action. Some community organizations have used TRI data to initiate discussions with local industries or to call on local and public interest organizations to lobby for their causes. Local public interest organizations improve citizen environmental awareness, encouraging them to become involved in the environmental health of their communities. Members of a local public interest organization can be of technical and legal help to citizens in the field of environmental negotiation. Examples of citizen activists and community interest organizations and the ways in which they use TRI data follow:

- The Eugene Toxics Right-to-Know program, a local grassroots organization in Eugene, Oregon, used TRI as a model to develop the first city right-to-know program. This program gives citizens information about toxic material use and materials accounting information to the kilogram level. Voters adopted the program in 1996 as an amendment to the Eugene City Charter. A citizen initiative placed the amendment on the ballot. Previously, information concerning the use of hazardous substances in the community, and the releases of those substances into the local environment in particular, was not readily accessible to citizens under existing reporting regulations. Unlike other hazardous substance reporting programs, the Eugene charter amendment requires affected businesses to provide materials balance accounting. In other words, inputs and outputs of hazardous substances must be reported and must balance. These reports, required annually, are available in an accessible format at the Eugene Public Library. For more information, or to view the database, go to <www.ci.eugene.or.us/firedept/Toxics/toxicsb.htm>.[2]

- South Carolina Environmental Watch is an environmental organization that educates communities about toxic chemicals and their possible health effects. The organization presents TRI data to communities and discusses the potential effects of toxic chemical releases.[3]

- The Louisiana Environmental Action Network (LEAN) was formed over a decade ago to educate and provide a voice for residents concerned about toxic chemical releases from local facilities. LEAN uses TRI data to help residents become aware of risks associated with toxic chemical releases and to facilitate discussions between communities and industries to evaluate the impact of those releases.[4] LEAN "encourages community decision-making and legislative challenge in neighborhoods near toxic chemical sites. The organization locates waste disposal sites, dumps and industrial facilities that could potentially affect communities, and compiles TRI, accident release data, and state groundwater data on these types of sites. The resulting data compilations are then used as the spearhead of strategic campaigns directed at making changes at the legislative level." LEAN publicizes its information in the form of "briefing books," which it

presents to members of the Louisiana House and Senate environmental committees. These reports "can be the starting points for change. The goal is to build a knowledge base for legislators and communities and to raise awareness of local environmental problems.... In one case, a briefing book was compiled for neighborhoods near a railroad switchyard, where leaking valves on the chemical transport cars stored there overnight were found to have contaminated groundwater. The chemicals included styrene, perchloroethylene, benzene, toluene, hexachlorobenzene, hexachlorobutadiene, and vinyl chloride."[5]

- California facilities are required to develop and make public P2 plans under the state Hazardous Waste Source Reduction and Management Review. A community organization called "The Mothers of East Los Angeles of Santa Isabel" used TRI data to compare toxic chemical release estimates listed in P2 plans submitted by facilities to their actual estimated releases.[6]

- The Oneida Environmental Resources Board in Wisconsin used TRI data to convince leaders of the Oneida Tribe to organize a conference on cleaner ways to manufacture pulp and paper. The Board used TRI data to show that the pulp and paper industry was the largest industrial source of toxic chemical releases in Wisconsin, despite industry claims that significant release reductions in the past made further improvements unnecessary. The conference improved industry awareness of more environmentally friendly practices and procedures. The Board also used TRI data to alert a local labor union about possible worker health risks. The union included requests for reductions in toxic chemical releases in its contract renewal negotiations.[7]

- California's Silicon Valley Toxics Coalition has used TRI data for over a decade. The *Silicon Valley Environmental Index (*The *Index)* <www.svep.org> shows "sustainability trends" in Santa Clara County, California. The *Index* provides information about, but not limited to, hazardous materials and air and water quality. At least five cities in Santa Clara County have referenced or relied on the *Index* as the basis for their "sustainable city" efforts or municipal environmental management system (EMS) initiatives. Private-sector companies, such as IBM and Philips Semiconductor, have also used the *Index* in evaluating their own EMS practices. Several universities have incorporated the *Index* into their environmental science course curricula. In addition, several states (Wisconsin, South Carolina, New Jersey) and countries (Germany and the Netherlands) have developed regional environmental indicators studies modeled after the *Index*.[8]

- Ms.Wilma Subra, a chemical research analyst in Louisiana, has been a vocal citizen leader and an active proponent of the TRI program for 20 years, working to change regulations and policies to improve public health and the environment at the local level.[9] Ms. Subra has informed residents about the possible effects of toxic chemical releases and has aided their work to improve environmental conditions. The TRI data support

Ms. Subra's efforts to reduce toxic chemical releases from Louisiana's industrial facilities. Ms. Subra gathers and analyzes TRI data, distributes information to the public, participates in legal and regulatory processes against industrial facilities, and is a member of national and international advisory committees.

National Organizations

National organizations employ TRI data in many of the same ways as small community organizations, but on a larger scale. Such organizations analyze TRI data, use it to conduct risk screening and risk assessment, and often help the public interpret the data. National organizations often work with local public interest and community organizations to initiate discussions between citizens and industry. Some national organizations also use TRI data to help them lobby for changes in environmental policy. Examples of TRI data used by national organizations include the following:

- Environmental Defense (ED) launched its Scorecard web site in1998 <www.scorecard.org/>. The site's "polluter locator" allows users to perform a search by ZIP code on a database containing information on more than 17,000 chemical-releasing facilities. The Scorecard also provides data on the health effects and regulatory status of different chemicals.[10] The site correlates TRI chemical release data with U.S. Census demographic data. ED is currently linking TRI data with toxicological studies to create a Scorecard tool that compares the risks of different toxic chemical releases.[11] Logging 500,000 data requests on its first day of operation, the Scorecard web site has drawn significant public interest.

- The Right-to-Know Network (RTKNet) web site <www.rtknet.org>, launched in 1989 by the nonprofit organizations OMB Watch and the Unison Institute, also facilitates public access to TRI data. Users can search the TRI data by ZIP code, city, county, state, year, or chemical. The web site also includes links to additional information about chemicals and right-to-know issues. RTKNet estimates that about a quarter of a million searches are performed on the site annually.[12]

- The former Environmental Information Center conducted a study of the Great Lakes in 1997. Scientists used TRI data to examine endocrine disrupters released in states bordering the Great Lakes. The study ranked the largest emitters of various classes of toxic chemicals by region, and found the Great Lakes region to be the nation's top emitter of reportable endocrine disrupting chemicals.[13]

- In September 2000, Physicians for Social Responsibility, along with the National Environmental Trust and the Learning Disabilities Association of America, released the report, "Polluting Our Future: Chemical Pollution in the U.S. that Affects Child Development and Learning" <www.psr.org/trireport.pdf>. This report used TRI and

other data to present national information about releases of chemicals that present potential developmental and neurological risks. The report ranked states by their releases of these chemicals and included information about counties, industries, and facilities with the highest toxic chemical releases.[14]

- Labor unions also have used TRI data to support demands for safer working conditions for employees. Other than citizens who live near facilities, employees of TRI reporting facilities are most at risk from toxic chemical releases because they are most likely to come in regular contact with these chemicals. Beginning in 1990, the International Union, United Automobile, Aerospace & Agricultural Implement Workers of America (UAW) began training employees and managers of UAW companies to access, interpret, and utilize computer databases and programs in "critically assessing industrial emergency response activities at their facilities." Workers were trained to download and interpret environmental compliance data. TRI data comprised one of the main sources of information for the program. Concerning TRI, the UAW stated, "knowing about maximum amounts on-site can help people prepare for a 'worst-case scenario.' It can help an emergency response planning group decide if there are enough response equipment and personnel to deal with an emergency involving the chemical(s) in question."[15] The UAW continues to provide potential risk information to workers regarding toxic chemical releases to the environment using TRI data. The UAW website provides links to EPA Envirofacts, and to the most recent TRI Data Release (<www.uaw.org/hs/at/index.html>).

Direct Negotiation

Through increasing their understanding of TRI data, members of the public can begin to understand potential risks associated with toxic chemical releases in their communities, and can work with facilities to reduce those risks. The nation's first "right-to-act" law was enacted in September 1999 by the Passaic, N.J., Board of Chosen Freeholders, the county's governing body. The law "allows neighbors and/or employees to petition the county health officer for creation of Neighborhood Hazard Prevention Advisory Committees (NHPACs) for specific facilities."[16] Even without the aid of this law, concerned citizens nationwide can take action in their own communities. Community organizations and citizen activists have used TRI data to negotiate with local facilities. Examples of direct negotiation agreements between citizens and facilities follow:

- In the city of Richmond, California, community members were concerned about toxic chemical releases from several oil refineries and other large industrial facilities. The West County Toxics Coalition, a local environmental organization, joined with Communities for a Better Environment, a statewide environmental organization, to investigate industrial polluters in Richmond. Using the TRI and other databases, they published the report, *Richmond at Risk*, which identified the area's 20 largest industrial polluters and named the Chevron oil refinery the number one polluter. The report served

to initiate discussions among Chevron, the West County Toxics Coalition, and other community and environmental organizations. As a result of the meetings, the company agreed in 1994 to close down older portions of the plant and install P2 equipment to achieve zero net toxic chemical releases on its reformulated fuel project.[17]

- The Calhoun County Resource Watch (CCRW), founded by a Texas environmental activist and shrimper named Ms. Dianne Wilson, used TRI data to build community awareness about pollution of the rich shrimp and oyster breeding grounds of Lavaca Bay on the Gulf of Mexico[18]. Calhoun County was ranked first in the nation for toxic chemical disposal to the land, based on the 1987 TRI data. Lavaca Bay was designated as a Superfund site in 1993. CCRW brought suit against the Aluminum Company of America (Alcoa) related to this pollution. In 1995 Alcoa signed an agreement designed to protect the breeding grounds.[19] Two Alcoa firms, a chemical plant and a bauxite refinery, committed to "fund independent review of zero discharge options and to adopt the technologies where technically, economically, and environmentally sound."[20] In return, CCRW agreed to drop its legal challenges and suspend permit interventions against the companies. According to an Alcoa Operations Manager, as of March 2000 the company had made considerable progress toward the goals set in 1995, including compliance with a permit that sets the "allowed total annual maximum mass loading mercury limit" at 30 pounds, development and implementation of a Best Management Practices plan, and installation of an "evaporative spray and dust control system" near the refinery.[21]

- In 1998, Butler County, PA, warned pregnant women and infants against drinking water from Connoquenessing Creek due to high levels of nitrates in the water. In its report, the Pennsylvania Public Interest Research Group (PennPIRG) used TRI data to highlight the significant quantities of nitrate compounds being released into the creek.[22] The report identified the major source of the nitrates as the AK Steel Corporation. TRI data showed that the company had discharged approximately 29 million pounds of nitrates into the creek in 1997 and 32 million pounds in 1998. This report and several newspaper articles about these toxic chemical releases prompted the state to commit to reduce the levels of nitrates that AK Steel is permitted to release into the creek.[23] Pennsylvania began developing a new water permit to reduce allowable nitrate releases to a level 90 percent lower than the previous level. In June 2000, EPA issued an emergency order requiring AK Steel to significantly reduce the nitrate compounds it discharges into Connoquenessing Creek. In addition, AK Steel was required to provide and pay for an alternative water source for the affected public on any day that the local water plant could not meet the federal maximum nitrate contaminant standard.

- Working with The Ecology Center, a public interest organization based in Ann Arbor, Michigan, residents of the town of Flat Rock used TRI data to obtain a commitment from Auto Alliance International to enact an aggressive solvent reduction program. TRI data

showed that the company's air releases of toluene had increased from 100,000 pounds in 1991 to 800,000 pounds in 1993, along with an increase in noxious odors in the community. A former Ecology Center staff member, Andrew Cormai, said, "[R]esidents who have put up with the smells since 1987 suddenly have a bone to pick with the company. The company is going to be saving some money by recapturing solvents, and they will be improving community air quality."[24]

Environmental Justice

The goal of environmental justice is to ensure that all people, regardless of race, national origin, or income, are protected from disproportionate impacts and environmental hazards. "The concept [of environmental justice] addresses evidence [that] in some parts of the nation, poor and minority communities live closer to factories, highways and airports and are exposed to more pollution and noise and generally more environmental risks than the population at large."[25] TRI data have proved to be an important tool in environmental justice. Communities that were once uninformed about the toxic chemical releases in their area now have access to that information. Examples of TRI data use in environmental justice activities include:

- Two areas of Louisiana have become focal points for environmental justice efforts: the Mississippi River corridor, popularly known as "Cancer Alley," and the Lake Charles region. Local groups have used TRI data to illustrate the high toxic chemical release rates in these areas compared to those in other regions.[26] Several small communities have confronted industrial facilities about their toxic chemical releases and possibly related health effects. One illustrative dispute arose in Mossville, Calcasieu Parish, Louisiana, where some residents suspected that poor health in their community was due to the activities of 17 industrial facilities located within one half-mile of the community. Their concerns prompted numerous public interest organizations to collaborate on the report, *Breathing Poison: The Toxic Costs of Industries in Calcasieu Parish, Louisiana*. The 2000 report used TRI data and information from the Scorecard web site to convey the health risks to which the community might be exposed, and stated the need for "pollution reduction, environmental health services, and a fair and just relocation for consenting residents."[27]

- The Asian Pacific Environmental Network (APEN) works with Asian and Pacific Islander communities in the San Francisco Bay Area, California. APEN created a series of maps that combined TRI and demographic data, to show that many poor Asian and Pacific Islanders live in "toxic hot spots." The maps increased awareness among community members about both their environment and environmental justice issues. APEN might add more environmental, health, and demographic information, and expand its mapping work to other nearby counties.[28]

- The Los Angeles chapter of Communities for a Better Environment used TRI data to help

ensure that the communities it serves would not be exposed to higher environmental risks as a result of poverty or ethnicity. In one project, the organization combined 1996 TRI data with GIS mapping data to show that 80 to 100 percent of facilities that release toxic chemicals in Los Angeles County were located in areas where a large majority of the residents were people of color. These findings led to the report, *Holding Our Breath – the Struggle for Environmental Justice in Southeast Los Angeles.*[29]

Industry Use

Although Congress intended the public to be the primary audience for TRI data, the TRI has also benefitted industries.

Cost Reduction

A primary goal of ISO 14000 (International Organization for Standardization's standards on environmental management) was to bring environmental issues to the attention of the highest levels of corporate management. Leaving decision-making to environmental managers alone might not produce the corporate commitment necessary to achieve the best success.[30] TRI data have been used as evidence to convince high-level management of the need for an Environmental Management System (EMS). In turn, the proactive environmental protection afforded by an EMS can reduce corporate costs.

For some industries, the creation of the TRI marked the first time that company managers and operators could look closely at the quantity of chemicals being released from their facilities. Initially, some companies expressed surprise at their own toxic chemical release amounts and set goals to improve their environmental performance. Some companies have reduced their toxic chemical releases and increased their efficiency at the same time, leading to an increased profit. Examples of ways that industry has used TRI data to reduce costs follow:

Industry can work with TRI data to:

- *improve internal auditing*
- *stimulate more efficient use of chemicals by identifying material losses*
- *provide a template for environmental reporting under ISO 14000.*

- At the1997 EPA Toxics Release Inventory and Right-to-Know Conference, John Pine provided examples of how TRI information has helped companies develop waste reduction strategies. For example, Marathon Oil installed a thermal desorption unit to process oily waste and recovered over 120,000 barrels of oil and the Georgia Gulf Corporation relocated a methanol stripper purge line that resulted in the recovery of 9,300 gallons of

methanol that previously underwent biological waste treatment.[31]

- The Haartz Corporation, located in Acton, Massachusetts, makes coated fabrics used in automobiles. The firm once used 800,000 pounds per year of methyl ethyl ketone (MEK), a solvent that can cause dizziness, nausea, or unconsciousness when inhaled.[32] In 1987, when Haartz was preparing its first TRI report, the company installed a new emissions control system to capture and recycle MEK. TRI data enabled Haartz Corp. to track the association between reduced toxic chemical releases and reduced costs. According to the Haartz environmental manager, the company's "emissions have stayed pretty flat" despite its "double-digit sales growth" between 1993 and 1998. In addition, reducing its MEK releases saved Haartz an estimated $200,000 annually.[33]

Public Relations Tools

Demonstrating environmental progress has become a selling point for industries, and many company web sites now include an environmental report. Examples of positive environmental marketing include:

- The Boeing Company posts TRI release data on its web site and uses the information to track the company's environmental progress. The web site noted that overall toxic chemical releases have decreased by more than 82 percent since 1991, and that "Boeing continues to invest and innovate in pollution prevention programs and find new ways to get greater leverage for current emission reduction programs."[34]

- Monsanto's similar web site provides both current and past TRI information on consolidated chemical releases and transfers from Monsanto facilities. The web site also includes data about carbon dioxide releases, priority on-site toxic chemical releases, compliance penalties, chemical spills, Superfund sites, safety, and compliance.[35]

Public Disclosure

Companies can use TRI data to "obtain an overview of the release and management of toxic chemicals, to identify P2 and release reduction targets, and to measure progress toward these goals. The publicity that has resulted from the availability of TRI data has prompted many facilities to pledge toxic chemical release reductions, and to work with communities to develop effective strategies for reducing environmental and human health risks."[36] For example, the Iowa Association of Business and Industry organized a community-wide pollution prevention initiative in the Des Moines-Polk County area. The organization adopted a goal of a 60 percent reduction of all TRI chemicals by 1992 and a 70 percent reduction by 1995. [37]

Government Use

Environmental Solutions

Government agencies can take a variety of actions when TRI data reveal an environmental problem in a specific state or region. Some of these actions involve voluntary incentive programs for companies. Although these programs are not binding commitments, they offer good publicity for participating companies. Examples include:

- Governor Frank O'Bannon of Indiana announced the Indiana Governor's Toxics Reduction Challenge in 1998. The challenge pledged to "support the state's goal to reduce toxic chemical releases to the air and water from 1995 levels: 50% by December 31, 2000, in large urban areas for carcinogens and persistent bioaccumulative toxic chemicals; 60% by December 31, 2002 statewide for these chemicals; and, 50% by December 31, 2002, statewide for all toxic chemicals reported in the Toxics Release Inventory." The Challenge also pledged to "energetically help the state reach these goals through efforts emphasizing pollution prevention within your organization and/or in cooperation with other organizations." As of mid-April 2000, 67 companies in Indiana had committed to the Challenge. A list of the companies and an update on their progress is available on the Indiana state web site <www.in.gov/idem/oppta/p2/toxicchallenge/>.[38]

- The EPA "33/50 Program" targeted 17 priority TRI chemicals for 33 percent and 50 percent reductions from 1988 release levels, to be attained by 1992 and 1995, respectively. More than 1,200 companies nationwide joined the Program, which provided several forms of recognition to participating companies. The Program reached both its interim 33 percent reduction goal and its final 50 percent reduction goal one year early.

- The P2 Program of the Colorado Department of Public Health and the Environment used TRI data, in combination with other data about hazardous waste and toxic chemical releases to air and water, to identify the ten industry organizations responsible for the largest quantities of hazardous waste generation or toxic chemical releases in the state. This research served as the basis for establishing priorities for P2 activities and for distribution of technical assistance grants. The report also aided in targeting large companies for participation in the "Governor's P2 Challenge Program" to reduce toxic chemical releases and hazardous waste generation.[39]

- Due to the new TRI reporting requirements for dioxin, the Delaware Department of Natural Resources and Environmental Control became aware of dioxin-tainted waste at DuPont's Edge Moor, DE titanium dioxide (TiO[2]) plant. Subsequently, DuPont agreed to pay an estimated $15 million to remediate dioxin-tainted waste at this facility. DuPont discovered that the waste sludge was contaminated with dioxin while the company was

preparing to comply with EPA's requirement that dioxin releases be reported under TRI. In addition, DuPont agreed with the Delaware Department of Natural Resources and Environmental Control to spray a 23-acre stretch along the Delaware River with a starch-like coating to keep the dioxin from being stirred up by the wind or eroding into the river. DuPont used the site to store waste sludge from the Edge Moor plant. The company will also close four sludge lagoons near the plant and plans to cut dioxin formation in half by 2003 and by 90 percent by 2007.

Environmental Targeting

Budgets to fund environmental programs and measures often do not increase in proportion to the need for these activities. Environmental targeting initiatives, such as those listed below, help governments and communities prioritize their needs and ensure that their resources are used most efficiently.

- The P2 Division in Georgia's Department of Natural Resources used TRI data to identify the technical assistance needs of manufacturing sectors generating chemicals that pose the greatest relative risk to public health and the environment. The Division prioritized chemicals, examined manufacturing sectors releasing the highest priority chemicals, and identified particular subsectors for further assessment. The Division also conducted in-depth manufacturing sector assessments to determine which processes produce which wastes, what multi-media waste problems exist, what P2 activities were being undertaken, and what additional opportunities might exist.[40]

- The Florida Waste Reduction Assistance Program provides assistance in source reduction and waste minimization to facilities handling TRI chemicals. The Program relies on TRI and other data to target facilities for the Program.[41]

- EPA's Office of Enforcement and Compliance Assurance uses TRI data within its Online Tracking Information System (OTIS) -- a collection of on-line search engines that enables EPA staff, state/local/tribal governments, and federal agencies to access a wide range of data relating to enforcement and compliance. Data on the OTIS site are from OECA's Integrated Data for Enforcement Analysis (IDEA) system, which extracts and integrates information from TRI as well as the following databases: AFS (Clean Air Act -- AIRS Facility Subsystem), PCS (Clean Water Act -- Permit Compliance System), RCRAInfo (Resource Conservation and Recovery Act Information System), the Federal Enforcement Docket, National Compliance Database (NCDB), and the 1990 U.S. Census. OTIS can be used for many functions, including program planning, enforcement targeting, sector and geographic analyses, data quality review, and pre-inspection review. As of March 2002, all states, all EPA Regional Offices, and another 90 local, state and federal governmental organizations are registered.

Legislation and Regulations

TRI data often provide the impetus for legislative action from federal, state, and local governments. For over a decade, TRI data has been used to influence and change environmental standards, regulations, and legislation, for example:

- In response to legislation passed in 1987 to address toxic chemical releases to the air, the Illinois EPA Bureau of Air used TRI data to determine quantities of stack and fugitive air emissions of reported substances to support continued development of regulatory proposals.[42]

Risk Assessment

As the connection between toxic chemicals and human health becomes better known, public health officials are looking for ways to assess the levels of risk in their communities. TRI data have been a crucial component in creating tools to address these assessments. Examples follow:

- The New York State Department of Health developed a risk screening protocol using TRI air release data and toxicity potency data to produce relative risk scores and rankings for facilities and chemicals within the state. Results suggested the need for a more careful evaluation of health effects resulting from large releases of noncarcinogenic compounds.[43]

- Researchers from EPA's Office of Health Research published a study of national and regional differences in county-level TRI chemical releases to air according to the ethnicity or race and household income of the populations. Using the "Population Emissions Index," a population-weighted average release for each county, the study found that all minority groups except Native Americans tend to live in counties where levels of TRI chemical releases to air are higher. The data also suggest that household incomes tend to be higher in counties with higher TRI chemical releases to air.[44]

- The EPA Office of Pollution Prevention and Toxics's Risk-Screening Environmental Indicators Model provides year-to-year indicators of the potential impacts of TRI chemical releases on human health and the environment. The indicators consider TRI release and transfer volumes, chronic toxicity, exposure potential, and the size of receptor populations. Both generic and site-specific exposure characteristics can be incorporated. The model allows the targeting and prioritization of chemicals, industries and geographic areas. Facility scores can also be tracked from year to year to analyze trends.[45]

Quality Assurance and Control

Some states, such as Massachusetts, that require separate reporting of toxic chemical releases for their facilities find TRI data to be a useful measure of quality assurance and control. The Air Pollution Control Program in the Missouri Department of Natural Resources also compares fugitive and stack emissions reported to the TRI with toxic chemical release data reported on the state's Emissions Inventory Questionnaire for quality control.[46]

Other Government Uses

Additional governmental uses of TRI data can be found in agencies not immediately associated with environmental issues. The U.S. Internal Revenue Service used TRI data to identify companies releasing chlorofluorocarbons (CFCs) in order to enforce a tax imposed on releases of CFCs and thus facilitate the phase-out of these chemicals.[47]

International Right-to-Know

The TRI has served as the model for many countries' Chemical Right-To-Know programs and laws. Within the next few years, more than 30 nations are expected to have a TRI-like system, known internationally as Pollutant Release and Transfer Registers (PRTRs). PRTRs allow the public to obtain toxic chemical release data over a large geographic area. Countries can compare their data and share ideas about improving environmental regulations. Examples of how PRTR information is being used include:

- The Commission for Environmental Cooperation (CEC), which was created by a side-agreement to the North American Free Trade Agreement (NAFTA), began it's PRTR work by preparing a document that compares U.S. and Canadian PRTR systems. The CEC now develops an annual report, entitled "*Taking Stock*", that correlates data from the TRI and the Canadian National Pollutant Release Inventory to give an overall view of releases and transfers of toxic chemicals within and between countries. The CEC also has created an Internet search engine that allows the public to obtain continental PRTR data.[48]

- In 2000, the Silicon Valley Toxics Coalition attended an international conference in Croatia on public participation and community right-to-know. Participants recognized the fundamental importance of Chemical Right-To-Know and are lobbying the United Nations to promote the program and persuade nations to support the passage of community right-to-know laws modeled after the TRI.[49]

Investment

The public's increased awareness of environmental issues has made environmental performance an important factor in their investment decisions. Many investment companies have responded to this demand by providing socially responsible investment options. Examples of how TRI data have been used in investment decisions include:

- Green Century Funds, an investment organization that specializes in socially responsible mutual funds, offers two funds committed to promoting corporate environmental responsibility. The Green Century Balanced Fund invests in "performance-driven companies that are a part of the solution to environmental problems," as well as in environmentally benign companies and "best of class" companies that are setting standards for environmental protection in their industries. The Green Century Equity Fund screens out companies with the worst environmental and social records. The funds are monitored for environmental performance using TRI data.[50]

- Vanderbilt University's Owen Graduate School of Management found a correlation between a company's stock value and its P2 efforts, which were assessed using TRI data. A researcher from the University performed two separate studies comparing the progress of a company's P2 activities as reported on TRI forms to a company's stock market performance. The study reported that "companies that underperform expected pollution prevention goals are penalized in the stock market, and the stock of the companies that engage in pollution prevention activity tends to outperform the stock of companies that do not engage in pollution prevention."[51]

- Using TRI data, the Investor Responsibility Research Center (IRRC) developed an Emissions Efficiency Index® that indicates which companies have a competitive edge in environmental performance. The Index is predicated on the idea that greater toxic chemical releases are associated with higher risks of negative publicity, more tort actions, and higher costs for pollution control and waste management. IRRC's constituency uses TRI-based information to identify companies with poor environmental records. Using the index, investors can either screen such companies out of their portfolios or purchase shares and use their ownership as leverage to improve environmental performance.[52]

Academic Use

A variety of TRI data use applications occur in academia, in areas ranging from doctoral theses to journal publications to use in the classroom itself.

Research

Universities and research institutions are using TRI data as a means for "examining environmental policies and strategies, and clarifying risks associated with toxic chemicals at the state and local level."[53] Students and faculty in the academic community also perform studies based on TRI data. Examples of academic research using TRI data include:

- In February 2000, the journal *Drug and Chemical Toxicology* published an article entitled, "Using GIS to Study the Health Impact of Air Emissions." This article showed how public health professionals are able to use data (such as the TRI) on toxic chemical releases to air, air dispersion modeling, and GIS to identify and define a potentially exposed population. In addition, such data can be analyzed to estimate the health risk burden of that population and determine correlations between point-based health outcome results and estimated health risk.[54]

- In the *Journal of Environmental Economics and Management* in 1999, researcher Mr. Madhu Khanna published results of research that examined the environmental, economic and investment effects of voluntary and mandatory toxic release reporting programs. One of the research studies focused on the EPA's "33/50" Program during its first three years, 1991-1993, and its impact on the U.S. chemical industry. The paper concluded that Program participation led to a statistically significant decline in toxic releases over the time period, a statistically significant negative impact on current return on investment, but a positive and statistically significant impact on the expected long run profitability of firms.[55]

- At Louisiana State University, environmental science professor Paul Templet developed a method, using TRI data, to evaluate the comparative effectiveness of pollution control strategies, policies, and programs, by calculating an "emissions to jobs ratio." This ratio consists of the number of pounds of toxic chemical releases per job in a given industry and location, can be compared to a national or other average. The comparison is then used to assess the relative toxic air releases associated with a certain job. This ratio was used to modify tax exemptions granted to facilities to encourage and reward job creation.[56]

- Professor Mark Stephan used TRI as the background for an academic paper focusing on the role of information disclosure programs in environmental policy. Professor Stephan used TRI as a prime example for the fundamental theories and concepts that underlie the empirical work on the comparison of basic theories arising from the knowledge of economics, psychology, and politics.[57]

- Researchers Klassen and Whybark studied management of the natural environment in manufacturing firms, given increased public awareness and scrutiny as a result of

programs like the TRI. In one of their published studies, they concluded that an emphasis on pollution prevention instead of pollution control, improved delivery performance and firm competitiveness.[58]

Classroom Use

High school and university instructors have incorporated the TRI into curricula involving subjects ranging from introductory chemistry to business.

- The JSI Center for Environmental Health Studies developed a field-based environmental education curriculum for high school students in Chelsea, Massachusetts, a low-income minority community near Boston. The goal was to encourage student participation in environmental assessment and protection. Students learned to inventory sources of contamination in a local creek and worked with community agencies on protecting a valuable environmental resource. TRI data were an integral part of the students' research.[59]

Conclusions

A variety of stakeholders work with TRI data on a regular basis. Some data uses, such as risk screening, were recognized when the TRI was first implemented; other uses have developed as the program has matured and expanded. TRI data have been a key tool in the environmental justice movement and in the drive toward more environmentally responsible investment. The applications of TRI data will likely increase in number as environmental awareness grows and opportunities are identified for integrating TRI data with other types of information.

Appendix A: Expanded Lists of TRI Data Uses and Benefits

User	Description	Reference
PUBLIC USE - Citizens/Community Organizations		
Amalgamated Clothing and Textile Workers Union and community activists in Northfield, MN	Amalgamated called for emissions reductions from a local facility ranked as the nation's 45th largest emitter of carcinogens to the air. Contract negotiations led to an agreement for a 64% reduction in use of toxic chemicals by 1992 and a 90% reduction in toxic emissions by 1993.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-20, April 1997
California Public Interest Research Group (CALPIRG)	CALPIRG uses TRI data to supplement the information that water utilities publish in their Consumer Confidence Reports, and to identify potential water contamination sources. CALPIRG presents these data to policymakers to provide more information to the public on drinking water contamination.	<www.calpirg.org>
Don't Waste Arizona	Don't Waste Arizona produced two videos about the Community Right-to-Know Act for the public and the regulated community. The organization held "house parties" to show the videos and discuss how communities can identify and reduce toxic pollution. Don't Waste Arizona has also distributed videos to citizens, libraries, and compliance assistance centers throughout Arizona, thus increasing public awareness about pollution.	*A Citizen's Guide to Reducing Toxics Risks: Putting the TRI to Work!,* EPA 909-B98-001, Region 9 Cross Media Division, January, 1998

User	Description	Reference
PUBLIC USE - Citizens/Community Organizations		
Eugene Toxics Right-to-Know program, OR	The Eugene Toxics Right-to-Know program used TRI as a model to develop the first city right-to-know program. This program gives citizens information about toxic material use and materials accounting information to the kilogram level. A citizen initiative placed the amendment on the ballot. Voters adopted the program in 1996 as an amendment to the Eugene City Charter. For more information, or to view the database, go to <www.ci.eugene.or.us/firedept/Toxics/toxicsb.htm>.	<www.ci.eugene.or.us/firedept/toxicsb.html>
JSI Center for Environmental Health Studies	The Center trained librarians on how to access information from computerized electronic databases, including TRI, especially for use as tools to investigate environmental health problems.	JSI Center for Environmental Health Studies: A Division of the JSI Research and Training Institute
Louisiana Environmental Action Network	The Network uses TRI data as part of strategic campaigns for change at a better informed legislative level. The network creates "briefing books" for state House and Senate members and holds tours of focus sites for representatives, media, citizens, etc.	<www.leanweb.org/>
Massachusetts Toxic Usage Reduction Institute (TURI)	TURI uses TRI production data to normalize information on annual toxic chemical releases to eliminate the effects of changes in production.	Tenney, H.M., Mass TURI, e-mail correspondence with Abt Associates on 4/01/99 and 4/15/99

User	Description	Reference
PUBLIC USE - Citizens/Community Organizations		
Mothers of East Los Angeles of Santa Isabel	The organization used TRI data to compare toxic chemical release estimates contained in P2 plans with actual releases to the environment., which led to community evaluation of facility P2 plans.	<http://clnet.ucr.edu/community/intercambios/melasi/>
National Conference of State Legislators (NCSL)	NCSL conducted a 1996 survey of states, which EPA used to assess how states currently access and use TRI data. Twenty-four states produce annual TRI reports, 37 use TRI data to identify facilities for P2 activities, 22 use TRI data to target facilities for inspection to ensure compliance with permits, 22 use TRI data for emergency planning, seven use TRI data to develop or revise permits, and 5 use TRI data for facility siting and permitting decisions. Other state-produced documents include annual press releases, facts sheets, computer applications, chemical fact sheets, and tables of emissions quantities.	*A Citizen's Guide to Reducing Toxics Risks: Putting the TRI to Work!,* EPA 909-B98-001, Region 9 Cross Media Division, January, 1998

User	Description	Reference
PUBLIC USE - Citizens/Community Organizations		
Silicon Valley Toxics Coalition	The Coalition uses TRI data on the hazardous materials section of their web site to display toxic chemical releases and other information, increasing public awareness. The Coalition also uses TRI data in its progress reports of the Silicon Valley toxic chemical releases.	<www.svep.org>
	The Coalition used TRI data to develop the first Silicon Valley Environmental Index <www.svep.org>, showing local sustainability trends in Santa Clara County.	
Wilma Subra, grass roots advocate	Ms. Subra uses TRI data to support regulations and policies to improve public health and the environment at the local level.	Personal interview by Katherine Jennrich, intern, Toxics Release Inventory Program Division, OPPT, US EPA, July 21, 2000
Toxics Action Center, Sharon, MA	The Center used TRI to assess the specific media through which toxic chemical releases are made, such as septic systems.	<www.toxicsaction.org>
WashPIRG	WashPIRG used TRI data to relate the number of TRI sites in states to the incidence rates of cancers associated with environmental toxins.	Wise, Alison. "The Toxic State of Washington: Our Health and Environment at Risk," April, 2001

User	Description	Reference
PUBLIC USE - National Organizations		
Citizen's Fund	The Fund summarized 1991 TRI data nationally and by state to attempt to measure the progress of manufacturers in preventing pollution, and included report cards of the top 50 waste generating facilities in the chemical industry. The Fund aggregated 1990 TRI data from different facilities by their parent companies to hold corporations more accountable for the full extent of their toxic pollution.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-20, April 1997
Environmental Defense (ED)	ED uses TRI data, along with other resources on its Scorecard web site, to allow the public to find chemical information about their communities by searching by ZIP code.	OMB Watch and the Unison Institute, "The Right Stuff: Using the Toxics Release Inventory."13 July 1995
	ED is in the process of linking toxic chemical release data with toxicological studies on its Scorecard web site. It released the first version in 1998 and focused on the human health impacts of toxins. The project ranked toxic chemical releases by equivalency factors, taking into account toxicity and exposure potential.	*A Citizen's Guide to Reducing Toxics Risks: Putting the TRI to Work!,* EPA 909-B98-001, Region 9 Cross Media Division, January, 1998
	ED used TRI data to rank the efficiency of 166 U.S. refineries based on toxic chemical releases and waste per barrel of oil refined per day.	Selcraig, Bruce. "What You Don't Know Can Hurt You," Sierra Magazine. Jan/Feb, 1997

User	Description	Reference
PUBLIC USE - National Organizations		
Envirotrust	Envirotrust uses section 8 TRI data to develop an index that can compare facilities' progress toward better environmental management.	Nathan, T. Envirotrust, phone conversation with Abt Associates, March 3, 1999
Hampshire Research Institute (HRI)	HRI surveyed TRI facilities reporting large reductions in their toxic chemical releases and production-related waste to determine if these changes resulted from P2 activities, "paper" reporting changes, or other factors.	<www.hampshire.org/hri02.htm>
National Environmental Trust for Clear the Air, the National Campaign Against Dirty Power	These organizations analyzed TRI data from power plants, and compared them to those of other industry sectors, and used TRI data to rank the power plants within individual sectors.	Nathan, et al. *Toxic Power: What the TRI Tells Us About Power Plant Pollution*, August 2000
Physicians for Social Responsibility (PSR)	PSR used TRI and other data in a report that includes national information about releases of developmental and neurological toxins, a ranking of the states, and information about the top releasing counties, industries, and facilities in each of the 50 states.	<www.psr.org/trireport.pdf>
Right-to-Know Network (RTKNet)	RTKNet maintains a web site similar to Environmental Defense's Scorecard (see p.22). Users can also search by specific chemicals.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-20, April 1997
Sierra Club	The Sierra Club uses TRI data in citizen outreach documents.	<www.sierraclub.org>

User	Description	Reference
PUBLIC USE - National Organizations		
Public Interest Research Group (U.S. PIRG)	U.S. PIRG examined TRI releases to surface waters and to publicly-owned treatment works (POTWs) in *Troubled Waters: Major Sources of Toxic Water Pollution* (1993). U.S. PIRG identified the nation's top releasers of toxic chemicals to those water sources. The organization made recommendations for amending the Clean Water Act to provide the public with more information about toxic chemical releases to waterways.	Hopey, Don. Post-Gazette (Pittsburgh). February 18, 2000 <www.post-gazette.com/healthscience/20000218/pollute2.asp>
Unison Institute/OMB Watch	The organizations collected anecdotal data about how the Right-to-Know Network (RTKNet) used TRI data in *The Right Stuff: Using the Toxics Release Inventory* (1995).	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-20, April 1997
	The organizations' publication *Where the Wastes Are* examines facilities receiving the largest quantities of shipments of TRI chemicals in waste.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-20, April 1997
Working Group on Community-Right-to-Know	The Working Group created a list of questions for concerned citizens, reporters, and other interested parties to ask corporations reporting reduced toxic chemical releases, to find out if the decrease is a "phantom reduction" due to a change in reporting procedure (e.g., acetone no longer being required for reporting) rather than a change in production practices.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997

User	Description	Reference
PUBLIC USE - National Organizations		
	The Working Group prepared a bibliography listing well over 100 state and local reports and more than 30 national TRI reports compiled by public interest groups.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-20, April 1997

User	Description	Reference
PUBLIC USE - Direct Negotiation		
Communities for a Better Environment, CA	In 1994, the organization targeted 16 facilities in California that failed to submit toxic release information of ozone depleting chemicals. In all but one settlement, industries agreed to phase out the chemicals and to donate funds to local community or environmental groups.	Selcraig, Bruce. "What You Don't Know Can Hurt You."Sierra Magazine. Jan/Feb, 1997
Communities for a Better Environment, Richmond, CA	The organization used TRI data to negotiate an agreement with General Chemical, which will fund a $15,000 study of public health, spend $100,000 on the surrounding neighborhood, pay for community's experts to do a safety audit of the plant, and then submit to binding arbitration should it disagree on safety recommendations made by those experts.	*A Citizen's Guide to Reducing Toxics Risks: Putting the TRI to Work!,* EPA 909-B98-001, Region 9 Cross Media Division, January, 1998
Consumer Policy Institute of Brooklyn, NY	The institute used 1988 TRI data to identify Ulano Corporation as the top industrial air toxic polluter in New York City, and launched a media campaign to pressure the state Department of Environmental Conservation (DEC) to take action. The DEC forced Ulano to use a new incinerator that reduced toluene emissions by approximately 95%.	Fung and O'Rourke, "Reinventing Environmental Regulations from the Grassroots Up," Environmental Management. Vol. 25, No. 2

User	Description	Reference
PUBLIC USE - Direct Negotiation		
Don't Waste Arizona	In 1996, the organization filed about 30 lawsuits against facilities for not submitting information on their toxic chemical releases. Facilities signed agreements to adopt P2 measures that resulted in significant reductions in toxic chemical releases.	*A Citizen's Guide to Reducing Toxics Risks: Putting the TRI to Work!,* EPA 909-B98-001, Region 9 Cross Media Division, January, 1998
Ecology Center, Ann Arbor, MI	The Center used TRI data to get commitments from the president of Auto Alliance International to embark on an aggressive solvent reduction program. The commitments improved air quality (fewer instances of noxious odors).	OMB Watch and the Unison Institute, "The Right Stuff: Using the Toxics Release Inventory."13 July 1995
MapCruzin	MapCruzin combines GIS technology with TRI data to let Santa Cruz residents and Silicon Valley residents find the exact location of businesses in their areas that report transfers and toxic chemical releases <www.mapcruzin.com/svtc_maps/ index.html>.	<www.mapcruzin.com/environmental_justice.htm>
Massachusetts Public Interest Research Group (MASSPIRG)	MASSPIRG used TRI data to target Raytheon, the state's largest emitter of ozone-destroying chemicals such as CFCs and methyl chloroform, in a public accountability campaign in 1990. MASSPIRG obtained a pledge from Raytheon to switch to water-based alternatives to CFCs.	Fung and O'Rourke, "Reinventing Environmental Regulations from the Grassroots Up," Environmental Management, Vol. 25, No. 2

User	Description	Reference
PUBLIC USE - Direct Negotiation		
Minnesota Citizens for a Better Environment	The organization released a report profiling the state's "top 40 toxic polluters" based on emissions of certain priority chemicals. TRI data were combined with other data to provide enough information to support local efforts to negotiate with facilities for emissions reductions. Since publication, activists have worked with 18 of the 40 facilities.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
Pennsylvania Public Interest Research Group (PennPIRG)	PennPIRG used TRI data to identify AK Steel Corporation as the source of nitrate loading of Connoquenessing Creek, a local water source. PennPIRG's report prompted the state to commit to reduce the amount of nitrates AK Steel is permitted to release into the creek.	<www.pennpirg.org>
Community Members of Mansfield, TX	Community Members of Mansfield used TRI data to negotiate permission to have its own experts perform regular environmental and safety audits of a local Rhone-Poulenc chemical plant.	Selcraig, Bruce. "What You Don't Know Can Hurt You."Sierra Magazine. Jan/Feb, 1997

User	Description	Reference
PUBLIC USE - Environmental Justice		
Asian Pacific Environmental Network (APEN)	APEN created a series of maps that combine TRI and demographic data through GIS. The maps show that many poor Asian and Pacific Islander communities live in toxic hot spots and are a powerful visual tool to raise awareness among community members about their environment and environmental justice.	*A Citizen's Guide to Reducing Toxics Risks: Putting the TRI to Work!,* EPA 909-B98-001, Region 9 Cross Media Division, January, 1998
Environmental Systems Research Institute	The institute used TRI data in a study that compared race, age, and income in areas that were near or far from airborne toxic chemical releases. The study used buffers, based on the toxin released, its quantity, and the atmospheric conditions present at the time of the release, to measure "nearness." Various maps created in the study help communicate results and explain spatial relationships.	"Toxics Releases and Demography in Minneapolis/St. Paul: A GIS Exploration." <www.esri.com/index.html>

User	Description	Reference
PUBLIC USE - Environmental Justice		
North Baton Rouge (LA) Environmental Association, Florence Robinson	The organization used TRI and U.S. Census data to demonstrate environmental racism in Cancer Alley, in testimony before the Civil Rights Association and at hearings on environmental justice for the Department of Environmental Quality.	OMB Watch and the Unison Institute, "The Right Stuff: Using the Toxics Release Inventory."13 July 1995
Residents of Louisiana's Mississippi River corridor, popularly known as "Cancer Alley" and Lake Charles regions of LA	The residents used TRI data (and ED's Scorecard web site) to show that poor and minority populations suffer from more environmental risks than the public at large. The residents published a report *Breathing Poison: The Toxic Costs of Industries in Calcasieu Parish, Louisiana*, which indicates the health risks to which the minority community might be exposed.	"Breathing Poison: The Toxic Costs of Industries in Calcasieu Parish, Louisiana." Residents of Calcasieu Parish, Louisiana
Sheppard, E.; Leitner, H; McMaster, RB; Tian, H. *Journal of Exposure Analysis and Environmental Epidemiology*	The authors used 1995 TRI and 1990 U.S. Census data for the City of Minneapolis, MN, to make a comparative evaluation of two commonly employed proximity measures in GIS-based environmental equity assessment and their influence on the results of the analysis. The authors proposed a methodology for evaluating the significance of these results.	Sheppard, E.; Leitner, H; McMaster, RB; Tian, H. "GIS-based Measures of Environmental Equity: Exploring Their Sensitivity and Significance." Journal of Exposure Analysis and Environmental Epidemiology, 9 Issue 1, p. 18-28

User	Description	Reference
PUBLIC USE - Environmental Justice		
Texas Network for Environmental and Economic Justice	The Network published *Toxics in Texas and Their Impact on Communities of Color*. The network used TRI and other data to document disproportionate environmental impacts on racial and ethnic minority communities in Texas.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
University of California, Los Angeles	The University found that low-income and Latino neighborhoods in Los Angeles County are more likely than other communities in the region to be near major sources of toxic air pollution.	Kolacovic, Gary. Los Angeles Times. October 18, 2001 <www.greenwire.com>
U.C. Santa Barbara, Center for Geographic Information and Analysis	The Center used 1989 TRI data and U.S. Census data to examine and map significant relationships between race and income populations and their proximity to TRI sites in Los Angeles.	<www.mapcruzin.com/scruztri/docs/seek55.htm>

User	Description	Reference
INDUSTRY USE - Cost Reduction		
Commonwealth Edison (ComEd), other companies	These companies have applied life-cycle costing methods to achieve significant savings. These steps resulted at least in part due to public awareness of the TRI and the addition of electric utilities to TRI. ComEd has saved over $25 million since the program's inception in 1993.	McDonnell, Jeff S., "The Toxics Release Inventory: A New Challenge for Electric Utilities," < www.battelle.org>
EPA Region III TRI workshop, 1997	Attendees provided reasons for undertaking waste reduction activities. Their most frequent reason given was cost reduction (98% of respondents).	EPA Region III TRI workshop, 1997
Florida Power and Light (FPL)	FPL created a recycling center to recover and sell a variety of scrap materials, due to public awareness of the TRI and the addition of electric utilities to the TRI. This center generates $1.8 million in profits annually.	McDonnell, Jeff S., "The Toxics Release Inventory: A New Challenge for Electric Utilities," <www.battelle.org>

User	Description	Reference
INDUSTRY USE - Cost Reduction		
Pine, J. *1997 Toxics Release Inventory and Right-to-Know Conference Proceedings*	Pine provided examples of how TRI information has helped companies develop waste reduction strategies. For example, Marathon Oil installed a thermal desorption unit to process oily waste and recovered over 120,000 barrels of oil; Georgia Gulf Corporation relocated a methanol stripper purge line that resulted in the recovery of 9,300 gallons of methanol that previously underwent biological waste treatment.	Pine, John. *1997 Toxics Release Inventory and Right-to-Know Conference Proceedings*
Various Companies, TRI Data Use Conference for 1993	Several corporations presented their experiences of how they reduced emissions and recognized P2 and cost saving opportunities through the EPA 33/50 program.	Various Companies, TRI Data Use Conference for 1993

User	Description	Reference
INDUSTRY USE - Public Relations Tools		
DuPont	DuPont lists TRI data on its web site and uses its progress in emissions reductions as a marketing tool.	<www.dupont.com>
Allegheny Energy and EPRI	As a result of public awareness of the TRI and the addition of electric utilities to the TRI, these two companies are coordinating their efforts to develop an approach for leveraging the utility-owned wetlands by selling conservation banking credits.	McDonnell, Jeff S. "The Toxics Release Inventory: A New Challenge for Electric Utilities." <www.battelle.org>
Boeing	Boeing uses TRI data to track the company's progress. The company continues to invest and innovate in P2 programs and find new ways to obtain greater leverage for current emission reduction programs. Boeing's overall emissions have decreased for more than a decade – more than 82% since 1991.	<www.boeing.com/companyoffices/aboutus/environment/eval_results.htm>
Eastman Chemical Company	Each of the company's four U.S. facilities has a Community Advisory Panel (CAP). In addition to other activities, the panel receives updates on TRI data. The CAP then uses the data to recommend process and waste management improvements and ways to present the data to the public.	Forrest, Carol J. "The TRI, P2, and Public Dialogue," Pollution Prevention Review, Winter 1995-96, p. 1

User	Description	Reference
INDUSTRY USE - Public Relations Tools		
Monsanto	Monsanto provides a web site similar to DuPont's (see above), including historical data for sites with over 100,000 pounds of toxic chemical releases.	<www.monsanto.com>
Polaroid	Polaroid used TRI data in its annual report to inform stockholders and the public of efforts they were making to reduce pollution.	OMB Watch and the Unison Institute, "The Right Stuff: Using the Toxics Release Inventory."13 July 1995

User	Description	References
INDUSTRY USE - Public Disclosure		
Chemical Emergency Preparedness and Prevention Office (CEPPO), U.S. EPA	CEPPO conducted a study to find out how the media affects industries and their emissions reductions. The office found that large polluters singled out by the media due to the public availability of TRI data have decreased their emissions by about twice the percentage as the overall average.	Chemical Emergency Preparedness and Prevention Office (CEPPO), U.S. EPA
Iowa Association of Business and Industry	The association coordinated a community-wide P2 initiative in the Des Moines-Polk County area. The association adopted goals of a 60% reduction of all TRI chemicals by 1992 and a 70% reduction by 1995.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997

User	Description	Reference
GOVERNMENT - Environmental Solutions		
Air Pollution Control Program of Missouri, Department of Natural Resources (DNR)	Missouri DNR used TRI data to check quality of their Missouri Emissions Inventory Questionnaire (EIQ) data. Missouri DNR was able to show that 2 facilities incorrectly reported emissions data on the EIQ.	E-mail from Giroir, Louis Eric, Toxicologist, Air Pollution Control Program, Missouri Department of Natural Resources to Katherine Jennrich, intern, Toxics Release Inventory Program Division, OPPT, June 13, 2000
Colorado Department of Public Health and the Environment, P2 Program	The Department used TRI and other data to identify the 10 industry groups responsible for the largest quantities of hazardous waste generation or toxic chemical releases in the state. This work will serve as the basis for establishing priorities for P2 activities and for distribution of technical assistance grants. It will also used to target large companies for participation in a Governor's P2 Challenge Program to reduce toxic emissions and hazardous waste generation.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
Indiana Governor's Office	The Indiana Governor's Toxics Reduction Challenge of 1998 gives publicity to companies meeting certain standards (i.e., reductions in toxic chemical releases).	<www.in.gov/idem/>

User	Description	Reference
GOVERNMENT - Environmental Solutions		
Louisiana's Environmental Leadership P2 Program	Louisiana used TRI data to track the progress of a statewide emissions prevention and reduction program that seeks a 45% reduction in toxic chemical releases by 1997, using 1992 data as a baseline. The Program sponsors the Governor Awards for Environmental Excellence to promote public recognition of industry achievements (U.S. EPA, 1993b).	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
North Carolina P2 Program	North Carolina uses TRI data to integrate multi-media toxic chemical release data into statewide waste reduction activities, such as technical assistance, grants, research, and demonstration projects.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997

User	Description	Reference
GOVERNMENT - Environmental Solutions		
States of Kentucky, Ohio, and West Virginia	The states jointly participated in a "Tri-State Initiative" to identify, prevent, and remediate environmental threats. Program coordinators use TRI data in their risk assessment process to focus on sources of greatest concern. The program will use voluntary industry commitments and cooperative efforts among industry, the public, and government to achieve reductions in TRI chemical and criteria air pollutant releases.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
States of Arkansas, Ohio, Oregon, and Washington	The states participated in the EPA Office of Solid Waste's Measurement Project, using TRI data in projects assessing P2 measurement at the facility level.	"Taking Stock" Commission for Environmental Cooperation (CEC)
U.S. EPA	The EPA 33/50 Program included 1200 companies that reduced emissions of 17 priority TRI chemicals from 1988 levels by 33% and 50% by 1992 and 1995, respectively. The program reached both goals a year early.	U.S. EPA's 33/50 Program, Office of Pollution Prevention and Toxics in the Office of Prevention, Pesticides and Toxic Substances

User	Description	Reference
GOVERNMENT - Environmental Targeting		
Florida Waste Reduction Assistance Program (WRAP)	WRAP uses TRI data to target facilities for the program, which answers facility requests to provide assistance in source reduction and waste minimization in the handling of TRI chemicals.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
Georgia Department of Natural Resources, P2 Division	Georgia used TRI data in the process of identifying the technical assistance needs of manufacturing sectors that generate chemicals posing the greatest relative risk to public health and the environment. The Division first prioritized chemicals, and then examined manufacturing sectors releasing the highest priority chemicals and identified particular subsectors for further assessment.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
Missouri Department of Natural Resources, Air Pollution Control Program (APCP)	APCP uses TRI data to identify air pollution sources that might have to comply with Maximum Achievable Control Technology (MACT) Standards. The Program also used TRI data to identify environmental "hot spots" in Missouri for community-based environmental project targeting.	E-mail from Giroir, Louis Eric, Toxicologist, Air Pollution Control Program, Missouri Department of Natural Resources to Katherine Jennrich, intern, Toxics Release Inventory Program Division, OPPT, June 13, 2000

User	Description	Reference
GOVERNMENT - Environmental Targeting		
New Jersey Department of Environmental Protection and Energy	New Jersey used TRI data in a computerized GIS to prioritize facilities and geographic areas for implementing P2 measures. The Department used minor watersheds to aggregate and map toxic chemical releases to water. The Department then grouped chemicals based on health and environmental effects to study the cumulative impact of many releases in the area.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
New York State Department of Environmental Conservation	New York State used TRI data to identify 400 facilities generating 95% of the state's toxic pollution for priority attention in multi-media inspection, enforcement, ongoing monitoring, and P2 planning.	"States as Innovators: It's Time for a New Look to Our 'Laboratories of Democracy' in the Effort to Improve Our Approach to Environmental Regulation." Alabama Law Review 347, p. 370-71 (1994)

User	Description	Reference
GOVERNMENT - Environmental Targeting		
U.S. EPA, Office of Enforcement and Compliance Assurance (OECA)	OECA uses TRI data as a tool in inspection targeting and enforcement and for cross-checking data from other sources. Enforcement personnel can use TRI data and the Facility and Company Tracking System (FACTS) to identify additional facilities owned by the same corporation or by the same parent company that might be subject to liability.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
U.S. EPA, Office of Enforcement and Compliance Assurance (OECA) (cont.)	OECA uses TRI data in its EPCRA Targeting System (ETS), which provides local access to TRI and FACTS data for all facilities subject to EPCRA section 313 requirements. ETS supports the creation of prioritized inspection targeting lists, generated from a wide array of selection criteria. It also supports daily targeting activities, such as contacting facilities and tracking tips and complaints. Nine out of ten Regional field offices currently use this new system.	as above

User	Description	Reference
GOVERNMENT - Environmental Targeting		
	OECA provides guidance to Regional field offices on the resources available to their inspectors in identifying non-reporters, later reporters, and data quality errors. These resources provide the inspectors with valuable information extrapolated from the TRI, such as facility reporting rates, processes, and toxic chemical releases.	as above
U.S. EPA, Office of Solid Waste and Emergency Response (OSWER)	OSWER uses TRI data when analyzing long-term trends and identifying particular industry practices that warrant attention by the Office. OSWER also uses TRI data when establishing liability under CERCLA and RCRA statutory authorities. TRI data can be used when developing emission inventories for the Superfund site discovery program and during preliminary assessments.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997

User	Description	Reference
GOVERNMENT - Environmental Targeting		
U.S. EPA, Office of Water Enforcement and Compliance (OWEC)	OWEC used TRI to identify industrial users with the greatest contribution of toxic pollutants to city sewer systems. The Office identified the industries and provided facility names to the Regions for further evaluation. OWEC also used TRI data to identify industrial users subject to pretreatment standards that are located in cities not required to have pretreatment programs.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
U.S. Occupational Safety and Health Administration (OSHA), local public health departments	OSHA and local public health departments requested identification of facilities in certain areas that release specific chemicals for the purpose of targeting exposure screening for facility employees.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997

User	Description	Reference
GOVERNMENT - Legislation and Regulations		
States of California, Delaware, Louisiana, New Jersey, and North Carolina	These and other states have used TRI to support the passage of stricter environmental legislation.	Fung and O'Rourke. "Reinventing Environmental Regulations from the Grassroots Up." Environmental Management, Vol. 25, No. 2
Illinois EPA, Bureau of Air	The Bureau uses TRI data to determine quantities of stack and fugitive air emissions of reported substances. This information supports continuing development of regulatory proposals in response to legislation passed in 1987 to address air toxics.	Dewulf, Cindy. "Utilization of Form R Data," TRI Contact for Ohio EPA
Louisiana State Legislature	TRI data supported the Legislature's actions to require the state DEQ to issue regulations identifying 100 priority pollutants, set emissions standards for those pollutants, and target a 50% emissions reduction from 1987 levels by 1994.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
Minnesota Legislature	The Minnesota Legislature amended the state's EPCRA in 1993 to expand TRI reporting requirements to non-manufacturing industries.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997

User	Description	Reference
GOVERNMENT - Legislation and Regulations		
North Carolina Environmental Management Commission	The Commission set limits for 105 pollutants after a public interest group published a report on unregulated air toxics emissions in the state.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
U.S. EPA, Office of Pollution Prevention and Toxics (OPPT), Pollution Prevention Division (PPD)	PPD used TRI data as a screening tool to prioritize proposed regulations and industrial source categories, to promote P2 in rulemaking. The P2 Senior Policy Council has identified a number of regulatory development efforts that should consider inclusion of P2 measures.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
U.S. EPA, Office of Water (OW)	OW used TRI data as one of several sources of information in developing regulations under section 316(b) regarding cooling water. The data were useful in identifying facilities to include in a nationwide list of facilities (i.e., the "sample frame") within several major industrial groups. OW used the list to select a random sample for survey.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997

User	Description	Reference
GOVERNMENT - Risk Assessment		
Kentucky Division of Environmental Services	Kentucky occasionally uses the TRI database when it makes determinations regarding risk assessments.	E-mail from Alex Barber to Katherine Jennrich, intern, Toxics Release Inventory Program Division, dated June 1, 2000
New York State Department of Health	New York State developed a risk screening protocol using TRI air release data and toxicity potency data to produce relative risk scores and rankings for facilities and chemicals within the state. Results suggested the need for more careful evaluation of health effects resulting from large releases of noncarcinogenic compounds.	Hazen, Susan B. "An Overview of Uses of the Toxics Release Inventory Data in the U.S." Environmental Assistance Division, OPPT, US EPA, 1995.
Oregon Department of Environmental Quality (DEQ)	Oregon relied on the TRI database to apply a computer model that evaluates cross-media impacts and ranks the relative risks to human health and the environment associated with pollutant discharges.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
U.S. EPA, Office of Enforcement and Compliance Assistance (OECA) and the Office of Research and Development (ORD)	OECA and ORD used TRI to develop a "Multi-Media Ranking System" to prioritize sites for enforcement actions and to evaluate the effectiveness of environmental laws in reducing risks from sites. The system ranks sites based on their multi-media releases of pollutants, their potential risk to human health and the environment, and the history of legal violations by the facility.	U.S. EPA, Office of Enforcement and Compliance Assistance (OECA) and the Office of Research and Development (ORD)

User	Description	Reference
GOVERNMENT - Risk Assessment		
U.S. EPA, Office of Health Research	The Office published a study of national and regional differences in county-level TRI air emissions according to the ethnicity or race and household income of the populations. Using the "Population Emissions Index," a population-weighted average emission for each county, the study found that all minority groups except Native Americans tend to live in counties where TRI toxic chemical releases levels are higher.	U.S. EPA, Office of Health Research
U.S. EPA, Office of Information Resources Management	The Office sponsored the development of a Population Estimation and Characterization Tool, which uses GIS technology and demographic data for risk-based and environmental justice applications. The tool allows users to estimate and characterize populations within a given radius of a single or multiple TRI facilities and to identify areas of potential multiple exposure to toxic chemical releases.	U.S. EPA, Office of Information Resources Management

User	Description	Reference
GOVERNMENT - Risk Assessment		
U.S. EPA, Office of Pollution Prevention and Toxics (OPPT), Existing Chemicals Program	OPPT uses TRI data for risk screening, determining testing needs and priorities, and considering and developing P2 activities. TRI data also serve as major inputs to exposure and risk assessments and are used in OPPT's outreach efforts in responses to inquiries from various sources.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
Environmental Assistance Division (EAD)	EAD developed software that contains health and ecotoxicity information on most section 313 chemicals. This software, called PC-TRIFACTS, was made available in January 1991. It enables the TRI data user to better understand the potential health and ecological effects of chemical activities identified in the TRI.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997

User	Description	Reference
GOVERNMENT - Quality Assurance and Control		
Missouri Department of Natural Resources (DNR), Air Pollution Control Program	Missouri compared fugitive and stack emissions reported to TRI with emissions data reported on the Missouri Emissions Inventory Questionnaire (EIQ), identifies facilities reporting incorrectly, and corroborates data.	E-mail from Giroir, Louis Eric, Toxicologist, Air Pollution Control Program, Missouri Department of Natural Resources to Katherine Jennrich, intern, Toxics Release Inventory Program Division, OPPT, June 13, 2000

User	Description	Reference
GOVERNMENT - Other Government Uses		
Illinois Department of Public Health	Illinois Department of Public Health requested and received TRI data to use as inputs into its Health and Hazardous Substances Registry.	Dewulf, Cindy. "Utilization of Form R Data," TRI Contact for Ohio U.S. EPA
Illinois EPA, Bureau of Land	Illinois EPA uses TRI data to identify toxic chemicals present at hazardous waste sites for a number of programmatic reasons.	Dewulf, Cindy. "Utilization of Form R Data," TRI Contact for Ohio U.S. EPA
U.S. EPA, Office of Enforcement and Compliance Assurance (OECA)	TRI data are included in the Integrated Data for Enforcement Analysis (IDEA) System, which combines TRI data with permit information from other databases. The public can access IDEA information for several industrial sectors and a subset of federal facilities through the Sector Facility Indexing Project (SFIP) web site <www.epa.gov/oeca/sfi>.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
U.S. Internal Revenue Service (IRS)	The IRS used TRI data to identify companies releasing CFCs in order to enforce a tax imposed on CFC releases.	Hazen, Susan B. "An Overview of Uses of the Toxics Release Inventory Data in the U.S." Environmental Assistance Division, OPPT, US EPA, 1995
West Virginia Division of Environmental Protection, Public Empowerment Program	West Virginia created a web site that includes TRI and other environmental, physical, and demographic data in an easy-to-use and format to increase the public's understanding of their communities through better access to information.	<www.dep.state.wv.us>

User	Description	Reference
INTERNATIONAL RIGHT-TO-KNOW		
Commission for Environmental Cooperation (CEC)	CEC releases *Taking Stock*, an annual sourcebook that uses TRI data to track the sources of industrial pollutants throughout the U.S. and Canada. Mexico is currently establishing an office to track toxic chemical releases.	<www.cec.org/takingstock/index.cfm?varlan=english>
	CEC correlated TRI data and the Canadian National Pollutant Release Inventory (NPRI) to give an overall view of releases and transfers of toxic chemicals across both countries. The CEC has developed a search engine that allows a user to search the TRI data and its Canadian equivalent.	<www.grconnect.com/querybuilder/index.php3?varlan=english&output=form>

User	Description	Reference
INVESTMENT		
Clean Yield Asset Management, New Hampshire	Clean Yield Asset Management compares companies' TRI release data to their industry averages of pounds of toxic chemicals per sales dollars. The firm uses this comparison to gauge how individual companies measure up against other companies in their industry. TRI data also allow Clean Yield Asset Management to track how a company's toxic chemical release performance improves from year to year.	OMB Watch and the Unison Institute, "The Right Stuff: Using the Toxics Release Inventory."13 July 1995
Green Century Funds	Green Century Funds offers socially responsible mutual funds and uses TRI data to track portfolio company performance.	<www.greencentury.com>
Investor Responsibility Research Center, Inc.	The Center has an Emissions Efficiency Index® based on TRI data that indicates which companies have a competitive edge in environmental performance.	*Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313,* p. 6-29, April 1997
	The Center uses TRI data in developing its *Corporate Environmental Profile Directory*, which presents quantitative, consistently-derived data that allows investors to evaluate and compare corporate environmental performance.	

User	Description	Reference
INVESTMENT		
Fortune magazine	The magazine used TRI data as a central element in compiling a "green index" of America's largest manufacturers by examining companies' environmental records and developing a relative ranking system that assigned companies scores from 0-10 in 20 categories.	Rice, Faye, 1993. "Who Scores Best on the Environment," Fortune, Vol. 128, No. 2 (July 26, 1993)
Neuberger and Bergman	Neuberger and Bergman use TRI data to screen socially-responsible portfolios.	Hendricksson, Marla, "Proof Positive: TRI Success Stories," Public Access Information, Vol. 3, No. 2
Vanderbilt University, Owen Graduate School of Management	Vanderbilt University used TRI data in separate studies showing that companies that engage in P2 activity have better stock values.	<http://mba.vanderbilt.edu/fmrc/pdf/wp9719.pdf>

User	Description	Reference
ACADEMIC - Research		
Drug and Chemical Toxicology	An article shows how utilizing air emission data (such as the TRI), air dispersion modeling, and GIS data enables public health professionals to identify and define the potentially exposed population, estimate the health risk burden of that population, and determine correlations between point-based health outcome results and estimated health risk.	Dent, A.L., D.A. Fowler, B.M. Kaplan, G.M. Zarus, W.D. Henriques. "Using GIS to Study the Health Impact of Air Emissions." Drug and Chemical Toxicology, 23, Issue 1, p. 161-178
Duke University, James Hamilton	Mr. Hamilton found that stock prices of companies that reported high emissions dropped measurably the day the TRI data were first released. Another study showed that pressure from communities and investors influenced firms to cut their toxic chemical releases.	Varon, Elena. "Power to the People." Federal Computer Week. March 30, 1998 <www.fcw.com>
Institute for Environmental Studies, University of North Carolina at Chapel Hill, Frances M. Lynn	The Institute conducted a national study of users of TRI data during 1991. The study provides evidence that the availability of TRI data has contributed to the ability of the right-to-know community to effect changes in behavior in 3 broad areas. Legislation or regulatory action was stimulated by efforts to use TRI data, source reduction activities had taken place, and the data's availability had prompted increased face-to-face meetings between community groups and industry.	Lynn, Frances. "The Toxics Release Inventory: An Evaluation of Use and Impact." Institute for Environmental Studies, UNC at Chapel Hill

User	Description	Reference
ACADEMIC - Research		
Madhu Khanna, Lisa Damon, Wilma Rose H. Quimio, Dora Bojilova - *Journal of Environmental Economics and Management*	*The Journal of Environmental Economics and Management* has published an article by Madhu Khanna and others that examines the potential of voluntary programs as instruments for regulating toxic releases as well as their role vis-à-vis mandatory regulations. Another study in the same journal examines investor reactions to the repeated disclosure of environmental information about firms in the chemical industry and the effectiveness of this information as a decentralized mechanism for deterring their pollution.	Madhu Khanna, Lisa Damon, Wilma Rose, H. Quimio, Dora Bojilova. "EPA's 33/50 Program: Impact on Toxics Releases and Economic Performance of Firms"
Louisiana State University, Paul Templet, Environmental Science Professor	Templet developed a method to evaluate the comparative effectiveness of pollution control strategies, policies, and programs by calculating an "emissions to jobs ratio," which is the number of pounds of emissions per job in a given industry and location. This ratio is compared to a national or other average to assess the job's standing. The ratio was used to modify tax exemptions granted to facilities to encourage and reward job creation.	Templet, Paul H., 1993. "The Emissions to Jobs Ratio," Environmental Science and Technology, Vol. 27, No. 5 (May)

User	Description	Reference
ACADEMIC - Research		
Lynn and Kartez, *Environmental Management*	Lynn and Kartez conducted a mail survey of active TRI users. The survey showed which data the respondents found most helpful and how they used the data (e.g., check emissions with permit records, identify source reduction opportunities, etc.). The authors wrote that the TRI promotes sound policy development by fostering dialogue among experts and the general public on how to most effectively control toxic emissions into the environment.	"Environmental Democracy in Action: The Toxics Release Inventory." Environmental Management, Vol 18
New York State School of Industrial and Labor Relations (NYSSILR), Cornell University, John Bunge	Bunge conducted a statistical analysis of TRI data to test the hypothesis: "Is formal employee involvement in source reduction associated with greater reduction in toxic releases?" The study found, for example, that manufacturers using a certain combination of three formal employee participation practices had triple the reduction in toxic chemical releases of manufacturers using none of these practices. The study also discussed competing predictors of source reduction and assessed future research directions.	Center for Advanced Human Resource Studies, New York State School of Industrial and Labor Relations. 1996. <www.cfe.cornell.edu/WEI/employee.html>.
Texas A&M	Texas A&M used TRI and RCRA data in a study of 58 landfills. The study determined that of 143 toxic chemicals found, 60 occurred in municipal waste samples, 31 in industrial waste landfills, and 39 in both.	Toxics Watch, 1995 <www.informinc.org/summaries_chem.php>

User	Description	Reference
ACADEMIC - Classroom Use		
JSI Center for Environmental Health Studies	The Center developed a curriculum for high school students to encourage participation in environmental assessment and protection. The TRI was an integral part of the students' research.	JSI Center for Environmental Health Studies: A Division of the JSI Research and Training Institute
Florida International University, Professor Robert Hognor	Professor Hognor used TRI data in classes in the Department of Business and Society. Students issued a report in 1994 on the impact of toxic chemicals in the Caribbean.	OMB Watch and the Unison Institute, "The Right Stuff: Using the Toxics Release Inventory."13 July 1995

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TRI Chemicals

The current TRI toxic chemical list contains 582 individually listed chemicals and 30 chemical categories (including 3 delimited categories containing 58 chemicals). If the members of the three delimited categories are counted as separate chemicals then the total number of chemicals and chemical categories is 667 (i.e., 582 + 27 + 58). This page contains links to information on TRI chemical lists, tri pbt chemicals, list changes, toxicity, regulatory program information, fact sheets, and chemical specific guidance documents.

Note: Three chemicals on the current list (methyl mercaptan, hydrogen sulfide, and 2,2-dibromo-3-nitrilopropionamide) are under administrative stays and are not currently reportable.

TRI Chemical Lists

- 2003 Reporting Year List of TRI Chemicals (PDF, 200KB)
- 2002 Reporting Year List of TRI Chemicals (PDF, 201KB)
- 2001 Reporting Year List of TRI Chemicals (PDF, 200KB)
- 2000 Reporting Year List of TRI Chemicals (PDF, 225KB)
- 1999 Reporting Year List of TRI Chemicals (PDF, 87KB)

PBT Chemicals

- TRI PBT Chemical Rules - Information on the rules which have lowered reporting thresholds for Persistent, Bioaccumulative, and Toxic (PBT) Chemicals.
- TRI PBT Chemicals List - List of TRI PBT chemicals extracted from Current List of TRI Chemicals.

TRI Chemical List Changes (1987- 2001)

- TRI Chemical List Changes (PDF, 26KB)
  EPA has made chemical list changes through the chemical petitions process and EPA-initiated review, therefore, the TRI list of reportable toxic chemicals can vary from year to year. The chemicals reportable in a given year are listed by the date of the reporting year. For information about the toxic effects of some of the TRI chemicals, see Toxicity Information, and for lists of regulations that cover some TRI chemicals, see Regulatory Program information.

Regulatory Program Information

- TITLE III List of Lists (PDF, 586KB)
  This is a consolidated list of chemicals subject to reporting requirements under Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) with references to their reporting status under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), The Resource Conservation and Recovery Act (RCRA), and Sections 302 and 313 of The Emergency Planning & Community Right-To-Know Act (EPCRA).

- Regulatory Matrix of TRI Chemicals in other Federal Programs (PDF, 183KB)
  A matrix has been developed for each TRI chemical indicating whether it is regulated under other selected environmental laws.

Toxicity Information

- Hazard Information on Toxic Chemicals Added to EPCRA Section 313 Under Chemical Expansion.
  This page provides summary hazard information on the 286 chemicals that were added to the Toxics Release Inventory in 1994. EPA has developed information summaries on 40 selected TRI chemicals to describe how you might be exposed to these chemicals, how exposure to them might affect you and the environment, what happens to them in the environment, who regulates them, and whom to contact for additional information.

- TRI Chemical Fact Sheets
  Chemical fact sheets for many of the TRI chemicals are available from the collection of New Jersey's Right to Know Hazardous Substance Fact Sheets.

- TRI Chemicals Classified as OSHA Carcinogens
  This is a list of TRI chemicals that are classified as carcinogens under the requirements of the Occupation Safety and Health Administration (OSHA) and, the basis of the classifications. OSHA carcinogens have a 0.1% de minimis concentration limit instead of 1%. Amounts of TRI chemicals present below the de minimis concentration limit in mixtures do not have to be included in threshold determinations or release and other waste management calculations.

- ATSDR TOXFAQS
  These are a series of summaries developed by the Agency for Toxic Substances and Disease Registry (ATSDR) that contain frequently asked questions about the health effect for 60 hazardous substances. About 50 of these chemicals are also TRI chemicals.

Source: http://www.epa.gov/tri/chemical/index.htm

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Environmental Protection Agency

Office of Pollution
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Washington, DC 20460

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EPCRA Section 313 Questions and Answers

Revised 1998 Version

Q&A

Section 313 of the Emergency Planning and Community Right-to-Know Act

Toxic Chemical Release Inventory

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INTRODUCTION

The Environmental Protection Agency (EPA) has prepared this 1998 EPCRA Section 313 Questions and Answers Document to help clarify the reporting requirements under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA, or Title III of the Superfund Amendments and Reauthorization Act of 1986, Public Law 99-499). The EPCRA Section 313 program is also referred to as the Toxics Release Inventory or TRI. This document supersedes all previous versions of the EPCRA Section 313 Question and Answer Document. Use this document as guidance beginning with the 1999 reporting year for reports due July 1, 2000.

This manual is intended solely for guidance and does not alter any statutory or regulatory requirements. The document should be used in conjunction with the statute and regulations but does not supersede them. The guidance provided in this document addresses the very specific circumstances stated in each question. Accordingly, the reader should consult other applicable documents (e.g., the statute, the Code of Federal Regulations (CFR), relevant preamble language, and the current Toxic Chemical Release Inventory Reporting Forms and Instructions).

Under Section 313, *facilities* are required to report *releases* and other *waste management* of specifically listed chemicals. They also are required to report transfers of *toxic chemicals* for *waste management* to off-site locations. *Facilities* that meet all three of the following criteria are subject to EPCRA Section 313 *release* and other *waste management* reporting:

- the *facility* has 10 or more *full-time employees*;
- the *facility* has a primary *Standard Industrial Classification (SIC) code* in any of the groups listed in the table on the following page; and
- the *facility manufactured* (defined to include *imported*), *processed*, or *otherwise used*, in the course of a calendar year, any *toxic chemical* in quantities greater than the set threshold.

Reports under Section 313 (EPA Form R or Form A) must be submitted annually to EPA and to designated *State* (or Tribal) agencies. Reports are due by July 1 of each year and cover activities at the *facility* during the previous calendar year.

The Agency developed this document to facilitate *facility* reporting and to provide additional explanation of the reporting requirements. This document supplements the instructions for completing the Form R and the Alternate Threshold Certification Statement (Form A). Terms printed in italics in the text of this document are defined in the glossary in Appendix B to this document.

Copies of EPA's Form R, instructions for completing the Form, and related guidance documents are available from the National Center for Environmental Publications and Information (NCEPI), P.O. Box 42419, Cincinnati, Ohio 45242-2419. Additional information may be obtained by accessing EPA's TRI Homepage on the Internet at http://www.epa.gov/opptintr/tri or calling the EPCRA Hotline at (800) 424-9346. In the Washington, D.C. area call (703) 412-9810.

The questions and answers in this document are organized in sections as listed in the table of contents on the following pages. There is also an expanded keyword index at the end of this document. The terms in the index are also found in the sidebar of the document near relevant questions.

STANDARD INDUSTRIAL CLASSIFICATION (SIC) GROUPS SUBJECT TO EPCRA SECTION 313

SIC	Industry Group
10* (except 1011, 1081, and 1094)	Metal Mining
12* (except 1241)	Coal Mining
20	Manufacturing
21	Tobacco
22	Textiles
23	Apparel
24	Lumber and Wood
25	Furniture
26	Paper
27	Printing and Publishing
28	Chemicals
29	Petroleum and Coal
30	Rubber and Plastics
31	Leather
32	Stone, Clay, and Glass
33	Primary Metals
34	Fabricated Metals
35	Machinery (excluding electrical)
36	Electrical and Electronic Equipment
37	Transportation Equipment
38	Instruments
39	Miscellaneous Manufacturing
4911, 4931, 4939* (limited to facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce)	Electric Utilities (electric services), Electric Utilities (electric and other service combined), electric utilities (combination utilities, not elsewhere classified)
4953* (limited to facilities regulated under the Resource Conservation and Recovery Act, Subtitle C, 42 U.S.C. section 6921 et seq.)	Commercial Hazardous Waste Treatment
5169*	Chemical and Allied Products Wholesale
5171*	Petroleum Bulk Terminals and Plants
7389* (limited to facilities primarily engaged in solvent recovery services on a contract or fee basis)	Solvent Recovery Services

*Coverage Started January 1, 1998.

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Section 1. DETERMINING WHETHER OR NOT TO REPORT: FACILITY

A. Types of Facilities That Must Report

Reporting Criteria

1. What *facilities* are subject to EPCRA Section 313 reporting?

Facilities must report *release* and other *waste management* information pursuant to EPCRA Section 313 if they: (1) have 10 or more full-time employees or the equivalent; (2) are in a *covered SIC code*; and (3) exceed any one threshold for *manufacturing* (including *importing*), *processing*, or *otherwise using* a *toxic chemical* listed in 40 CFR Section 372.65.

Reporting Criteria, Form R, Form A, Alternate Threshold

2. Is a *facility* which meets the employee and *toxic chemical* activity thresholds and is in a *covered SIC code*, as described in question one, required to report if it had no *releases* of the *toxic chemical* during the reporting year?

Yes, even if it *release*s no *toxic chemicals* into the *environment* and does not conduct any other *waste management* activities involving the listed *toxic chemical*, the *facility* must submit either the Form R or Form A (Alternate Threshold Certification Statement). If the *facility* meets the employee and chemical activity thresholds and is in a *covered SIC code*, but its annual reportable amount of the *toxic chemical* does not exceed 500 pounds and the *facility* has not *manufactured*, *processed*, or *otherwise used* more than one million pounds of the *toxic chemical*, the *facility* may submit the Form A (a two-page certification statement) instead of the Form R. However, if the *facility* exceeds either the 500 or one million pound limits, it must report on the Form R. (See Section 5A of this document on Alternate Threshold Reporting.)

Reporting Criteria, Facility Closure

3. Must the Form R report be submitted by July 1 for *facilities* that were in operation during part of the reporting year, but which were closed by December 31?

Yes. A *facility* that operated during any part of a reporting year must report if it meets the SIC code, employee, and chemical activity thresholds for that reporting year.

SIC Code, Definition of Facility, Vessels

4. In Alaska several fish processors have factories on ships. They use ammonia and chlorine in their fish processing operations. Is each ship a *covered facility* under Section 313 or is the whole group of ships (all of which belong to one company) a *covered facility*?

A *facility* is defined as all buildings, equipment, structures, and other stationary items which are located on a single site or adjacent or contiguous sites owned or operated by the same person (40 CFR Section 372.3). A ship

is not a *facility* as defined under the Section 313 regulations. It is not stationary and it is not located on a single site (if it moves to other locations). Therefore, the ships should not report even if they are in a *covered SIC code*.

Definition of Facility, Facility Construction

5. A recently constructed *facility* which has not begun production but is in a *covered SIC code* has used several listed *toxic chemicals* in preparing a reactor bed and distillation columns for manufacturing. Is the *facility* required to report these chemicals if they exceed the threshold levels?

Yes. Once a *covered facility* has been constructed, any *toxic chemicals* used to prepare production equipment for manufacturing activities must be included towards the threshold determinations that reporting year. This includes start-up activities.

Definition of Facility, Pipeline

6. A covered petroleum company sends its hazardous waste containing a Section 313 *toxic chemical* to a land treatment unit by underground pipeline. The petroleum company and the land treatment unit are owned and operated by the same individual. The land treatment unit is not adjacent nor contiguous to the petroleum company, but the petroleum company maintains a "right-of-way" of the pipe-line. Are these two *facilities* under EPCRA Section 313?

Since the land treatment unit is not adjacent nor contiguous to the petroleum company and they are connected only by a pipeline, the two are considered two separate *facilities* with the same owner/operator, even though the petroleum *facility* controls "right of way" of the pipeline. However, *releases* and other *waste management* activities associated with loading or unloading activities or leaks from a pipeline within either *facility* would be covered.

Definition of Facility, Pipeline

7. Two covered bulk petroleum stations owned by the same parent company, but a considerable distance apart from each other, are connected to each other by a pipeline. The parent company has an easement to access the pipeline but the land on which the pipeline rests is not owned by the parent company. The easement only allows the parent company to conduct repairs on a sporadic basis. The parent company has no other rights to the land and does not exert any other control over the land. For the purposes of reporting on the Form R, are the two stations considered two separate *facilities*?

Yes. Since the two bulk petroleum stations are not contiguous or adjacent properties and are connected only by a pipeline, the two stations are considered two separate *facilities* with the same owner. The parent company has an easement on which the pipeline is located, but does not control, operate, or own the land on which the pipeline rests to an appropriate degree.

Definition of Facility, Contiguous/ Adjacent

8. A company houses all of its operations including its manufacturing processes in a leased warehouse that is neither contiguous nor adjacent to the *facility*. In June, it bought a different warehouse and moved the manufacturing operations there. These two locations are neither adjacent nor contiguous. The company did not shut down or close during this time. How should the company make threshold determinations and report for Section 313?

Because the operations were carried out at two distinctly separate, physical sites, the company operated two separate *facilities*. The owner/operator of the company, therefore, must make threshold determinations and *release* and other *waste management* calculations individually for each *facility*. The company need only file Form Rs for the *facility*(*ies*) that exceeded the reporting thresholds during the reporting year. If independently both *facilities* meet the reporting criteria, the company must submit the appropriate forms for each *facility*.

Definition of Facility, Distinction of Owner/ Operator

9. Two distinct SIC code operations that are covered under EPCRA Section 313 (e.g., an electricity generating unit and a cement plant) are located on adjacent properties and are owned by the same parent company. The two operations are operated completely independently of one another (e.g., separate accounting procedures, employees, etc.). Are these two operations considered one *facility* under EPCRA Section 313?

Yes. Under EPCRA Section 313, a *facility* is defined as, "all buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person." Because these two operations are located on adjacent properties and are owned by the same person they are considered one *facility* for EPCRA Section 313 reporting purposes.

SIC Code

10. *Facilities* in the scrap and waste materials businesses are in SIC Code 5093, indicating that they assemble, shred, sort, melt, and wholesale scrap metal ingots and waste materials. When they landfill residuals, a small volume of air pollutants are generated. How extensive will the reports be for such operations?

Such scrap metal processing *facilities* are not currently covered by Section 313 reporting requirements if their primary SIC codes are in 5093.

SIC Code, Solvent Recovery

11. Is a mobile solvent recovery unit within the solvent recovery SIC code?

Yes. If the owner or operator of a mobile solvent recovery unit conducts solvent recovery services on a contract or fee basis, it is in SIC code 7389—the solvent recovery SIC code.

SIC Code

12. Is an automobile proving ground *facility* subject to reporting under Section 313?

Provided the automobile proving ground is not an auxiliary *facility*, the SIC code for "automobile proving and testing grounds" is 8734. It, therefore, is not within a *covered SIC code* and would not need to report under EPCRA Section 313.

SIC Code, Activity Restricted to Company

13. Does a *facility* that is subject to RCRA Subtitle C, and just happens to manage waste generated by facilities within the same company, fall within the *covered SIC code* range for EPCRA Section 313 reporting?

Waste treatment facilities are classified in SIC code 4953--Refuse Systems, which includes such activities as hazardous waste treatment and *disposal* sites. Hazardous waste treatment *facilities* that are regulated under the Resource Conservation and Recovery Act, subtitle C, 42 U.S.C. Section 6921 et seq. were added in the final rule published on May 1, 1997 (62 FR 23833). Provided that the *facility* is classified within SIC code 4953 or another covered SIC code and meets the employee requirement, the *facility* would be required to consider its chemical management practices for purposes of EPCRA Section 313 reporting. A *facility's* SIC code classification is not necessarily affected because it limits activities to *facilities* within the same company.

Reporting Criteria, SIC Code

14. I run a trucking company and all I do is pick up the chemicals at the vendor and take them to the customer. Must I report under Section 313?

Trucking companies are generally not in a *covered SIC code*. If you are not in a *covered SIC code*, then you are not required to report under Section 313.

SIC Code, Reporting Responsibility

15. Is a *waste management facility* that is classified in SIC code 4953 (Refuse Systems), but is not regulated under Subtitle C of the Resource Conservation and Recovery Act (RCRA), subject to EPCRA Section 313?

No. Facilities in SIC code 4953 are only subject to EPCRA Section 313 if they are also regulated under RCRA Subtitle C. Many types of *waste management* facilities operate within SIC code 4953 that are not regulated under the RCRA Subtitle C programs, such as sanitary landfills, garbage collection, and street refuse systems, which were not added under EPCRA Section 313 by the May 1, 1997, final rule.

SIC Code, Reporting Responsibility

16. The final rule on *facility* expansion created regulatory language in 40 CFR Section 372.22(b) that limits the coverage of electricity generating *facilities* to those that operate in SIC codes 4911, 4931, and 4939 and specifically to those "*facilities* that combust coal and/or oil for the purpose of generating power for distribution in commerce." Based on

this regulatory language, are electricity generating *facilities* that only use coal and/or oil to test backup generators considered *covered facilities* for EPCRA Section 313 reporting?

No. Use of oil or coal for purposes of testing, (e.g., testing safety equipment at nuclear facilities) would not constitute a use of oil or coal for purposes of generating power for distribution in commerce. However, if a *facility* intentionally generates excess power during the testing operations for the purpose of distributing it in commerce, the *facility* would be "covered." In fact, if the *facility* is intentionally generating electricity for distribution in commerce, provided that the *facility* meets the chemical activity and employee thresholds, the *facility* would be considered "covered" even if only a small amount of fuel oil used.

SIC Code, Form R Revisions

17. A *facility* whose SIC code is outside the *covered SIC codes* believes that their current SIC code is misrepresentative of the *facility's* activities. In actuality, the *facility* may be better represented by an SIC code within the *covered SIC codes*. If the *facility* changes its SIC code to a covered group, should they back report for previous reporting years under EPCRA Section 313?

If the *facility* has not altered its operations and should have been classified in a *covered SIC code* and has met the threshold and employee criteria, it is required to report for all the previous years under EPCRA Section 313. If the mix of activities at the *facility* shifted from non-covered to *covered SIC codes*, then it should begin reporting for the year in which the change occurred.

SIC Code, NAICS

18. Effective January 1, 1997, the Office of Management and Budget adopted the North American Industry Classification System (NAICS), a new economic classification system that replaces the 1987 Standard Industrial Classification (SIC) system (62 FR 17228; April 19, 1997). How will EPA update its EPCRA Section 313 regulations to reflect this change?

EPA will be addressing this SIC code change, as it relates to EPCRA Section 313, in an upcoming Federal Register notice.

Fuel, Electricity Generating Facility, Kerosene, Coal or Oil

19. An electricity generating *facility* (EGF), in SIC code 4911, combusts kerosene for the purpose of generating power for distribution in commerce. Is the *facility* subject to EPCRA Section 313?

Yes. Under the rule that expanded the industry sectors (May 1, 1997; 62 FR 23834) that must report under EPCRA Section 313, electricity generating *facilities* (EGFs) in SIC codes 4911, 4931, or 4939 that combust coal and/or oil for the purpose of generating power for distribution in commerce are

subject to EPCRA Section 313 reporting requirements, provided that the other threshold criteria are met. Pursuant to this expansion, kerosene (as well as petroleum coke) is an oil.

Electricity Generating Facility, Oil-contaminated Debris, Coal or Oil, Fuel

20. A *facility* in SIC code 4939 combusts refuse-derived fuel. During the reporting year, the *facility* combusts small amounts of oil-contaminated debris to produce electricity for distribution into commerce. Is the *facility* covered by EPCRA Section 313?

No. *Facilities* in SIC codes 4911, 4931, or 4939 are only covered by EPCRA Section 313 if they combust coal and/or oil for the purpose of generating power for distribution in commerce. "Coal and/or oil" does not include non-hazardous oil-contaminated debris. Since the *facility* is in SIC code 4939, but does not combust coal or oil, it is not covered by EPCRA Section 313.

B. Employee Threshold

Employee Threshold, Contractor Hours

21. When should an individual's time spent working for a *facility* be counted for purposes of determining whether or not a *facility* exceeds the 20,000-hour employee threshold?

If an individual is employed by the *facility* or by the *facility's* parent company to work for the *facility*, then all of the hours worked by the individual for the *facility* should be counted toward the 20,000-hour employee threshold. For example, a headquarters engineer spends most of her time at headquarters, but some of her time is spent at a *covered facility*. The time the engineer spends at the *covered facility* and the time the engineer spends working for the *covered facility* while at headquarters should be included in the *facility's* employee threshold determination. If the individual is hired by the *facility* (or by the *facility's* parent company) as a contractor to work at the *facility* and is based at the *facility*, then all hours worked by the contractor should be counted. If the individual is not an owner, contractor, nor an employee of the *facility*, then the individual's time spent working at the *facility* should not be counted toward the 20,000-hour employee threshold. For example, the time spent by individuals who are performing intermittent service functions at the *facility*, such as municipal trash collectors or the electric utility company repairing power lines, should not be counted.

Employee Threshold, Vacation Hours, Sick Leave

22. Under the Section 313 regulations, a *full-time employee* is defined to "...mean 2,000 hours per year of full-time equivalent employment." The definition of *full-time employee* goes on to stipulate that "(a) *facility* would calculate the number of *full-time employees* by totaling the hours worked during the reporting year by all employees including contract employees and dividing the total by 2,000 hours" (40 CFR Section 372.3). (It follows that 20,000 hours worked is equivalent to 10 *full-time employees*.) When calculating the total number of hours worked by all employees during the reporting year should vacation and sick leave used be included toward the 20,000 hour threshold?

Yes. When making the *full-time employee* determination the *facility* should consider all paid vacation and sick leave used as hours worked by each employee who claims such vacation or sick leave. If the *facility* meets or exceeds the 20,000-hour threshold (including vacation and sick leave), the *facility* is considered to have 10 or more *full-time employees*.

Employee Threshold, Paid Holidays

23. Must paid holidays be included in an owner's employee threshold calculation?

Yes. Paid holidays need to be included in the owner's employee threshold calculation.

Employee Threshold, Part-Time Employee, Full-Time Employee

24. Would a *facility* with nine *full-time employees* and four part-time employees be required to report under Section 313?

The total hours worked by all employees should be reviewed. A *full-time employee* is defined on a time equivalent basis of 2,000 labor hours per year (40 CFR Section 372.3). If the total hours worked by all employees at a *facility*, including contractors, is 20,000 hours or more, the criterion for number of employees has been met. Therefore, if combined, the 13 employees of the *facility* worked 20,000 hours or more, the *facility* has satisfied the employee threshold.

Employee Threshold, Full-Time Employee

25. A manufacturing *facility* has 8 employees. Each employee worked 2,500 hours in the reporting year. Consequently, the total number of hours worked by all employees at this *facility* is 20,000 hours. How should the *facility* determine whether it meets the 10 *full-time employee* threshold for purposes of reporting under Section 313?

One *full-time employee* is equal to 2,000 hours (40 CFR Section 372.3). The number of *full-time employees* is determined by dividing the total number of hours worked, 20,000, by 2,000 hours, or 10 *full-time employees*. Therefore, even though only eight persons worked at this *facility*, the number of hours worked is equivalent to 10 *full-time employees* and this *facility* has met the employee criterion.

Employee Threshold, Full-Time Employee

26. Is an "employee" a group of people who work 2,000 hours per year (such as three people who work 1/3 time) or is it one person who works full-time?

An "employee" can be either a single person or a group of people, including the owner. The regulatory criterion is that the total hours worked by all employees is equal to or greater than 20,000 for that reporting year at the *facility*.

Employee Threshold, Sales Staff

27. Does the *full-time employee* determination include the hours worked by sales staff whose office is included in the same building as the production staff?

Yes. All persons employed by a *facility* regardless of function (e.g., sales, clerical) or location count toward the employee threshold determination (40 CFR Section 372.22(a)).

Employee Threshold, Maintenance Staff

28. An electricity generating *facility* has maintenance staff for maintaining the electricity distribution system. Staff are based on-site. When counting the hours of this staff, the electricity generating *facility* is over the 20,000 hours or 10 FTE (*full-time employee*) threshold. Without counting the management staff hours, the electricity generating *facility* falls below the 20,000 hours or 10 FTE threshold. Because these hours are not directly in support of the electricity generating portion of the *facility* (i.e., they are in support of the distribution system), do they count toward the 20,000 hours or 10 FTE threshold?

Yes. Hours worked by employees who support the distribution system must be included in the *facility's* employee determination. All of the hours worked by all employees based at a *covered facility* must be considered toward the *facility's* employee threshold, regardless of whether the activities they perform are associated with covered activities.

Employee Threshold, Truck Drivers

29. The employee threshold under Section 313 is 10 *full-time employees* or the equivalent, 20,000 work hours/year. This includes all sales staff, clerical staff, and contractors. Would this also include delivery truck drivers who returned to the *facility* only to pick up a shipment and then leave again?

If the truck drivers are employed by the *facility* or the *facility's* parent company, and paid by the *facility* or by the parent company, then they are employees of the *facility* and would be factored into the employee threshold. If they are based at the *covered facility*, all of the hours worked by the truck drivers for the *facility* are counted towards the employee threshold. If the truck drivers are not based at the *covered facility*, then only their time spent servicing the *covered facility* is considered towards the employee threshold. However, *facilities* are not required to count hours worked by contract drivers.

Employee Threshold, Truck Drivers

30. A *facility* employs drivers to pick up and deliver its products. Some of the drivers use the *facility*'s trucks, while other drivers use trucks not owned by the *facility*. Should the *facility* count all driver hours towards its employee threshold, regardless of whose trucks the drivers use?

Yes. Hours worked directly for the *facility* by drivers that are employed by the *facility* are counted, regardless of whose truck they use.

Employee Threshold, Off-site Employees

31. Facility A manufactures and sells machinery. Facility A sends employees to customers' sites to repair and service the machinery. These employees are not based at Facility A. For example, some of the employees pick up company vehicles and needed supplies from rented property before going to the client's site. Facility A also has employees who work directly for the *facility*, but work entirely from their homes. Should Facility A consider hours worked by these employees in making the employee threshold determination?

Yes. If an individual is employed by a *covered facility* and works for the *covered facility*, then all hours worked by that individual must be counted towards the 20,000 hour employee limit, regardless of where the employee works (i.e., on-site or off-site).

Employee Threshold

32. A *facility* covered under EPCRA Section 313 has nine full-time employees and one part-time employee. The *facility* also has an employee who works at the *facility*, but does not draw a salary. Should the hours worked by the employee who does not draw a salary be counted towards the employee threshold for the *facility*?

Yes. Even though the employee does not draw a salary, he/she is still working for the *facility*. Therefore, the employee's hours must be counted towards that *facility's* employee threshold.

Employee Threshold, Off-site Employees

33. Does Facility A need to include in its employee threshold (10 FTE/ 20,000 hours) determination sales representatives that work for Facility A but are never/rarely physically working at Facility A?

Yes. For purposes of determining the EPCRA Section 313 employee threshold, employee hours for employees that directly support the *facility*, should be included in the employee calculation for the *facility*. Therefore, if the hours spent by sales staff directly support a *facility*, then their hours should be allocated to the *facility* they directly support, regardless of the amount of time those employees are physically at the *facility*.

Employee Threshold, Corporate Employees

34. A *covered facility* that is part of a larger corporate entity has corporate employees located on-site. These employees do not directly support the activities that are conducted at the *facility* where they are located; rather, their time is spent working for that *facility* as well as for other facilities that are part of the same corporate entity. Does the *facility* where these employees are located have to count the hours worked by these employees toward its employee threshold?

Yes. The *facility* where these employees are located should count the hours worked by them toward the *facility*'s employee threshold, unless the *facility*'s time keeping system allows it to track the time worked by these employees according to the actual *facility* for which they are working. If a *facility* can demonstrate through time keeping records that the time worked by these employees was in support of another *facility* within the same corporate entity, then it does not have to count the hours worked by these employees towards its own employee threshold. The *facility* that these employees directly support would have to count the hours toward its employee threshold.

Employee Threshold, Facility Owner

35. If an individual both owns and works at a *facility*, how should the owner's time be accounted for when determining whether or not the *facility* exceeds the 20,000 hour employee threshold?

The owner must be counted as the equivalent of a *full-time employee* of the *facility* and his/her hours must be applied toward the 20,000 hour employee threshold.

Employee Threshold, Facility Owner, Profit Share

36. The owner of a *covered facility* does not work at the *facility* but draws an income from profit sharing. Would he/she be considered an employee according to the definition under EPCRA Section 313 (40 CFR Section 372.3)?

No. If the owner of the *facility* does not work at the *facility* and only draws a profit share, the owner is not considered an employee and the reporting *facility* will not count the owner towards the employee threshold.

Employee Threshold, Permanent Disability

37. A *covered facility* under EPCRA Section 313 has nine *full-time employees*. The *facility* also has one paid employee who is on permanent disability. Should the *facility* include this employee in their employee threshold determination (40 CFR Section 372.22(a))?

No, the *facility* does not have to include the disabled employee when determining their employee threshold. The employee would be considered the equivalent of a retired employee.

Employee Threshold, Contractors

38. A *facility* employs several contractors for various types of work, on-and off-site. Which contractors should the *facility* consider in its employee threshold determination?

The *facility* must include maintenance contractors, such as those for general building structure maintenance, process equipment maintenance, and lawn care, in its employee threshold determination. Major contractors for services such as tank building/wrecking and tank painting are also included in the employee threshold. The *facility* should not include hours worked by minor on-site intermittent service vendors such as trash haulers, vending machine servicers, and service repair persons for utility-owned equipment that are not employed by the *covered facility*.

Employee Threshold, Contractors

39. An *establishment* leases one acre of land adjacent to the reporting *facility* from a three-acre strawberry farm. The *facility imports* and repackages methyl bromide for sale and distribution. Does the *facility* have to include the strawberry pickers when determining whether the 10 full-time employee equivalent criterion applies?

The reporting *facility* should not tabulate the hours worked by farm workers it does not pay. If, however, the reporting *facility* actually employs or contracts with these farm workers then the hours worked on-site by these workers would count towards the 10 *full-time employee* equivalent (40 CFR Section 372.3).

Employee Threshold, Contractors

40. A manufacturing company that normally employs only four employees hires a construction company to modify its *facility*. The construction workers are employees of the construction company and worked on-site for several months. Do the hours worked by the construction workers count toward the 10 or more *full-time employee* threshold (20,000 hours of work)?

Yes. The hours these contract employees worked on-site or off-site for the *facility* must be counted toward the 20,000-hour threshold (40 CFR Section 372.3). In general, a contract employee is a person working on-site or off-site for the *facility* under a specific contractual agreement performing specific tasks or services for the *facility*, except intermittent service vendors.

Employee Threshold, Truck Jobbers

41. A petroleum bulk terminal contracts with truck jobbers who purchase its petroleum products. The terminal has no direct control over the activities of the truck drivers. Are the hours worked by these jobbers and their drivers at the petroleum terminal counted towards the terminal's employee threshold calculation?

No. The hours worked by the truck jobbers do not directly support the terminal. The jobbers purchase the petroleum products and function as customers to the terminal. However, the petroleum bulk terminal must consider these activities toward its *processing* threshold.

Employee Threshold, Contractors, Multi-establishment

42. Should contractors who construct dikes, clean tanks, and perform inventory control activities conducted off-site, and who are all performing process-related activities in support of a *covered facility*, be included in the employee threshold determinations?

Yes. The hours worked on- or off-site by any contract employee for the *facility* must be counted toward the 20,000-hour threshold. *Facilities* should keep records that identify all hours employees or contract employees work in support of *facilities*. EPA describes a contract employee as a person working on-site or off-site for the *facility* under a specific contractual agreement

performing specific tasks or services for the *facility*, except intermittent service vendors such as trash pick-up.

Multi-Establishment, Joint Venture, Facility-Definition of, Electricity Generating Facility

43. Electricity generating unit 1 (EGU 1) is subject to EPCRA Section 313 and is owned by Company A. EGU 2 is also subject to EPCRA and is adjacent to EGU 1. EGU 2 is owned by a joint venture, 80 percent of which is owned by Company A and 20 percent of which is owned by Company B. Are EGF's 1 and 2 two separate *facilities* for the purpose of EPCRA Section 313?

No. Because Company A owns the majority share in the joint venture, Company A owns EGU 2 and therefore owns EGUs 1 and 2. Because EGU 1 and 2 are adjacent to one another and have the same owner, they constitute one *facility*. As one *facility*, the owner or operator should consider the *toxic chemicals* and operations at both *establishments* for threshold determinations and *release* and other *waste management* calculations.

Employee Threshold, Facility Closure

44. A manufacturing *facility* was shut down on January 30. Between January 1 and January 30, the *facility manufactured* a *toxic chemical* in excess of 25,000 pounds, and 10,000 hours were worked at the *facility*. After the *manufacturing* activities ceased on January 30, six employees remained to work on electrical wiring and warehouse activities. For purposes of reporting under EPCRA Section 313, does the *facility* have to add the working hours of the 6 employees to the 10,000 hours worked during January 1996 in order to determine if 20,000 hours or more were worked at the *facility* during reporting year?

Yes. In calculating the working hours, the manufacturing *facility* has to include the employees who worked after the *facility* ceased actual *manufacturing* operations regardless of the type of work they did (the number of hours worked do not necessary correlate directly to the *manufacturing* activities). If, during the reporting year, the total working hours at the *facility* is equal to or in excess of 20,000 hours, the *facility* owner/operator is subject to reporting for that reporting year (40 CFR Section 372.22).

Employee Threshold, Overtime

45. How does a *facility* consider overtime worked by full-time employees?

For purposes of determining the *facility*'s employee threshold, the actual number of hours worked are considered and, therefore, the *facility* should count the overtime hours for any employee that directly supports the *facility*.

C. Persons Responsible for Reporting

Reporting Responsibility, Owner/ Operator

46. Is the owner or the operator of a *covered facility* responsible for reporting?

Both the owner and the operator are subject to the Section 313 reporting requirements. If no reports are received from a *covered facility* both persons are liable for penalties, provided that the *facility* was required to file a Form R or the Alternative Certification Statement (Form A). As a practical matter, EPA believes that the operator is more likely to have the information necessary for reporting.

Reporting Responsibility, Change of Ownership

47. Who is obligated to file Form Rs for a given reporting year if the *facility* has changed ownership during the year? Would both owners be obligated to file separate Form Rs for that year?

The owner/operator of the *facility* on the annual July 1 reporting deadline is primarily responsible for reporting the data for the previous year's operations at that *facility*. Any other owner/operator of the *facility* before the reporting deadline may also be held liable. The reports submitted must cover the full reporting year.

Reporting Responsibility, Employee Threshold, Off-site Support

48. Facility A stores oil at Facility B. Facilities A and B have different owners. Facility A sends personnel to Facility B to load oil onto Facility A's trucks using Facility B's truck rack. Facility A then distributes the oil in commerce. Who *processed* the oil and does Facility B have to count Facility A's hours?

Facility B has *processed* the oil that was taken from Facility B's truck rack located on Facility B's property. Facility A's use of product at Facility B must be considered toward Facility B's threshold, *release* and other *waste management* calculations, where appropriate. The hours spent by Facility A's truck drivers while at Facility B do not directly support Facility B but instead directly support Facility A and should be accounted for by Facility A.

Reporting Responsibility, Change of Ownership

49. A company purchased a *facility* in September through bankruptcy proceedings. The previous owner of the *facility* filed Form Rs under EPCRA Section 313 for the preceding reporting year. The new owner of the *facility* has no plans to continue any manufacturing activities at the site. All listed EPCRA Section 313 *toxic chemicals* at the *facility* were removed or sold by the previous owner as terms of the bankruptcy proceedings prior to final sale to the new owner. Who must submit Form Rs for the months during the reporting year that the *facility* was in operation and sold through bankruptcy?

The new owner/operator of the *facility* is liable for filing Form Rs for the months of operation during the previous reporting year since he/she is the

owner/operator of the *facility* on the reporting deadline. The purchase of a *facility* through bankruptcy proceedings does not negate the liability for reporting activities at the *facility* during the period it was in operation. The new owner/operator must attempt to acquire the necessary information to determine if Form Rs are to be submitted for the reporting year. If reports must be filed, the new owner/operator must submit them in a timely and accurate manner.

Reporting Responsibility, Change of Ownership

50. Company A owns and operates an electricity generating *facility*. The *facility* consists of a combustion unit and a peaker unit. Company A sells the combustion unit to Company B on June 15 of the reporting year, but retains ownership of the peaker unit. From the time of purchase, Company B owned, controlled, and operated the combustion unit and Company A continued to own and operate the peaker unit. What are the reporting responsibilities of Companies A and B for determining thresholds and filing Form R reports?

From the time of the purchase transaction on June 15, there are two separate facilities with two non-related owners and operators. Thus, Company B is responsible only for reporting for the combustion unit after its purchase. Company A is responsible for the combustion unit and the peaker unit prior to sale, but only the peaker unit after the sale. Thus, for threshold determinations, Company A must combine amounts of *toxic chemicals manufactured*, *processed*, or *otherwise used* at the entire *facility* before the transaction on June 15, with those *manufactured*, *processed*, or *otherwise used* at the peaker unit after the transaction.

Reporting Responsibility, Change of Ownership, Definition of Facility

51. A *facility* owner sold a quarter of his plant to another company. This purchase transaction was finalized January 15, 1996. The quarter of the plant that was sold was moved to its new location in April of the same year. During the period between sale and move, the entire *facility* kept operating. The new owner, however, controlled and operated the sold part of the *facility*. For purposes of reporting under EPCRA Section 313, is the original owner responsible for 1996 reporting for the part of the *facility* that was sold?

From the time of the purchase transaction on January 15, there are two separate *facilities* with two nonrelated owners and separate operators. Therefore, the original owner must report on the three quarters of the *facility* retained after the sale if he *manufactured*, *processed*, or *otherwise used* a *toxic chemical* equal to or in excess of a threshold amount for 1996. The original owner, however, would also include in threshold determinations and *release* and other *waste management* calculations any activities that went on from the beginning of January 1996 up to the time of the purchase transaction (January 15) for that part of the *facility* that was sold. The owner of the quarter of the original *facility* also must report if that new *facility* exceeds the

reporting threshold during the period of January 15, 1996 through April 1996. Once the *facility* is moved to its new location, a new threshold determination must be made for the remainder of the reporting year and the *facility* would be assigned a new TRI Identification number.

Reporting Responsibility, Change of Ownership, NON

52. When a *facility* changes ownership after a Form R has been submitted, who is required to respond to a Notice of Noncompliance (NON) related to the Form R? Is the current or prior owner/operator required to respond to the NON?

The current owner/operator has the primary responsibility for responding to a NON. However, all prior owners/operators back to January 1 of the reporting year may also be held responsible if the current owner/operator does not respond to the NON in an accurate, complete, and timely manner.

Reporting Responsibility, Owner/ Operator, Business Interest

53. Would an owner of a *facility* who has no knowledge of any operations at the *facility* be responsible for reporting?

An owner with no business interest in a *facility* beyond owning the real estate on which the *covered facility* is located is not responsible for reporting (40 CFR Section 372.38(e)). If the owner is part of the same business organization as the operator, or has a business interest in the *facility* and contracts out the operation of a particular site, he/she is not exempt from reporting.

Parent Company, Joint Venture

54. Who is the parent company for a 50/50 joint venture?

The 50/50 joint venture is its own parent company.

Definition of Facility, Joint Venture

55. An EPCRA Section 313 *covered facility* transfers wastes containing a *toxic chemical* to a 50/50 joint venture company for treatment. The joint venture is located within the property boundaries of the *covered facility*, and is a partnership between the owners of the *covered facility* and a separate company. The 50/50 joint venture operates the treatment unit. Is the joint venture a separate *facility* as defined in 40 CFR Section 372.3?

The term *facility* includes all "buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person (or by any person which controls, is controlled by, or under common control with such person)" (40 CFR Section 372.3). The joint venture is a separate *facility* because a 50/50 joint venture is its own parent company. As its own parent company, the joint venture is not owned nor operated by the same person (or by any other person which controls, is controlled by, or under common control with such person) as the *covered facility*.

Parent Company, Wholly Owned Subsidiary

56. Mom and Pop Plastics is a wholly owned subsidiary of a major chemical company which is a wholly owned subsidiary of Big Oil Corporation, located in St. Paul, MN. Which is the parent company?

Big Oil Corporation is the parent company.

Reporting Responsibility, Facility

57. Company A owns a *facility* which manufactures crude oil. It sells the crude oil to Company B, but the oil is kept in tanks located on Company A's *facility* but that are leased to Company B. Who is subject to reporting under Section 313?

Since the tanks are part of Company A's *facility* and they are the owner/ operator of the *facility*, Company A would be subject to Section 313 reporting for any *releases* and any other *waste management* activities involving *toxic chemicals* from the tanks.

Facility-Definition of, Facility-Facility Reporting, Reporting Responsibility

58. A RCRA-permitted subtitle C *facility* shares a common fence line with a RCRA subtitle D *facility* that landfills municipal solid waste and non-hazardous special wastes. Each of these operations has its own *waste management* permits and are considered distinct entities. They are both operated by the same company and owned by the same parent company. Are both operations subject to EPCRA section 313?

Two adjacent *establishments*, owned or operated by the same corporation constitute one *facility* under section 313. As such, the *facility* must consider their combined activities for threshold determinations and *release* and other *waste management* calculations.

Reporting Responsibility, Multiple Owners/ Operators

59. A piece of contiguous property consists of three covered sites with various buildings, structures and equipment. The three sites are owned by two different companies - Company A and Company B. All three sites operate completely independently of each other and have separate personnel, finances, and environmental reporting systems. Site 1 and its buildings and structures are owned and operated by Company A and site 3 and its buildings and structures are owned and operated by Company B. The middle site, site 2 and its buildings and structures, are owned by Company A and operated by Company B (see diagram). Are all three sites and their buildings and structures considered separate *facilities* under EPCRA Section 313? Who is responsible for reporting for each?

Site 1	**Site 2**	**Site 3**
Owned and operated by A	Owned by A and operated by B	Owned and operated by B

Under 40 CFR Section 372.3 a *facility* is defined as; "all buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person." Because all buildings and structures located on sites 1 and 2 are located on contiguous property and are owned by the same person, they are considered one *facility*. Because all buildings and structures located on sites 2 and 3 are located on contiguous property and are operated by the same person, they are also considered one *facility*. Therefore, for purposes of determining thresholds, the *toxic chemicals manufactured*, *processed*, and *otherwise used* at site 2 must be counted toward both Facility A's and Facility B's threshold determinations. Because the operator is primarily responsible for reporting, estimating and reporting *releases* and other *waste management* calculations for sites 2 and 3 are the primary responsibility of Company B and the *release* and other *waste management* reporting for site 1 is the primary responsibility of Company A. EPA allows the *release* and other *waste management* reporting to be done in this manner to avoid "double counting" *releases* and *waste management* activities at site 2. However, provided thresholds have been exceeded, if no reports are received from a *covered facility* both the owner and the operator are liable for penalties.

Definition of Facility, Reporting Responsibility, Waste Disposal, Waste Management Activities

60. A recycling and disposal *facility* encompasses several RCRA subtitle C hazardous waste and subtitle D municipal solid waste management units. Is this *facility* subject to EPCRA Section 313?

Yes. This *facility* is subject to EPCRA Section 313. Because at least one unit at this *facility* is regulated by RCRA subtitle C and the *facility's* operations are classified in SIC code 4953, for the purposes of EPCRA Section 313, this *facility* is considered to be in SIC code 4953 (regulated under RCRA subtitle C). As such, this *facility* must consider all non-exempted activities at the entire *facility* for threshold determinations and release and other waste management reporting. The owner or operator should be sure to include any information the *facility* may have concerning toxic chemicals at the solid waste units of the *facility* as well as at the hazardous waste units.

Definition of Facility, Reporting Responsibility, Waste Disposal, Waste Management Activities

61. A RCRA subtitle C hazardous waste landfill *facility* in SIC code 4953 is planning to construct a RCRA subtitle D *disposal* cell on-site. Is this *facility* subject to EPCRA Section 313?

Yes. This *facility* is subject to EPCRA Section 313. Because at least one unit at this *facility* is regulated by RCRA subtitle C and the *facility's* operations are classified in SIC code 4953, for the purposes of EPCRA Section 313, this *facility* is considered to be in SIC code 4953 (regulated under RCRA subtitle C). As such, this *facility* must consider all non-exempted activities at the entire *facility* for threshold determinations and *release* and other *waste management* reporting. The owner or operator should be sure to include any

information the *facility* may have concerning toxic chemicals at the solid waste units of the *facility* as well as at the hazardous waste units.

Facility, Business Interest, Multi-establishment

62. A fish processor rents space in a building. The refrigeration system in the building uses ammonia. The building owner supplies the ammonia, runs the refrigeration system, and bills the fish processor based on the amount of fish processed. Must the fish processor report for ammonia? Another business, a frozen food packager also uses the refrigeration system but is a separate company from the fish processor.

The owner of the building must report on the ammonia if the threshold for ammonia is exceeded since he/she is operating the system. In this instance, the owner has more than just a real estate interest in the property. If both businesses are in *covered SIC codes* and the owner is operating part of that *facility*, he/she should report.

Definition of Facility, Contiguous/ Adjacent

63. How would a *facility* report *toxic chemicals* in wastes that are treated in waste treatment units that it does not own? For example, if a *facility* sold a unit that is within its contiguous property to another company, which *facility* should report?

The *facility* creating the waste containing the *toxic chemical* would report the *toxic chemicals* as an off-site transfer. Assuming the waste treatment units are neither owned nor operated by the *facility* creating the waste, the waste treatment unit is a separate *facility*. The waste treatment *facility* would only report if they *manufacture*, *process*, or *otherwise use* the *toxic chemical* in excess of the thresholds. In that case, the waste treatment *facility* would report any *release* or other *waste management* activities associated with the *toxic chemical* at its *facility*.

SIC Code 4953, Hazardous Waste Facility, Definition of Facility

64. Are all processes occurring at a single hazardous waste *facility* potentially covered by EPCRA Section 313 if only some of the activities are regulated by RCRA subtitle C?

If all of the activities occurring at a site are occurring on the same contiguous or adjacent piece of land and are owned or operated by the same organization, the entire area is considered one *facility*. If the *facility* is a hazardous waste *facility* with primary SIC code of 4953 and <u>any</u> portion of the facility is regulated under RCRA subtitle C, the *facility* meets the SIC code criterion and must thus determine thresholds and calculate *releases* and other *waste management* amounts for <u>all</u> activities at the *facility*, even those not regulated under RCRA subtitle C.

D. Multi-Establishment Facilities

Primary SIC Code, Multi-establishment

65. What is the definition of primary SIC code? How can there be more than one primary SIC code for a *facility*?

A primary SIC code generally represents those goods produced or services performed by an *establishment* that have the highest value added of production or produce the most revenues for the *facility*. Form R and the Alternate Certification Statement (Form A) provide space for more than one primary SIC code because a *facility* may be made up of several *establishments* each of which may have a different primary SIC code.

SIC Code, Multi-Activity Facility, Petroleum Bulk Stations

66. Many bulk petroleum stations operating in some midwestern *states* sell their petroleum products directly to end users. These plants typically sell to farmers and construction companies, as well as *state* and local governments. Generally, quantities are transferred to the customer in quantities of 500 gallons or less. For these *facilities*, distribution to retail facilities may make up approximately 5 percent of their overall customer business. Are these *facilities* considered bulk wholesale distributors of petroleum products, or are they more appropriately classified in retail trade and therefore not covered under EPCRA Section 313?

Based on the facts provided in the question, these *facilities* are properly classified in SIC code 5171 (bulk petroleum stations and terminals), which are included in the list of *facilities* covered under EPCRA Section 313. According to the SIC code Manual (1987 edition) "...*establishments* or places of business primarily engaged in selling merchandise to retailers; to industrial, commercial, institutional, farm, construction contractors, or professional business users; or other wholesalers; or acting as agents or brokers in buying or selling merchandise to such persons or companies" are properly classified in Division F, Wholesale Trade, and are therefore covered under EPCRA Section 313, beginning with the reporting year 1998. EPA believes that the *facilities* described in the above question are appropriately classified in the Wholesale Division as defined in the SIC code manual.

Multi-establishment, Definition of Facility, Establishment, SIC Code

67. Clarify the application of SIC codes for *facility* versus *establishment*?

The SIC code system classifies businesses on the basis of an *establishment*, which is generally a single business unit at one location. Many Section 313 *covered facilities* will be equivalent to an *establishment*. If the *facility's* SIC code is a *covered SIC code*, the *facility* has met the SIC code criterion for reporting under EPCRA Section 313. However, a reporting *facility* can encompass several *establishments* located on a single site or on contiguous or adjacent sites owned or operated by the same entity. Therefore, a Section 313 *facility* can be a multi-*establishment* complex. To determine if a multi-

establishment complex is a *covered facility*, the owner/operator must determine the complex's primary SIC code based on the relative value of products and services provided by the various *establishments*. If the primary SIC code for the *facility* is a *covered SIC code*, the *facility* has met the SIC code criterion.

SIC Code, Multi-establishment

68. Suppose a *facility* consists of several *establishments*, some of which have primary SIC codes within the *covered SIC codes* and some of which have primary SIC codes outside that range. How would this *facility* determine if it is covered by EPCRA Section 313?

To determine if a *facility* is covered by EPCRA Section 313, the *facility* must determine if it meets the SIC code criterion. To make this determination, the *facility* must report if those *establishments* that are in the *covered SIC codes* have a combined value of more than 50 percent of the total value of services provided or products shipped or produced by the whole *facility*, or if one of those *covered SIC code establishments* has a value of services or products shipped or produced that is greater than any other *establishment* in the *facility* (40 CFR Section 372.22(b)(3)). If the *facility* determines that the *establishment*s meet this test, the entire *facility* has met the SIC code criterion. If the entire *facility* also meets the employee and chemical activity thresholds (based on all *establishment*s at the *facility*), then the entire *facility* would be subject to EPCRA Section 313 reporting.

Primary SIC Code, Multi-activity Facility

69. SIC Code 7389 (business services, not elsewhere classified) contains many diverse activities. How does a *facility* that conducts more than one activity in SIC 7389 determine if it is primarily engaged in solvent recovery, and therefore, covered under EPCRA Section 313?

A *facility* that conducts several uniquely different activities that are within SIC code 7389 should identify the value of the goods or services that each activity contributes. A *facility* is considered to be "primarily engaged" in solvent recovery if the goods or services produced by the solvent recovery activity has a value of more than 50 percent of the total value of all goods and services produced at the *facility*, or if the goods and services produced by the solvent recovery activity of the *facility* are greater than those produced by any other activity at the *facility*.

Multi-establishment, Activity Threshold

70. A *covered facility* is comprised of several *establishments*. None of the *establishments* meet a chemical activity threshold separately, but together, the *facility* exceeds a chemical activity threshold. Since no single *establishment* exceeds the reporting quantities, is it necessary for the *facility* to file a Form R?

The *covered facility*, not the *establishments*, must report if the *facility* meets all of the reporting criteria. The threshold determination for *manufacture*,

process, or *otherwise use* of the listed chemical must be made by adding the amounts of the chemical from appropriate activities of all the *facility's establishments*.

Facility, Multi-establishment

71. If a company has a plant in New Jersey, which *processes* 15,000 pounds of methanol, and a plant in Texas, which *processes* the same amount of methanol, do both plants have to report as *establishments* of a *facility*?

No. The two processing plants are separate *facilities* because they are not located within the same, or adjacent, or contiguous physical boundary. Thus, their activities are not additive and neither would report for methanol because the *processing* threshold of 25,000 pounds has not been met by either *facility*.

Primary SIC Code, Multi-establishment

72. A multi-*establishment facility* grows wheat and mills it into flour. At the agriculture portion of the *facility*, all of the wheat grain is grown, harvested and placed into a silo. After leaving the silo, 20 percent of the wheat grain is sold, while the remaining 80 percent of the wheat grain is milled into flour and packaged. If the *facility* farms and sells more than it mills into flour and sells, is it a *covered facility*? What is the primary SIC code of this *facility*?

In order to make the *facility* coverage determination, the *facility* must compare the relative value of products shipped and/or produced at the two different *establishments* (i.e., agriculture versus the flour processing). The value of the product produced at the agricultural *establishment* (SIC code 0111, not in a *covered SIC code*) is the market value of all the wheat grain harvested during the reporting year. The value of the product from the milling/packaging *establishment* (in SIC code 2041, a *covered SIC code*) is the value of the products shipped and/or produced minus the market value of the wheat grain used to produce the flour. In other words, you do not double count the value of the wheat grain as part of the value of the products from the flour processing operation. If the "value-added" of milled flour products is greater than the value of harvested grain, then the *facility's* primary SIC code would be within a *covered SIC code* and the facility would be subject to reporting under EPCRA Section 313.

Primary SIC Code, Multi-establishment, Off-site Services

73. A *facility* has two *establishments*, one in SIC code 35 (a *covered SIC code*), and one in SIC code 70 (not a *covered SIC code*). In determining the *facility*'s primary SIC code, the *facility* must determine the sum of the services provided and/or products shipped from or produced by each *establishment*. Some of the employees who support the *establishment* in SIC code 70 work entirely off-site, either at home or at clients' sites. Should the *facility* consider this off-site work when determining the value of the services provided by SIC code 70?

Yes. In determining the primary SIC code, the *facility* should consider the value of services provided by each *establishment*, including services provided by employees who work for that *establishment* at home or who service that *establishment*'s products at clients' sites.

Multi-establishment, Reporting Criteria, Product Value

74. A *facility* consists of several different *establishments*. In terms of the SIC Code determination, how is product value defined? Where do state and federal taxes fit into the calculation of value? Is pre-tax or after tax value counted? Over what period of time is value calculated?

Product value should be based on the total sales before taxes, not profits. Total product value includes the value of services provided, products shipped, and/or products produced. This includes a fair market value for inter-company transfers, including a reasonable proportion of overhead and profits. If the *facility* transports the products itself, the value of the transportation services should be part of the calculation of the total value of all production, shipments, and/or service. Taxes collected from customers and forwarded to local, state, or federal taxing authorities should be excluded from the calculation of product value. Taxes that are paid by manufacturers, wholesalers, or retailers upstream of the *facility* and passed on to the *facility* in the price of goods and services it purchases should be included in the calculation of product value. The time period for calculating product value should be the reporting year in question.

Multi-establishment, Zero Releases

75. A *covered facility* with three *establishments* exceeds an activity threshold for a listed toxic chemical. The *facility* has the option to file one form to cover the activities at the entire *facility* or they may file forms for each of the *establishment*s as long as the threshold determinations and *release* and other *waste management* calculations are based on all of the activities at the entire *facility*. The *facility* chooses to file separate Form R reports for each *establishment*. All three of the *establishment*s conduct a threshold activity with the listed toxic chemical. However, one *establishment* does not *release* or perform any *waste management* activities with the listed toxic chemical. Must this *establishment* also file a Form R or can the *facility* submit only two Form R reports?

If individual *establishment*s or groups of *establishment*s report separately for one listed toxic chemical, they must report separately all covered activities, *releases*, and other quantities of the *toxic chemical* managed as waste. Therefore, if each *establishment* conducts a threshold activity with the toxic chemical, each *establishment* is also required to report separately for the *toxic chemical* even if the *establishment* had no *releases* or other *waste management* activities with the *toxic chemical*. Such *establishment*s should make certain that they file a complete Form R including reporting the chemical activity information on Part I, Section 3 of the Form.

Multi-establishment, Off-site Transfer, Form R Submissions

76. Each *establishment* of a multi-*establishment facility* files its own Form R for a *toxic chemical*. The waste that this multi-*establishment facility* ships off-site is inventoried on an entire *facility* basis. To report the listed *toxic chemical* in this waste, does each *establishment* estimate their percentage of the total listed *toxic chemical* in the waste or can one *establishment* report the entire quantity of the listed *toxic chemical* in the waste?

If individual *establishments* or groups of *establishments* report separately for one listed *toxic chemical* they must report separately all *releases* and other quantities of the *toxic chemical* managed as waste. Therefore, in the case cited above, one *establishment* cannot report the off-site transport quantity of a *toxic chemical* in waste from the entire *facility*. Each *establishment* would have to report separately its percentage of the transfer quantity.

Multi-establishment, Part II Section 3

77. A *facility* consists of many *establishments* and the operators have chosen to file Form Rs by *establishment* rather than as a *facility*. *Establishment* 1 has a manufacturing process that *otherwise uses* over 10,000 pounds of a listed *toxic chemical*. *Establishment* 1 sends its wastewater to *establishment* 2, where it is treated. *Establishment* 2 just treats the *toxic chemical* and does not use it anywhere else. Since a Form R has to be filed because of *establishment* 1's activities, how should the operator of *establishment* 2 fill out the Form R? Specifically, how should *establishment* 2 address Part II Section 3 for activities and uses at the facility? How should *establishment* 2 reflect the *releases* resulting from the waste treatment?

Since the *facility* has chosen to report separately as two *establishments*, rather than not answering that Section of the Form R, EPA recommends that *establishment* 2 check the block 3.3(c) for *otherwise use* as an ancillary use. The rest of the Form R can be filled out as if that second *establishment* had triggered reporting itself. If any further questions were to arise about activities at *establishment* 2, its required recordkeeping should indicate that the Form R is for treatment only and reflects *releases* and other *waste management* activities transferred to *establishment* 2 by other *establishments*.

Multi-establishment, Separate Form Rs

78. Establishments A, B, and C are all part of a *facility* and the *facility* elects to file Form Rs by *establishment* for chemicals that exceeded a threshold based on combined activities. The *facility* exceeds the reporting threshold for benzene, but only establishments A and B use any benzene. Is establishment C required to file a Form R report for benzene?

Provided that establishment C has no amounts of the *toxic chemical* involved in threshold or *release* and other *waste management* calculations, establishment C is not required to submit a report for that chemical.

Definition of Facility, Right-of-Way

79. A single company owns two divisions that operate separately. Both divisions are within a *covered SIC code*. The two divisions are located on contiguous/adjacent property that is divided by a public right-of-way. The entrance and exit between the two operations are not at a cross-roads (i.e., access between the two operations can only be gained by going along the public right-of-way, not simply crossing the public right-of-way). Are the two divisions considered two separate *facilities* under EPCRA Section 313?

No. Because the two divisions are owned by the same person and are physically contiguous/adjacent to one another, except for a public right-of-way, they are considered one *facility* for Section 313 reporting purposes. A *facility* may consist of more than one *establishment*. The entrances to each *establishment* within a multi-*establishment facility* do not have to be located at a crossroads in order to meet the definition of *facility*. EPCRA Section 313 defines a *facility* as "all buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person" (40 CFR Section 372.3).

GOCOs, Definition of Facility, Right-of-Way

80. The definition of *facility* under EPCRA Section 329(4) includes "all buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person (or by any person which controls, is controlled by, or under common control with, such person)." Two Government-Owned, Contractor-Operated (GOCO) sites are separated by a street. The GOCOs are owned by the same federal agency, but operated by different contractors. When, as required by Executive Order (EO) 12856, the federal agency is making threshold determinations under EPCRA Section 313, must it consider the two GOCOs as part of the same federal *facility*?

Yes. The two GOCOs are considered to be a single federal *facility* for the purposes of EPCRA Section 313 threshold determinations and *release* and other *waste management* reporting as required by EO 12856. EPA has interpreted "contiguous or adjacent sites" to include sites separated only by a public right-of-way. Further, Sections 2-201 and 2-202 of EO 12856 expanded the definition of "person" under EPCRA Section 329(7) to include federal agencies, as defined in 5 U.S.C. Sections 102 and 105. Therefore, the two GOCOs are considered to occupy sites that are contiguous or adjacent and which are owned by the same person. Each GOCO should provide any information required by the federal *facility* in making threshold determinations and reporting *releases* and other *waste management* under EPCRA Section 313.

EO 12856 does not alter any separate obligation(s) a GOCO may have under EPCRA and the Pollution Prevention Act (PPA) (EO 12856 Section 1-103). Private contractors operating at federal *facilities* must continue to meet any legal reporting requirements they have under EPCRA and PPA. Thus, a GOCO that operates a *covered facility* under 40 CFR Section 372.22 must file a Form R or an Alternate Certification Statement (Form A) for each *toxic chemical* for which the *facility* exceeds an activity threshold as specified in 40 CFR Section 372.25.

Multi-establishment, Facility, Right-of-Way

81. Two manufacturing *establishments*, owned by the same corporation, are divided by a public railroad. One *establishment* has rented parking lot space from the other *establishment* and a walkway was constructed so the employees can go over the railroad tracks to the parking lot. Is this a multi-*establishment facility* or two separate *facilities*?

Two *establishments* owned by the same corporation separated by a railroad constitute one *facility* for Section 313, since they are still physically adjacent to one another except for a public right-of-way. Therefore, reporting thresholds would be determined by the combined *toxic chemical* quantities *processed*, *manufactured*, or *otherwise used* at both *establishments*.

Multi-establishment, Facility, Pipeline

82. Two manufacturing plants owned by the same parent company are connected to each other by a thin patch of land on which a pipeline rests that joins the two plants. The pipeline and connecting land are also owned by the same parent company. For the purposes of reporting on the Form R, are the plants considered two separate *facilities*, or are they *establishments* of the same *facility*?

Under 40 CFR Section 372.3 the definition of *facility* means, "all buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person (or by any person which controls or is controlled by or under common control with such person). A *facility* may contain more than one *establishment*." Since both plants are connected to each other by a strip of land that is owned by the same parent corporation, they are contiguous and, therefore, are considered *establishments* of the same *facility*. This *facility* must make threshold determinations based on the combined amounts of listed *toxic chemicals* at both *establishments*. Both *establishments* may report together as the same *facility* or they may report separately provided that the sum of the *releases* of the *establishments* reflects the total *releases* of the *facility* and threshold determinations are based on activities at the entire *facility*.

E. Threshold Determinations

Threshold Determination, Otherwise Use, Preparation for Otherwise Use

83. A *facility* buys 10,000 pounds of a listed *toxic chemical* in one year and creates a *mixture* for a metal cleaning bath. In the following year, the *facility* begins cleaning metal in the bath. How does the *facility* determine thresholds for both years?

The threshold applies to the total amount of the *toxic chemical otherwise used* during the reporting year that the *mixture* was created. The *facility* would count the entire 10,000 pounds and any amount added to the bath during that year toward the *otherwise use* threshold the first year. Only the amount of the *toxic chemical* added to the bath during the second year would be counted toward the *otherwise use* threshold determination for the second year.

Threshold Determination, Process, Preparation for Distribution

84. A *facility* owner/operator begins a process in December 1996 by mixing a batch of listed *toxic chemicals* into their product formulation. The *mixture* remains in the vat until January 1997. At that time, the *mixture* is packaged into quart containers and sent to customers. For Section 313 threshold purposes, are the *toxic chemicals* in the *mixture* considered *processed* in 1996 or 1997?

Process is defined as "the preparation of a *toxic chemical*, after its *manufacture*, for distribution in commerce" (40 CFR Section 372.3). The Agency interprets the activity of *processing* to be reportable when the *toxic chemicals* are initially prepared. Therefore, the amount of *toxic chemicals* mixed in 1996 would be added to the *processing* threshold determination for 1996.

Process, Preparation for Distribution

85. If ore is extracted for ultimate distribution in commerce, are *toxic chemicals* in ore that are not actually distributed during the reporting year considered to be *processed* for threshold determination purposes, since they were prepared for distribution during the reporting year?

Yes. The total amounts of the listed *toxic chemicals* contained in the ore are considered toward the *facility*'s *processing* threshold in the year that the amounts undergo a *processing* step. For purposes of the EPCRA Section 313 threshold determination, extraction is considered a *processing* step and all amounts extracted for preparation of a product to be distributed in commerce are considered *processed* in the year they are extracted.

Process, Limited Distribution, Samples

86. Electricity generating *facilities* supply companies with ash for off-site market testing (e.g., the receiving company may test the ash to see if it can be used in a topsoil). Is this *processing*?

Amounts of listed *toxic chemicals* contained in material or products that are sent off-site for sample testing are considered *processed* and these amounts

must be considered toward threshold and *release* and other *waste management* calculations.

Threshold Determination, Activity Threshold, Storage, Maximum Amount On-site

87. If a *facility* has a chemical in storage but does not *process* or *otherwise use* it during the reporting year, is the owner/operator subject to reporting?

No. Storage, in itself, would not meet an activity threshold under EPCRA Section 313 (Note: the *facility* may have reporting requirements under other portions of EPCRA such as Sections 311 and 312). However, if the *facility* exceeds the *manufacturing*, *processing*, or *otherwise use* threshold for the same *toxic chemical* elsewhere at the *facility*, the *facility* must consider *releases* from the storage of the *toxic chemical*. The *facility* must also consider the amount of the Section 313 chemical in storage when calculating the maximum amount on-site during the year.

Threshold Determination, Storage

88. Are materials in inventory (i.e., amounts on hand at year end) factored into threshold determinations?

No. Only quantities of a *toxic chemical* actually *manufactured* (including *imported*), *processed*, or *otherwise used* during the reporting year are to be counted toward a threshold.

Activity Threshold, Storage

89. A coal mine receives a flotation agent containing a Section 313 chemical in December of 1998, but does not use it until January of 1999. Is the amount of *toxic chemical* in the flotation agent considered for threshold determinations in the 1998 reporting year?

No. Storage in itself of a *toxic chemical* is not considered a *manufacturing*, *processing*, or *otherwise use* activity and, therefore, is not subject to threshold determinations. However, the *facility* is required to include any amounts *released* or otherwise managed as waste that occur during storage of the listed *toxic chemical*, provided a threshold for the same chemical has been exceeded elsewhere at the *facility*. When the *toxic chemical* is used in 1999, the *facility* will include the amount of *toxic chemical* used towards the 10,000 pound *otherwise use* threshold, or the 25,000 pound threshold for *processing*, whichever is appropriate.

Reuse System, Threshold Determination

90. If a *facility* employs a reuse system, how does it determine the amount that it must consider for threshold determinations?

For reuse systems, the amount considered for threshold determination purposes is the amount added to the system during the reporting year. If the system is completely empty and is started up during the year, a *facility* makes its threshold determination by adding the total amount needed to charge the system to any amount which is added to the system during the reporting year.

Threshold Determination, Reuse System, Closed-loop, Otherwise Use

91. Many *facilities* maintain reuse operations such as closed-loop refrigeration systems. If a *facility* uses 15,000 pounds of ammonia as a coolant in a closed-loop refrigeration system, this amount of the *toxic chemical* is considered *otherwise used* under EPCRA Section 313 because the ammonia is not incorporated into the final product. Only the amount of a listed *toxic chemical* added to a refrigeration system during the reporting year must be included in the threshold calculation. If the *facility* replaces its refrigeration system but uses the same ammonia to maintain the new system, must the transferred ammonia be considered *otherwise used* and therefore included in threshold determinations for EPCRA Section 313 reporting?

In such reuse systems, the amount of listed *toxic chemical* which must be applied toward the *otherwise use* threshold would include any quantity added as a result of start-up or total replacement of the contents of the reuse operation. If a reuse system is completely empty and is started up during the year, a *facility* must base its threshold determination on the total amount initially needed to charge the system plus any amount which is subsequently added to the system during the year. In this case, the 15,000 pounds of ammonia should have been counted towards the *otherwise use* threshold when it was first used to charge the old system and any ammonia added to maintain the level of ammonia in the old system should also have been counted towards the *otherwise use* reporting threshold in the year that it was added. If the *facility* is reusing ammonia from the old system by simply using it again in a new system this amount of ammonia would not have to be counted towards the *otherwise use* threshold because it should have already been counted towards that threshold. Once a chemical has been counted towards the *otherwise use* threshold, any further use of that listed chemical at a *facility* does not need to be counted again towards the *otherwise use* threshold.

Recycle, Reuse System, Threshold Determination

92. A *toxic chemical* in a solvent is used, recycled on-site, and then reused as a solvent at the *facility*. How is that *toxic chemical* handled for the purpose of threshold determination for Section 313?

For solvents in an on-site recycle and reuse system, the total amount of new *toxic chemical* added to the system during the reporting year is counted towards the *otherwise use* threshold. The amount of the *toxic chemical* that is recirculated in the recycle/reuse system is not considered towards the threshold determination unless it is replaced.

Threshold Determination, Equipment Efficiency

93. A *covered facility* feeds 50,000 pounds of solvent containing 90 percent MIBK (i.e., 45,000 pounds) into a recycling process that is 85 percent efficient. The *facility* distributes the recovered MIBK in commerce. Should the *facility* count 45,000 pounds of MIBK (i.e., the entire amount that was inserted into the process) towards the *processing* threshold?

Yes. The *facility* considers the entire amount (45,000 pounds of MIBK) entering the recovery system toward the *processing* threshold regardless of the recovery efficiency of the process.

Threshold Determination, Remediation

94. If you operate a treatment plant as part of remediation at a Superfund site on your *facility*, do contaminants (already present at the site) have to be included in calculating thresholds and *releases* and other *waste management* activities?

EPCRA Section 313 listed *toxic chemicals* undergoing remediation are not included in threshold determinations because remediated chemicals are not *manufactured*, *processed*, or *otherwise used*. However, if a *covered facility* exceeds an activity threshold for a listed *toxic chemical* elsewhere at the *facility*, any *releases* and other *waste management* activities of the listed *toxic chemicals* undergoing remediation must be included in the *facility's release* and other *waste management* calculations. In that event, a *release* does not include material already in a landfill but does include any material *released* to the *environment* or transferred off-site due to the remedial activity.

Threshold Determination, Remediation, Release Reporting, Intake Water Exemption

95. A *covered facility* removes *toxic chemicals* from groundwater in a clean-up action. The listed *toxic chemicals*, after treatment, are sent off-site for *disposal*. Is the *facility* required to report? Does the exemption for intake water apply?

Since the *toxic chemicals* are not *manufactured*, *processed*, or *otherwise used*, no reporting threshold applies to the cleanup action. If the *toxic chemicals* are *manufactured*, *processed*, or *otherwise used* elsewhere at the *facility* and exceed a threshold, *releases* and other *waste management* activities from the cleanup must also be reported on the Form R. The quantities of *toxic chemicals* in the remediation wastes that are sent off-site for *waste management* are reported in Part II, Section 8.8. The intake water exemption does not apply since the *toxic chemicals* are not being used in a process activity and because the *toxic chemicals* in groundwater are not at background levels.

Manufacture, Import, Threshold Determination

96. If a *covered facility manufactures* 19,000 pounds, *processes* 18,000 pounds, and *imports* 7,000 pounds of *toxic chemical* X during the reporting year, is it required to report for *toxic chemical* X?

Yes. For the reporting year, the *facility* would have to report for *toxic chemical* X because it would have exceeded the *manufacture* threshold of 25,000 pounds (19,000 (*manufactured*) + 7,000 (*imported*) = 26,000). Note that *importing* constitutes *manufacturing*, and therefore, the amounts must be added together for threshold determinations.

Threshold Determination

97. Are the thresholds for *manufacture* and *process* considered separately? That is, if a *covered facility manufactures* 24,000 pounds of *toxic chemical* A and *processes* 24,000 pounds of *toxic chemical* A, does the *facility* need to report for *toxic chemical* A?

No. The *facility* does not have to report because it has not independently exceeded either threshold. Thresholds are considered separately for *manufacture*, *process*, and *otherwise use* of the same *toxic chemical*. Assuming that no individual threshold is met for chemical A (i.e., *manufacturing*, *processing*, or *otherwise use*), the *facility* does not trigger reporting for chemical A.

Manufacture, Process

98. A chemical manufacturing *facility manufactures* 20,000 pounds of benzene on-site for distribution and sale. The same *facility* purchases and then repackages and sells a cleaning *mixture* that contains benzene. Over the calendar year the *facility* repackages and sells (i.e., *processes*) 10,000 pounds of benzene in the cleaning *mixture* and sells the 20,000 pounds of benzene that is *manufactured* on-site. How many pounds of benzene should the *facility* count toward its *processing* threshold?

The *facility* should consider 30,000 pounds of benzene (the 10,000 pounds in the cleaning solution plus the 20,000 pounds of benzene *manufactured* and sold) toward the *facility*'s *processing* threshold. When determining if a *facility* meets a chemical use threshold, owners and operators of *covered facilities* must consider each chemical use activity separately to determine if any one threshold has been met. For the purposes of EPCRA Section 313, *process* means "the preparation of a toxic chemical, after its *manufacture*, for distribution in commerce..." (40 CFR Section 372.3) A *facility* that creates a listed *toxic chemical* and then prepares it for distribution in commerce is both *manufacturing* and *processing* the listed *toxic chemical* and must consider the amount of the *toxic chemical manufactured* and *processed* towards both thresholds.

Threshold Determination, Warehouse

99. How are warehouses affected by Section 313?

A warehouse located within the physical boundary of a *covered facility* is part of the *facility*. *Toxic chemicals manufactured*, *processed*, or *otherwise used* at the warehouse are included in making threshold determinations and *release* and other *waste management* calculations for the *toxic chemicals*. If the warehouse is not within the physical boundary of the *covered facility*, it may be covered as an auxiliary *facility*. (See auxiliary *facility* discussion in Section 1H of this document.)

Asbestos, Threshold Determination

100. Are *releases* of asbestos from the demolition of an old plant reportable?

Maybe. If friable asbestos is not being *manufactured*, *processed*, or *otherwise used*, no *releases* or other *waste management* of asbestos must be reported unless there are other covered activities involving asbestos in the friable form at the *facility*, and the threshold for reporting has been exceeded. If, however, during the demolition of the plant, asbestos is created in the friable form, the *manufacturing* threshold may be triggered.

Threshold Determination, Concentration Range, Upper Bound

101. If a *covered facility* only knows the range of concentration of a Section 313 *toxic chemical* in a *mixture*, is it required to use the upper bound concentration to determine thresholds? Use of the average or midpoint of the range will avoid overestimating emissions. If a metal *mixture* contains a range of 1 to 10 percent of three metals together, how can this information be used to determine thresholds?

The upper bound should be used if the person knows only the upper bound concentration. For the combination of three *toxic chemicals*, the owner/operator of the *facility* should split the upper bound among the three *toxic chemicals* based on the knowledge that it has, so the total equals 10 percent. If a range is available, using the midpoint or average is reasonable. In this case, if there is a range of 1 to 10 percent of a *mixture* of three *toxic chemicals*, the *facility* would divide the midpoint (5 percent) by three. Therefore, the *facility* would assume 1.33 percent of each of the *toxic chemicals* in the *mixture*. The owner/operator of the *facility* does not have to assume 10 percent maximum for each *toxic chemical*.

Threshold Determination, Concentration Range, Mixture

102. A *covered facility* uses a *mixture* in its processing operations and knows only that the *mixture* contains less than 99.9 percent of four listed *toxic chemicals* (combined). How should it report?

The *facility* should proportion the amount of chemicals so that their total percentage equals 99.9 percent, since each one cannot physically be present at 99.9 percent. The percentage could be divided equally among the four, unless the *facility* has some basis for proportioning them differently.

Threshold Determination, Concentration Range

103. A *covered facility* is told by its supplier that the *mixture* the *facility* receives contains as much as 80 percent of 4-aminobiphenyl, a listed *toxic chemical*, and as little as 20 percent. How should the *facility* estimate the concentration of 4-aminobiphenyl in this *mixture*?

If the *facility* knows the upper and lower bound concentrations in a *mixture* (i.e., 80 and 20 percent), it should use the midpoint of these concentrations for threshold determinations. In this instance, 50 percent should be used because it is the midpoint between 80 and 20 percent.

Threshold Determination, Concentration Range, Lower Bound

104. A *covered facility* receives a *mixture* from a supplier who only provides the lower bound concentration of a Section 313 listed *toxic chemical* in the *mixture* (e.g., more than two percent toluene). Should the *covered facility* use this information in threshold determinations for the listed *toxic chemical*?

The *facility* should subtract out the percentage of any other known components of the *mixture* to determine what a reasonable "maximum" percentage of toluene could be (e.g., if the *mixture* contains 80 percent water then toluene can be no more than 20 percent). The *facility* then should use the midpoint of the "minimum" and "maximum" percentages in order to determine the pounds of toluene to apply toward the threshold. If no other information is available, the *facility* should assume that the "maximum" is 100 percent.

Threshold Determination, Concentration Range, Upper Bound, Mixture

105. A *covered facility* knows that a *mixture* it *processes* contains up to 56 percent of mustard gas, a listed *toxic chemical*. How should the *facility* estimate the concentration of mustard gas in this *mixture* for threshold determinations?

If the *facility* knows only the upper bound concentration of the listed *toxic chemical* and has no other information about the concentration of the other components of the *mixture*, it should use this upper bound (i.e., 56 percent) for threshold determinations.

Threshold Determination, Facility Construction

106. A covered manufacturing *facility* ceased operations at the beginning of the reporting year and construction work took place through July. At that time, the *facility* resumed manufacturing operations. Listed *toxic chemicals* were used at the *facility* during the construction phase. For purposes of threshold determinations and *release* and other *waste management* calculations under EPCRA Section 313, does the *facility* include in its calculations the *toxic chemicals* used during construction when the *facility* was not in operation?

Yes. Since the *facility* is a *covered facility*, any covered activity of a listed *toxic chemical* will count toward an applicable threshold. Therefore, the *toxic chemicals* used during the construction phase would be counted toward threshold determinations. *Releases* and other *waste management* of a given *toxic chemical*, used during construction, would also be reported if, during the course of a reporting year, an activity threshold was exceeded for that *toxic chemical*. If the *toxic chemical* becomes a fixed part of the *facility* structure and is not process related, then the structural component exemption may apply.

Threshold Determination, Metal Alloy, Mixture

107. How does a *facility* determine the threshold for reporting of a listed *toxic chemical* (such as chromium) in a solid piece of steel which it *processes*?

Since steel is a *mixture* (and not a compound), the *processing* threshold determination is made based on the total amount of each *toxic chemical* present in the steel. If the *toxic chemical* is present in a known concentration, the amount present can be calculated by multiplying the weight of the steel by the weight percent of the listed *toxic chemical*. The threshold for *processing* is 25,000 pounds.

Threshold Determination, Metal Compounds

108. How are threshold determinations made for metal-containing compounds?

Threshold quantities for metal compounds are based on the total weight of the metal compound, not just the metal portion of the metal compound. The threshold quantities are determined by adding up the total weight of all metal compounds containing the same parent metal. However, *release* and other *waste management* calculations are based solely on the weight of the parent metal portion of the metal compounds. Note that there are a few metal compounds that are separately listed and are not counted in the metal compounds categories. For example, maneb (CAS number 12427-38-2) is a manganese compound that is a separately listed chemical and is not reportable under the manganese compounds category.

Threshold Determination, Metal Alloy, Article Exemption, De Minimis Exemption

109. Regarding metals in *mixtures*, such as chromium in an alloy (stainless steel), how are thresholds and *releases* and other *waste management* activities accounted for in a foundry type operation where all of the metals are melted down? Could the de minimis and *article* exemptions be applied?

For threshold purposes, if the listed *toxic chemicals* in the metals are *processed*, *otherwise used*, *manufactured* as an impurity (that remains with the product), or *imported* below the de minimis levels, then the de minimis exemption may be taken for that metal in the alloy. However, the *article* exemption cannot be taken for this type of foundry operation since in founding, a metal is melted down and poured into a mold. Consequently, the resulting metal is not recognizable as its original form.

Threshold Determination, Metal Compounds Solution

110. If a *covered facility* has a solution containing a chromium compound, does the *facility* need to report on the entire *mixture* or just the chromium when making a threshold determination under Section 313?

To determine if a *facility* meets an applicable threshold for the chromium compound (or any *toxic chemical*) in a solution, the *facility* is required to determine the weight percent of chromium compound in the solution and use that amount for the threshold determination.

Threshold Determination, Process, Electroplating

111. A product is immersed into a plating bath containing nickel chloride (NiCl) to bond nickel to it prior to distribution in commerce. Nickel is incorporated into the final product whereas the chloride remains in the plating bath. Since nickel chloride is reportable under the nickel compound category of Section 313, which threshold applies?

The total weight of nickel chloride used in the plating bath is considered towards the *facility's processing* threshold determination. If the *facility* exceeds the threshold, the owner/operator would only report *releases* and other *waste management* of the nickel, the parent metal. Because the *facility* is also creating elemental nickel, the amount of nickel *manufactured* from nickel chloride is considered towards the *manufacturing* threshold. The *facility* is also *processing* the elemental nickel. If the *facility* exceeds thresholds for both chemicals independently, they may file one Form R for nickel and nickel compounds.

Threshold Determination, Metal Compounds, Mixture, Metal Silicates

112. A *covered facility manufactures* specialty glass products. The starting materials are primarily metal silicates which are ground into a powder, mixed, and heated. The resulting *mixture*, the specialty glass, has all the metal silicates melted together in a non-crystalline structure. Since the metal silicates do not exist by themselves in the *mixture*, how should a threshold determination be made?

The metal silicates are *processed* since they become incorporated into a product (the specialty glass) that is distributed in commerce. If the metal silicates still exist as the original metal silicates but just mixed together then each metal silicate that belongs to a particular metal compound category is included in the *processing* threshold calculations for that category. If the metal silicates have been reacted to produce another compound (i.e., if the specialty glass is not just a *mixture* of individual metal silicates but is another new metal compound) then the metal silicates have still been *processed*, but a new metal compound has also been *manufactured* and its weight (i.e., the whole weight of the glass) must be included in the *manufacturing* threshold calculations.

Threshold Determination, Manufacture, Fuel, Natural Gas

113. A *covered facility* purchases natural gas that contains EPCRA Section 313 *toxic chemicals*. The *facility* uses the gas on-site to heat buildings and power equipment. Before the natural gas is used, the listed *toxic chemicals* are removed and destroyed in a flare. The definition of *manufacturing* in 40 CFR Section 372.3 states that, "*manufacture* also applies to a *toxic chemical* that is produced coincidentally during the *manufacture*, *processing*, *otherwise use* or *disposal* of another chemical or *mixture* of chemicals, including a *toxic chemical* that is separated from that other chemical or *mixture* of chemicals as a byproduct..." Are the *toxic chemicals* that are removed from the natural gas coincidentally *manufactured*, and hence subject to threshold determination under EPCRA Section 313?

The removal and destruction of an EPCRA Section 313 *toxic chemical* from a fuel before it is used by a *facility* is not considered an activity that falls under the definition of *manufacturing, processing* or *otherwise use*. *Facilities* that use natural gas in production processes sometimes need to remove impurities from the gas before it is used. Such a *facility* does not coincidentally produce *toxic chemicals* as byproducts, but merely separates and removes *toxic chemicals* already present in the gas. These chemicals would not be subject to threshold determinations for reporting under EPCRA Section 313, and would not be subject to *release* and other *waste management* reporting unless an activity threshold is exceeded elsewhere at the *facility*. If the *facility* exceeds an activity threshold elsewhere, all *releases* and other *waste management* activities from the impurity removal process would be reportable.

Although these chemical impurities are usually destroyed, they could also be captured for further use at the *facility* or for sale as products, either of which would constitute a reportable activity under EPCRA Section 313. If the chemicals are collected and sold as products or incorporated into products, they are considered *processed* and the amount of each chemical is applied toward its *processing* threshold. *Otherwise use* refers to any use of a *toxic chemical* that is not covered by the definitions of *manufacture* or *process* (40 CFR Section 372.3). If the chemicals are collected for further use at the *facility* or if the chemicals are combusted for energy recovery, the chemicals are considered *otherwise used*, and the amount of each chemical is applied toward its *otherwise use* threshold.

Threshold Determination, Non-isolated Intermediates, TSCA

114. The Toxic Substance Control Act (TSCA) does not regulate non-isolated reaction intermediates. Do these intermediates still need to be considered for threshold determinations and *release* and other *waste management* calculations for EPCRA Section 313?

A *covered facility* owner/operator would need to consider the quantity of non-isolated reaction intermediates *manufactured*, *processed*, or *otherwise used* at the *facility* when determining thresholds and *releases* and other *waste management* activities for EPCRA Section 313. There is no exemption for non-isolated intermediates under EPCRA Section 313.

PCB, Transformers, Disposal, Threshold Determination

115. A covered manufacturing *facility* removes PCB-laced oil that was contained in its on-site transformers. Would this activity be considered *processing* or an *otherwise use* of the PCBs, a listed *toxic chemical*, if the *facility* only extracts the PCB to dispose of it off-site?

If the PCB-laced oil is removed from an on-site transformer for *disposal* and is not replaced with clean PCB-laced oil, this would not be considered *processing* or an *otherwise use*. Removal of a *toxic chemical* from an *article* for *disposal* does not constitute a *process* or *otherwise use* activity.

Therefore, this activity would not be subject to threshold determinations and *release* and other *waste management* reporting under EPCRA Section 313.

F. Manufacturing, Processing, or Otherwise Use

Activity Threshold, Process, Otherwise Use, Incorporation

116. What is the difference between *process* and *otherwise use* for the purposes of EPCRA Section 313 threshold determinations?

Process implies incorporation; the function or intent of the *toxic chemical* is dependent upon becoming a part of a product. *Otherwise use* implies non-incorporation; the function of the *toxic chemical* is not dependent upon becoming a part of a product. Beginning with reporting year 1998, *otherwise use* will include the on-site *disposal*, *treatment for destruction* and *stabilization* of *toxic chemicals* in wastes received from off-site for the purposes of further *waste management*. *Otherwise use* will also include the on site *disposal*, treatment for destruction, or stabilization of *toxic chemicals* produced from the management of wastes received from off-site.

Activity Threshold

117. If I *manufacture* 74,000 pounds of a *toxic chemical* and *otherwise use* 9,000 pounds, am I covered?

Yes. The *facility* has exceeded the *manufacturing* threshold of 25,000 pounds for the *toxic chemical*. *Releases* and other *waste management* from all activities including the 9,000 lbs *otherwise used* of the *toxic chemical* at the *facility* are reportable.

Reclamation, Processing, Distribution in Commerce

118. Is the reclamation of elemental mercury from mercury retorting (e.g., recycled fluorescent lamps, contaminated phosphor powder, mercury batteries, and other sources) and the subsequent sale of the recovered mercury (e.g., for use in thermometers and other equipment) subject to the 25,000 pound *processing* threshold?

Yes. Mercury retorted from wastes and subsequently distributed into commerce should be counted towards the 25,000 *processing* threshold.

Activity Threshold, Recordkeep-ing

119. A *covered facility* exceeds a threshold for *manufacturing* copper compounds and keeps documentation to justify its *manufacturing* threshold determination. The *facility* frequently *otherwise uses* various *mixtures* containing copper compounds during the year. Must the *facility* track their *otherwise use* of copper compounds and document that usage?

Yes, the *facility* must track its *otherwise use* of the copper compounds. However, because the *facility* has already exceeded the threshold for manufacturing, the *facility* does not have to track the copper compounds for the purpose of determining if the *otherwise use* threshold has been exceeded, but instead must track its *otherwise use* of the copper compounds to properly

fill out all applicable sections of the reporting form. In short, if a *facility* exceeds an activity threshold it must report on all activities at the *facility* involving the chemical, except for those activities that qualify for an exemption provided for in 40 CFR Section 372.38. (40 CFR section 372.25(c)) And because the *facility* must report the *otherwise uses*, the *facility* must satisfy the recordkeeping requirements of 40 CFR section 372.10.

Otherwise Use, Off-site Waste

120. A *covered facility* receives a waste containing 13,000 pounds of a listed *toxic chemical*. The *facility* disposes of 5,000 pounds of the *toxic chemical* and stabilizes the other 8,000 pounds of the chemical. Does the *facility* meet a Section 313 chemical activity?

Until January 1, 1998, this *facility* would not be *manufacturing*, *processing* or *otherwise using* the listed *toxic chemical*. However, beginning January 1, 1998, the *facility* would be *otherwise using* the *toxic chemical*. Because the *facility* received the 13,000 pounds of chemical A in wastes received from off-site for the purposes of further *waste management*, the amount of the *toxic chemical* that is subsequently *stabilized* or *disposed* on-site is considered *otherwise used* at the *facility* for the purpose of threshold determinations. The *facility* would need to add the amount of the *toxic chemical* that is involved in all *otherwise use* activities to determine whether the *otherwise use* threshold of 10,000 has been exceeded. In this case, 13,000 pounds of the chemical would be considered *otherwise used*.

Definition of Otherwise Use, Activity Threshold, Coincidental Manufacture, Off-site Waste

121. A *covered facility*, in treating for destruction listed *toxic chemical* A, which it receives from off-site, *manufactures* 11,000 pounds of chemical B, another listed *toxic chemical*. The *facility* subsequently disposes of chemical B on-site. Would the *facility* meet the *manufacture* or *otherwise use* threshold for chemical B?

This *manufacture* of chemical B is below the *manufacturing* activity threshold of 25,000 pounds. However, after January 1, 1998, the *facility* would also be *otherwise using toxic chemicals* A and B. Included in activities covered by EPA's revised interpretation of *otherwise use* is the *disposal* of a *toxic chemical* that is produced from the management of a waste that is received by the *facility*. In this example, because the *facility* received from off-site a waste containing a chemical that is treated for destruction (i.e., chemical A) and during that treatment produced and subsequently disposed of chemical B, the *disposal* of chemical B under EPA's revised interpretation would be considered *otherwise used* as well as the treatment for destruction of chemical A. Because the *facility* disposed of, or *otherwise used*, 11,000 pounds of chemical B, the 10,000 pound statutory threshold for *otherwise use* is met. Thus, the *facility* would need to report all *releases* of, and *waste management* activities involving chemical B. If the *facility* treats for destruction more than 10,000 lbs of chemical A, it would also report for this *toxic chemical*.

Activity Threshold, Otherwise Use

122. A *covered facility manufactures* 11,000 pounds of chemical A, a listed *toxic chemical* from the treatment of another *toxic chemical* which was received from off-site. The *facility* disposes of 6,000 pounds of chemical A and uses 5,000 pounds of chemical A in a non-incorporative, manufacturing activity at the *facility*. Does this *facility* meet an activity threshold?

Prior to January 1, 1998, this *facility* would not meet the *manufacturing* threshold of 25,000 pounds for chemical A nor would it have met the *otherwise use* threshold of 10,000 pounds because it only *otherwise used* 5,000 pounds. However, after January 1, 1998, the *facility* would meet the *otherwise using* threshold for chemical A. Both the on-site *disposal* and the non-incorporative activities are considered to be *otherwise use* activities. The on-site *disposal* of chemical A is included among the various activities covered by EPA's revised interpretation of *otherwise use*. The *facility* would add the amounts of chemical A involved in both *otherwise use* activities at the *facility* to determine whether they exceed the 10,000 pound *otherwise use* threshold. Since the total amount of chemical A that is *otherwise used* is 11,000 pounds, the *facility* would need to report on all *releases* and *other waste management* activities involving chemical A.

Hazardous Waste, Waste Management Activities, Otherwise Use

123. Is the transfer of hazardous waste containing a Section 313 *toxic chemical* from one container or tank considered *waste management* for the purposes of the definition of *otherwise use*?

No. On-site container and on-site tank transfers do not constitute a *waste management* activity as described in the preamble to the May 1, 1997 final rule (62 FR 23834). Such transfer activities are not considered *manufacturing*, *processing*, or *otherwise using* activities in themselves. However, if the *facility* elsewhere exceeds a threshold because of other activities, any *releases* and other *waste management* associated with the transfer operations must be reported appropriately in Sections 5 and 8 of the Form R.

Otherwise Use, Treatment for Destruction

124. A *covered facility* has a commercial wastewater treatment operation and receives wastewater containing *toxic chemicals* from off-site. During treatment, most of the *toxic chemicals* are destroyed on-site. The remainder is sent off-site for incineration. Should the *facility* count the entire amount of the *toxic chemical* received from off-site towards its *otherwise use* threshold?

No. The *facility* should count only the amount of the *toxic chemical* that is treated for destruction on-site. The amount of the *toxic chemical* sent off-site for incineration would not be applied towards the *facility*'s threshold determination. However, if the *facility* exceeds a threshold for that chemical, it must report the amount treated for destruction on-site in Part II, Section 8.6, and the amount sent off-site for incineration in Part II, Sections 6.2 and 8.7.

Otherwise Use

125. A *facility* receives waste containing a *toxic chemical* from off-site, and disposes of the waste on-site. Should the *facility* count the *toxic chemicals* in the waste towards the *otherwise use* threshold upon receipt of the waste shipment (e.g., signing the hazardous waste manifest), or upon actual *disposal*?

The *facility* must count the amount of the *toxic chemical* towards its *otherwise use* threshold upon actual *disposal* of the waste. *Toxic chemicals* are applied toward the *otherwise use* threshold upon the performance of that activity. The *facility* does not *otherwise use* the *toxic chemical* in the waste received from off-site until the *facility* disposes of the waste on site.

Activity Threshold, Otherwise Use, Neutralization

126. A *covered facility* adds a listed acid to wastewater to neutralize the wastewater prior to discharge. Is this activity *manufacturing*, *processing*, or *otherwise using* the *toxic chemical*?

Because the listed acid is not incorporated into the final product and distributed in commerce, nor is it created at the *facility*, the *toxic chemical* is *otherwise used* with a threshold of 10,000 pounds.

Process vs. Otherwise Use, Activity Threshold, Wastewater Treatment

127. Would a chemical used only for wastewater treatment be considered *processed* or *otherwise used* for determining the threshold level?

Because its function (to treat wastewater) is such that it is not intended to be incorporated into a product distributed in commerce, the *toxic chemical* would be *otherwise used.*

Otherwise Use, Landfill Leachate

128. A *facility* captures leachate from a landfill, treats the leachate with a *toxic chemical* and then uses the treated leachate as on-site irrigation water. Assuming the *facility* exceeds the *otherwise use* threshold for the *toxic chemical*, is the *otherwise use* of treated leachate (containing the *toxic chemical*) as irrigation water reported as a release to land in Part II, Section 5.5.4 (Other Disposal)?

Yes. Use of a leachate and chemicals contained in the leachate for irrigation purposes is considered an *otherwise use* and amounts of listed *toxic chemicals* contained in the leachate must be counted toward the *otherwise use* threshold. Any listed *toxic chemicals* *manufactured* during the treatment of the leachate would also need to be considered toward the *manufacturing* threshold. The leachate, and listed *toxic chemicals* contained in the leachate, are also considered a waste and any *otherwise use* of listed *toxic chemicals* contained in the leachate are not eligible for the de minimis exemption. This is the case even though the listed *toxic chemical* in the leachate must be counted toward the *otherwise use* threshold. Also, the *otherwise use* of these chemicals for irrigation constitutes a release to land and would be reportable in Part II, Section 5.5.4 (Other Disposal) and Section 8.1.

Otherwise Use, Treatment for Destruction, Phase Separation

129. If a *toxic chemical* is derived from the phase separation of wastes received from off site and that chemical is subsequently incorporated into a product at the *facility* and then distributed into commerce, has the toxic chemical been *processed* or *otherwise used*?

If a facility receives materials containing *toxic chemicals* from off-site for further *waste management* and the *toxic chemicals* are *treated for destruction*, stabilized, or *disposed* on-site, the *facility* would be *otherwise using* the *toxic chemical*. However, during phase separation the *toxic chemical* in the waste is not actually destroyed. Furthermore, the *toxic chemical* is incorporated into a product at the *facility* and is further distributed in commerce (e.g., retorted mercury sold for reuse in thermometers and mercury switches). Thus, as long as the *toxic chemical* coming from the waste is not stabilized, *treated for destruction*, or *disposed*, it would not be *otherwise used* because it is neither *treated for destruction* nor *disposed* on site. Because it is distributed in commerce, it would be *processed* and therefore subject to the 25,000 pound threshold. Once a *facility* exceeds a threshold for a particular *toxic chemical*, amounts of that chemical that are *released* or otherwise managed as a waste must be calculated for all on-site activities.

Facility-Facility Reporting, Multi-Establishment, Stormwater, Wastewater, Otherwise Use

130. Three separately owned companies are located within a single industrial park. These companies are separate *facilities* under EPCRA Section 313. *Facility* A discharges wastewater through a pipeline to an outfall on *Facility* B's property. *Facility* B runs the discharge permit for another outfall through which stormwater from *Facility* C passes. Both the wastewater and stormwater contain several *toxic chemicals*, which pass through the outfalls untreated (within permitted levels) to a nearby waterway. *Facility* A and *Facility* C exceed activity thresholds for these *toxic chemicals* in their manufacturing processes. *Facility* B does not use the chemicals in any manufacturing operations on-site. However, more than 10,000 pounds of each *toxic chemical* contained in the wastewater and stormwater annually flow through *Facility* B's piping and outfalls. Must *Facility* A and C report the discharges as off-site transfers in Part II Section 6.2 of the Form R, or in Section 5.3, as a discharge to a stream as well as a *release* in Section 8.1? Must *Facility* B consider these *toxic chemicals* towards the *otherwise use* threshold even though the *toxic chemicals* are not *treated for destruction*, stabilized or *disposed* on-site?

In this situation, *Facility* A and *Facility* C would report the *toxic chemicals* transferred to *Facility* B, as an off-site transfer in Part II, Section 6.2 using treatment code M90, other off-site management and in Section 8.1 as *released*. *Facility* B would not consider these *toxic chemicals* towards their *otherwise use* threshold because *Facility* B does not receive *toxic chemicals* in waste from off-site for *disposal* on-site under EPCRA Section 313. If, however, *Facility* B meets an activity threshold for these chemicals elsewhere

at the *facility*, it would report the *release* of the chemicals in the wastewater received from *Facility* A and the stormwater from *Facility* C in Part II, Section 5.3 and 8.1 of the Form R.

Otherwise Use, Definition of, Treatment for Destruction, Waste Management Activities

131. A *covered facility* receives an organic waste stream from off-site for the purposes of further *waste management*. The *facility* treats the organic *toxic chemicals* for destruction. This waste contains a small fraction of Section 313 metal compounds. The metal fraction of this waste is either stabilized and *disposed* on-site or sent off-site for *disposal* without stabilization. Should these Section 313 metals be considered towards the *facility's otherwise use* threshold?

The chemicals in the organic fraction of the waste received from off-site that undergo *treatment for destruction* are counted towards the *otherwise use* threshold. Additionally, the metals that are stabilized and *disposed* on site are counted towards the *otherwise use* threshold. Any of the *toxic chemicals* in wastes received from off-site that are not *treated for destruction*, stabilized or *disposed* of on-site do not meet the definition of *otherwise use* and are not counted towards this threshold. Therefore, the metals fraction of the waste stream that is sent off-site for *disposal* is not counted towards this threshold. If, however, a threshold is exceeded for these metals elsewhere in the *facility*, the transfer off-site for further *waste management* of the parent metal should be reported in Part II, section 6.2 and 8 of the Form R. Additionally, the possibility exists for new chemicals to be created during on-site treatment, *disposal*, or stabilization. If a new section 313 chemical is created, it must be considered towards the *facility's manufacturing* threshold.

Otherwise Use, Threshold Determination, Fumigants

132. Must *releases* of listed *toxic chemicals* used as fumigants be reported if the other criteria and thresholds are met?

Yes. Fumigant use would be subject to the 10,000 pound *otherwise use* threshold.

Coincidental Manufacture, Activity Threshold, Process, Ammonia, Waste

133. A *covered facility* renders byproduct animal parts and blood into protein for use as animal feed. The byproduct animal parts and blood may contain nitrogen compounds, which when they decompose generate ammonia. The ammonia is therefore incorporated into the protein product that is distributed in commerce. Is the ammonia subject to Section 313 reporting?

Yes. The ammonia is being coincidentally *manufactured* as a result of the decomposition of the byproduct animal parts. The ammonia is also being *processed* since it is incorporated into the end-product. Therefore, the ammonia in the byproducts is subject to both the *manufacturing* and *processing* thresholds under EPCRA Section 313.

Relabel, Threshold Determination

134. Our *facility* domestically purchases a *mixture* containing *toxic chemicals*. We store it and then sell it to our customers without even opening the boxes. Must we report on these *toxic chemicals*?

No. *Covered facilities* must only report on those *toxic chemicals* that they *manufacture, process*, or *otherwise use* in excess of the applicable activity thresholds. Because relabeling or redistributing the *toxic chemical* where no repackaging of the *toxic chemical* occurs is not *manufacturing, processing* or *otherwise using* the *toxic chemical* (40 CFR Section 373.3), the *facility* is not conducting a reportable activity. Therefore, it does not need to apply these *toxic chemicals* to the reporting thresholds.

Repackaging, Container Size

135. Does it matter for purposes of determining the *processing* threshold if amounts that are received in smaller containers are removed from the smaller containers and repackaged into a larger container prior to their distribution in commerce?

No. The act of transferring any amount from one unit container to another prior to distributing the material in commerce constitutes the act of *processing*. The size of the container does not matter.

Lab Packs, Processing, Repackaging

136. Lab packs and hazardous waste in general tend to move progressively from smaller containers to larger containers. Is this repackaging activity covered by the *processing* threshold?

Repackaging *toxic chemicals* in hazardous waste may be covered by the *processing* threshold. For an activity to be considered *processing* under EPCRA Section 313, the *toxic chemical* must be prepared for distribution in commerce. If the listed *toxic chemical* is not removed or taken from the smallest unit, but is simply placed in a larger container while the contents remain in the smaller container, then the listed *toxic chemical* is not considered to be repackaged. If the listed *toxic chemical* is taken out of the smallest unit container and is transferred to another container, it is considered repackaged. However, if, after the *toxic chemical* has been repackaged, it is not distributed in commerce (e.g., instead of being distributed in commerce, it is sent off-site for *disposal* or treatment) the activity is not a covered *processing* activity under EPCRA Section 313. It would only be considered *processed* if the *toxic chemicals* in the lab packs, after being repackaged, are sent off-site for recycling or for further use or reuse.

Threshold Determination, Metal Compounds, Metals, Chemical Conversion, Copper, Electroplating

137. In an electroplating operation, a *facility* uses an elemental copper anode and an electrolyte solution containing a copper compound. During the electrolytic process, elemental copper is deposited at the cathode (the item being plated). As elemental copper is plated out at the cathode, copper goes into solution at the anode forming a copper compound. For purposes of EPCRA Section 313, how would the *facility* make threshold determinations for copper and copper compounds?

The electroplating of copper is a two step process in which the elemental copper from the anode is converted into a copper compound in solution and the copper compound in solution is converted to elemental copper.

A constant concentration of copper compounds is thus maintained in the electrolytic solution surrounding the electrodes. In such an electrolytic cell, four separate thresholds are applicable for purposes of EPCRA Section 313:

a. The amount of copper anode consumed counts towards a *processing* threshold for elemental copper (since its purpose is to provide copper to the cathode, via the bath).

b. The amount of copper compound generated in the electrolytic solution (as a result of oxidation of elemental copper at the anode) would count towards a *manufacturing* threshold for copper compounds.

c. The amount of copper compound converted to elemental copper in the electrolytic solution counts toward a *processing* threshold for copper compounds (since it is available for reduction at the cathode).

d. Finally, the amount of copper deposited at the cathode would count towards a *manufacturing* threshold for elemental copper (since elemental copper is being produced from a copper compound).

For example, a *facility* uses up 15,000 pounds of copper anode per year (the anode is composed of elemental copper). The elemental copper is *processed* by *manufacturing* 37,000 pounds of copper sulfate (copper sulfate ($CuSO_4$) is 40 percent copper by weight and, in this example, is the form in which copper exists in the electroplating bath). The copper sulfate is then *processed* by *manufacturing* 15,000 pounds of elemental copper. The following thresholds apply:

	Manufacture	*Process*
Elemental Copper	15,000 lbs	15,000 lbs
Copper Compounds	37,000 lbs	37,000 lbs ($CuSO_4$)

The *facility* would file a Form R for "Copper Compounds" because it exceeds the *manufacturing* and *processing* thresholds for a copper compound.

Activity Threshold, Process, Otherwise Use, Metal Compounds, Electroplating

138. A covered electroplating *facility* uses copper cyanide as its source of copper in plating baths in their electroplating operation. Are they *manufacturing*, *processing*, or *otherwise using* this compound? How do they determine whether they meet the activity threshold and how are *releases* and other *waste management* activities reported for this chemical?

In this process the copper cyanide is both *manufactured* and *processed*. The copper cyanide is created in the plating solution, and the amount created should be counted towards the 25,000 pound *manufacturing* threshold. The copper cyanide is also being *processed* since the copper from the copper cyanide is plated onto an object that is to be distributed in commerce. Thus, the copper cyanide used in this process should be counted towards the *processing* threshold for both copper and cyanide compounds.

The copper cyanide is both a copper compound and a cyanide compound and is reportable under both the copper compounds category and the cyanide compounds category. The total weight of the copper cyanide is to be counted towards the thresholds for both categories. However, for reporting *releases* and other *waste management* activities, the total weight of the copper cyanide is to be reported under the cyanide compounds category, but only the weight of the copper is to be reported under the copper compounds category.

Multiple Activity Threshold, Manufacturing

139. At a mining *facility*, sulfuric acid aerosol is sprayed onto a copper ore pile to leach copper sulfate for further *processing*. How should the *facility* make threshold determinations for sulfuric acid?

Sulfuric acid is reportable only in aerosol form. Therefore, the *facility* *manufactures* sulfuric acid (acid aerosol) each time the acid passes through the spray mechanism. In this particular example, the acid converts to copper sulfate, which is subsequently reacted to generate sulfuric acid and is applied to the ore pile. Because the *facility* generates another listed *toxic chemical* (copper sulfate), the *facility* must count the amount of sulfuric acid (acid aerosol) *manufactured* each time it passes through the spray mechanism, and apply this amount to the *manufacturing* threshold of 25,000 pounds for sulfuric acid (acid aerosol), in addition to considering amounts of copper sulfate that are also *manufactured*. Because all the sulfuric acid (acid aerosol) *manufactured* is subsequently *otherwise used*, the *facility* must apply this same amount towards the *otherwise use* threshold of 10,000 pounds. Facilities are also directed to refer to the Guidance for Reporting Sulfuric Acid (EPA-745-R-97-007; November 1997) for further assistance.

Multiple Activity Thresholds

140. At a covered mining *facility*, hydrochloric acid aerosol is sprayed onto an ore pile to leach minerals for further *processing*. According to Guidance for Reporting Sulfuric Acid, the total volume of acid should be

counted towards the manufacturing threshold of 25,000 pounds. Should this quantity also count towards the *otherwise use* threshold?

Yes, because the *facility* is *otherwise using* the hydrochloric acid (acid aerosol) as a leaching agent to enable minerals leached to then be *processed*.

Multiple Activity Thresholds, Cyanide Compound, Gold Leaching Operations

141. A covered metal mine uses cyanide compounds in a gold leaching operation to extract gold from ore. The cyanide compound reacts with gold to form gold cyanide. The gold cyanide is then reacted to generate gold metal and sodium cyanide. The sodium cyanide is used to leach more gold from the ore pile. How should the covered metal mine consider these cyanide compounds for EPCRA Section 313 threshold purposes?

In the gold leaching operation, the covered mine is *otherwise using*, *processing*, and *manufacturing* cyanide compounds. The cyanide compounds that react with the gold in the ore (e.g., sodium cyanide) are *otherwise used*. The gold cyanide *manufactured* in this reaction are considered towards the *facility*'s *manufacturing* threshold for cyanide compounds. The gold cyanide compound is also *processed* as a reactant because the gold from the compound is distributed in commerce.

Multiple Activity Thresholds, Mining Disposal, Injection, Leaching System, Sulfuric Acid

142. Sulfuric acid is injected into a Class II well for the purpose of in-situ leaching, not for the purpose of waste *disposal*. The in-situ leaching is a recirculating system and as sulfuric acid is injected into the well, low concentrations of metals are solubilized, brought to the surface, and the metals are subsequently separated from the sulfuric acid solution and distributed in commerce. Some of the metal compounds that are solubilized remain with the sulfuric acid solution and are reinjected into the in-situ recirculating leaching system. Would the amount of metal injected back into the Class II well be reported in Part II, Section 5.4 if an activity threshold is exceeded?

There are several activities that are taking place in the above scenario that the *facility* needs to consider in terms of EPCRA Section 313 reporting. The injection of sulfuric acid solution to extract certain metals is likely to result in the formation or *manufacturing* of listed *toxic chemicals* such as metal sulfate compounds. The amounts of listed *toxic chemicals manufactured* must be considered toward the *facility*'s *manufacturing* threshold. The metal compounds are also being recovered for subsequent distribution in commerce, and these amounts must be considered toward the *processing* threshold. Metal compounds that are being reinjected are being *released*, but for purposes of EPCRA Section 313 reporting, amounts of listed *toxic chemicals* reinjected and recirculated are not reportable as *released* provided that these amounts continue to be circulated. Any amounts known to escape the "recirculating/leaching system" and remain in the leaching zone or otherwise escape within the reporting year would be considered a *release*.

Multiple Activity Thresholds

143. A *facility manufactures* an aluminum dust that is captured in a bag house, the dust is put into a smelter, and then put back into the process where it is recast into ingots, and sold. How is the dust considered for purposes of determining thresholds and estimating *releases* and *waste management* activities?

The *facility* must count the amount of aluminum dust that is *manufactured* toward the *manufacturing* threshold. The amount of aluminum dust that is collected and recast into ingots and sold is incorporated into a product that is distributed in commerce. These amounts are considered to be *processed* and must be counted toward that *processing* threshold. The aluminum dust that is captured from the pollution control device and put back into the process is reported in Part II, Section 8.6 (Quantity Treated On-Site) because the aluminum dust is converted to a non-listed form of the chemical.

Activity Threshold, Blending

144. A TSD *facility* receives naphthalene from off site. The naphthalene is reacted with sodium to produce sodium naphthalene. The sodium naphthalene is reacted with PCB-contaminated oil to remove the PCB contaminants. The resulting oil, now containing naphthalene, is sent off site for further distribution in commerce. Is the naphthalene considered to be *manufactured*, *processed*, and/or *otherwise used*?

Yes. The naphthalene has been *manufactured*, *processed* and *otherwise used* by the TSD *facility*. When the TSD *facility* reacted the naphthalene with the sodium to produce a compound capable of removing the PCB contaminants, the *facility otherwise used* the naphthalene. The reaction of the sodium naphthalene with the PCB-contaminated oil *manufactured* naphthalene as a component of the oil. Finally, the distribution of the naphthalene in the oil in commerce constitutes *processing*. Accordingly, the *facility* would have to consider all three activity thresholds; *manufacturing*, *processing*, and *otherwise use*.

Activity Threshold, Process, Otherwise Use, Adhesive, Process vs. Otherwise Use

145. A *facility* covered under EPCRA Section 313 *manufactures* shoes. During production the *facility* uses adhesives that contain solvents such as toluene. Due to the inefficiency of the *process*, 20 percent of the solvent remains behind in the shoes when they are sold in commerce. Would the *facility* count the amount of solvent remaining in the shoes toward the 25,000 pound *processing* threshold?

No. The amount of solvent used in the adhesive would count toward the 10,000 pound *otherwise use* threshold. Since the *toxic chemical* does not function as a component of the shoe, it would not be considered *processed*. Thus, the *facility* would file a Form R if it meets a 10,000 pound *otherwise use* threshold for the toluene in the adhesive.

Process vs. Otherwise Use, Purpose Behind Incorporation, Flotation Agent, Process, Otherwise Use

146. A covered coal mine uses a flotation agent containing listed *toxic chemicals* to clean coal. Some of the flotation agent remains on the coal, which is then distributed into commerce. The *facility* chooses the flotation agent for the purpose of cleaning the coal and not to add value to the coal product. Has the *facility* *processed* the amount of the listed *toxic chemical* that adheres to the coal from the flotation agent?

No. In this example the *facility* is *otherwise using* the listed *toxic chemicals* that are components of the flotation agent. Amounts of listed *toxic chemicals* contained in the flotation agent must be considered toward the *facility*'s *otherwise use* threshold. The *facility* is using these listed *toxic chemicals* for the purpose of cleaning the coal and not for the purpose of adding value to the coal product.

Activity Threshold, Process, Impurity, Process vs. Otherwise Use

147. A raw material contains a listed *toxic chemical* as an impurity. The raw material is *processed* at the *facility*, and the *facility* does not have any devices to remove the impurity, which is incorporated into the final product. However, the intent is not to have an impurity in a final product. Is this *facility processing* or *otherwise using* the chemical?

For Section 313 reporting purposes, as long as the *toxic chemical* impurity is in the raw material being received at the *facility*, and there is no system at the *facility* to remove the impurity, the *facility* is *processing* the *toxic chemical*.

Process, Solvents

148. A *facility* feeds 50,000 pounds of solvent containing 50 percent MIBK and 50 percent glycol ether into a recycling *process*. The *facility*'s intent is to recover as much of the organics as possible and distribute the organics into commerce. The *facility* is primarily concerned with the recovery of MIBK. The product specification of the resulting solvent requires a specific concentration range for MIBK, but the amount of glycol ether in the final product does not matter. How does the *facility* consider amounts of glycol ether?

Given that the *facility* knows that glycol ether is recovered with the desirable MIBK, the *facility* should count all amounts of glycol ether that enter the recovery system toward the *facility*'s *processing* threshold.

Process, Impurity

149. Are trace metals in ore that remain in the product and are in the same form as extracted considered *processed*? What if the trace metals that were extracted do not remain in the product?

Amounts of listed *toxic chemicals* that remain with the product (metal concentrate) that are distributed in commerce are considered *processed* and these amounts must be factored into the *facility*'s *processing* threshold. Amounts of listed *toxic chemicals* in *mixtures* and *trade name products* that are *processed* are eligible for the de minimis exemption. Any trace metal or

other listed *toxic chemical* that is completely removed from the *facility*'s product prior to distribution and disposed, would not count toward the *facility*'s *processing* threshold, but would need to be considered in *release* and other *waste management* calculations if the *facility* has exceeded thresholds for the listed *toxic chemical* elsewhere.

Coal Mine, Ethylene Glycol, Process vs. Otherwise Use

150. A covered coal mine applies ethylene glycol to coal to prevent freezing during on-site activities. The ethylene glycol remains on the coal that is sold. However, the purchaser does not request ethylene glycol, and the ethylene glycol does not add any value to the coal. Is the ethylene glycol *processed* or *otherwise used*?

The ethylene glycol is *otherwise used*. The *facility* is using the ethylene glycol solely for the purpose of preventing the coal from freezing at the *facility*. However, if the *facility* adds the ethylene glycol to the coal to protect it from freezing during transfer, the *facility* has intentionally incorporated the *toxic chemical* into its product for distribution in commerce and, therefore, is *processing* the *toxic chemical*.

Activity Threshold, Coincidental Manufacture

151. Do *toxic chemicals* produced coincidentally to *manufacturing*, *processing*, or *otherwise using* have to be reported?

Toxic chemicals manufactured coincidentally are included in determining the quantity of the *toxic chemical manufactured.* In the case of coincidental *manufacture* of an impurity that remains in the product, below the de minimis level, for distribution in commerce the de minimis exemption may apply (40 CFR Section 372.38(a)). If, however, the impurity is removed from the final product prior to distribution in commerce, the exemption does not apply.

Activity Threshold, Coincidental Manufacture, Wastewater Treatment

152. How can wastewater treatment products be considered as *manufactured* from a treatment process?

The definition of *manufacture* includes the coincidental generation of a listed *toxic chemical* as a consequence of the *facility's* waste treatment or *disposal* activities. These *toxic chemicals* may not be produced for commercial purposes. They are, nevertheless, created as a result of the *facility's* activities and they must be included in *activity threshold* determination and their *release* or other *waste management* must be considered.

Activity Threshold, Coincidental Manufacture, Adhesive, Neutralization

153. A *covered facility* uses a caustic product in the manufacturing of an adhesive. A listed acid is added to neutralize the solution to form another listed Section 313 *toxic chemical*. Is this a covered activity?

Yes. The *facility* is coincidentally *manufacturing* the listed *toxic chemical*.

Coincidental Manufacture, Metal Compounds

154. Do *covered facilities* need to consider the inadvertent conversion of one metal compound to another as *manufacturing*? For example, a pulp and paper mill inadvertently converts metal carbonates and oxides in wood to metal sulfides during pulping. Is this a covered *manufacturing* activity?

Yes. *Manufacturing* is not limited to intentional *manufacturing*; it also includes coincidental *manufacture* or, inadvertent *manufacture*. In general, anytime one metal compound has been converted to another metal compound, the *facility* must count the new metal compound towards the *manufacturing* threshold. The fact that the parent metal is the same in both compounds does not negate the fact that a new metal compound has been *manufactured*.

Activity Threshold, Process

155. A *facility* draws steel rods into a smaller diameter and then distributes the rods in commerce. Is this *manufacture*, *process*, or *otherwise use*?

This activity is considered *processing* because the *toxic chemical* remains incorporated in the final product distributed in commerce.

Otherwise Use, Manufacturing Aid, Processing Aid

156. What is the difference between a manufacturing aid and processing aid?

A chemical *processing* aid is added directly to the reaction *mixture* or is present in a *mixture* used to aid in *processing* and its function is such that it does not remain in the product. Examples include catalysts, solvents, and buffers. A manufacturing aid helps to run the equipment and is never incorporated into the product. Examples include lubricants, coolants, and refrigerants. Since, in either case (manufacturing aid or processing aid), incorporation of the *toxic chemical* into the final product is not required for the chemical to perform its function, *toxic chemicals* that are used as manufacturing aids or as processing aids are considered *otherwise used* under EPCRA Section 313.

Manufacture, Chemical Qualifier, Fume or Dust, Coincidental Manufacture, Mold, Fumigants, Aluminum

157. A *covered facility* has purchased in excess of 100,000 pounds of aluminum material in block form to make a mold which stays on-site. When making the mold, fumes and dust are byproducts. Do we report these as the *toxic chemical*?

Aluminum appears on the list of *toxic chemicals* as "aluminum (fume or dust)." You must determine if you *manufacture*, *process*, or *otherwise use* aluminum fume or dust. In this case you do not *process* or *otherwise use* the fume or dust, but you do *manufacture* aluminum fume or dust coincidentally as a byproduct of making molds. Therefore, you must report for aluminum (fume or dust) if you exceed the 25,000 pound *manufacture* threshold for the reporting year.

Fume or Dust, Activity Threshold, Process

158. A *covered facility manufactures* a part from stainless steel bar which it then distributed in commerce. The annual quantity purchased is 500,000 pounds which is 18 percent chromium and 8 percent nickel. Does the *facility* have to report under Section 313 for either chromium or nickel?

The *facility* must report for the chromium because its quantity (90,000 pounds) is above the *processing* threshold of 25,000 pounds. The *facility* would also have to report for nickel because its quantity (40,000 pounds) is also above the *processing* threshold.

Fume or Dust, Process, Activity Threshold, Ingots

159. A *facility* melts aluminum ingots, reshapes them, and injects them into die to form parts which it then distributes in commerce. Does the 25,000 pound *processing* threshold apply to the amount of molten aluminum *processed*?

For the reporting year, the 25,000 pound threshold applies to the amount of aluminum fume or dust generated at the *facility*, not the aluminum in molten (liquid) or solid form. Therefore, the *facility* must determine whether they *manufacture* or *process* more than 25,000 pounds of aluminum fume or dust during their processing operation.

Activity Threshold, Lead Deposits

160. A remanufacturer of auto engines cleans the engine parts and thereby produces a lead-containing waste (from gasoline lead deposits) which it sends off-site for *disposal*. Does the *facility manufacture, process,* or *otherwise use* lead compounds?

None of the EPCRA Section 313 activities apply. Neither lead nor lead compounds are *manufactured*. Lead is not incorporated into products for distribution in commerce nor is it a manufacturing aid or a processing aid as those terms are defined. Lead in the waste would not be included for a threshold determination. The *facility* does not *manufacture*, *process*, or *otherwise use* lead compounds.

Fume or Dust, Mixture, Process, Threshold Determination

161. Are chromium and nickel as components of stainless steel exempt from reporting if the *facility* is *processing* the stainless steel?

No. Stainless steel is a solid/solid *mixture*. Chromium and nickel are components of stainless steel. If the *facility* is incorporating the stainless steel into a product it intends to distribute in commerce, the company is *processing* the stainless steel as defined in Section 313. For example, if the *facility* makes porous metal filters from stainless steel powder or fabricates pressurized vessels, bars, or ingots of stainless steel, threshold determinations for the nickel and chromium components of the steel are required. The *facility* must report if the amounts *processed* exceed the reporting thresholds.

Activity Threshold, Chromium, Refractory Brick, Metal Compounds

162. A glass manufacturer uses a brick in its refractory kiln that contains chromium (III) compounds. During the manufacturing process, the chromium reacts to generate chromium (VI) compounds. The chromium compounds, while being used in the kiln, become part of the glass being manufactured. All the brick in the kiln is replaced every four to five years. What activity thresholds apply to chromium in this situation?

The brick, and thus the chromium (III) compounds in the brick, are being *otherwise used* based on the quantity of the bricks installed within a reporting year. The chromium compounds in the bricks are also considered *processed*, because the chromium compounds in the brick are incorporated as an impurity into the final product (the glass) which is distributed in commerce. However, for this *processing* step, the de minimis exemption may be taken. The chromium (VI) compounds generated from the chromium (III) compounds are considered *manufactured*. Thus, threshold calculations should be made for all three EPCRA Section 313 activity thresholds. The thresholds would be calculated based on the total weight of the chromium compounds being *manufactured*, *processed*, or *otherwise used*. However, only the weight of the chromium in the chromium compounds are used in *release* and other *waste management* calculations. Any *releases* that go up the stack or are sent off-site for *waste management* must be included. When the brick is replaced and *disposed* of, the amount of chromium that remains in the brick would also need to be included in *release* and other *waste management* calculations.

Activity Threshold, Process, Repackage

163. A multi-*establishment facility*, with a primary SIC code of 2911 operates a petroleum bulk plant, with SIC code 5171. The bulk plant receives gasoline from tanker trucks and stores the gasoline in storage tanks on-site. The *facility* also loads other tanker trucks with gasoline that distribute the gasoline to service stations. Are the listed *toxic chemicals* in the gasoline *processed*, *otherwise used*, or neither?

Since the *facility* repackages the gasoline by transferring it between trucks and bulk storage containers for further distribution into commerce, the *facility* is *processing* the listed *toxic chemicals* in the gasoline.

Repackaging via Pipeline

164. A petroleum bulk plant receives petroleum via pipeline. The petroleum goes from the pipe into a storage tank and exits the *facility* again through the pipeline. It is then sent to another petroleum bulk plant within the same company but located on non-contiguous and non-adjacent property, which distributes the petroleum into commerce (i.e., their customers). Did the first plant repackage and therefore *process* the petroleum?

Yes. The petroleum received via pipeline, stored and subsequently transferred to another *facility* has been repackaged and the listed *toxic*

chemicals have been distributed in commerce. Amounts of listed *toxic chemicals* contained in the amount repackaged must be considered toward the *processing* threshold.

Activity Threshold, Otherwise Use, Solvents

165. If a solvent that is a listed *toxic chemical* is used to clean an apparatus but does not become part of the final product, is the chemical covered for reporting purposes under EPCRA Section 313?

If a solvent is not incorporated into a product distributed in commerce, then for the purposes of Section 313, it would be considered *otherwise used*. It would be subject to reporting if used in quantities exceeding 10,000 pounds per year.

Activity Threshold, Otherwise Use

166. A *covered facility* uses paint thinners in its operations. The thinners are evaporated or baked out of the finished painted products. Are those chemicals subject to Section 313 regulations?

If the chemical evaporates or is baked out of a finished coating, it has been *otherwise used* and is subject to the 10,000 pound threshold.

Process

167. Is soldering light bulbs with lead solder considered *processing* of the solder?

Yes, it incorporates the solder into a product for distribution in commerce.

Activity Threshold, Process, Otherwise Use

168. A *covered facility* uses methanol in its gas-carburizing heat treatment of steel. The main purpose of methanol in the *facility's* operations is to provide the source of carbon that is deposited on the steel. Is this *processing* or *otherwise use* of the methanol?

The methanol is being *processed*, not *otherwise used*, because the methanol is the source of the carbon for the carburization activity. The methanol is being reacted, and the carbon from it is being incorporated into the steel.

Activity Threshold, Process, Repackage

169. Does the placing of a bulk liquid containing a small percentage of a Section 313 *toxic chemical* into small bottles for consumer sale constitute a reportable/threshold activity of the *mixture*?

Yes, repackaging for distribution in commerce is a type of *processing* (40 CFR Section 372.3). If the bulk liquid contains a Section 313 listed *toxic chemical* in excess of the de minimis level, the *toxic chemical* in the liquid would have to be factored into calculations in determining whether the *processing* threshold is exceeded for that *toxic chemical*.

Repackaging, Processing

170. A *covered facility* receives a chemical in bulk and repackages it into smaller containers that are sent to consumers. Are amounts repackaged considered toward an activity threshold?

Amounts of the *toxic chemical* that a *covered facility* repackages for distribution in commerce must be considered toward the *processing* threshold amount of 25,000 pounds per listed *toxic chemical*.

Repackaging

171. A *covered facility* receives a chemical in bulk, repackages the chemical into reusable containers that are sent to customers, who then return the containers to be refilled. How does the *facility* consider residual amounts of the product returned to the *facility* in used containers, which are then subsequently refilled and redistributed in commerce?

When the *facility* originally places the *toxic chemical* into the reusable containers, the *facility* is *processing toxic chemicals*. Because the residual amounts that are returned to the *facility* in the reusable containers are not transferred to other containers or packages, the residual amounts have not been repackaged. Therefore, the listed chemicals in the residual amounts do not have to be considered toward the *facility*'s *processing* threshold again.

Repackage, Recycle

172. After an EPCRA Section 313 *toxic chemical* is spent, a *covered facility* removes waste containing the *toxic chemical* from the production *process* and places it into drums. The *facility* sends these drums containing 30,000 pounds of the *toxic chemical* off-site to be recycled. The *facility* exceeds the 25,000 pound *processing* threshold for this *toxic chemical* and is required to file a Form R for the listed toxic chemical. What is the appropriate box to check in Part I, Section 3.2 of the Form R?

All activities involving the preparation of a listed *toxic chemical*, after its *manufacture*, for distribution in commerce are to be included in the *processing* threshold determination for that chemical. The act of repackaging an EPCRA Section 313 *toxic chemical* and then transferring it off-site for recycling is considered *processing*. As such, facilities sending *toxic chemicals* in wastes off-site for recycling should check "repackaging" in Part I, Section 3.2 of the Form R.

Activity Threshold, Process, Otherwise Use, Paint

173. Paint containing listed *toxic chemicals* is applied to a product and becomes part of an *article*. Does the 25,000 pound *processing* threshold apply? What about the volatile *toxic chemicals* from the painting operation - are they *otherwise used*, and thus subject to the 10,000 pound threshold?

Yes. This is a case in which different listed *toxic chemicals* in the same *mixture* may have different uses and therefore, different thresholds. The listed *toxic chemicals* that are incorporated as part of the coating are *processed*, whereas the volatile solvents in the paint are *otherwise used* because their function is such that they do not become incorporated into the *article*.

Activity Threshold, Otherwise Use

174. A printing company uses a listed *toxic chemical* to manufacture labels. The chemical is mixed with ink and then applied to the labels. The chemical slows down the ink's evaporation rate. During the drying process, the chemical is evaporated and the final product contains no trace of the *toxic chemical*. Does the use of the chemical in this manner constitute *processing* because it is used as a "performance enhancer?"

No. The *toxic chemical* is considered *otherwise used* because the listed *toxic chemical* is not incorporated into the final product when it is distributed in commerce. A *toxic chemical* is considered a "performance enhancer" if the *toxic chemical* is incorporated into the end product and improves the performance of the end product distributed in commerce.

Threshold Determination, Release to Land, Treatment, Release Reporting, Fertilizer

175. When completing the Form R, how would a *facility* report the *releases* of a listed *toxic chemical* that is used as a fertilizer? Does it matter if the fertilizer is a waste or a purchased product? Would the application on-site constitute a *release* to land on Part II, Section 5.5 of the Form R?

Based on the information provided, the amount of the *toxic chemical* in the fertilizer applied to land on-site would be counted towards the *otherwise use* threshold unless it meets the facility grounds maintenance exemption. The *toxic chemical* in the fertilizer would be reported in Part II, Section 5.5 of the Form R as a release to land, regardless of whether it is a purchased product or a waste.

Fertilizer, Land Treatment/ Application Farming

176. If a manufacturing *facility* that has a farming area applies a *toxic chemical* in waste generated on-site to land on-site, for use as a fertilizer, must the *facility* report the amount of the *toxic chemical* on the Form R? Should the *facility* also report any volatilization of the *toxic chemical* that occurs during land application, on the Form R?

Yes. Chemicals applied to land during use for farming are *released* to the *environment* and are to be reported as such. In addition, the chemicals are being *otherwise used*. Whether or not the *facility* intends the use during farming to be a *disposal* method, the *facility* must report the quantity of the *toxic chemical* in waste *released* to land in Section 5.5.2 (Land Treatment/ Application Farming) of the Form R.

The *facility* must report that portion of the *toxic chemical* that volatilizes from the land application unit during the same reporting year in Section 5.1 (Fugitive Air Releases) of the Form R. This quantity would not be included in the *releases* reported to land in Part II, Section 5.5.2. The sum of the amounts *released* to land and to air must be included in Section 8.1 of the Form R.

Process, Repackage, Article Component

177. A car manufacturer has a central 25,000 gallon storage tank on-site. A pipe leads from the central storage tank to a fill station where the cars are filled with gas before being sent off-site to be sold. Is the *processing* of the *toxic chemical* components of the gasoline considered "repackaging only" or "as an *article* component" in Part II, Section 3.2(e) of the Form R?

The *toxic chemicals* in the gasoline should be reported as *processed* as an "*article* component" because they are incorporated into the car which is an *article*. (See Section 3.2(c) of the Form R and Instructions.)

Activity Threshold, Process, Chlorine

178. In an aluminum casting process, a *facility* bubbles chlorine gas through molten aluminum. The chlorine reacts with impurities in the aluminum and produces a byproduct called "dross," which is distributed in commerce. Small quantities of unreacted chlorine are emitted during this process. What is the applicable threshold for chlorine in this process?

Because the chlorine reacts with impurities and becomes incorporated in the dross, which is distributed in commerce, the chlorine is considered *processed*. If the amount of chlorine *processed*, which includes both the chlorine incorporated in the dross and the unreacted chlorine, exceeds 25,000 pounds, a Form R must be filed and any *releases* or other *waste management* of chlorine must be reported.

Activity Threshold, Process, Otherwise Use, Methylenebis (Phenyliso-cyanate), Mold

179. A *facility* uses a listed *toxic chemical* methylenebis (phenylisocyanate) to create molds from which they produce metal castings. Normally these molds are kept by the manufacturer or are broken up for reuse. Has the *toxic chemical* been *otherwise used* or *processed* by the *facility*?

The *toxic chemical* is *otherwise used*. The *toxic chemical* is not *processed*, because it does not become part of a product that is distributed in commerce.

Activity Threshold, Process, Toll Processor, Pesticides

180. An agri-chemical manufacturer produces a specialty pesticide for a farmer by blending chemicals which have been supplied by the farmer. It then applies the pesticide to the farmer's crops. Does the blending of the listed *toxic chemicals* received from the farmer for application to the farmer's crops constitute *processing* of the *toxic chemicals*? Does the agri-chemical manufacturer, as a "toll processor," have to count the listed *toxic chemicals* towards the threshold determination?

Yes, these activities constitute *processing*. The blending of the *toxic chemicals* and their subsequent transfer back to the farm for application to the farmer's fields constitutes *processing*. The origin of the *processed* material is irrelevant, and the return of the blended *toxic chemicals* for application on the

farmer's fields can be considered products distributed in commerce. Therefore, the *processing* threshold would apply. "Toll-processing" is no different than any other *processing*. Assuming that the primary SIC code of the agri-chemical manufacturer is a *covered SIC code* (e.g., 2875 and not 0711), and they meet the employee criterion, the agri-chemical manufacturer must make threshold determinations based on the amount of any listed *toxic chemical* it *processes* as well as any other *manufacture* or *otherwise use* activities that occur at its *facility*.

Coincidental Manufacture, Ammonia

181. Are meat renderers who *process* animal waste byproducts (i.e., blood, feathers, bones, etc.) required to report the ammonia generated in the condensate water from the cooking of these byproducts?

The ammonia generated from the rendering (cooking) process is considered to be coincidentally *manufactured*, and thus, must be reported under EPCRA Section 313 if ten percent of the amount of aqueous ammonia produced exceeds the 25,000 pound *manufacturing* threshold.

Activity Threshold, Otherwise Use, Ammonia, Manufacture

182. A food processor uses ammonia in its baking processes. In the first process, aqueous ammonia is reacted to form ammonium bicarbonate. The ammonium bicarbonate is added to the dough which is baked in an oven. When baked, the ammonium bicarbonate is dissociated in the dough and the heat drives off anhydrous ammonia. Is this considered *manufacturing* or *otherwise using* ammonia?

The aqueous ammonia is reacted with another substance to form ammonium bicarbonate which is then used on-site. Therefore, the aqueous ammonia is considered to be *otherwise used* and is subject to the 10,000 pound *otherwise use* threshold. The anhydrous ammonia is being *manufactured* from the breakdown of the ammonium bicarbonate during the baking process which generates anhydrous ammonia, carbon dioxide, and water vapor. Thus, the amount of anhydrous ammonia generated during baking is counted towards the 25,000 pound *manufacture* threshold.

Activity Threshold, Process, Redistribute, Storage

183. If a person is simply storing and redistributing a *toxic chemical* without repackaging it, is this activity considered *processing* of the *toxic chemical* for Section 313 purposes?

No. The term *process* means the preparation of a listed *toxic chemical*, after its *manufacture*, for distribution in commerce. Because the *toxic chemical* is not repackaged but is merely redistributed, the *facility* is not *processing* the *toxic chemical*.

Activity Threshold, Process, Waste, Recycle

184. A barge repair *facility* (SIC code 3731 - ship building and repairing) cleans barges at its *facility* by vacuuming out residual *toxic chemicals* and selling the waste to a chemical recovery company to recycle. Must the *facility* report for the listed *toxic chemicals* in waste? Is it *processing* these chemicals under Section 313

Because the *facility* distributes the *toxic chemicals* in the waste into commerce, they are *processing* the *toxic chemical*. *Releases* from activities such as spills and equipment cleaning, must be reported if the *facility* exceeds the *processing* threshold. The quantity of the *toxic chemical* sent off for recycling should be reported in Part II, Sections 6.2 and 8.5. If the *toxic chemicals* in the waste were not distributed into commerce (e.g., if the *toxic chemicals* were sent off-site for disposal), the *facility* would not be *manufacturing*, *processing*, or *otherwise using* the *toxic chemical*.

Coincidental Manufacture, Byproduct, Threshold Determination, Concentration Information

185. A listed *toxic chemical* is *manufactured* as part of a *mixture* which is a byproduct. The *facility* does not know the specific concentration of the listed *toxic chemical* in this byproduct. For determining the threshold for Section 313, does the *facility* include this byproduct without knowing the specific concentration of the listed *toxic chemical*?

Because the reporting *facility* is *manufacturing* the *toxic chemical mixture* on-site, the *facility* is required to calculate the amount of the *toxic chemical* coincidentally *manufactured* during the reporting year based upon a reasonable estimate of the percentage of the *toxic chemical* in the *mixture*. This quantity is aggregated to determine if the *facility* exceeds the 25,000 pound threshold for *manufacturing*.

Activity Threshold, Process, Otherwise Use, MDI

186. A *covered facility* uses methylene bis(phenylisocyanate) (MDI) as an ingredient in the making of packing foam. When blown into foam, the MDI reacts to form a polymer. This foam is then packed with metal parts and shipped from the *facility*. Is the *facility processing* or *otherwise using* the MDI?

The MDI would be subject to the *processing* threshold, since it is incorporated into a product that is further distributed in commerce.

Activity Threshold, Otherwise Use, Methanol, Packing Medium

187. A *facility* received material X packaged in 50-gallon drums. Material X is immersed in methanol which acts as a packaging/coolant medium for material X during transport. As soon as the *facility* receives its delivery, it removes material X from the methanol, recaps the drum, and sends it back to the supplier. Should the owner/operator consider the methanol for threshold determinations and *release* and other *waste management* calculations under EPCRA Section 313?

Yes. The methanol, in this instance, is being *otherwise used*. The owner/operator must consider the methanol used to cool material X in its threshold determinations and *release* and other *waste management* calculations

Activity Threshold, Otherwise Use, Xylene

188. A *facility* uses xylene as a carrier to apply coatings to a product. The xylene is not incorporated into the product but it is necessary in order to manufacture it. Is the xylene *processed* or *otherwise used*?

The xylene is *otherwise used* since it is not incorporated into the product, nor is it distributed into commerce.

Activity Threshold, Otherwise Use, Ammonia

189. An engineering company performs reduction processes. In a NOx reduction process ammonia is used. Ideally, all of the ammonia would be consumed but, realistically, some always escapes out the stack. The ammonia reductions were determined to effect a net reduction in emissions. Are the minor quantities that escape subject to Section 313 reporting?

The ammonia used in the process would be *otherwise used*. If the *otherwise use* exceeds the 10,000 pound threshold, the *facility* would be required to report any *releases* or other *waste management* of ammonia.

Activity Threshold, Process, Ammonia, Chemical Conversion, Otherwise Use

190. Ammonia, an EPCRA Section 313 chemical, is used at a manufacturing *facility* to adjust pH levels in cheese products. During this process, the ammonia is converted into a salt which remains with the final cheese product. The cheese is then distributed in commerce. Is this considered a covered activity under EPCRA Section 313, and, if so, how should it be reported on the Form R?

Ammonia used in this manner is considered *processed* under EPCRA Section 313 and must be applied toward that threshold. The definition of *process* found at 40 CFR Section 372.3 affirms that a listed *toxic chemical* prepared for distribution in commerce is a reportable activity even if it is distributed in a different form or physical state from that in which it was originally received. All of the ammonia incorporated into the cheese is *processed* as a reactant and should be reported as such on the Form R.

Chemical Qualifier, Fume or Dust, Ammonia

191. A *facility* uses aluminum in its manufacturing operations. These operations involve welding, diecasting, buffing, and grinding. Is the *facility* subject to Section 313 reporting for this use of aluminum?

Because aluminum has a fume or dust qualifier, aluminum would be reportable under EPCRA Section 313 if a fume or dust were generated (i.e., *manufactured)* during welding, diecasting, buffing, grinding, or other operations above 25,000 lbs. If the aluminum is incorporated into a product in a fume or dust form, the *processing* threshold must also be considered.

Activity Threshold, Process, Fuel

192. A *covered facility* manufactures and repairs airplanes. Prior to beginning any repair work, any fuel remaining in the airplane's fuel tanks is emptied by service personnel at the *facility*. After the repairs are completed, the airplane is refueled with fuel removed from the airplane's fuel tanks and/or new fuel. Should the owner/operator of the manufacturing and repair *facility* consider the *toxic chemicals* present in the fuel when making Section 313 threshold and *release* and other *waste management* calculations?

Yes. For purposes of EPCRA Section 313 threshold determinations and *release* and other *waste management* calculations, the listed *toxic chemicals* present in the fuel are considered to be *processed* because they are being repackaged and further distributed in commerce. Thus, the listed *toxic chemicals* present in the fuel are subject to the 25,000 *processing* threshold.

Otherwise Use, Threshold Determination, Refractory Brick

193. Refractory brick containing 12,000 pounds of lead is installed in a reaction vessel. Is the lead in the brick considered *otherwise used* for purposes of EPCRA Section 313? Also, are *releases* of lead from the brick during the 1997 reporting year subject to *release* reporting on the Form R if no new bricks are added during the reporting year?

The lead contained in the bricks is considered *otherwise used* since it is not incorporated into the final product. The *facility* would count the amount of lead in the bricks that are added to the reaction vessel only for the year in which the bricks are installed. In answer to the second question, if the 10,000 pound threshold is exceeded, then all *releases* and other *waste management* of lead would be reported from both the newly added bricks and those installed in previous years. Neither the lead contained in the refractory bricks in the inventory (i.e., not yet installed), nor the lead in place, contained in bricks (i.e., installed in a previous year) are to be included in threshold determinations for the reporting year in question. If no bricks are installed during the reporting year, and lead is not used elsewhere at the *facility*, then a report would not be required.

Activity Threshold, Process, Repackage

194. A *covered facility* receives a shipment of five-gallon cans of paint containing a listed *toxic chemical*. The *facility* breaks up the shipment into separate five-gallon cans and packages each can in a box with a paint brush for sale. Is the listed *toxic chemical* repackaged and thus *processed* for purposes of EPCRA Section 313?

No. "Repackaging" refers to the act of removing a *toxic chemical* from one container and placing that toxic chemical into another container. Simply repackaging one container (that contains a *toxic chemical*) into another container does not constitute *processing* of that listed *toxic chemical* under EPCRA Section 313. The nesting of containers is not repackaging for EPCRA Section 313 purposes.

Repackaging, Breaking the Seal

195. Does breaking the integrity of the package that contains the *toxic chemical* constitute repackaging?

No. The listed *toxic chemical* must be transferred from one package to another in order for the listed *toxic chemical* to be considered repackaged.

Repackaging, Breaking the Seal

196. A *facility* receives a waste from off-site, samples the waste, and then sends the remaining waste off-site to be recycled without changing the packaging. Has the *facility processed* the listed *toxic chemical* in the waste?

No. Provided that the listed *toxic chemical* transferred to the off-site *facility* remains in the packaging in which it was received, it has not been repackaged. The *facility* has simply opened the original package for sampling and transferred the listed *toxic chemical* to another *facility*. Because no repackaging has occurred, no *processing* has taken place.

Activity Threshold, Process, Reclamation, Solvents

197. A reclamation *facility* receives waste solvents containing an EPCRA Section 313 *toxic chemical* from a separate *facility* that generated the wastes (the generating *facility*). The reclamation *facility* reclaims the listed *toxic chemical* and returns it, as a product, to the generating *facility*. For the purpose of EPCRA Section 313 threshold determinations, is the reclamation *facility processing* the listed *toxic chemical*?

Yes. By reclaiming the listed *toxic chemical* and returning it to the generator, the reclamation *facility* has prepared the chemical for distribution in commerce by incorporating the chemical into a product (i.e., the reclaimed *toxic chemical*). Therefore, the reclamation *facility* is *processing* the *toxic chemical* in the waste solvent it receives. Assuming the reclamation *facility* is a *covered facility*, it is required to report under EPCRA Section 313 for the *toxic chemical* if it exceeds an activity threshold (e.g., *processing* more than 25,000 pounds) during the course of a reporting year.

Process, Naturally Occurring Chemical, Nicotine

198. A cigarette manufacturer receives tobacco which naturally contains nicotine, an EPCRA Section 313 *toxic chemical*. The manufacturer does not add or alter the concentration of nicotine in the cigarettes when *processing* the tobacco. Is the nicotine considered to be *processed* even though it is naturally present in tobacco and not added to the finished product?

Yes. There are no provisions under EPCRA Section 313 that exempt naturally occurring chemicals that are known to be a part of a *facility's* raw material. Although the *facility* does not manipulate the concentration of the *toxic chemical* in the raw material, the *facility* is *processing* the *toxic chemical* as defined in 40 CFR Section 372.3. Thus, the *facility* would need to file a Form R or Form A for nicotine if it is *processed* at the *facility* in amounts greater than or equal to the 25,000 pound activity threshold, assuming that the *facility* meets the other applicability criteria found in 40 CFR Section 372.22.

Definition of Commerce, Distribution Restricted to One Facility

199. An electricity generating *facility* produces power using coal and/or oil. All of the power generated at the *facility* is used to support one other *facility* within the same company that operates off-site from the electricity generating *facility*. Is the electric power produced by the electricity generating *facility* considered to be distributed in commerce for purposes of determining if the *facility* is covered by EPCRA Section 313?

Yes. The electricity generating *facility* is classified within the SIC codes of 4911, 4931, or 4939 and combusts coal and/or oil for purposes of generating power for distribution in commerce. Supplying electricity to a *facility* off-site is considered generating power for distribution in commerce. For purposes of EPCRA Section 313 reporting, it does not matter that the sole user of the electricity produced by the electricity generating *facility* is part of the same company.

Process, Intracompany Transfer, Formalde-hyde, Economic Benefit

200. A *facility* covered under EPCRA Section 313 uses formaldehyde as an ingredient in feedstock. The feedstock is sent for use to another *facility* under common ownership. The preparing *facility* does not receive direct compensation for the product, nor is the product distributed to the general public. Does such a transfer of a listed *toxic chemical*, after its preparation, to another *facility* under common ownership constitute distribution in commerce and thus need to be considered in threshold determinations for reporting under EPCRA Section 313?

Yes. Under EPCRA, *process* means the preparation of a listed *toxic chemical*, after its *manufacture*, for distribution in commerce (40 CFR Section 372.3). Distribution in commerce includes any distributive activity in which benefit is gained by the transfer, even if there is no direct monetary gain. Listed *toxic chemicals* that are shipped from one *facility* to another *facility* under common ownership are considered to be distributed in commerce. Although the chemical in the product is not distributed to the general public, the preparing *facility* does derive economic benefit by transferring the listed *toxic chemical*, as both *facilities* are under common ownership. The amount of listed *toxic chemical* prepared at the *facility* must be counted towards the 25,000 pounds *processing* threshold.

Process, Intracompany Transfer, Economic Benefit

201. Company A stores oil at their Storage Facility 1 . Company A transfers oil from Storage Facility 1 to their Storage Facility 2 (a separate *facility* for EPCRA Section 313 purposes). From Storage Facility 2, the oil is distributed to customers. Does the transfer from Storage Facility 1 to Storage Facility 2 constitute *processing* on the part of Storage Facility 1?

Yes. Under EPCRA Section 313, *processing* means the preparation of a listed *toxic chemical* after its *manufacture*, for distribution in commerce (40 CFR Section 372.3). Distribution in commerce includes any distributive activity in which benefit is gained by the transfer, even if there is no direct monetary gain. Listed *toxic chemicals* that are shipped from one *facility* to another *facility* under common ownership are considered to be distributed in commerce. Although the chemical in the product is not distributed to the general public, the preparing *facility* does derive economic benefit by transferring the listed toxic chemical, as both facilities are under common

ownership. The amount of listed *toxic chemical* prepared at the *facility* must be counted towards the 25,000 pounds *processing* threshold.

Process, Intracompany Transfer, Economic Benefit

202. A mine sends a metal concentrate for smelting to another *covered facility* owned by the same company. Has the mine distributed *toxic chemicals* in the concentrate into commerce, and therefore, *processed* them?

Yes. Under EPCRA *process* means the preparation of a listed toxic chemical, after its *manufacture*, for distribution in commerce (40 CFR Section 372.3). Distribution in commerce includes any distributive activity in which benefit is gained by the transfer, even if there is no direct monetary gain. Listed *toxic chemicals* that are shipped from one *facility* to another *facility* under common ownership are considered to be distributed in commerce. Although the chemical in the product is not distributed to the general public, the preparing *facility* does derive economic benefit by transferring the listed toxic chemical, as both facilities are under common ownership.

Process, Steps Taken by Different Facilities

203. Facility 1 receives a spent solvent, repackages it, and sends it off-site to a recycling *facility* (Facility 2). Facility 2 recovers the solvent and returns it to Facility 1 who then repackages it to be distributed into commerce. Does Facility 1 count the *toxic chemical* in the solvent twice toward the *processing* threshold (i.e., when it is distributed off-site for recycling and when they distribute the recovered solvent into commerce)?

Yes. Amounts of listed *toxic chemicals* that are transferred off-site for recycling are considered *processed* and Facility 1 *processed* the listed *toxic chemical* when it was sent off-site for recycling. Facility 2 who recovers the listed *toxic chemical* also *processed* amounts recovered, which were subsequently distributed back to Facility 1. Facility 1 then receives amounts of the listed *toxic chemical* recovered by Facility 2 and Facility 1 repackages the listed *toxic chemical* and further distributes it in commerce. Therefore, Facility 1 must, once again, include these amounts toward their *processing* threshold. While this may seem to be a double counting of the same amounts of the listed toxic chemical, the activities are completed at each interval and are clearly taking place at multiple locations. Each activity is independently performed and there is no double counting within the same activity step.

Process, Double Counting, Multiple Process Steps

204. A metal fabrication *facility* covered by EPCRA Section 313 extrudes ingots containing 20,000 pounds of copper into rods. The *facility* then transfers the rods containing 20,000 pounds of copper to another portion of the *facility*, which is completely separate from the extruding operation, for further *processing*, such as grinding. Has the *facility processed* 40,000 pounds of copper, and thus exceeded the *processing* threshold of 25,000 pounds per reporting year?

No. In this scenario, the *facility* has only *processed* 20,000 pounds of copper and would not be subject to reporting pursuant to 40 CFR Part 372 for this *toxic chemical*. For threshold purposes, *facilities* must count the amount of a *toxic chemical* that is *processed* during the reporting year. *Facilities* should not, however, double count *toxic chemicals* that are subject to multiple on-site *processing* steps before being distributed in commerce. Conversely, *facilities* that transfer listed *toxic chemicals* off-site for *processing* and receive the same *toxic chemical* back for further *processing* must count the listed *toxic chemical* twice when calculating thresholds because the listed *toxic chemical* is considered to be newly obtained.

Process, Multiple Process Steps

205. How does a *facility* consider multiple activities within the same threshold activity, such as multiple repackaging steps, or blending followed by repackaging?

Amounts of a listed *toxic chemical* undergoing multiple activities on-site within a single threshold activity are counted only once during the activity sequence. For example, if a *facility* receives a bulk quantity of a chemical that it then places in a storage container from which amounts are subsequently blended and placed in smaller containers that are sold, the *facility* has prepared for distribution in commerce the entire amount of the chemical, and therefore, the *facility* has *processed* the entire amount of the listed *toxic chemical*.

Process, Metal Compounds, Chemical Conversion

206. The preamble to the May 1, 1997, Final rule (62 FR 23834) says that extraction of ore containing *toxic chemicals* for subsequent distribution in commerce constitutes the *processing* of those listed chemicals. Does this mean that metal compounds in extracted ore are *processed*, even if they are later converted to different compounds prior to their actual distribution in commerce (i.e., the extracted compound is considered a *process* intermediate)?

Yes. Amounts of materials that undergo a processing step (extraction) as part of the *facility*'s preparation of a material for distribution in commerce are considered *processed* and must be considered toward the facility's *processing* threshold because a part of the original metal compound is incorporated into the product which is ultimately distributed in commerce.

Process, Repackage

207. A *covered facility* receives shipments of an EPCRA Section 313 listed *toxic chemical* in rail cars. The listed *toxic chemical* is transferred from the rail cars into large tank trucks for distribution to customers. The quantity of the listed *toxic chemical* held in the tank trucks is approximately equivalent to the amount held in the rail cars. Would the transfer of the listed *toxic chemical* from the rail cars to the tank trucks be considered repackaging and therefore included in *processing* threshold determinations?

Yes. All activities involving the preparation of a listed *toxic chemical*, after its *manufacture*, for distribution in commerce are to be included in the *processing* threshold determination for that chemical. The Agency defines *processing* to include "...the preparation of a chemical for distribution in commerce in a desirable form, state, and/or quantity (i.e., repackaging)..." (53 FR 4506; February 16, 1988). The act of removing a listed *toxic chemical* from one container and placing it in another is considered repackaging, regardless of the size of the containers involved. As such, the *facility* must include any amounts of a listed *toxic chemical* transferred from the rail cars to the tank trucks in its *processing* threshold for that chemical.

Activity Threshold, Manufacture, Compounds, Compounding, Process

208. The EPCRA Section 313 definition of *manufacture* includes the term compounding. Does this mean that if a chemical is mixed with other chemicals in order to compound a product that the *manufacturing* threshold is to be used?

No. Compounding as used under Section 313 means that a chemical has been created, not that chemicals have been mixed together to form a new product. Thus, depending on the specifics of the use of the chemical, amounts would be counted towards the *otherwise use* threshold or the *processing* threshold, but not the *manufacture* threshold.

Activity Threshold, Otherwise Use, Formaldehyde

209. A melamine formaldehyde resin containing a small amount of unreacted formaldehyde monomer is purchased by a *facility*, dissolved in water and applied to paper to produce a polymer-coated product. In the process of coating the paper all of the formaldehyde evaporates. Is the formaldehyde *processed* or *otherwise used*?

Since the formaldehyde is not incorporated into the product, it is *otherwise used*. The formaldehyde would not be counted at all if the amount is below the de minimis of 0.1 percent in the incoming resin *mixture*.

Metal Mining, Overburden, Waste Rock, Otherwise Use, Regrading

210. A covered metal mining *facility* is required by other environmental laws to regrade (i.e., recontour) their *overburden* and/or waste rock piles. Is the *covered facility* required to consider the amounts of listed *toxic chemicals* in the pile toward their *otherwise use* threshold?

Provided that materials remain within the same *disposal* unit, the *facility* is not conducting a threshold activity, nor is the *facility releasing* materials that would have to be considered for reporting. If the *facility* regrades the material outside of the *disposal* unit, for use as road building material for example, then the *facility* is *otherwise using* the previously disposed material and would have to consider amounts of listed *toxic chemicals* contained in these materials for threshold determinations and *release* and other *waste management* calculations.

G. Importing

Import, Broker

211. Under *manufacture/import*, what constitutes *import*? Does the threshold apply if you have a broker who *imports* the *toxic chemical* for you, stores it for you, and then ships the *toxic chemical* to you? What criteria apply?

Use of a broker does not negate *facility* "*importation*" (*manufacture*) of a listed *toxic chemical*. If your *facility* specified that a listed *toxic chemical* or *mixture* containing a *toxic chemical* be obtained from a foreign source, then your *facility* "*imported*" the *toxic chemical*. You are considered to have *imported* a toxic chemical if you have caused the listed *toxic chemical* to be brought into the *customs territory* of the U.S. and you "control the identity of the *toxic chemical* and the amount to be *imported*."

Import, Manufacture

212. Should the amounts of a chemical created and *imported* be added together to count towards the *manufacturing* threshold?

Yes. Because EPCRA Section 313 defines both creation and *importation* as *manufacturing*, you must add the amounts of the chemical undergoing each activity together to determine the *manufacturing* threshold.

Import, Customs Territory of U.S.

213. For purposes of considering listed *toxic chemicals* to be *imported* under EPCRA Section 313, are the U.S. Virgin Islands within the *customs territory* of the United States?

No. The U.S. Virgin Islands are not within the *customs territory* of the United States. The *customs territory* of the United States is comprised of the 50 States, the District of Columbia, and Puerto Rico. The 50 States do not include Guam, American Samoa, the U.S. Virgin Islands, the Northern Mariana Islands, or any other territory or possession over which the United States has jurisdiction. Therefore, listed *toxic chemicals* that come from the U.S. Virgin Islands into the U.S. *customs territory* would be considered *imported* under EPCRA Section 313.

Import, Foreign Trade Zone

214. My *facility imports* over 25,000 lbs of an EPCRA Section 313 *toxic chemical* to be used in the U.S. to manufacture a product (e.g., used as an intermediate) or to be *processed* in the United States. The product is then exported in its entirety. Is the chemical subject to the EPCRA Section 313 requirements?

Yes. If the *facility* that caused the *importation* meets the employee criterion, *covered SIC code* criterion, and *toxic chemical* activity threshold, then the *facility* must fill out a Form R or the Alternate Certification Statement (Form A). The only exception would be if the chemical were *imported* for entry into "Foreign Trade Zones (FTZ)" for reexport. However, if any portion of the chemical or the product is withdrawn from the FTZ with the intention of

distribution into the U.S., then the chemicals that were used for the portion entering U.S. commerce are counted toward the activity threshold. Please remember, there are other EPA *importing* requirements under other environmental statutes.

Otherwise Use, Manufacture, Importing Waste

215. A *facility imports* a *toxic chemical* in waste from outside the U.S. and treats the entire amount of the *toxic chemical* for destruction. Has the *facility manufactured* or *otherwise used* the toxic chemical?

Both. The *facility* must apply the amount of the *toxic chemical* toward both the *manufacture* and *otherwise use* activity thresholds. The *facility* caused the *toxic chemical* to be *imported*, and therefore *manufactured* the toxic chemical. The *facility* then treated the toxic chemical, which was received in waste from off-site, for destruction. Thus, the *facility* also *otherwise used* the *toxic chemical*.

Import, Toll Processor, Threshold Determination

216. Facility A orders 50,000 pounds of a listed *toxic chemical* from a foreign supplier but has that *toxic chemical* shipped directly to a toll processor. The toll processor then sends the formulated product containing the *toxic chemical* to Facility A in the same reporting year. Who is considered the *importer* and thus subject to the *manufacture* threshold for that *toxic chemical*?

The toll processor has not caused the listed *toxic chemical* to be *imported*. Therefore, the toll processor is not subject to the *manufacturing* threshold. However, if the toll processor repackages the *toxic chemical* before distributing it to Facility A, they are subject to the *processing* threshold for that listed *toxic chemical*. Facility A has *imported* the listed *toxic chemical* when the product is received from the toll processor. This is because Facility A has caused the listed *toxic chemical* to be *imported* and ultimately received the listed *toxic chemical*, even though there was some intermediate *processing* applied to the *toxic chemical*. There is no practical difference in coverage under the regulations unless the manufacturing *facility* does not further *otherwise use* or *process* the product. For example, if the *facility* only labels the product containers and ships them to customers, the facility is still subject to reporting because the act of *importation* is considered *manufacturing.*

Import, Warehouse

217. A *facility imports* a listed chemical, but it is *imported* directly to stand-alone warehouses (not owned by the *facility*). The *facility* controls the sale/distribution of these unaltered products. Should the warehouses properly report on these materials or should the *facility*?

The *facility* should count the chemical towards its *manufacturing* threshold only if it actually receives the *toxic chemical* at the *facility*. The warehouse is a separate *facility*, and may not be within a *covered SIC code*; it, therefore,

may not need to report. If the warehouse assumes the SIC code of the *facility* it supports, it is an auxiliary *facility*, and it will need to independently make employee and threshold determinations. Because the warehouse has not caused the *toxic chemical* to be *imported*, it has not *manufactured* the *toxic chemical*. However, if the warehouse *processes* or *otherwise uses* the chemical above an applicable activity threshold, and meets the other EPCRA Section 313 criteria, it would be required to file the Form R.

Import, Actual Receipt

218. A TSDF regulated under RCRA Subtitle C imports a waste that contains a listed EPCRA Section 313 chemical. The waste is received by a transfer *facility*, and the transfer *facility* sends it to a final TSDF. This final TSDF did not initiate the *importation*. Who has *imported* the waste?

For purposes of EPCRA Section 313 reporting, the *importing facility* never takes physical possession of the waste, therefore, no *facility* in this scenario would count amounts of listed *toxic chemicals* in the waste toward their *manufacturing* threshold based on *importation*. To be considered an *importer* the *facility* receiving the material from a source outside the *customs territory* must have *imported* or "caused the material to be *imported*." If the ordering *facility* receives the shipment, then the ordering *facility* has *imported* the listed *toxic chemicals* in the waste shipment and must consider these amounts toward their *manufacturing* thresholds. However, if the ordering *facility* directs another *facility* to receive the shipment, then the receiving *facility* has not *imported* the shipment, and neither has the ordering *facility* for purposes of EPCRA Section 313 because the listed *toxic chemicals* were not brought on-site of the ordering *facility*. Regardless, the receiving *facility* would need to consider amounts received for the purpose of further *waste management* toward their *otherwise use* threshold if they *treat for destruction*, *stabilize*, or *dispose* the *toxic chemical*.

Import, Broker

219. A TSDF regulated under RCRA Subtitle C requests certain types and quantities of waste containing *toxic chemicals* from an import/export broker. The broker then forwards the waste to the TSDF for *waste management*. Who caused the *toxic chemical* to be *imported*?

The TSDF caused the *toxic chemical* to be *imported* into the *customs territory* of the United States and must count the amount *imported* towards its *manufacturing* threshold. By ordering the waste containing listed *toxic chemicals*, the TSDF "caused it to be imported," even though it used an *import* brokerage firm as an agent to obtain the *toxic chemicals*. This TSDF would also need to consider amounts received for the purpose of further *waste management* toward their *otherwise use* threshold if they *treat for destruction*, *stabilize*, or *dispose* the listed *toxic chemical*.

Import, Purchasing Agent

220. The corporate office for a chemical distribution company directly purchases products which will be shipped to several of its chemical distribution facilities. The corporate purchasing department purchases one of these products, which contains a section 313 chemical, from a foreign source. The product is shipped directly to one of its chemical distribution *facilities*. Did the individual *facility* cause the *importation* of the section 313 chemical thereby requiring it to apply the 25,000 pound *manufacturing* threshold to the quantities of this material received by the *facility* in the reporting year?

If the chemical distribution *facility* that actually received the product did not have any input regarding the quantity or identity of the *toxic chemical*, the *facility* did not cause the *importation* of the *toxic chemical* in the product and does not have to apply the listed chemical in the product to its *manufacturing* threshold. To be considered an *importer* the *facility* receiving the material from a foreign source must have *imported* or "caused the material to be imported." If the ordering *facility* receives the shipment, then the ordering *facility* has *imported* the listed *toxic chemicals* and must consider these amounts toward their *manufacturing* thresholds. However, if the ordering *facility*, on its own initiative, directs another *facility* to receive the shipment, and that other *facility* has no input in deciding whether it will receive the toxic chemical, then the receiving *facility* has not *imported* the shipment and the ordering *facility* has also not *imported* the shipment for purposes of EPCRA Section 313 because the listed *toxic chemicals* were not brought on site of the ordering *facility*.

Import, Broker

221. A *facility* did not specify a source for a material broker to obtain a listed *toxic chemical*, but the *facility* learns that the only U.S. *manufacturer* of the chemical has gone out of business. Therefore, is the *facility* *importing* the chemical, making the *facility* subject to the *manufacturing* threshold?

Yes. The *facility* knows that it has caused the listed *toxic chemical* to be *imported* to the U.S. because there are no U.S. sources. Therefore, the amount of the chemical that is caused to be *imported* by the *facility* through a broker must be included within the 25,000 pound *manufacturing* threshold determination for that listed *toxic chemical*.

Import, Purchasing Agent

222. A chemical distributor arranges the *importation* of a material containing a *toxic chemical* by specific request from a customer. The material goes directly to the customer. The material never enters the boundaries of the chemical distributor's *facility*. Who should count the amount of *toxic chemical* towards the *manufacturing* threshold?

The customer has caused the *toxic chemical* to be *imported* into the *customs territory* of the United States. If the customer is a *covered facility*, the

customer must count the amount of the listed *toxic chemical imported* that enters their *facility* toward the *manufacturing* threshold. The chemical distributor acted as an agent for the customer, and therefore, did not *import* the toxic chemical.

Import, Contractual Relationship

223. U.S. law requires that wastes produced in Mexico by an American owned company be sent back to the U.S. for further *waste management* (Maquiladora waste). When the *facility* operating within the U.S. receives the wastes, has it *manufactured* the *toxic chemicals* contained in the waste? Because this law requires that these wastes be returned to the U.S. for further *waste management*, did the U.S. *facility* receiving these wastes cause the wastes to be *imported*?

Yes. The receiving *facility* either has a contract or agreement in place to receive *imported* waste and is functioning as the *importing facility*. Amounts of listed *toxic chemicals* received in waste must be counted toward the *manufacturing* threshold. The receiving *facility* would also need to consider amounts received for the purpose of further *waste management* toward their *otherwise use* threshold, if they *treat for destruction*, *stabilize*, or *dispose* the *toxic chemical* on-site.

H. Auxiliary Facilities

Auxiliary Facility, Reporting Criteria

224. Are auxiliary *facilities* associated with activities at a *facility* in a *covered SIC code* exempt from reporting under Section 313?

No. An auxiliary *facility* is one that directly supports another *facility*/ enterprise's activities and therefore takes the SIC code of the *facility* supported. Auxiliary *facilities* located on separate property must report if they also meet the employee and activity thresholds. Auxiliary *establishments* that are located on *multi-establishment facilities* should be included in *facility* threshold determinations and *release* and other *waste management* calculations. For example, a spill of a *toxic chemical* from the on-site warehouse would be included in the *covered facility's release* quantities.

Definition of Auxiliary Facility

225. A retail gas station sells only products supplied by one covered bulk petroleum station. Is the retail gas station considered an auxiliary *facility* and therefore does it take on the *covered SIC code* of the bulk petroleum station?

No. While the retail gas station sells only products supplied by the covered bulk petroleum station it is not an auxiliary *facility* because it does not support the operation of the bulk petroleum station (i.e., the retail sale of gasoline and other petroleum products is a distinctly separate activity that benefits the gas station as opposed to benefitting the bulk petroleum station).

An auxiliary *facility* is one that supports another *facility's* activities. An auxiliary *facility* can assume the SIC code of another *covered facility* if its primary function is to serve that other *covered facility*'s operations.

Auxiliary Facility, SIC Code

226. An auxiliary wastewater treatment plant, which is not a RCRA Subtitle C *facility*, has taken on the SIC code of a *covered facility* because it primarily services a *covered facility*. Does the *facility* where the treatment plant is located have to report even if the rest of the *establishments* at that *facility* are not in the *covered SIC codes*?

A *facility* must report only if it meets the employee, SIC code and activity criteria. As long as the wastewater treatment plant does not represent the *major part* of the goods and services produced at the *facility*, the SIC code criterion is not met. Therefore, the *facility* as a whole need not report. The *covered facility* producing the listed *toxic chemical* in the waste must report the off-site transfer to the *facility* containing the wastewater treatment plant.

Auxiliary Facility, Reporting Responsibility

227. A chemical distribution *facility* has an off-site chemical bulk storage unit on a non-contiguous property that is typically unmanned. When filling orders for customers, the *facility* sends trucks to the off-site bulk storage unit, "drums-off" a specified amount and delivers the order to the customer. What reporting is required for the chemicals that are *processed* at this off-site location?

The off-site location may itself be classified as a chemical distribution *facility* and be covered in terms of its SIC code designation. The off-site bulk storage *facility* may also assume the SIC code of the covered chemical distributor that it supports and also be considered covered. In terms of determining if the off-site *facility* meets the employee threshold, potentially requiring it to report, the *facility* should consider all of the hours spent servicing the units such as product delivery, tank clean-out, and construction in making that determination. If these hours add up to 20,000 hours over the course of the reporting year, the *facility* would meet the employee threshold and would be required to consider its chemical activities. It is possible that the type of employee hours associated with the off-site bulk storage *facility* would potentially exceed thresholds in one year and not in another.

Auxiliary Facility, SIC Code

228. A *covered facility* consists of three *establishments*. If a warehouse located on a non-contiguous/adjacent site 20 miles away solely supports one of the *covered facility*'s *establishments* that is not within a *covered SIC code*, is that warehouse considered a *covered facility* because of its status as an auxiliary *facility*?

No. An auxiliary *facility* may assume the SIC code of the specific *establishment* or *establishments* it supports. Because the auxiliary *facility* assumes a non-*covered SIC code*, it is not a *covered facility*.

Reporting Responsibility, Auxiliary Facility, SIC Code Determination

229. An electricity generating *facility* in SIC code 4939 combusts coal for generating power for distribution in commerce. A warehouse is located several miles away and stores materials for the electricity generating *facility*. While the warehouse serves as support to a *covered facility* and is considered an auxiliary *facility*, the warehouse does not combust coal or oil. Is the warehouse subject to EPCRA Section 313?

No. Although the warehouse is an auxiliary *facility*, and therefore assumes SIC code 4939 from the electricity generating *facility*, facilities in SIC code 4939 are only covered by EPCRA Section 313 if they also combust coal or oil for purposes of generating electricity for distribution into commerce. Since the warehouse does not combust coal or oil, it is not subject to reporting under Section 313.

Auxiliary Facility, SIC Code, Multi-establishment, Laboratory

230. Is my *facility* covered by EPCRA Section 313 if the value of laboratory research at my *facility* is greater than 50 percent of the total value of goods and services produced at my *facility*?

If the research laboratory is a separate *establishment* from the other activities at the *facility* and its SIC code is not in a *covered SIC code*, then the 50 percent test is used to determine if the whole *facility* is in the *covered SIC codes* (40 CFR Section 372.22). In this case, the *facility* would not be subject to reporting because the primary SIC code is not within the *covered SIC code*s. However, if the laboratory is within the *covered SIC code*s because it is an auxiliary *establishment* providing research to support operations in the *covered SIC code*s, then the *facility* would be covered by Section 313.

Electricity Generating Facility, Auxiliary Facility, SIC Code Determination

231. An electricity generating *facility* in SIC code 4911 uses a separate *facility* (Facility A) for ash disposal. Facility A's primary function is to *dispose* ash generated at the electricity generating *facility*. Facility A does not produce electricity. Is Facility A, which is not contiguous or adjacent to the electricity generating *facility*, subject to EPCRA Section 313?

No. Although Facility A is an auxiliary *facility* and, therefore, assumes the electricity generating *facility*'s SIC code (4911), facilities in SIC code 4911 are only covered by EPCRA Section 313 if they also combust coal or oil for purposes of generating electricity for distribution into commerce. Since Facility A does not combust coal or oil for distribution into commerce, it is not subject to reporting under Section 313.

Auxiliary Facility

232. An airplane engine repair shop (generally SIC code 7699) owns an auxiliary *facility* at a separate location that does metal plating for the engine repair shop and other unrelated *facilities* (generally SIC 3471--Plating of Metals and Formed Products). Would the plating *facility* be exempt?

According to the SIC code manual, this *facility* would not be auxiliary because it is not primarily engaged in performing support services for one other *facility* or enterprise. Instead this *facility* would be considered a separate operating *establishment* conducting a *manufacturing* activity. It would, therefore, need to make the employee and activity threshold determinations and report, if appropriate, because it falls within a *covered SIC code*.

Auxiliary Facility, Reporting Requirements

233. A reclamation center collects and sorts scrap metal received from many different *facilities* owned by the same corporate entity. This corporate entity also performs the reclamation center's payroll. Is this reclamation center considered an auxiliary *facility* and therefore subject to EPCRA Section 313 reporting requirements?

No. For the purposes of EPCRA Section 313, auxiliary *facilities* are primarily engaged in performing support services for another *facility*, or *establishment* of a primary company. In general, the company performs the auxiliary *facility*'s basic administrative services (e.g, filing paperwork, performing payroll activities, or employing the auxiliary *facility's* administrative staff). In addition, auxiliary *facilities* perform an integral role in the primary company's activities. Both of these factors must be present to establish an auxiliary *facility*. Because reclamation is not integral to the primary company's activities, the reclamation center does not play an integral role in the primary company's operations and it would not be considered an auxiliary *facility*.

I. Indian Lands

Indian Lands, EPCRA Reporting

234. In 1986, Congress passed EPCRA, to help local communities, including Indian reservations, protect public health and the *environment* from chemical hazards by informing citizens about the chemicals present in their communities. On July 26, 1990, EPA published a rulemaking in the Federal Register designating Indian Tribes and their chief executive officers as the implementing authority for EPCRA on all Indian lands (55 FR 30632). What is EPA's policy regarding the implementation of the different provisions of EPCRA on Indian lands?

EPA's policy is to work with Tribes on a government to government basis in implementing the requirements of EPCRA. EPCRA contains four major provisions: planning for chemical emergencies, emergency notification of chemical accidents and *releases*, reporting of hazardous chemical inventories, and *toxic chemical release* reporting. The emergency planning provisions of EPCRA Sections 301-303 are designed to help Indian Tribes prepare for, and respond to chemical emergencies occurring on Indian lands that involve extremely hazardous substances (EHSs), found at 40 CFR Part 355, Appendix A and B. The chief executive officers of federally recognized Tribes must

appoint *Tribal Emergency Response Commissions* (*TERCs*), responsible for carrying out the provisions of EPCRA in the same manner as State Emergency Response Commissions (SERCs). Alternatively, Tribal leaders can join a Tribal Coalition which functions as the *TERC*, or establish a Memorandum of Understanding with a *State* to participate under the SERC. *TERC*s establish emergency planning districts and can appoint Local Emergency Planning Committees (LEPCs) or act as *TERC*s/LEPCs, performing the functions of both. LEPCs use information collected under EPCRA to develop local emergency response plans to respond quickly to chemical accidents. The chief executive officer should ensure that *TERC*s maintain a broad-based representation, including Tribal public agencies and departments dealing with environmental, energy, public health and safety issues, as well as other tribal community groups with interest in EPCRA. The Tribal LEPC should also be representative of the community, and should include elected Tribal officials, fire chiefs, Indian Health Services officials, Bureau of Indian Affairs officials, Tribal elders and leaders, representatives of industries on or near the reservation, and members of the general community.

The emergency *release* notification provisions of EPCRA Section 304 require *facilities* to immediately notify *TERC*s and LEPCs of *releases* in excess of reportable quantities of EHSs and CERCLA hazardous substances, found at 40 CFR Section 302.4. *Facilities* must also provide written follow-up reports on the actions taken to respond to *releases* and possible health effects of the released substances. The emergency *release* notification provisions cover *releases* from commercial, municipal, and other *facilities* on Tribal lands, including those owned by the Tribe, and those from accidents on transportation routes within the reservation. Substances covered by this Section include not only EHSs, but also hazardous substances subject to the emergency *release* notification requirements of CERCLA Section 103. CERCLA requires notification of *releases* to the National Response Center. In cases where *releases* from *facilities* located on Indian lands may affect areas outside Indian jurisdiction, the legislation under EPCRA Section 304(b)(1) requires that notice be provided to all SERCs and LEPCs likely to be affected by the *releases*. Response to such *releases* will be handled by cooperation between the affected jurisdictions. EPA encourages Indian Tribes, SERCs, and LEPCs to participate in joint planning efforts to prepare for such potential emergencies. The hazardous chemical right-to-know provisions of EPCRA Sections 311 and 312, require *facilities* that prepare *Material Safety Data Sheets* (*MSDS*s) for hazardous chemicals under OSHA, and have hazardous chemicals or EHSs present above applicable threshold levels, to submit these *MSDS*s, or lists of such chemicals to *TERC*s, LEPCs, and local fire departments. *Facilities* are also required to submit hazardous chemical inventory forms which detail the amounts, conditions of storage, and locations of hazardous chemicals and EHSs to *TERC*s, LEPCs, and local fire departments. It is the responsibility of *TERC*s and LEPCs to make this information available to the public.

Toxic chemical *release* reporting under EPCRA Section 313 requires *covered facilities* to submit annual reports on routine and accidental *toxic chemical releases* and other *waste management* activities to EPA and the Tribal environmental, health, or emergency response agency which coordinates with the *TERC*. *TERC*s and EPA make this information available to the community through the national Toxic Release Inventory (TRI) database. The data is also released to the public annually in national and state TRI reports.

The information collected under EPCRA enables *TERC*s and LEPCs to paint a picture of the hazardous substances, chemicals, and toxics found on Indian lands. It also allows the Tribal communities to work with industries to reduce the use and *releases* and other *waste management* of *toxic chemicals* and prevent chemical accidents. EPA recognizes that resources are often limited on Indian lands, and EPA is committed to helping Indian tribes comply with EPCRA. EPA provides technical assistance, guidance, and training tailored to the needs of Indian tribes. EPA's Office of Chemical Emergency Preparedness and Prevention (CEPPO) can provide *TERC*s with grants/ cooperative agreements to aid in the implementation and effectiveness of their EPCRA programs. To be eligible for consideration under this grant program, a tribe or Tribal Coalition must function as an independent *TERC*. To the extent that Tribes have these functions performed by *state*s, they are not eligible for these grants. Tribal agencies can also apply for training grants provided by FEMA under EPCRA Section 305(a) to gain or improve skills needed for carrying out emergency planning and preparedness programs. These grants are provided through the *TERC*s or other agencies. The Hazardous Materials Transportation Uniform Safety Act of 1990 (HMTA) also includes funding grants for Indian tribes for training public sector employees in emergency response activities. HMTA provides planning grants for developing, improving, and implementing EPCRA plans, and for developing a training curriculum for *TERC*s and LEPCs. Tribes should contact their EPA Regional office for information on how to apply for these grants.

Enforcing the provisions of EPCRA is key to providing Tribal communities with the information necessary to prepare for and prevent chemical accidents. EPA provides assistance to Tribal communities for specific enforcement actions against violators of Sections 302, 311, and 312. Since EPA does not receive or process information under these Sections, actions should be initiated at the tribal and district levels.

Section 2. EXEMPTIONS

A. General, Personal Use, and Intake Water or Air

Exemption Retention

235. Can the exempted uses of a *toxic chemical* remain exempted even if other formulations, *articles,* or fuels with the same listed *toxic chemical* are not exempt?

Yes, the *toxic chemical* retains its exemption. Exempted uses of a listed *toxic chemical* do not need to be reported, even if other (non-exempted) uses of the same listed chemical trigger thresholds at the *facility*.

FDA

236. Is a feed company that is regulated by the Food and Drug Administration (FDA) exempt from filing Form R under Section 313?

No. EPCRA Section 313 applies to any *facility* that meets all the applicable criteria. There is no specific exemption for *facilities* or *toxic chemicals* regulated by the FDA.

Personal Use Exemption, Office Supplies

237. Do office supply type products require coverage under EPCRA Section 313 reporting?

EPA does not intend to require *covered facilities* to account for listed *toxic chemicals* in typical office supplies such as correction fluid and copier machine fluids. Although not specifically exempted by the regulation, EPA interprets such *mixtures* or products to be equivalent to personal use items or materials present in a *facility*'s cafeteria, store, or infirmary (40 CFR Section 372.38(c)(3)).

Personal Use Exemption, Office Supplies

238. A *facility* meets the threshold for *otherwise use* of 1,1,1-trichloroethane as a cleaner. Would the *release* of that listed *toxic chemical* contained in the office supply product "white-out" also be included?

Office products fall within the same realm as the personal use exemption. The *release* of 1,1,1, trichloroethane in "white-out" is exempt.

Personal Use Exemption, Employee Comfort

239. A *facility* adds chlorine to its water supply system. The chlorinated water is used only for drinking purposes by employees. Is this use of chlorine reportable under EPCRA Section 313?

Chlorine that is added by a *facility* to its water supply system to prepare potable water for consumption at the *facility* is exempt from reporting under the personal use exemption, which exempts as "personal" use, by employees or other persons at the *facility*, the use of foods, drugs, cosmetics, or other personal items containing *toxic chemicals*, including supplies of such products within the *facility* such as in a *facility* operated cafeteria, store, or

infirmary (40 CFR Section 372.38(c)(3)). Since chlorine is used to prepare an item (i.e., potable water) that will be used only for drinking purposes by *facility* employees, it is exempted from reporting under EPCRA Section 313.

Personal Use Exemption, Office Supplies

240. A *covered facility* uses ammonia in gas cylinders in their blueprint machines. A total of 12,000 pounds of reportable ammonia is used per year in this operation and the *facility* does not *otherwise use* or *process* any other quantities of ammonia. Is this use exempt from Section 313 reporting under the office supplies for personal use exemption (40 CFR Section 372.38(c)(3))?

Blueprint machines are not typical office supply items for personal use. Since the 10,000 pound *otherwise use* threshold is exceeded, the *facility* must report for the ammonia.

Personal Use Exemption, Cafeteria Refrigerants

241. A *covered facility* uses listed *toxic chemicals* in its cafeteria refrigeration units. The units enable the cafeteria to store food that will later be served to staff of the *facility*. Would these chemicals need to be included in EPCRA Section 313 threshold determinations?

No. Under the personal use exemption "foods, drugs, cosmetics or other personal items containing *toxic chemicals*, including supplies of such products within the *facility* such as in a *facility* operated cafeteria, store, or infirmary" used by employees or other persons at the *facility* are exempt from threshold determinations (40 CFR Section 372.38(c)(3)). The listed *toxic chemicals* used in the cafeteria refrigeration units, therefore, are exempt from threshold determinations and *release* and other *waste management* reporting requirements. Non-exempt uses of the same listed *toxic chemicals* elsewhere at the *facility*, however, must be included in threshold determinations and *release* and other *waste management* reporting.

Personal Use Exemption, Employee Comfort, Air Conditioning

242. Would listed *toxic chemicals* used as refrigerants in a *facility's* air conditioning unit be exempt from EPCRA Section 313 reporting under the personal use exemption (40 CFR Section 372.38(c)(3))?

Yes, if the air conditioning unit is used for the purpose of maintaining employee comfort, the listed *toxic chemicals* used in the unit would be exempt from EPCRA Section 313 reporting under the personal use exemption. If, however, the air conditioning unit is integral to the *facility*'s operation or activity (e.g., maintaining constant temperature and humidity for machinery or cold storage rooms), then the *toxic chemicals* used in the unit would not be exempt from EPCRA Section 313 reporting.

Personal Use Exemption, Air Conditioning

243. Are the listed *toxic chemicals* used in cooling equipment for air conditioning process control rooms eligible for the personal use exemption?

No. As provided in 40 CFR Section 372.38, the personal use exemption applies to the use of listed *toxic chemicals* limited to: personal use, by employees or other persons at the *facility*, of foods, drugs, cosmetics, or other personal items containing *toxic chemicals*, including supplies of such products within the *facility* such as in a *facility*-operated cafeteria, store, or infirmary. This exemption is limited and does not include chemicals used in process related activities.

Personal Use Exemption, Process Related, Air Conditioning

244. Would a *facility* be required to report on the Section 313 chemicals in an air conditioning unit that cools a mine's process operation or production room in which employees must work? In other words, because the air conditioning unit is being used in a production process, could the personal use exemption for employee comfort still apply for these activities?

No. The "use exemption for personal uses by employees or other persons" was intended to apply to such incidental uses of *toxic chemicals* that may take place at a *facility* simply because of personal needs. The types of incidental chemical uses intended to be eligible for this exemption include foods, drugs, cosmetics, or other personal items containing *toxic chemicals*, including supplies of such products within the *facility* such as in a *facility* operated cafeteria, store, or infirmary. The use of chemicals to promote process related activities, including employee access to such process-related areas that would not otherwise be possible, is not incidental to the process, and therefore, must be considered toward threshold and *release* and other *waste management* calculations.

Personal Use Exemption, Administrative Setting

245. Is the use of *toxic chemicals* for employee comfort only applicable in an administrative setting for the personal use exemption?

The personal use exemption is limited to chemicals used in non-process related activities, which may include administrative activities. Amounts of listed *toxic chemicals* used for administrative purposes are eligible for the personal use exemption and do not have to be considered toward threshold or *release* and other *waste management* calculations.

Personal Use Exemption, Ammonia, Sewage

246. A *facility* covered under Section 313 of EPCRA has met a reporting threshold for ammonia. A sewage system within the facility collects human waste from different parts of the *facility*. The ammonia present in the sewage is not involved in any *manufacturing*, *processing*, or *otherwise use* activities at the *facility*. Since the *facility* has already exceeded an activity threshold for ammonia, are they required to report the ammonia that is emitted in the sewage?

Yes. The ammonia present in the sewage is being coincidentally *manufactured* as a result of the waste decomposition. Quantities of the *toxic*

chemical that are coincidentally *manufactured* are not eligible for the personal use exemption. This exemption only covers the *otherwise use* of *toxic chemicals*, not their *manufacture*. The *facility* should report that it has *manufactured* ammonia as a by product in Part II, Section 3.1(e). In addition, to the extent that the *facility* has knowledge concerning the quantity of the ammonia manufactured from the waste decomposition, they should report the quantity as transferred a POTW in Part II, Section 6.1, and as sent off-site for treatment in Part II, Section 8.7.

Personal Use Exemption, Sewage, Nitrate Compounds

247. A *facility* is treating sanitary waste and, as a result of the treatment, nitrate compounds and/or ammonia are coincidentally *manufactured*. Are the *manufactured* Section 313 chemicals considered exempt under the personal use exemption?

No. Exemptions provided in 40 CFR Section 372.38 apply to the use of listed *toxic chemicals*. These exemptions do not include *manufacturing* or *processing* of listed *toxic chemicals*, even if this results from an activity where the use is exempt. If a listed toxic chemical is coincidentally *manufactured* during an activity where the use of a listed *toxic chemical* is exempt, the chemical *manufactured* is not exempt and amounts *manufactured* must be considered toward threshold and *release* and other *waste management* calculations.

Intake Water Exemption

248. A *facility* uses river water as process water. The water taken from the river contains more lead (1.0 ppb) than the water returned to the river (0.5 ppb). Is it eligible for the process water exemption (40 CFR Section 372.38 (c)(5))? If not, is the *facility* treating the water?

The process water can be considered exempt because the listed *toxic chemical* was present as drawn from the *environment*. The *facility* does not need to consider lead in the process water for threshold or *release* and other *waste management* reporting.

Otherwise Use Exemption, Manufacturing During Use

249. Are *facilities* required to consider in threshold determinations and *release* and other *waste management* calculations, amounts of Section 313 chemicals *manufactured* from combustion during exempt *otherwise use* activities (e.g., from motor vehicles, personal use, routine maintenance, intake water, and structural component).

The exemptions defined at 40 CFR Section 372.38(c) are intended for *toxic chemicals otherwise used*. Amounts of *toxic chemicals manufactured* or *processed* during these "exempt" activities are not exempt.

Intake Water Exemption, Wastewater

250. If a *facility* uses process wastewater containing a listed *toxic chemical* on-site, are *toxic chemicals* in the wastewater exempt under the intake water exemption?

No. Since the listed *toxic chemicals* are not drawn from the *environment*, the *facility* must count the amount of the listed *toxic chemicals* toward threshold determinations and *release* and other *waste management* calculations.

Intake Water Exemption, Stormwater

251. A *covered facility otherwise uses*, as process water, wastewater or storm water that contains a *toxic chemical*. Is the *facility* required to count the amount of the *toxic chemicals* toward threshold determinations and *release* and other *waste management* calculations or would the section 313 chemicals be exempt under the intake water exemption?

The intake water exemption is specifically limited to *otherwise use* of *toxic chemicals* present in process water or non-contact cooling water that are drawn from the *environment* or from municipal sources. The above *facility otherwise uses* water in its process sequence and would not be required to account for amounts of listed chemicals contained in stormwater that is drawn from the *environment*. The *facility*, however, would have to account for amounts of listed chemicals acquired by the storm water after the storm water has run onto and off of equipment and buildings. Likewise, wastewater is not drawn from the *environment* and amounts of listed *toxic chemicals* in wastewater which are *otherwise used* are ineligible for the exemption and any information on amounts of listed *toxic chemicals* from wastewater would have to be considered toward threshold determinations and *release* and other *waste management* calculations.

Intake Water Exemption, Compressed Air

252. Would a listed *toxic chemical* present in compressed air be exempt? What if the listed *toxic chemical* is present in air emissions from a *boiler*?

A listed *toxic chemical* present in compressed air drawn from the *environment* would not have to be counted toward a threshold determination because it meets the intake air exemption (40 CFR Section 372.38(c)(5)). If that same listed *toxic chemical* is present in the *boiler* emission air only because it was in the compressed air fed to the *boiler*, then it would remain exempt. However, if the listed *toxic chemical* is created as a result of combustion, you have coincidentally *manufactured* the *toxic chemical* and must consider it for reporting.

Intake Water Exemption, Disposal of Intake Water, Underground Mine

253. A *facility* dewaters its underground mine and places the water in a surface impoundment. Are *toxic chemicals* in the water eligible for the intake water exemption and are they exempt from *release* and other *waste management* reporting?

No, because the *facility* is not *otherwise using* the water drawn from the underground mine the intake water exemption does not apply. In this scenario, the *facility* is simply disposing of the water containing these chemicals drawn from materials on site, and therefore, the *facility* is not

manufacturing, *processing*, or *otherwise using* chemicals and amounts of these *toxic chemicals* would not count toward thresholds. However, the *facility* is disposing of these chemicals and if a threshold is exceeded elsewhere at the *facility* for one of the same chemicals, then the *facility* would be required to report the amounts *released* to the surface impoundment.

Intake Water Exemption, Disposal of Intake Water, Underground Mine

254. A *facility* dewaters its underground mine and injects the water into a well on-site. Are the amounts of listed *toxic chemicals* injected considered a *release* to land, or are these amounts exempt under the "use of *toxic chemicals* present in process water and non-contact cooling water as drawn from the *environment*?" The water is not used, nor is it considered process water or non-contact cooling water.

No. The exemption for *toxic chemicals* contained in water drawn from the *environment* or from municipal sources is provided for the use of water containing these chemicals in *processes* and for non-contact cooling purposes. The *facility* is not *otherwise using* the water drawn from the underground mine, and therefore, the intake water exemption does not apply. The *facility* is simply disposing of the water containing listed *toxic chemicals* as drawn from on-site, and therefore, the *facility* is not *manufacturing*, *processing*, or *otherwise using* these chemicals. These amounts would not count toward thresholds. However, the *facility* is *disposing* of these chemicals and if a threshold is exceeded elsewhere at the *facility* for one of the same chemicals, then the *facility* would be required to count amounts injected as *released*.

Storm Run-off, Intake Water Exemption, Wastewater

255. A *covered facility* collects run-off from ore piles, natural topography, waste rock piles, and other on-site features in an on-site pit. The *facility* precipitates metals from the collected water by adding hydroxides to the pit. Is the resulting sludge, and any discharges from the pit, exempt from *release* and other *waste management* reporting under the intake water exemption?

The intake water exemption is specifically limited to *otherwise use* of *toxic chemicals* present "in process water and non-contact cooling water as drawn from the *environment* or from municipal sources". (40 CFR Section 372.38(c)(5)) In the scenario described above, the *facility* is actively using hydroxides to precipitate out metals. The *facility* is using storm water run-off as part of its process sequence to extract desirable materials. Amounts of listed *toxic chemicals* contained in storm water run-off are exempt from *otherwise use* threshold calculations, but any new listed *toxic chemicals* which are *manufactured* from the *facility's* use of the storm water must be counted toward the *facility's manufacturing* threshold. Likewise, any *toxic chemicals* that are recovered and distributed in commerce must be considered toward the *facility's processing* threshold. The *facility* would also have to

account for amounts of listed chemicals acquired by the storm water after the storm water has run onto and off of equipment and buildings.

Intake Water Exemption, Personal Use Exemption, Employee Comfort

256. Do we have to count the chlorine in the city water we use? Are water treatment chemicals such as chlorine covered?

You are not required to account for amounts of a listed *toxic chemical* present in water that you draw into your *facility* from the *environment* or municipal sources (40 CFR Section 372.38(c)(5)). For example, chlorine present in water taken from municipal sources does not have to be considered for threshold determinations and *release* and other *waste management* estimates. Any chlorine you use to treat process water used in your *facility*, however, counts toward the *otherwise use* threshold determination. However, if you use the chlorine to treat drinking water for personal use at the *facility* the chlorine is exempt under the personal use exemption from threshold and *release* and other *waste management* calculations (40 CFR Section 372.38(c)(3)).

Intake Water Exemption

257. A *covered facility* draws drinking water from an on-site well. The water contains a Section 313 chemical as a contaminant. Must the *facility* count the amount of the contaminant in its threshold determinations?

No. The listed *toxic chemicals* in the water would be exempt from Form R reporting under the personal use exemption if the water is for the employees consumptive use on-site (40 CFR Section 372.38(c)(3)).

Intake Water Exemption, Processing of Intake Water

258. A *covered facility* dewaters its underground mine and sells the water which contains reportable *toxic chemicals* to other *facilities*. Are *toxic chemicals* in the water exempt from threshold determinations?

No. If a *facility* sells water that it extracts from its underground mine, it is *processing* the water and any listed *toxic chemicals* contained in the water must be considered toward threshold determinations and *release* and other *waste management* calculations.

B. Facility Maintenance and Structural Components

Facility Maintenance Exemption, Process Equipment Maintenance

259. How is routine janitorial maintenance defined in the exemption list? Is equipment maintenance included?

Equipment maintenance such as the use of oil or grease is not exempt. The routine janitorial and *facility* grounds maintenance exemption is intended to cover janitorial or other custodial or plant grounds maintenance activities using such substances as bathroom cleaners, or fertilizers and pesticides used to maintain lawns (40 CFR Section 372.38(c)(2)).

Facility Maintenance Exemption, Process Equipment Maintenance

260. An EPCRA Section 313 *toxic chemical* is used to clean a process-related tower at a manufacturing *facility*. Is the use of the chemical exempt from threshold and *release* and other *waste management* calculations under the routine janitorial and *facility* grounds maintenance exemption of 40 CFR Section 372.38(c)(2)?

No. Materials used to maintain process-related equipment at a *facility* (e.g., cleaners and lubricants) are not exempt under Section 372.38(c)(2). Because the tower is process related, the exemption does not apply. This exemption only applies to the use of products that are specifically used for routine janitorial or *facility* grounds maintenance.

Facility Maintenance Exemption, Recreational Use, Swimming Pool

261. A *facility* maintains a swimming pool on the *facility* site for recreational use by the *facility* employees. Chlorine is used to treat the swimming pool water. Is the chlorine so utilized by the *facility* subject to threshold and *release* and other *waste management* calculations under EPCRA Section 313?

No. The chlorine used to treat the swimming pool water is exempt from threshold and *release* and other *waste management* calculations under the exemption found at 40 CFR Section 372.38(c)(2) for use of products for routine janitorial or *facility* grounds maintenance.

Facility Maintenance Exemption, Similar in Type or Concentration, Manufacture

262. An EPCRA Section 313 *covered facility* uses 55-gallon drums of paint containing a listed *toxic chemical* to paint lines on the roads. Paint is also used to maintain road signs and *facility* building signs. Would the listed *toxic chemicals* in the paint be exempt from EPCRA Section 313 reporting requirements under the *facility* grounds maintenance exemption found at 40 CFR Section 372.38(c)(2)?

The *facility* grounds maintenance exemption in 40 CFR Section 372.28(c)(2) applies to the use of products used for routine janitorial or *facility* grounds maintenance. This exemption includes both individually packaged products (e.g., cans of paint) and substances in bulk containers (e.g., 55-gallon drums of paint). Therefore, if the paint in the drums used to maintain the roads and the signs is similar in type and concentration to consumer products, the listed *toxic chemicals* in the paint would be exempt from EPCRA Section 313 reporting requirements. However, if the paint is used for process-related roads or equipment, such as airstrips at federal *facilities*, the exemption would not apply.

Facility Maintenance Exemption, Similar in Type or Concentration, Coincidental Manufacture

263. A *covered facility* has an ornamental pond on-site. Does the addition of listed *toxic chemicals* to an ornamental pond on a *facility* site qualify for the routine janitorial or *facility* grounds maintenance exemption (40 CFR Section 372.38(c)(2))?

Yes. The *facility* grounds maintenance exemption applies. However, the *facility* owner/operator should also be aware that the coincidental *manufacture* of other *toxic chemicals* may result (e.g., nitrate compounds) and, any listed chemicals *manufactured* must be applied to the *manufacturing* threshold.

Facility Maintenance Exemption

264. It appears that janitorial type chemicals are exempt. Does this mean that if I use formaldehyde as a disinfectant in a sterile area in excess of the threshold, it is exempt?

No. The use of the disinfectant described in the question seems to be process-related and is therefore not exempt. Also, "janitorial type chemicals" are not exempt; rather, *toxic chemicals* used for routine janitorial or *facility* grounds maintenance are exempt.

Facility Maintenance Exemption, Otherwise Use

265. A *covered facility* uses a contact cleaner to clean relays that are used to control lights. For Section 313 purposes, is this use exempt as part of routine janitorial grounds maintenance or must the amount of the listed *toxic chemical* in the cleaner used be included in an applicable threshold?

The use of the cleaner is not exempt because it is not a janitorial use and does not relate to *facility* grounds maintenance. The use is integral to the production processes of the *facility*. Therefore, the amounts of the listed *toxic chemicals* in the cleaner must be included in the calculation of *otherwise use* for the *facility*.

Facility Maintenance Exemption, Otherwise Use, Cooling Towers

266. Are pesticides which are used to control algae in cooling water towers exempt?

No, such pesticides would not all fall under the routine maintenance exemption. The *otherwise use* threshold would apply.

Facility Maintenance Exemption, Pesticides

267. Would a *facility* that exterminates insects using pesticides containing listed *toxic chemicals* need to report for the listed *toxic chemicals*?

If the pesticides are used as part of routine facility maintenance and are not process related, they would be exempt under the *facility* grounds maintenance exemption (40 CFR Section 372.38(c)(2)). If the pesticides are used for the comfort of the *facility* personnel, the listed *toxic chemicals* would be exempt

under the personal use exemption (40 CFR Section 372.38(c)(3)). However, if the pesticides are used to support the *facility's* process, neither exemption would apply, and a *covered facility* would need to consider the *otherwise use* of the listed *toxic chemical* in the pesticides in making threshold determinations. If the *otherwise use* threshold is exceeded, the *facility* should report the application of pesticides in Section 5.5.4 (Other Disposal).

Facility Maintenance Exemption, Dust Suppressant, Ancillary Uses

268. Does a listed toxic chemical that is applied to a road as a dust suppressant qualify for the routine *facility* grounds maintenance exemption (40 CFR Section 372.38(c))?

The application of a dust suppressant that contains listed *toxic chemicals* to land surfaces at the *facility* is beyond the scope of the "*facility* grounds maintenance" exemption. Listed *toxic chemicals* contained in *mixtures* used as dust suppressants are not eligible for the "*facility* grounds maintenance" exemption. The original intent of the *facility* grounds maintenance exemption was to provide facilities relief from tracking such ancillary uses of chemicals involved with such routine activities as janitorial cleaning supplies, fertilizers, and pesticides that are similar in type and concentration to consumer products. Dust suppressants are not products that are generally considered similar to consumer products. The large scale use of dust suppressants likely to occur at a mining extraction *facility* is considered integral to the *facility*'s process operations and of such a magnitude that amounts of listed *toxic chemicals* used for dust suppression are not eligible for the "*facility* grounds maintenance" exemption.

Structural Component Exemption, Stationary Equipment, Mobile Equipment, Welding Rods

269. Would the structural component exemption apply to welding rods used to maintain process equipment? Would the structural component exemption apply to welding rods used to maintain non-process related equipment (40 CFR Section 372.38(c)(1))?

No, welding rods used to maintain process equipment are not exempt. However, if the same rods are used solely to maintain the *facility* (such as in the repair of a door frame) then the *facility* maintenance exemption would apply.

Structural Component Exemption, Paint, Solvents

270. Are solvents and other listed *toxic chemicals* in paint used to maintain a *facility* exempt?

Yes. Painting to maintain the physical integrity of the *facility* is consistent with the structural component exemption (provided that it is used to paint passive structures), even though the solvents in the paint do not become part of the structure (40 CFR Section 372.38(c)(1)).

Structural Component Exemption, Paint

271. A *covered facility* routinely paints the exterior of on-site buildings. The solvent in the paint is an EPCRA Section 313 *toxic chemical*. The paint brushes used to paint the buildings are cleaned with a solvent that is also an EPCRA Section 313 *toxic chemical*. Is the solvent used to clean the brushes subject to threshold determinations and *release* and other *waste management* calculations under Section 313?

The structural component exemption set out at 40 CFR Section 372.38(c)(1) applies to the solvent in the paint used to paint the *facility*. It also applies to the solvent used to clean the paint brushes since this is part of the painting process. Likewise, any paint and cleaning solvent residues would not be subject to threshold determinations and *release* and other *waste management* calculations.

Structural Component Exemption, Paint, Pipes

272. Is the painting of process equipment to meet OSHA standards exempt from Form R threshold determinations and *release* and other *waste management* calculations under the structural component exemption?

No. Painting process pipes would not qualify for the structural component exemption because the exemption only applies to non-process related equipment (40 CFR Section 372.38(c)(1)).

Structural Component Exemption, Paint, Pipes

273. Are listed *toxic chemicals* contained in paint that is used to paint processing equipment subject to threshold determination and *release* and other *waste management* reporting?

Yes. Paint used on process related equipment would not qualify for the structural component exemption. Amounts of listed *toxic chemicals* used to paint process related equipment must be considered toward threshold determinations and *release* and other *waste management* calculations.

Structural Component Exemption, Fuel

274. An EPCRA Section 313 *covered facility* uses a fuel-powered paint sprayer for the sole purpose of painting the *facility's* structure. The listed *toxic chemicals* within the paint used to maintain the *facility's* appearance are exempt from EPCRA Section 313 threshold determination and *release* and other *waste management* reporting requirements under the structural component exemption (40 CFR Section 372.38(c)(1)). The fuel used to power the paint sprayer also contains listed *toxic chemicals* reportable under EPCRA Section 313. Must the listed *toxic chemicals* in the fuel be applied toward the 10,000-pound *otherwise use* threshold?

No. The listed *toxic chemicals* are exempt from EPCRA Section 313 threshold determinations and *release* and other *waste management* reporting requirements. Although the structural component exemption most commonly

applies to *toxic chemicals* incorporated into a *facility's* physical structure, the exemption also extends to *toxic chemicals* whose sole use derives from or is associated with an exempt use. Examples of *toxic chemicals* exempt in this manner include solvents used to clean paint brushes that were used to paint a *facility's* structure and fumes generated from the welding of non-process related pipes during installation at a *facility*. Be aware that the combustion of fuels may coincidentally *manufacture* Section 313 *toxic chemicals*. Such coincidental *manufacture* is not eligible for de minimis limitations (see the directive on de minimis) or the structural component exemption and amounts produced must be compared against the *manufacturing* threshold. The EPA publication, Toxic Air Pollutant Emission Factor - A Compilation of Selected Air Toxic Compounds and Sources (EPA 45/2-88-006a) contains emission factors for many specific compounds emitted during fuel combustion.

Structural Component Exemption, Pipes

275. Are the listed *toxic chemicals* contained in process related equipment, such as piping, eligible for the structural component exemption?

No. If pipes are process related, the structural component exemption does not apply and the *facility* may have to consider toward the *facility*'s threshold determination, amounts of listed *toxic chemicals* contained in process related pipes that are put into use during the reporting year. And the facility would have to include *release* and other *waste management* amounts in calculations where applicable.

Structural Component Exemption, Pipes

276. Does the structural component exemption (40 CFR Section 372.38(c)(1)) cover the small amounts of abraded or corroded metals from pipes and other equipment that become part of process streams?

If the pipes are not process related, the structural component exemption would apply and the listed *toxic chemicals* contained in the pipes would not need to be considered in threshold determinations and *release* or other *waste management* calculations. If the pipes are process related, the structural component exemption does not apply, and if the *facility* exceeds a threshold for the listed *toxic chemical*, any *releases* and other *waste management* of the listed *toxic chemical* should be reported.

Threshold Determination, Aluminum Oxide, Structural Component Exemption

277. A foundry uses aluminum oxide in grinding wheels as well as in the refractory brick that lines the furnace. Must the *facility* count the aluminum oxide in the brick toward the reporting threshold, or is the brick exempt as part of the structure of the *facility*?

The aluminum oxide in the brick must be counted toward the *otherwise use* threshold if it is a fibrous, man-made form of aluminum oxide. It does not meet the structural component exemption because it is a material that is, in essence, a replaceable insulation liner that is part of the process. If *releases*

from the brick amount to less than 0.5 lbs over the course of the reporting year, the *article* exemption may apply.

Structural Component Exemption

278. Does material contained in the structure of a building need to be reported?

No. Structural materials not associated with the process are exempt from reporting. They are exempt from threshold determinations and *release* and other *waste management* calculations and also from the maximum quantity on site.

Structural Component Exemption, Active/Passive Degradation

279. The structural component exemption under EPCRA Section 313 covers the small amounts of abraded/corroded metals from pipes and other non-process related *facility* equipment (40 CFR Section 372.38 (c)(1)). Does the structural component exemption apply to equipment which regularly suffers abrasion, such as grinding wheels and metal working tools? What criteria can a *facility* use to decide which pieces of equipment are structural components and which are not?

The EPCRA Section 313 structural components exemption would not apply to grinding wheels and metal working tools. These items are intended to wear down and to be replaced because of the nature of their use. The structural component exemption applies to passive, non-process related structures, such as pipes for potable water not related to the *facility's* process. The abrasion/corrosion includes normal or natural degradation, such as occurs in pipes, but not active degradation, such as occurs in a grinding wheel.

Article Exemption, Structural Component Exemption, Cement Kiln Equipment

280. Can some equipment used in the production processes of cement kiln manufacturers (e.g., grinding balls, hammers, kiln chains, mill liners and lining bars, and cooler grates and side wall liners) qualify for the structural component exemption or the *article* exemption?

The structural exemption does not apply to these uses of *toxic chemicals*. EPA believes that grinding balls, hammers, kiln chains, mill liners and lining bars, and cooler grates and side wall liners are all integral components of the process activities at the *facility*. Therefore, these items would not be eligible for the structural component exemption.

The *article* exemption may apply to these items. The *article* exemption is meant for the *processing* or *otherwise use* of manufactured items that: are formed to a specific shape or design during manufacture; have end use functions dependent in whole or in part upon its shape or design and do not *release* a toxic chemical under normal conditions of *processing* or use of that item at the *facility* (February 16, 1988; 53 FR 4507). The grinding balls, hammers, kiln chains, mill liners and lifting bars, and cooler grates and side

wall liners are being *otherwise used* by the *facility*. Therefore, if these pieces of equipment meet the three criteria above throughout their use during the calendar year, the exemption may be taken.

Structural Component Exemption, Article Exemption

281. If a *covered facility* stores a listed *toxic chemical* on-site, and then uses it by installing it in the *facility*, is the *facility* required to consider the listed *toxic chemical* (a component) for EPCRA Section 313?

When the listed *toxic chemical* is installed as a passive structural component (a component not related to the *facility's* process), then the structural component exemption applies to the *toxic chemical* in the component (40 CFR Section 372.38(c)(1)). If the *toxic chemical* is in a process-related component, the structural component exemption does not apply. However, if there are less than 0.5 lbs of *releases* of the *toxic chemical* over the course of the year, it may qualify for the *article* exemption. (See also Appendix A: Section 313 Policy Directive #1 - Article Exemption.)

Structural Component Exemption, Degreasers, Otherwise Use

282. Are degreasers employed in plant maintenance shops exempt under the structural component exemption (40 CFR Section 372.38(c)(1))?

No, degreasers used in plant maintenance do not meet the structural component exemption. The listed *toxic chemicals* in the degreasers would be considered towards the *facility's otherwise use* threshold.

Structural Component Exemption, Active Degradation, Electroplating

283. As part of the equipment involved in a hard chrome plating process, lead anodes conduct a current to parts being plated. The lead anodes do not provide a metallic ion to the plating process, but only act as bus bars to conduct the electrical current. The anodes require replacement over time due to erosion just like other pieces of electrical supply equipment. The anodes are solidly connected to the electrical supply system for the sole purpose of conducting electricity. Are the anodes considered a structural component of the *facility* and therefore, exempt from reporting under the structural components exemption (40 CFR Section 372.38(c)(1))?

No, the lead anodes are not considered exempt as a structural component since they play such an integral role in an electrochemical process. The erosion which the anodes undergo is not the same as other electrical supply equipment since the degradation is specifically caused by contact with process chemicals in a plating bath.

Structural Component Exemption, Asbestos

284. A *facility* is removing asbestos insulation for *disposal*. Is this activity covered by the structural component exemption?

The removal for *disposal* of friable asbestos insulation is not considered to be the *manufacture*, *process*, or *otherwise use* of friable asbestos. Since friable asbestos is not being *otherwise used* in this activity, the structural component

exemption cannot be taken. However, if the *facility* does *manufacture*, *process*, or *otherwise use* friable asbestos in excess of the thresholds elsewhere at the *facility*, this type of off-site transfer would be reportable in Part II, Sections 6.2 and 8.1.

C. Vehicle Maintenance (see also Appendix A: Section 313 Policy Directive #3 - Motor Vehicles Use Exemption)

Motor Vehicle Exemption, Gasoline, Anti-freeze

285. Please verify that any motor vehicle operated by the *facility*, whether licensed or not, is eligible for the exemption listed in 40 CFR Section 372.38(c)(4). This includes forklifts and automobiles. Also, please verify that gasoline, lubricants, oils and antifreeze are all considered to be substances subject to this exemption.

The motor vehicle exemption does not include all motor vehicles in any use at the *facility*. The exemption only applies to the *otherwise use* of the *toxic chemical*. It does not apply to *processing* or *manufacturing* of *toxic chemicals*. For example, this exemption would not apply in the case of an automobile manufacturing plant. As part of the production of vehicles, such a *facility* would be incorporating the *toxic chemicals* into an *article* for distribution in commerce. Another example of a nonexempt activity would be the manufacture of combustion byproducts from motor vehicles. The motor vehicle exemption does apply to components of gasoline (e.g., benzene); lubricants and oils; and antifreeze used to maintain and operate a motor vehicle employed at the *facility*.

Motor Vehicle Exemption, Mining Vehicles

286. Are *toxic chemicals* used to maintain fleets of large earth-moving vehicles at mining *facilities* exempt from threshold determinations and *release* or other *waste management* reporting?

Yes. Listed *toxic chemicals* used to maintain motor vehicles owned and operated by the *facility* are eligible for the motor vehicle exemption.

Motor Vehicle Exemption

287. A single company owns many *facilities* which are required to report under Section 313. The company stores gasoline at one of the *facilities*. The gasoline is used by trucks from all of the *facilities*, which come to the off-site central location for fuel and then leave. Is the gasoline in the storage tank exempt because it is used to maintain motor vehicles even though the vehicles are operated by different *facilities*?

The motor vehicle exemption only applies to the *otherwise use* of *toxic chemicals* in motor vehicles that are stationed at the *facility* that holds the gasoline. Since the *facility* with the gasoline storage unit is incorporating

toxic chemicals into trucks which are then sent back to another *facility*, the *facility* storing the gasoline is *processing* the *toxic chemicals*. Therefore, the gasoline used to fuel off-site trucks would not be exempt from reporting pursuant to 40 CFR Section 372.38(c)(4). Instead, the *facility* should consider the *toxic chemicals* in the gasoline towards their *processing* threshold. The *facilities* that have their trucks fueled at another station may be eligible for the motor vehicle exemption for the *toxic chemical* in the gasoline *otherwise used* on-site.

Motor Vehicle Exemption, Non-Motorized Barge

288. Are chemicals used to maintain a non-motorized barge stationed at a *facility* eligible for the motor vehicle maintenance exemption?

Listed *toxic chemicals* used to maintain a non-motorized barge are not eligible for the motor vehicle maintenance exemption because the barge is not a motor vehicle. *Toxic chemicals* used to maintain the non-motorized barge must be factored into threshold determinations and *release* or other *waste management* calculations. Additionally, listed *toxic chemicals* used to operate machinery positioned on the barge, such as dredging equipment or cranes, are similarly not eligible for the motor vehicle exemption.

Motor Vehicle Exemption, Railcars, Tractor Trailers

289. Does the motor vehicle exemption apply to railcars, which contain no motors; e.g., maintenance of railcars or tractor trailers?

Chemicals such as paint and lubricants used to maintain railcars are not eligible for the motor vehicle maintenance exemption. Tractor trailers or railcars are not themselves motor vehicles and listed *toxic chemicals* contained in *mixtures* used to maintain them are not eligible for the motor vehicle maintenance exemption.

Motor Vehicle Exemption, Jet Fuel

290. An airplane manufacturer uses JP4, a jet fuel, to move the planes around the *facility*. Can this fuel be considered exempt under the "maintenance of motor vehicles used at the *facility*" exemption?

Amounts of fuel used only at the *facility* to transport vehicles on the *facility's* property do not have to be counted towards thresholds and can be included under the motor vehicle exemption. If the jet fuel is in the planes when they leave the site to be sold or distributed in commerce, then the *facility* is considered to be *processing* the jet fuel and the listed chemicals in the fuel are subject to threshold determinations and *release* and other *waste management* calculations.

Motor Vehicle Exemption, Used Motor Oil

291. How does a *facility* that collects a quantity of used motor oil from motor vehicles owned and operated by the *facility* consider amounts of the used oil that are sent off-site for recycling?

Amounts of *releases* (including *disposal*) or other *waste management* practices associated with an exempt *otherwise use* of listed *toxic chemicals*

are also exempt from *release* or other *waste management* calculations, provided the *facility* does not conduct a subsequent non-exempt activity involving the chemical.

D. Laboratory Activities

Laboratory Activity Exemption, QA/QC Activities

292. Does EPCRA Section 313 reporting include laboratory chemicals?

Yes. However, the quantity of a listed *toxic chemical manufactured*, *processed*, or *otherwise used* in a laboratory under the supervision of a technically qualified person is exempt from threshold determinations and *release* and other *waste management* calculations. This exemption includes laboratories performing quality control activities including those located in *covered facilities* (40 CFR Section 372.38(d)).

Laboratory Activity Exemption, Technically Qualified Individual, TSCA

293. 40 CFR Section 372.38(d) lists uses of listed *toxic chemicals* in laboratories which are exempt from threshold determination and *release* and other *waste management* reporting. It states: "if a *toxic chemical* is *manufactured*, *processed*, or *otherwise used* in a laboratory at a *covered facility* under the supervision of a technically qualified individual, as defined in Section 720.3(ee) of this title," it is excluded from 313 reporting requirements. What does this reference for technically qualified individuals include?

Section 720.3(ee) is found in the Toxic Substances Control Act (TSCA) regulations (40 CFR Section 720.3(ee)) and defines "technically qualified individual" as a person or persons who, because of education, training or experience, or a combination of these factors, is capable of understanding and minimizing risks associated with the substance, and is responsible for safe procurement, storage, use, and *disposal* within the scope of research.

Laboratory Activity Exemption

294. If a *facility* has covered activities and exempted laboratory activities on the same site, does the site have to include the exempted laboratory activities in the threshold determinations?

No. The *facility* does not need to consider listed *toxic chemicals* used in exempt laboratory activities when making threshold determinations and *release* and other *waste management* calculations.

Laboratory Activity Exemption

295. 40 CFR Section 372.38(d) states that if an EPCRA Section 313 toxic chemical is *manufactured*, *processed*, or *otherwise used* in a laboratory at an EPCRA Section 313 *covered facility*, the chemical does not have to be counted for threshold determinations and *release* and other *waste management* calculations. Must the threshold activity or *release* and other *waste management* activities take place in a laboratory or laboratory setting in order to be eligible for the laboratory activity exemption?

For *toxic chemicals* to be exempted from reporting under the laboratory activities exemption, the activities must take place inside the laboratory. (40 CFR Section 372.38(d)(3)).

SIC Code, Pilot Plant, Laboratory Activity Exemption

296. Does a pilot plant within a *covered SIC code* have to report or is it covered by the laboratory activities exemption?

A pilot plant within the appropriate SIC codes is a *covered facility* if it meets the employee and chemical threshold criteria. Pilot plants are not covered by the laboratory activities exemption.

Laboratory Activity Exemption, Speciality Chemical Production

297. What is meant by "speciality chemical production" as an exception to the laboratory activities exemption?

Specialty chemical production refers to listed *toxic chemicals* produced in a laboratory setting that are distributed in commerce.

Laboratory Activity Exemption, QA/QC Activities

298. Does the exemption for laboratory activities also cover quality control labs?

There is no specific "quality control lab" exemption. Rather, the exemption applies to activities in a laboratory in which a listed *toxic chemical* is *manufactured*, *processed*, or *otherwise used* under the supervision of a "technically qualified individual." This exemption can cover activities in quality control labs.

Laboratory Activity Exemption, Quality Control, Samples

299. If a *covered facility* takes a sample from its process stream to be tested in a laboratory for quality control purposes, are *releases* of an EPCRA Section 313 chemical from the testing of the sample in the laboratory exempt under the laboratory activities exemption?

Yes, provided that the laboratory at the *covered facility* is under the direct supervision of a technically qualified individual as provided in 40 CFR Section 372.38(d). The laboratory exemption applies to the *manufacture*, *process*, or *otherwise use* of listed *toxic chemicals* and any associated *release* or other *waste management* amounts that take place in a qualified laboratory.

Laboratory Activity Exemption, QA/QC Activities

300. A *facility* sends materials that are sampled from processing operations to a laboratory off-site for quality control purposes. Are these quantities exempted under the laboratory activity exemption, provided that they are handled by a technically qualified individual (40 CFR Section 372.38(d))?

No, The laboratory exemption applies to *toxic chemicals* that are *manufactured*, *processed*, or *otherwise used* in an on-site laboratory under the direction of a technically qualified individual. Amounts of *toxic chemicals*

sent to off-site laboratories are not eligible for this exemption and these amounts must be considered toward the *facility's* threshold determination.

Laboratory Activity Exemption, Quality Control, Samples

301. A TSD *facility* regulated under RCRA Subtitle C takes a sample from a process stream (i.e., wastestream), that has already undergone treatment, to be tested in a laboratory for quality control purposes. The waste is tested in a laboratory under the supervision of a technically qualified individual. The TSDF then places the sample back into the treated wastestream before being sent off-site for *disposal*. Provided the TSDF exceeds an activity threshold for the *toxic chemical*, is the TSDF required to report the off-site transfer of the sample in Part II, Section 6.2 of the Form R?

No. The portion of the waste *released* (including *disposed*) that is *manufactured*, *processed*, or *otherwise used* in a laboratory under the supervision of a technically qualified individual is eligible for the laboratory activities exemption (40 CFR Section 372.38). Amounts sampled by the on-site laboratory do not have to be included in the *facility*'s off-site transfer figures provided that the waste sample does not undergo any further non-exempt *otherwise use* or *processing* activity before leaving the *facility*.

Laboratory Activity Exemption, Quality Control, Samples

302. A TSD *facility* regulated under RCRA Subtitle C takes a sample from a process stream (i.e., wastestream) to be tested in a laboratory for quality control purposes. The waste is tested in a laboratory under the supervision of a technically qualified individual. The TSD *facility* then places the sample back into the process stream where it undergoes further treatment and is destroyed. Provided the TSD *facility* exceeds an activity threshold for the *toxic chemical*, is the TSD *facility* required to consider the amount of the *toxic chemical treated for destruction* as part of the *facility*'s *otherwise use* of the listed toxic chemical, as well as report any amount in Part II, Sections 5 and B of the Form R as appropriate?

Yes. Despite the fact that the *toxic chemical* may have been eligible for the laboratory exemption, amounts of the listed *toxic chemicals* were returned to a process stream and subject to subsequent *manufacture*, *process*, or *otherwise use* activities. Activities performed involving listed *toxic chemicals* subsequent to an exempted activity must be considered toward threshold determinations and *release* and other *waste management* calculations. Since the sample was placed back into the process stream and subsequently *otherwise used* (i.e., destroyed), amounts of the listed toxic chemical must be considered toward threshold determinations and *release* and other *waste management* calculations.

Laboratory Activity Exemption, Pilot Plant

303. If a pilot plant is contained within a laboratory, assuming the rest of the laboratory deals with research and quality control, must the *facility* calculate the threshold based on the entire lab, or just on the chemicals used for the pilot plant?

The *facility* would only be required to consider the pilot plant portion of the laboratory, assuming the remainder of the laboratory is under the supervision of a technically qualified individual.

Laboratory Activity Exemption, Research and Development Activities

304. A *facility* manufactures "prototype" vehicles (buses, etc.) for research and development. They *otherwise use* solvents that contain listed *toxic chemicals* in excess of the activity threshold. Are the listed *toxic chemicals* exempt under the laboratory activity exemption?

Yes, if the listed *toxic chemicals* contained in the solvents are *manufactured*, *processed*, or *otherwise used* in a laboratory at a *covered facility* under the supervision of a technically qualified individual, then they are exempt from threshold determinations and *release* and other *waste management* reporting.

Laboratory Activity Exemption, QA/QC Activities, Product Testing

305. A *facility* tests specific components of a machinery line. Its functions include testing for durability of engines, hydraulic systems, power trains, electrical systems and transmissions; building prototypes of products; and qualitative and quantitative analytical testing of materials in a chemical laboratory. Since these activities are test, development, and research oriented, is the *facility* eligible for the laboratory activity exemption (40 CFR Section 372.38(d))?

Equipment and component testing is equivalent to laboratory activities and thus is eligible for the laboratory activity exemption as long as listed *toxic chemicals* are *manufactured*, *processed*, or *otherwise used* in a laboratory at a *covered facility* under the supervision of a technically qualified individual.

Product Testing, Laboratory Activity Exemption

306. Are the following marine engine testing operations that use listed Section 313 *toxic chemicals* exempt under the laboratory activities exemption: (a) testing of production engines intended for sale in specialized engine test cells; (b) testing engines for research and development purposes in specialized engine test cells; (c) testing for research and development purposes in open water bodies?

While all of the noted operations are considered "product testing" and as such are potential candidates for the laboratory exemption, only those listed *toxic chemicals* that are *manufactured, processed*, or *otherwise used* in a laboratory at a *covered facility* under the supervision of a technically qualified individual (40 CFR Section 372.38(d)) are exempt. Therefore, if these conditions are met, the testing of production engines intended for sale in specialized engine test cells and testing engines for research and development purposes in specialized engine test cells would be eligible for the exemption. However, the testing and research in open water bodies would not qualify because these activities are not being performed in a laboratory.

Laboratory Activity Exemption, Testing Required for Permit

307. Are trial burns conducted in an incinerator for permitting purposes at TSD *facilities* exempt under the laboratory activity exemption, if conducted under the supervision of a technically qualified individual?

No. The listed chemicals associated with trial-burns required for permitting purposes at TSD *facilities* are not conducted in laboratories. For activities to be exempt from threshold determinations and *release* and other *waste management* calculations under the laboratory activity exemption, the *toxic chemicals* must be *manufactured*, *processed*, or *otherwise used* in a laboratory at a *covered facility* under the supervision of a technically qualified individual (40 CFR Section 372.38(d)).

Laboratory Activity Exemption, Laboratory Support Activity

308. The owner/operator of a newspaper has a photography laboratory on-site that produces the pictures that appear in the newspaper. The laboratory does not perform product testing or analysis for the newspaper. The primary function of the photography laboratory is to develop film to be used in the newspaper. Will this photo laboratory meet the laboratory activity exemption under EPCRA Section 313 (40 CFR Section 372.38(d))?

No. The laboratory activity exemption, 40 CFR Section 372.38(d), is primarily for laboratories that perform auxiliary functions for the *manufacturing* or *processing* activities at the *facility*. The photography laboratory does not perform an auxiliary function, but performs activities which are essential to the manufacturing of the newspaper, i.e., they make a product (photographs) that is used in the manufacture of another product (newspaper), and therefore these activities are not exempt from reporting under EPCRA Section 313.

Laboratory Activity Exemption, Samples

309. A *covered facility* prepares a product that contains a listed *toxic chemical* for sample distribution. The sample product is prepared on a small scale and is distributed to potential customers for trial use. Would the amount of *toxic chemical processed* in the preparation of these samples be exempted from threshold determinations and *release* and other *waste management* calculations under the laboratory activities exemption (40 CFR Section 378.38(d))?

No. Amounts of listed *toxic chemicals* that are *manufactured*, *processed*, or *otherwise used* in conjunction with the preparation of trial samples are not excluded from threshold determinations and *release* and other *waste management* calculations under the laboratory activities exemption.

Laboratory Activity Exemption, Threshold, Manufacture

310. A company *manufactures* 26,000 pounds a year of a listed *toxic chemical*, 2,000 of which are *manufactured* and used in an on-site laboratory under the supervision of a technically qualified individual. Should the 2,000 pounds be counted toward determination of the *manufacturing* threshold under EPCRA Section 313, or will this

***manufacturing* activity be exempt under the laboratory activity exemption (40 CFR Section 372.38(d))?**

The 2,000 pounds are exempt from the threshold determination for *manufacturing* under the laboratory activities exemption (40 CFR Section 372.38(d)) because the listed *toxic chemical* was *manufactured* in a laboratory under the supervision of a technically qualified individual. The *facility* will count only 24,000 pounds of the *manufactured* chemical toward its applicable *manufacturing* threshold.

Laboratory Activity Exemption, Threshold Determination, Release Calculation, Laboratory Support Activity

311. A *covered facility* operates several on-site laboratories and shops (e.g., machine shops, glass blowing shops) that support the laboratory activities. Assuming the activities in the laboratories are exempt under 40 CFR Section 372.38(d), are the listed *toxic chemicals* used in the shops also exempt from threshold determinations and *release* and other *waste management* calculations? If the shops also support some nonexempt laboratory activities, would they be required to account for the fraction of chemicals used for nonexempt purposes?

In either case the listed *toxic chemicals* used in the shops would not be exempt from threshold determinations and *release* and other *waste management* estimates. The fact that the shops support exempt laboratory activities does not exclude the listed *toxic chemicals* used in the shops from threshold determinations and *release* and other *waste management* estimates. The laboratory activities exemption in Section 372.38(d) applies to *toxic chemicals* that are *manufactured, processed*, or *otherwise used* for certain purposes (such as research or quality control) in a laboratory under the supervision of a technically qualified individual. This exemption does not exempt the *facilities* themselves, it only exempts those listed *toxic chemicals* that are *manufactured, processed*, or *otherwise used* in a laboratory during certain laboratory activities, from threshold determinations and *release* and other *waste management* estimates required under EPCRA Section 313. Specifically, Section 372.38(d)(3) states that the exemption does not apply to "activities conducted outside the laboratory."

Activity Threshold, Otherwise Use, Laboratory Activity Exemption

312. A *facility* manufactures fire fighting and fire protection equipment. The *facility* has a training school on how to use that equipment. As part of the training school, on-site fires are set using gasoline containing benzene, a listed *toxic chemical*. For Section 313 threshold determinations, would this be an *otherwise use* of benzene, or would this use be exempt as product testing under the laboratory exemption? (40 CFR Section 372.38(d))

The benzene would be considered *otherwise used* for the Section 313 threshold determination since the benzene is being used in a nonincorporative activity in order to train individuals to use equipment. The laboratory activity

exemption is intended to cover activities in a laboratory (e.g., product testing) under the supervision of a technically qualified individual. Training is not considered product testing nor research and development and thus would not be exempt under the laboratory activities exemption.

Laboratory Activity Exemption, Process

313. After *otherwise using* an EPCRA Section 313 toxic chemical in a laboratory setting under the supervision of a technically qualified individual, a *covered facility* sends the *toxic chemical* in waste off-site to be recycled. The *facility* also *processes* the same chemical elsewhere but below the 25,000 pound threshold (e.g., 20,000 pounds). The *facility* is eligible for the laboratory activity exemption for the amount of the listed *toxic chemical otherwise used, processed,* and *manufactured* in the laboratory and amounts of the listed *toxic chemical released* from the laboratory. (40 CFR Section 372.38(d)) Is the *facility* required to count the amount of the listed *toxic chemical* sent off-site for recycling (e.g., 8,000 pounds) from the laboratory toward the *processing* threshold?

Covered facilities manufacturing, processing or *otherwise using* a *toxic chemical* in a laboratory setting under the supervision of a technically qualified individual, need not consider those quantities of the *toxic chemical* when determining EPCRA Section 313 chemical activity thresholds and calculating *releases* and other *waste management* amounts. The *facility* is eligible for the laboratory activity exemption for the amount of listed toxic chemical *otherwise used*, *processed*, and *manufactured* in the laboratory and amounts of the listed toxic chemical *released* or otherwise managed as waste from the laboratory. The *covered facility* is not required to count the amount of listed toxic chemical laboratory waste sent off-site for recycling (e.g., 8,000 pounds) toward the *processing* threshold. Any other non-exempt quantities of the toxic chemical *manufactured*, *processed* or *otherwise used* on-site, however, should be considered towards the appropriate threshold to see if the *facility* triggers reporting for that *toxic chemical*.

Laboratory Activity Exemption

314. A *covered facility* produces copper panels (e.g., circuit boards). A high percentage of these copper panels are produced as prototypes for *facility* research and development. The remainder of the copper panels are incorporated into products distributed in commerce. During production, all the copper panels are produced identically, in the same process, in the same *facility*, under the direct supervision of technically qualified individuals. Is the quantity of copper compounds *manufactured* and *otherwise used* for research and development eligible for the laboratory activity exemption and therefore excluded from threshold determinations?

All copper compounds and any other *toxic chemicals* created or *otherwise used* during the production of the copper panels are considered towards the *manufacturing* or *otherwise use* thresholds. At this point in the panel

production, the *toxic chemicals manufactured* or *otherwise used* in the entire panel production process are not eligible for the laboratory activities exemption. Those *toxic chemicals* in the panels distributed in commerce should also be considered towards the *processing* threshold. The *toxic chemicals* in the panels tested for research and development purposes become eligible for the laboratory activities exemption while the panels are being tested on-site under the supervision of a technically qualified individual in a laboratory setting.

E. De Minimis (see also Appendix A: Section 313 Policy Directive #2 -- De Minimis Exemption)

De Minimis Exemption, Trade Name Product

315. Please explain the de minimis concentration limitation under Section 313, and its application to *mixtures* and *trade name products* (40 CFR Section 372.38(a))?

The de minimis exemption allows *covered facilities* to disregard certain minimal concentrations of listed *toxic chemicals* in *mixtures* or *trade name products* that they *process* or *otherwise use* when making threshold determinations and *release* and other *waste management* determinations. The de minimis exemption does not apply to the *manufacture* of a listed *toxic chemical* except if that listed *toxic chemical* is *manufactured* as an impurity and remains in the product distributed in commerce below the appropriate de minimis level or is *imported* below de minimis concentrations. The de minimis exemption does not apply to a byproduct *manufactured* coincidentally as a result of *manufacturing, processing, otherwise use,* or any *waste management* activity.

When determining whether the de minimis exemption applies to a listed *toxic chemical*, the owner/operator should consider only the concentration of the listed *toxic chemical* in *mixtures* and *trade name products* in process streams in which the listed *toxic chemical* is undergoing a reportable activity. If the listed *toxic chemical* in a process stream is *manufactured* as an impurity or *imported, processed,* or *otherwise used* and is below the appropriate de minimis concentration level, then the quantity of the listed *toxic chemical* in that process stream does not have to be applied to threshold determinations nor included in *release* or other *waste management* calculations. If a listed *toxic chemical* in a process stream meets the de minimis exemption, all *releases* and other *waste management* activities associated with the listed *toxic chemical* in that stream are exempt from EPCRA Section 313 reporting. It is possible to meet an activity (e.g., *processing*) threshold for a *toxic chemical* on a *facility*-wide basis, but not be required to calculate *releases* or other *waste management* quantities associated with a particular process because that process involves only *mixtures* or *trade name products* containing the *toxic chemical* below the de minimis level.

Once a listed *toxic chemical* concentration is above the appropriate de minimis concentration, threshold determinations and *release* and other *waste management* calculations must be made, even if the chemical later falls below the de minimis level in the same process stream. Thus, all *releases* and other quantities managed as waste that occur after the de minimis level has been exceeded are subject to reporting. If a listed *toxic chemical* in a *mixture* or *trade name product* above the de minimis level is brought on-site, the de minimis exemption never applies.

The de minimis concentration level is consistent with the OSHA Hazard Communication Standard requirements for development of *Material Safety Data Sheets* (*MSDS*s). The de minimis level is 1.0 percent except if the listed *toxic chemical* is an OSHA-defined carcinogen. The de minimis level for OSHA-defined carcinogens is 0.1 percent. For *mixtures* or other *trade name products* that contain one or more members of a listed Section 313 *toxic chemical* category, the de minimis level applies to the aggregate concentration of all such members and not to each individually. The list of *toxic chemicals* in the publication Toxic Chemical Release Inventory Reporting Forms and Instructions for the current reporting year contains the de minimis values for each of the *toxic chemicals* and chemical categories.

This de minimis exemption applies solely to *mixtures* and other *trade name products*. EPA's long-standing interpretation has been that *mixture* does not include waste. Therefore, the de minimis exemption cannot be applied to *toxic chemicals* in a waste even if the waste is being *processed* or *otherwise used*.

De Minimis Exemption, Otherwise Use

316. A metal mining *facility* receives ash that it directly incorporates in concrete which it then uses on-site to form cement blocks. Is this direct use of ash eligible for the de minimis exemption?

The use of ash as a component of a *mixture* (concrete) that is *otherwise used* on-site to construct cement blocks constitutes an *otherwise use* of a material containing listed *toxic chemicals* and such amounts must be counted toward the *facility*'s *otherwise use* of those chemicals. In this case, the ash is not considered a waste because it is not managed as a waste. Thus, the listed *toxic chemicals* contained in the ash are eligible for the de minimis exemption if they do not exceed the de minimis concentrations.

De Minimis Exemption, Solvent Recovery

317. A *covered facility* receives a spent solvent, recovers the solvent and sells the recovered solvent in commerce. Is the recovered solvent considered a waste, and if not, is the reusable solvent considered a product? At what point might the solvent be eligible for the de minimis exemption?

The recovery *facility* must consider the amount of the material that it feeds into the recycling operation toward the *facility*'s *processing* threshold. The

solvent is part of a waste (not usable in the form received) and therefore the amount *processed* is not eligible for the de minimis exemption until the recovery is complete and the solvent is no longer subject to further *waste management* activities. Once the recovery is complete, the solvent is no longer a waste and thus the recovery *facility* may take the de minimis exemption for amounts subsequently prepared for distribution in commerce. The purchasing *facility* considers the recovered solvent as a new product and its subsequent *processing* or *otherwise use* of the solvent may be eligible for the de minimis exemption.

De Minimis Exemption, Mixture, Impurity, Waste, Byproduct

318. Does the de minimis exemption apply regardless of whether a listed *toxic chemical* is present in a *mixture* as an impurity or separated out as a byproduct? Does it apply to *toxic chemicals* in waste?

The de minimis exemption applies to impurities present in products *processed*, *otherwise used*, *imported*, or coincidentally *manufactured* as an impurity if the impurity remains in the product for distribution. The de minimis exemption does not apply to listed *toxic chemicals* that are *manufactured* as a byproduct regardless of whether the byproduct is a waste.

De Minimis Exemption, Coincidental Manufacture, Impurity

319. A *facility* adds a chemical to water for pH control that results in the coincidental *manufacture* of another *toxic chemical*. This chemical is then applied to coal that is further distributed in commerce. Is the generated chemical considered an impurity and eligible for the de minimis exemption?

No, under EPCRA Section 313, an impurity refers to a chemical that is coincidentally *manufactured* as a result of the *manufacture*, *process*, or *otherwise use* of another chemical, but is not separated from that chemical and remains primarily with the product or *mixture*. Because the listed toxic chemical is *manufactured* during the treatment of water and not during the *processing* of the primary product or *mixture*, it is not considered an impurity. In this case, the *facility* should consider amounts of chemicals *manufactured* toward the *manufacturing* threshold, to the extent that the *facility* has information on the amount of a *toxic chemical* that is *manufactured*. In addition, to the extent that the water and the *toxic chemicals* that are applied to the coal are intended to be incorporated into the coal product, the chemical *manufactured* in the water treatment process may also be *processed*.

Coincidental Manufacture, Chemical Category, De Minimis Exemption

320. A *covered facility* produces a non-listed inorganic heavy metal oxide. The ores used as raw materials for the production of the metal oxide contain EPCRA Section 313 *toxic chemicals* in small concentrations. During production, these impurities are chemically converted from oxides to sulfates or chlorides, separated from the main product stream, and discharged in wastes. At no point in the process

does the concentration of an EPCRA Section 313 toxic chemical (i.e., the sum of the concentrations of compounds falling into any listed chemical category) ever exceed the appropriate de minimis concentration. Can the de minimis exemption apply to these activities? Because the *toxic chemicals* being coincidentally *manufactured* are in the same EPCRA Section 313 category, is the conversion considered *manufacturing*?

The de minimis exemption does not apply in this instance. The de minimis exemption does not apply to chemical byproducts *manufactured* under Section 313. Additionally, any EPCRA Section 313 *toxic chemicals manufactured* during the *facility*'s production process, even if the *toxic chemicals* are created from *toxic chemicals* in the same EPCRA Section 313 category, must be considered towards the *facility*'s *manufacturing* threshold. Therefore, the *facility* must consider all the EPCRA Section 313 listed metal sulfates and chlorides created as a result of its production process for threshold determinations and *release* and other *waste management* reporting.

De Minimis Exemption, Metal Compounds

321. Does the de minimis exemption apply to the parent metal component of a compound in a *mixture* for Section 313 reporting?

No. For threshold determinations, the weight percent of the whole compound in the *mixture* is used. In general, the de minimis value for compounds is one percent, unless the particular compound is itself an OSHA carcinogen and then the de minimis level is 0.1 percent.

De Minimis Exemption, Xylene, Mixed Isomer

322. For calculating de minimis for xylene (mixed isomers), should the isomers be aggregated to determine if the weight percent is less than one?

Yes. To determine the de minimis for xylene (mixed isomers), the one percent would be applied to the aggregated isomer's weight percent in the *mixture*. For example, a *mixture* contains 30 pounds each of the three isomers, and 9,910 pounds of Chemical Z. The total xylene would be 90 pounds. That 90 pounds would constitute less than one percent of the total weight of 10,000 pounds, and would therefore, be exempt.

De Minimis Exemption

323. We are taking part in an experimental shale oil extraction process. When the shale is extracted, concentrations of a *toxic chemical* are present in trace amounts in the shale far below the de minimis concentration. Does the de minimis exemption apply?

Yes, the de minimis exemption applies to the listed *toxic chemical* present in the shale provided that it is *processed* or *otherwise used*.

De Minimis Exemption, De Minimis Level

324. How do we determine whether the de minimis level for a Section 313 listed *toxic chemical* should be 1 percent or 0.1 percent?

The de minimis levels are dictated by determinations made by the National Toxicology Program (NTP), the Annual Report on Carcinogens, the International Agency for Research and Cancer (IARC) Minographs, or 29 CFR Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administrations. *Toxic chemicals* listed as carcinogens or potential carcinogens under NTP (classified as a known or probable carcinogens), IARC (classified as 1, 2A or 2B), or 29 CFR Part 1910, Subpart Z, have a 0.1 percent de minimis concentration level. EPA generally refers to these chemicals as the "OSHA carcinogens." All other *toxic chemicals* have a 1 percent de minimis concentration level. EPA periodically reviews the latest editions of the IARC and the NTP reports, as well as 29 CFR Part 1910, Subpart Z, to see if a listed chemical's status has changed and updates the EPCRA Section 313 lists accordingly.

The list of *toxic chemicals* in the publication Toxic Chemical Release Inventory Reporting Forms and Instructions for the current reporting year contains the de minimis values for each of the *toxic chemicals* and chemical categories. The list is also available from the EPCRA hotline and on the EPA's TRI homepage on the Internet (http://www.epa.gov/opptintr/tri). Although not required to do so, EPA prepares this list as a courtesy to the reporting public

De Minimis Exemption, De Minimis Level, Carcinogen

325. What is the basis for determining that a *toxic chemical* is subject to the 0.1 percent de minimis level rather than the 1.0 percent de minimis level, and when do changes in *toxic chemical* de minimis levels take effect?

In the final rule (53 FR 4500, Feb. 16, 1988) that implements the reporting requirements of EPCRA Section 313, EPA adopts a de minimis exemption which permits *facilities* to disregard de minimis levels of listed *toxic chemicals* for threshold determinations and *release* and other *waste management* calculations. The regulations adopt a 0.1 percent de minimis level for chemicals that are carcinogens, as defined in 29 CFR Section 1910.1200(d)(4),as follows:

"(4) Chemical manufacturers, importers and employers evaluating chemicals shall treat the following sources as establishing that a chemical is a carcinogen or potential carcinogen for hazard communication purposes:

(I) National Toxicology Program (NTP), Annual Report on Carcinogens (latest edition);

(ii) International Agency for Research on Cancer (IARC) Monographs (latest editions); or

(iii) 29 CFR Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration."

Therefore, once a chemical's status under NTP, IARC, or 29 CFR Part 1910, Subpart Z, indicates that the chemical is a carcinogen or potential carcinogen, the reporting *facility* may disregard levels of the chemical below the 0.1 percent de minimis concentration, provided that the other criteria for the de minimis exemption are met. For convenience purposes, EPA refers to these chemicals as the "OSHA carcinogens."

If in reporting year "A," IARC or NTP classifies a chemical as a probable or known carcinogen (thus lowering the EPCRA Section 313 de minimis concentration from 1.0 to 0.1 percent), the lower de minimis concentration for the purposes of reporting would be applicable starting with reporting year "A+1." For example, vinyl acetate was classified as a group 2B chemical by IARC in 1995, so the lower de minimis level of 0.1 percent applied starting with the 1996 reporting year (i.e., it was effective as of January 1, 1996, for reports due July 1, 1997).

Suppliers would need to notify their customers of such changes with the first shipment in the year in which the change is applicable to reporting. If, as in the vinyl acetate example, the classification changes in 1995, then the supplier would notify customers with the first shipment on or after January 1, 1996.

De Minimis Exemption, Release Reporting

326. If a *covered facility* has process streams with less than 1 percent (or 0.1 percent for carcinogens) of a listed chemical, do fugitive *releases* from these streams have to be included in *release* calculations?

The de minimis exemption applies to process streams when a starting material for the process is a *mixture* containing less than 1 percent (or 0.1 percent) of a listed chemical. If the process stream is exempt under de minimis, *releases* from the stream are not reported on the Form R.

De Minimis Exemption, Concentration Range

327. A *covered facility* uses a chemical *mixture* that contains a listed Section 313 *toxic chemical*. The concentration of the listed *toxic chemical* is given as a range on the *Material Safety Data Sheet (MSDS)*. If the maximum and minimum concentrations are above and below the de minimis concentration level, how can the *facility* determine quantities for Section 313 compliance?

The amount of the listed *toxic chemical* in the *mixture* that is at or above the de minimis level, and therefore counts towards the threshold, can be assumed

to be proportional to the ratio of the amount at or above de minimis concentration to the amount of the total concentration range. The concentration of the chemical in the *mixture* that is not exempt is the average of the de minimis level and the maximum concentrations.

For example, assume that a *facility* *manufactures* 10 million pounds of a *mixture* containing 0.25–1.20 percent of a *toxic chemical* that is subject to a 1 percent de minimis level. The quantity of the *mixture* subject to reporting is:

$$\frac{10{,}000{,}000 \text{ lbs} \times (1.20 - 0.99)}{(1.20 - 0.25)} = 2{,}210{,}526 \text{ lbs}$$

Non-exempt *mixture*

This 2,210,526 pounds of non-exempt *mixture* is multiplied by the average concentration above the de minimis, which is 1.1 percent, or

$$\frac{1.20 + 0.99}{2} = 0.011$$

$$2{,}210{,}526 \times 0.011 = 24{,}316 \text{ pounds}$$

In this example, the amount of chemical that counts toward a threshold is 24,316 pounds.

De Minimis Exemption, Concentration Range

328. A *covered facility* *processes* a *mixture* of chemicals which includes a non-carcinogenic listed *toxic chemical* present between concentrations of 0.5–1.0 percent, as stated on the *MSDS* provided with the *mixture*. Is the listed *toxic chemical* in the *mixture* eligible for the de minimis exemption? If not, how would a *facility* make a threshold determination for a *toxic chemical* whose concentration ranges from below the de minimis level to the de minimis level?

A listed *toxic chemical* with a concentration range that has an upper bound equal to the de minimis level is not exempt from reporting under EPCRA Section 313. The exception applies only if the chemical concentration is below the de minimis level. The amount of the listed *toxic chemical* in the *mixture* that is at or above the de minimis level, and therefore counts towards the threshold, is proportional to the ratio of the amount at or above the de minimis concentration to the amount of the total concentration range. The concentration of the chemical in the *mixture* that is not exempt is the average of the de minimis level and the maximum concentration, which in this case is the same. The fraction of the listed *toxic chemical* that is not exempt is the fraction that is at the de minimis level, i.e., 1 percent. The fraction that is exempt is that below the de minimis level, which is 0.5 percent – 0.9 percent (one significant figure).

For example, assume that a *facility* *manufactures* 10 million pounds of a *mixture* containing 0.5-1.0 percent of a *toxic chemical* that is subject to a 1 percent de minimis exemption. The quantity of the *mixture* subject to reporting is:

$$\frac{10{,}000{,}000 \text{ lbs} \times (1.0 - 0.9)}{(1.0 - 0.5)} = \begin{array}{l} 200{,}000 \text{ lbs} \\ \text{Non-exempt } \textit{mixture} \end{array}$$

De Minimis Exemption, Waste

329. A raw material contains less than the de minimis level of a listed *toxic chemical*. During *processing* of the listed *toxic chemical*, its concentration remains below de minimis. However, the concentration of the listed *toxic chemical* in the wastestream that results from that *processing* activity is above the de minimis concentration level for that *toxic chemical*. The wastestream containing that listed *toxic chemical* is *disposed* in an on-site landfill. Should the *toxic chemical* handled in the process line be included in the *facility's* threshold determination? Do the quantities of the listed *toxic chemical* in wastestreams that are generated from this process require reporting? What about the listed *toxic chemical* present in the wastestream that is above the de minimis level?

No. The de minimis exemption can be applied to the listed *toxic chemical* in the raw material that is *processed*. Because the de minimis exemption can be taken, the quantities *processed* do not have to be applied to the *processing* threshold for that *toxic chemical* at the *facility* and quantities of the listed *toxic chemical* that are *released* or otherwise managed as waste as a result of this specific *processing* activity are exempt from *release* and other *waste management* calculations. The exemption applies even if the listed *toxic chemical* is concentrated above the de minimis level in the wastestream resulting from that *processing* activity.

Ash, De Minimis

330. A *covered facility* combusts coal in a combustion unit. The coal contains a toxic chemical below de minimis amounts. During combustion, *toxic chemicals* are *manufactured*. The ash containing the *toxic chemical* is generated from the combustion of the coal. The ash is then sold to another *facility* for direct reuse in the *manufacture* of concrete blocks. If the *toxic chemicals* in the ash are below the appropriate de minimis concentration, are they eligible for the de minimis exemption?

The *toxic chemicals* in the coal being combusted should be considered towards the *facility*'s *otherwise use* threshold and this activity is eligible for the de minimis exemption. The *toxic chemicals* that are *manufactured* as a result of the combustion *process* are byproducts and therefore not eligible for the de minimis exemption. The *toxic chemicals* in the ash that is sold for direct reuse off-site are considered *processed*. After combustion, when the *facility* is preparing the *toxic chemicals* in ash for distribution in commerce, they are eligible for the de minimis exemption.

De Minimis Exemption, Byproduct

331. A small quantity of a listed *toxic chemical* is *manufactured* in a wastestream. Are *facility* owners/operators required to include the amount of the listed *toxic chemical* present in the wastestream as part of the threshold determination if the concentration of the listed *toxic chemical* in the wastestream is below the de minimis level?

Yes. This de minimis exemption applies solely to *mixtures*. EPA's long-standing interpretation has been that *mixture* does not include waste. Also, generally, de minimis does not apply to listed *toxic chemicals* that a *facility manufactures*. The de minimis exemption cannot be applied to listed *toxic chemicals manufactured* as a byproduct.

Threshold Determination, De Minimis Exemption, Manufacture, Wastewater Treatment

332. If a *facility manufactures* 900,000 gallons per day of a *toxic chemical* at a 0.5 percent concentration in a wastewater treatment system, is this quantity to be considered for threshold determinations and *release* and other *waste management* calculations?

Since the chemical is *manufactured* at the *facility* as part of a waste treatment process, the de minimis exemption does not apply and the *toxic chemical* must be considered for both threshold determinations and *release* and other *waste management* calculations.

De Minimis Exemption

333. A *covered facility* receives chlorine in 100-ton tank car quantities in concentrations above the 1 percent de minimis level. The chlorine is transferred to a bleaching vessel to make a bleaching *mixture*, where its concentration drops below the de minimis level. Does the de minimis exemption apply?

No. The *mixture* received by and initially *processed* by the *facility* contains chlorine above the de minimis concentration level. Because the *mixture* contained chlorine in a concentration above the 1 percent de minimis level, the de minimis exemption does not apply. The *facility* must consider the total weight percent of the chlorine in the *mixture* toward a threshold determination. Any amounts of the listed *toxic chemical* that are ultimately *released* or otherwise managed as waste as a result of this *processing* activity should be reported regardless of the concentration of the chlorine in the wastestream.

De Minimis Exemption, Waste

334. A *covered facility otherwise uses* a *toxic chemical* that is above the de minimis concentration in a *mixture*. How does the de minimis exemption apply to listed *toxic chemical* residues from this use contained within used or spent containers that the *facility* sends off-site for *disposal*?

The de minimis exemption cannot be applied to quantities of the listed *toxic chemical* in used or spent containers that are sent off-site for *disposal* because

these quantities are being managed as a waste and the de minimis exemption does not apply to wastes. The de minimis exemption can only be applied to a listed *toxic chemical* in a *mixture* or *trade name products* that is *processed*, *otherwise used*, *manufactured* as an impurity (that remains with the product), or *imported*, provided that the listed *toxic chemical* is present in the *mixture* or *trade name product* below the de minimis concentration level.

De Minimis Exemption, Wastestream, Sewage, Otherwise Use

335. A covered metal mining *facility* receives sewage sludge from off-site for use in soil reclamation. Is the application of sewage sludge to land considered an *otherwise use*? Are the *toxic chemicals* used in the soil reclamation activity eligible for the de minimis exemption, and if so, how are amounts reported (e.g., *released* to land)?

The metal mine is *otherwise using* the listed *toxic chemicals* contained in the sewage sludge as a soil building material. However, because the listed *toxic chemicals* contained in the sludge are being applied to land, the *facility* is managing the sewage sludge as a waste. Therefore, in this example, amounts of listed *toxic chemicals* being *otherwise used* are not eligible for the de minimis exemption. Amounts of listed *toxic chemicals* are reported as a *release* to land. The *otherwise use* of listed *toxic chemicals*, such as nitrate compounds for farming, is to be reported as a release to land in Section 5.5 of the Form R.

De Minimis Exemption, Petroleum Refining

336. In petroleum refining processes, *mixtures* such as crude oils, petroleum products, and refinery process streams may contain trace amounts of listed *toxic chemicals*. During the refining process, these *mixtures* may undergo *beneficiation* activities which would result in the listed *toxic chemicals* being concentrated to levels that exceed the de minimis levels. Would the de minimis exemption apply to these processes?

The de minimis exemption would apply to these *toxic chemicals* until they are concentrated above the applicable de minimis level. For purposes of threshold determinations and *release* and other *waste management* calculations, the *facility* would account for a listed *toxic chemical* from the first point in the process in which the concentration of the *toxic chemical* meets or exceeds the applicable de minimis level for that *toxic chemical*, in the process *mixture*.

De Minimis Exemption, Air Releases, Storage Tanks

337. As a petroleum refiner, do we have to estimate air *releases* of chemicals from storage tanks containing crude oil if the concentration of the chemical is below de minimis level? We understand that the amounts of these chemicals would be counted towards threshold since, after storage, we are extracting and purifying them to concentrations above de minimis.

Facilities that receive chemicals into the plant at concentrations below de minimis have to report *releases* and other *waste management* activities from that point in the process when the chemical's concentration exceeds de minimis level. This *facility* would not have to report air emissions from their crude oil tanks for the chemicals present in oil below de minimis. For those above de minimis, they must report *releases* and other *waste management* activities.

De Minimis Exemption, Treatment Processes, Wastewater Treatment

338. Is the creation of listed chemicals in waste treatment processes exempt if the concentration is less than the de minimis level?

No. The *manufacture* of a Section 313 chemical during a waste treatment process is not covered by the de minimis exemption.

Ammonia, De Minimis Exemption

339. A *covered facility* places ammonium chloride in water, and *manufactures* aqueous ammonia for use on-site. Does the de minimis exemption apply to this activity?

No. The *facility* cannot take the de minimis exemption for this activity because the *facility manufactured* aqueous ammonia. The de minimis exemption does not apply to the *manufacture* of a *toxic chemical*, unless the *toxic chemical* is *manufactured* as an impurity and remains in the product distributed in commerce. Since the *facility* used the aqueous ammonia on-site and the ammonia is not an impurity that remains in a product distributed in commerce, the de minimis exemption does not apply.

De Minimis Exemption, Compound Category, Delimited Category

340. When determining the de minimis level for members of an EPCRA Section 313 category, the total weight of all the members of the category in the *mixture* must be counted and compared to the applicable de minimis level. How would a *facility* determine the de minimis level for a *mixture* containing members of a category, such as the polycyclic aromatic compounds category, where one or more of the members has a different de minimis level than the others?

For delimited categories in which one or more members have a lower de minimis level than the other members, two calculations are done. First, the weight of all members of the category in the *mixture* that have a 0.1 percent de minimis is determined and compared to the 0.1 percent de minimis level. Second, the weight of all members of the category in the *mixture* (both those with 0.1 percent and 1.0 percent de minimis) is determined and compared to the 1.0 percent de minimis. If only the first de minimis calculation is exceeded then only those chemicals with the 0.1 percent de minimis must be included in threshold and *release* and other *waste management* determinations. Therefore, category members with the 1.0 percent de minimis would be excluded from threshold and *release* and other

waste management determinations if only the first de minimis calculation is exceeded. If the second de minimis calculation is exceeded then all of the category members in the *mixture* must be included in threshold determinations and *release* and other *waste management* calculations.

Overburden, Waste Rock, Process, De Minimis

341. How should *covered facilities* consider consolidated rock that overlies an ore body and unconsolidated/consolidated materials that do not overlie an ore body but do not meet the classification as waste rock? Are these materials considered waste rock (i.e., de minimis exemption does not apply) for threshold determinations and *release* and other *waste management* calculations or, are they considered *processed* materials eligible for the de minimis exemption?

For covered metal mining facilities, unconsolidated material that overlies a deposit of useful materials or ores is eligible for the "*overburden* exemption" and does not have to be considered toward threshold determinations, or *release* and other *waste management* calculations. This exemption does not apply to consolidated material or unconsolidated/consolidated materials that do not overlie a deposit of useful material and which may be displaced or otherwise managed during extraction. Similar to waste rock that is separated from the useful more mineralized material at the point of extraction, amounts of these materials are not considered toward any threshold activities. However, these materials are not exempt from *release* and other *waste management* reporting and must be included if thresholds are exceeded elsewhere at the *facility* for the same listed *toxic chemicals*.

F. Articles

Article Exemption, Threshold Determination

342. Are *articles* exempt from threshold determinations in normal *processing*, *otherwise use*, or *disposal*?

An *article* would be exempt from threshold determinations if the *article* meets the criteria for exemption. The *article* must be a *manufactured* item: (1) which is formed to a specific shape or design during *manufacture*; (2) which has end use functions dependent in whole or in part upon its shape or design; and (3) which does not *release* a *toxic chemical* under normal conditions of *processing* or *otherwise use* of the item at the *facility* or *establishments*. If an item retains its initial thickness or diameter in whole or in part, as a result of normal *processing* or *otherwise use*, then it meets the first part of the definition. *Disposal* of materials that are recognizable as the *processed article* is not considered a *release* or management of a waste containing a listed *toxic chemical* from an *article*, and thus, does not negate the *article* status.

Article Exemption, Threshold Determination

343. Are metal *articles* exempt from threshold determinations under normal *processing* or *otherwise use*?

The fact that an item is metal is irrelevant because metals do not have special status under the *article* exemption. If the metal *article* meets all the criteria for the *article* exemption during normal *processing* and *otherwise use*, then it would be exempt from threshold determinations and *release* and other *waste management* calculations.

Threshold Determination, Article Exemption, Recycle

344. A *covered facility manufactures* "non-*article*" metal items. If all wastes from the manufacturing process are recycled, are the items still subject to threshold determinations?

If a "non-*article*" metal item is *processed* but all wastes are recycled, the item is still subject to threshold determinations and *release* and other *waste management* calculations. The *toxic chemicals* therein must be applied to the appropriate thresholds.

Article Exemption, Article Releases, Half Pound Policy

345. Please clarify the Agency's half pound policy for the *article* exemption.

The Agency has adopted a "round to the nearest pound policy." If the amount of a listed *toxic chemical* in *releases* from *processing* or *otherwise using* all like items is equal to or less than a half pound, this amount can be rounded to zero. Thus, the exemption would be maintained. The half pound limit does not apply to each individual *article*, but applies to the sum of all amounts released during *processing* or *otherwise use* of all like items over the entire reporting year. If the listed *toxic chemical* that is released exceeds a half pound and is completely recycled/reused, on-site or off-site, then the item may still maintain it status as an *article*.

Article Exemption, Manufacturing Article

346. Does the *article* exemption in the Section 313 rule apply to preparation (i.e., manufacture) of the *article*? What about *processing* or *otherwise using* that *article*?

The *article* exemption applies to the normal *processing* or *otherwise use* of an *article*. It does not apply to the manufacture of an *article*. For example, the manufacture of *articles* such as tableware is not exempt. *Toxic chemicals* processed into *articles* produced at a *facility* must be factored into threshold determinations and *release* and other *waste management* calculations.

Article Exemption, Manufacturing Article

347. A *covered facility* uses sheet metal to manufacture metal desks. When manufacturing the desks, the operator welds and solders some of the sheet metal together. Must the *facility* include the *toxic chemicals* in the welding rods, solders, and the metals being joined for its threshold determination? Does the metal desk meet the *article* exemption?

If 0.5 pounds or less of the *toxic chemical* is released from all like *articles* in the reporting year and the overall thickness or diameter of the sheet metal is not changed when *processed* into the desk, the sheet metal would retain its *article* status. The desk itself would not meet the criteria for the *article* exemption because the exemption does not apply to the *manufacture* of *articles*. Also, because air emissions are generated from the welding and soldering rods when they are used, the owner/operator must assess the entire amount of the *toxic chemical* in the rods for *processing* threshold purposes.

Article Exemption, Components of Product

348. A *covered facility* has a condenser that consists of many individual copper tubes. These copper tubes must be replaced periodically and are often replaced individually. Can each of the copper tubes be considered an *article* under Section 313?

Each tube may be considered an *article*. However, for amounts of listed *toxic chemicals* to be exempt from threshold determinations and *release* and other *waste management* calculations under the *article* exemption, releases of all listed *toxic chemicals* for all "like" *article*s must not exceed 0.5 pounds (see Toxic Release Inventory Forms and Instructions current version). In this example, releases from all the replaced copper tubes must not exceed 0.5 pounds for the reporting year for the amounts not to be considered. If the tubes are ineligible for the exemption, then amounts of listed *toxic chemicals* contained in the tubes replaced (put in service) during the reporting year must be counted towards thresholds.

Article Exemption, Article Releases, Welding Rods

349. Our *facility* uses welding rods for equipment maintenance. Can these be considered *articles*?

One of the three qualifying criteria for the *article* exemption (40 CFR Section 372.3), states that an *article* "does not release a *toxic chemical* under normal conditions of *processing* or *otherwise use* of that item at the *facility* or *establishment*." When the welding rod is used, a listed *toxic chemical* is released. Therefore, the welding rod can not be considered an *article*.

Article Exemption, Fume or Dust Qualifier

350. A *facility* generates metal dust when it processes sheet metal. Each dust particle is actually an alloy containing more than one type of metal (e.g., chromium and aluminum). If the *toxic chemical* in the metal is listed with a qualifier which includes dust (e.g., aluminum), does EPA consider the dust particle the listed *toxic chemical*?

In this example, EPA considers metal dust particles, which contain aluminum in the dust form, a listed *toxic chemical*. Therefore, that weight percentage of the metal dust which is aluminum would be subject to threshold determinations and *release* and other *waste management* reporting as aluminum dust.

Article Exemption

351. A *covered facility* uses a die block to manufacture items. When the block becomes worn and needs adjustments such as shaving and melting to restore its shape, how does the *facility* report on *releases* resulting from that activity?

If, upon shaving and melting the die block, the diameter or thickness are not retained in whole or in part or *toxic chemicals* are released in an amount which exceeds 0.5 pounds for all like items in a reporting year, then the block would no longer qualify for the *article* exemption and the *facility* would have to perform threshold determinations and report *releases* and other *waste management* of the listed *toxic chemical*. When threshold determinations are made, the *facility* must consider the weight of the *toxic chemical* contained in the entire block for threshold determinations. However, only quantities in like *articles* that do not meet the *article* definition and were placed into use within the reporting year would be considered towards thresholds. Those items in use from previous years would not be considered in the threshold determinations for the current reporting year.

Article Exemption, Change in Diameter/ Thickness

352. A mine's electrorefining operation uses an anode containing a *toxic chemical*. The anode is meant to degrade, and the thickness changes over the entire anode. Is this anode eligible for the *article* exemption?

No. Since the item did not retain its original thickness in whole or in part, the anode is not considered an *article*.

Article Exemption, Fume or Dust Qualifier

353. A company *processes* a galvanized sheet metal containing elemental zinc, not a zinc compound. When the sheet metal is *processed* it generates zinc dust, all of which is captured and sent off-site for recycling. The sheet metal is formed to a specific shape and its end use functions depend in whole on its shape during end use. Can the company claim an exemption because the sheet metal remains an *article*, or must it do a threshold determination for zinc because it has coincidentally *manufactured* zinc in the dust form?

Elemental zinc is listed with a qualifier, fume or dust, and is only reportable in the form of fume or dust. Thus, the zinc in the sheet metal would not count toward the threshold determinations since it is not in the fume or dust form. The zinc that is generated (in the form of fume or dust) as a result of the sheet metal *processing* is reportable and would be counted toward the 25,000 pound threshold determination for *manufacturing*, regardless of the sheet metal's *article* status.

Article Exemption, Process, Batteries

354. If an automobile manufacturer receives finished car batteries and places these batteries into the cars they sell, must the automobile manufacturer report the lead which is incorporated in the battery?

If the car battery is completely sealed while present at the *facility*, it would be considered an *article*, and thus would be exempt from EPCRA Section 313 reporting. If lead is released from the batteries under normal *processing* at the *facility*, as might occur during maintenance of the battery, the release would negate the *article* exemption. If the exemption is negated, the amount of lead and any other *toxic chemical* in these non-*article* batteries would be applied toward the 25,000 pound *processing* threshold to determine if the *facility* must report.

Article Exemption, Reportable Release

355. I am a power tool manufacturer and we use copper, a listed *toxic chemical*. We receive copper plates and shave the rough edges off them. All of the shavings are vacuumed and sold to a scrap metal *facility* which makes ingots and sells them. Is the copper plate an *article*? How do I consider the shavings?

Because all of the copper released from the plate is collected and reused, no reportable release has occurred and the *article* exemption is maintained. If the copper is *disposed* of, on the other hand, the plates lose the *article* status.

Article Exemption, Glass

356. If glass is purchased (with about a 20 percent lead content) and its form is physically changed to make light bulbs, is that considered *processing* or does the *article* exemption apply?

The *article* exemption does not apply because: (1) the end use of the glass is not dependent on the specific shape or design of the glass entering the process—the glass is melted and reshaped, and/or (2) emissions result from heating of the glass during processing.

Article Exemption, Article Releases

357. A *covered facility* cuts metal sheets containing nickel, releasing fumes. It then further grinds the metal to its final shape, producing grindings. For the sheets to retain their *article* status, the fumes and grindings must be equal to or less than 0.5 pound/year to any media. Does this value apply to aggregate grindings and fumes from like *articles* being *processed* or *otherwise used* in the same way (i.e., cutting or grinding) or to grindings and fumes generated from all manners of *processing* or *otherwise use* of like *articles*?

The 0.5 pound/year release value applies to aggregate grindings and fumes from like *articles* being *processed* or *otherwise used* in all manners at the *facility*. This value applies to the total aggregate grindings and fumes of the listed *toxic chemical* from both steps of the process (i.e., cutting and grinding). The various shapes resulting from the cutting are "the same type of item" as the initial sheet. Thus, the amount of fumes resulting from cutting should be added to the amount of resulting grindings.

Article Exemption, Article Releases, Supplier Notification

358. A *covered facility* uses plastic containing di-(2-ethylhexyl) phthalate (DEHP) to wrap its products. The plastic is cut by a hot wire, a process during which minute quantities of DEHP are *released*. Is the plastic exempt from reporting and from supplier notification because it can be considered an *article*?

The plastic wrap containing DEHP is not exempt as an *article* because quantities of DEHP are released during the cutting process. If a *facility* releases 0.5 pounds or less of DEHP during the reporting year from all like items, this amount can be rounded to zero and therefore would be exempt. If the *facility* can reasonably document that none of its customers are likely to release more than 0.5 pounds, no supplier notification is required.

Article Exemption, Sheet Metal, Threshold Determination, Processing Determination

359. A *covered facility processes* sheet metal that contains a listed *toxic chemical*. When *processed*, some pieces of the sheet metal are cut generating shavings which contain the listed *toxic chemicals* and which are not 100 percent recycled. Specifically, more than 0.5 lbs is released from all like items during the reporting year, and therefore, the sheet metal does not meet the *article* exemption criteria. Must the *facility* consider the amount of the listed *toxic chemical* in the entire piece of sheet metal for threshold determinations or may the *facility* consider just the amount of listed *toxic chemical* in the area of the sheet metal that is cut?

All of the listed *toxic chemical* in the entire piece of cut sheet metal must be counted toward the shavings or the *processing* threshold, not just the weight of the listed *toxic chemical* in the section of the item on which work is done. The weight of the listed *toxic chemical* in the entire piece of sheet metal is used; the exemption cannot apply to a portion of the *article*.

Article Exemption, Wire, Compounds

360. I use copper wire in one of my products. I cut it and bend it and then heat seal it into a glass bulb. How do I consider the copper wire for Section 313 reporting?

First, the wire would remain an *article* if during the manufacture of the glass bulbs no *toxic chemicals* are released, and if the wire meets the other two criteria of the *article* exemption (i.e., it is formed to a specific shape or design during manufacture and it has end use functions dependent in whole or in part upon its shape or design). If the wire is not an *article*, then for an element such as copper, both copper metal and copper compounds are subject to EPCRA Section 313 reporting. Determine the form of the copper in the wire first. If it is pure copper wire, the entire weight of the entire wire must be used. If it is an alloy, the weight percent of the *toxic chemical* times the entire wire weight must be used. If there are multiple copper compounds, the entire weight of each copper compound must be used for the *processing* threshold determination.

Article Exemption, Wire

361. We cut copper wire into segments which are then wound around a motor part. The ends are not stacked and our engineer determined that no copper is released. Is the wire still an *article*?

Cutting the wire into segments and winding it around a motor part do not negate the exemption since the diameter and thickness of the wire is not changed. The copper wire remains an *article* as long as no *toxic chemicals* (or less than 0.5 lbs for all like items over the entire reporting year) are released during use. Since your engineer determined no copper is released, the *article* exemption does apply and the copper wire does not have to be considered for threshold determinations and *releases* and other *waste management* calculations.

Article Exemption, Wire

362. Copper wire at a *facility* is cleansed by dipping it into a sulfuric acid solution. This acidic solution etches away a portion of the surface of the wire. The etched copper reacts with the acid to form copper sulfate. The wastestream containing the copper sulfate is sent directly to a POTW and no other releases of copper occur on-site to any other environmental media. Is the article exemption (40 CFR Section 372.38(b)) negated for the copper wire?

The transfer of the copper sulfate to the POTW constitutes a release from the article. The release from the copper wire in the form of a copper compound would negate the *article* exemption for the copper wire. If the *facility* exceeds an activity threshold for the copper wire, a report must be filed for copper. In addition, if the 25,000 pound *manufacturing* threshold is exceeded for the copper sulfate, a report must also be filed for copper compounds. If a threshold for copper and copper compounds is individually met, the *facility* may file one report for both.

Article Exemption, Sheet Metal

363. I run a metal fabrication facility, SIC code 34. If I cut the metal sheets and send the shavings off-site for reuse, can I consider the metal sheets *articles*?

Yes. If the only thing separated from the metal sheets during cutting are shavings, and if all the shavings are sent off-site for reuse, and the thickness of the metal sheet is not completely altered during *processing*, then the metal sheets are still considered *articles* and are exempt. If cutting results in shavings or other waste materials from the sheets, and if these shavings are completely captured and sent either on-site or off-site to be either recycled or reused, then the item (in this case, metal sheets) can retain the *article* exemption, given that the other criteria for exemption are met.

Article Exemption, Sheet Metal, Article Releases

364. A *covered facility processes* metal sheets containing nickel in a four-step *process*: (1) sheets are cut with a laser saw (releasing nickel fumes); (2) pieces are further ground to their final shape (releasing grindings); (3) ground pieces are sent off-site for heat treatment; and (4) heat treated pieces are returned to a *facility* where holes are bored (producing turnings) and the resultant pieces are assembled into the final product. How are releases reported?

Although the pieces are sent off-site in step 3, they are returned to the *process* as essentially the same material. Thus, the activity is to be treated as a continuous *process* activity. If there is scrap material which is recognizable as the original form of the *article*, and if releases from steps 1, 2, and 4 (collectively), which are not recycled, do not exceed 0.5 pounds for the entire reporting year, then the metal sheets could be exempt as *articles.*

Article Exemption, Sheet Metal

365. Does the *article* exemption apply to flat rolled sheet metals, if they are used in operations which typically produce scrap but no release?

Assuming the scrap metal pieces are recognizable as the original piece, the *article* exemption does apply to these metals if the forming process caused 0.5 pounds or less of releases of a listed *toxic chemical* from all like items or the items retain the thickness of sheet metal in whole or in part. Once an operation is performed on a metal that causes a release which is not recycled and which exceeds 0.5 pounds for the reporting year (for example, from operations such as heating, grinding, or welding), the *article* exemption no longer applies and releases must be reported when listed chemicals in a sheet metal are *processed* in quantities greater than 25,000 pounds.

Article Exemption, Article Releases

366. A metals working plant machines, cuts, forms, and joins plate, cylinder, and other purchased metal alloy parts. Alloys of nickel and chromium, above de minimis levels, are *processed* in amounts that exceed 50,000 pounds per year. Does the *article* exemption apply since emissions from operations such as welding represent only a small fraction of the total metallic component of the surface area *processed*?

Releases greater than 0.5 lbs/yr of the chemicals contained in *mixtures*, including alloys, during fabrication operations disqualifies the item *processed* from the *article* exemption. Releases include the chemical component of fumes, dust, grindings, and turnings generated from metal fabrication activities. However, wastes generated in a form recognizable as the *processed article* (e.g., pieces of a plate or cylinder) are exempt from *release* and other *waste management* calculations.

Article Exemption, Bar Stock

367. Is bar stock that is used to make precision tuned parts an *article* and thus exempt from Section 313 reporting? The bar stock is *processed* to produce parts that in whole or in part retain the basic dimensional

characteristic of the bar stock. The production of the part itself is dependent upon the specific shape and dimension of the bar stock and there are no *releases* during *processing*.

Bar stock is an *article* if its basic dimensional characteristics are maintained in whole or in part in the finished product and if *processing* the bar stock does not result in releases. If the end product is totally different in diameter or thickness from the bar stock, the bar stock would not be an *article*.

Article Exemption, Bar Stock

368. Can *covered facilities* which extrude copper bars or rods into wire treat the bar or rod as an *article*?

No. If you are completely changing the shape or form of an item during *processing,* the *article* exemption no longer applies. An *article* has end use functions dependent in whole or in part upon its shape or design during end use. The end use function is dependent upon the copper being in the shape of the wire, so the copper bar cannot be considered an *article*. Also, in the above example the thickness or diameter of the entire item has been altered.

Article Exemption, Manufacturing Article, Plastic Bottles

369. A manufacturer of plastic bottles makes the bottles by blow-molding a *mixture* of plastic resin and polymer pellets that contain lead chromate (a *toxic chemical*) and fillers. Once the bottles are made, they are checked for flaws (i.e., a quality assurance check). Any bottles that do not pass the quality assurance test are placed in the *facility* dumpster and are subsequently *disposed* of in the local municipal landfill. Do these substandard bottles meet the *article* exemption and thereby exempt the lead chromate from being a *release* of a listed *toxic chemical* under Section 313?

No. The manufacture of *articles* is not exempt. Thus, the lead chromate that is sent to the landfill is considered a release of lead chromate since the substandard bottles that are *disposed* of are waste from the manufacturing process.

Article Exemption, Lead Bricks

370. A ship building *facility* incorporates lead bricks as ballast into the ships it distributes in commerce. The lead bricks remain permanently with the ship. They could be considered *articles* and therefore be exempt from reporting. However, the *facility* infrequently cuts some of the bricks, generating lead dust, which it collects and sends to an off-site lead reprocessor. How should the *facility* report? What should be counted towards the threshold if the lead bricks are not considered *articles*?

If all of the lead is recycled or reused then the lead dust does not have to be counted as a release. Therefore, the cut bricks retain their *article* status. If while cutting the bricks, there are *releases* which are not recycled and that

exceed 0.5 pounds for a year, then the cut bricks would not be considered *articles*. In this case, count only the lead in bricks actually *processed* toward the threshold determination. Any amounts of *toxic chemicals* sent off-site for recycling would be reported appropriately on the Form R.

Article Exemption, Article Releases, Steel Plates

371. During the construction and repair of ships, small quantities of a listed *toxic chemical* are emitted in the form of fumes when steel plates are being welded together. The steel plates are formed to a specific shape during manufacture and their end use function is dependent upon their shape. Are these steel plates *articles* and should the amount of *toxic chemical* (fumes from the steel plates) emitted from the steel plates during the welding *process* be included in determining the threshold?

If the *processing* or *otherwise use* of all like manufactured items results in the release of 0.5 pounds or less of a *toxic chemical*, EPA will allow this quantity to be rounded to zero and the steel plates may be exempt as *articles*. If the listed *toxic chemical* that is released exceeds 0.5 pounds over a calender year and is completely recycled or reused, on-site or off-site, then these steel plates may also be exempt as *articles*. Any amount that is not recycled or reused will count toward the 0.5 pound per year cut-off value.

Article Exemption, Batteries

372. How should a *facility* owner/operator handle the reporting requirement for listed *toxic chemicals* found in industrial and commercial batteries under EPCRA Section 313 that it uses on site? What if the *facility* manufactures the batteries?

An already manufactured item (e.g., maintenance-free batteries) containing a listed *toxic chemical* may be considered an *article* if the *facility* uses the item as intended and the listed *toxic chemical* is not emitted during its *processing* or *otherwise use*. If the *facility* services the item by replacing the listed *toxic chemical*, the amount of the listed *toxic chemical* added during the reporting year must be counted toward the threshold determination. For *facilities* which manufacture batteries, lead that is incorporated into a lead acid battery is *processed* to manufacture the battery, and; therefore, must be counted toward threshold determinations and *release* and other *waste management* calculations. The *article* exemption does not apply to the manufacture of an item. However, the use of the battery elsewhere in the *facility* may not have to be counted. *Disposal* of the battery after its use does not constitute a release.

Article Exemption, Catalyst

373. A *facility* uses a catalyst containing a listed *toxic chemical* in a fixed bed reactor. The catalyst is in the form of cylindrical or trilobed extrudates (pellets) in a specific size. It is used to promote a chemical reaction and is not physically altered during use. The spent catalyst is sent to a reclaimer for eventual reuse. Can the catalyst be exempted as an *article* under Section 313?

No. Although the catalyst is manufactured to a specific shape or design, and has end use functions dependent upon its shape during end use, EPA believes that releases occur during transfer operations. Therefore, the *article* exemption does not apply. Such catalysts usually contain dust size material that is not the same size and shape of the pellets. The likely releases would be dust emissions and potential spills that occur during charging and removing the catalyst from the reactor. Such operations are part of the normal conditions of *processing* and *otherwise use* that must be considered under the *article* definition. The intent of EPCRA is to capture all *releases*, whether they are intentional or not. The spent catalyst sent off-site for recycling does not itself constitute a release that invalidates the *article* exemption, as long as all of the *toxic chemical* is recycled. The *facility* should also consider whether any on-site regeneration of the catalyst results in the *toxic chemical* being released in wastestreams.

Article Exemption

374. A *covered facility processes* a metal item containing nickel. The finished product retains in part the dimension characteristics of the original item and all the metal shavings resulting from the *process* are sent off-site for recycling. Since the Pollution Prevention Act requires reporting of recycled amounts of a listed *toxic chemical*, does that mean the material is not an *article*?

The Pollution Prevention Act requirements do not affect the *article* status of the metal item. If all of the releases from the *article* are sent off-site for recycling, the item would still be exempt as an *article*. If this is the only occurrence of nickel in the *facility*, the *facility* would not have to report for nickel.

Article Exemption, End Use Function

375. A *facility* manufactures lead came (i.e., slender, grooved, lead rods). A lead billet is placed into a press and pushed through a die to produce a unique form. The *facility processes* 100,000 pounds of lead came. Is this *process* exempt from reporting under the *article* exemption?

The *article* exemption does not apply. The lead billet does not qualify as an *article* because it does not have an end use function other than to be of a size and shape convenient to further processing, and the end product is significantly different in shape and dimension from the starting material. Since the *facility processes* more than 25,000 pounds of lead, the *facility* must report for this *toxic chemical*.

Article Exemption, Recognizable as an Article, Disposal, Process, Lead

376. A covered manufacturing *facility* produces neon signs by bending leaded glass tubing. The *facility* uses enough tubing annually to *process* in excess of 25,000 pounds of lead, an EPCRA Section 313 *toxic chemical*. When signs are formed from glass tubing, the diameter of the tubes remains unchanged and lead is not released during the heating or bending *process*, qualifying the tubes for the *article* exemption. If a discrete number of glass tubes are broken and discarded during the

year, under what circumstances would *disposal* of the broken tubes constitute a release that negates the *article* exemption, and how would the *facility* calculate the amount of lead used in their operation?

Disposal of the glass does not necessarily constitute a release which automatically negates the *article* exemption. For the tubing to meet the definition of an *article* when discarded, the diameter of the tubing must remain intact and unchanged. As a result, shards of glass no longer qualify as *articles*. If more than 0.5 pounds of lead is released and not recycled, then the *article* exemption would not apply to this glass tubing.

Article Exemption, Light Bulbs

377. A *facility* subject to EPCRA Section 313 crushes light bulbs and uses the crushed glass in their *process*. The light bulb stems are not used in the *process* and are *disposed*. There is a lead "button" in each light bulb stem which is *disposed*. Is this button considered an *article* and therefore exempt from threshold and *release* and other *waste management* calculations under 40 CFR Section 372.38(b)?

No, the lead buttons from crushed light bulbs would not be considered *articles* and the lead would not be exempt from threshold determinations and *release* and other *waste management* calculations. The lead in these buttons would not be counted toward any threshold. The *facility* would only be required to report the release of lead buttons if a threshold for lead was exceeded by a covered activity or other *waste management* elsewhere at the *facility*.

Article Exemption, PCB Transformers

378. A *covered facility* uses PCB transformers. Are these considered to be *articles*, and therefore exempt from reporting under Section 313?

PCB transformers are considered to be *articles*, as long as PCBs are not released from the transformers during normal use or if the *facility* does not service the transformer by replacing the fluid with other PCB-containing fluid. (See also: Section 313 Policy Directives - Directive #6: PCBs Threshold Determinations and *Release* and other *Waste Management* Reporting.)

Article Exemption, PCB Transformers, Ancillary Use

379. A *covered facility* has a PCB transformer on-site which it uses for energy. The PCBs were removed from the transformer and *disposed*. Is the amount of PCB removed for *disposal* counted towards the *otherwise use* threshold? How is this activity covered under EPCRA Section 313?

If the *facility* removes the entire transformer including the PCB-laced oil as an *article*, the amount of PCB in the *article* would not be included in Section 313 threshold determinations and *release* and other *waste management* calculations. If a *toxic chemical* is present in an *article* at a *covered facility*, the owner/operator is not required to consider the quantity of the *toxic*

chemical present in such *article* when determining whether an applicable threshold has been met or when determining the amount to be reported as a *release* or other *waste management*.

If the *facility* removes the PCB-laced oil from the *article*, this removal would negate the *article* exemption. To determine if the *facility* exceeds a threshold, the operator of the *facility* must count the amount of the chemical added to the recycle/reuse operation during the reporting year (40 CFR Section 372.25(e)).

If a *facility* has a transformer that leaks PCB-laced oil, this leaking would also negate the *article* exemption. To determine if the *facility* exceeds a threshold, again, the owner/operator of the *facility* must count the amount of the chemical added to the recycle/reuse operation during the reporting year.

The *facility* would be *otherwise using* the PCB added to the transformer (ancillary use). Only the amount of PCB added to the transformer needs to be aggregated for threshold determination, and the *facility* will most likely not be adding PCB-laced oil to the transformer. Therefore, it is unlikely that the *facility* will exceed the l0,000 pound *otherwise use* threshold. The *facility*, therefore, would not be required to report *releases* and other *waste management* of the PCBs for Section 313.

If, however, the *facility* exceeds the 10,000 pound threshold and needs to report PCBs, the PCBs removed from the transformer and sent off-site for final *disposal* would be a reportable *release*.

Article Exemption, Article Releases

380. I *process* a plastic pipe which contains formaldehyde (3 percent by weight). I also know how much formaldehyde is *released* when I *process* the pipe. Do I need to report these emissions?

If the quantity of the formaldehyde released during *processing* of all like items exceeds 0.5 pounds per year, the *facility* cannot take the *article* exemption for the pipe and all formaldehyde incorporated into the pipe should be counted toward the *processing* threshold. The *facility* should report if the *processing* threshold is exceeded. If the quantity of formaldehyde released during *processing* of the pipes is 0.5 pounds or less per year, the *facility* would not have to report because it is part of an *article*.

Article Exemption, Article Releases, Polyurethane Foam

381. A *facility* buys and sells rigid polyurethane insulating foam containing a fluorocarbon in higher than the de minimis concentration. The *facility* cuts the foam and packages it to be sold and distributed in commerce. Does the *facility* need to report the fluorocarbon, a Section 313 chemical, *released* to the air as a result of cutting polyurethane foam?

Fluorocarbon in foam pieces that are cut counts toward the *processing* threshold. If the threshold is met, the *facility* must report all *releases* and other *waste management* of fluorocarbon as a result of cutting polyurethane foam and any diffusion of fluorocarbon in polyurethane foam to the *environment* under normal storage conditions. Note that the polyurethane foam may meet the *article* exemption if 0.5 pounds or less of fluorocarbon, from all like items, is released during *processing* and the foam maintains a specific shape or design.

Article Exemption, Facility-Facility Reporting, Metals, SIC Code

382. Are there recommended methods for determining if the 0.5 lb *release* limit is exceeded from a metal stamping operation?

EPA recommends that *facilities* use one or more of the following for performing *release* and other *waste management* calculations of EPCRA Section 313 chemicals: monitoring data, mass balance, emission factors, and engineering calculations. If all wastes generated from stamping operations (including fume, dust, sludge and scrap pieces) are recycled or reused and the *facility's* total *releases* will be equal to or less than 0.5 lb limit for each *toxic chemical* per year, the *article* exemption may apply. If *releases* (including *disposal*) of a *toxic chemical* are more than 0.5 lb, the *article* exemption is negated for that chemical and all quantities of that chemical in the metal sheets should be included in threshold determinations and *release* and other *waste management* calculations.

G. Coal Mining/Extraction Exemption

Coal Mining, Surface Mining, Extraction Exemption

383. A covered coal mine uses material containing listed *toxic chemicals* (waste rock, ash, etc.) in its surface mining operation to replace excavated land. Is this activity considered extraction and; therefore, eligible for the coal mining extraction exemption (40 CFR Section 372.3)?

No. The *otherwise use* of waste rock, ash, or other material in surface mining to replace excavated land is a reclamation activity. The *otherwise use* of these materials for reclamation is not considered part of extraction, and amounts of listed *toxic chemicals* contained in these materials must be considered toward threshold determinations and *release* and other *waste management* calculations.

Metal Mining, Overburden Exemption

384. Are listed *toxic chemicals* in *overburden* displaced at a covered metal mine subject to reporting under EPCRA Section 313? What about *toxic chemicals* used in removing *overburden*?

No. Listed *toxic chemicals* that are constituents of *overburden*, as defined in the May 1, 1997, final rule (62 FR 23833), which are *manufactured*, *processed*, or *otherwise used* are not subject to threshold determinations or reporting for *releases* and other *waste management* activities (40 CFR

Section 372.38(h)). However, listed *toxic chemicals* used in removing *overburden* during metal mining activities are not eligible for the *overburden* exemption.

Coal Mining, Extraction Exemption

385. In the final rule (62 FR 23833; May 1, 1997), EPA provided an exemption for *coal extraction* activities. Can a coal mining *facility* assume that all activities prior to *beneficiation*, or in other words all activities that take place before the coal enters a processing plant, are exempt under the extraction exemption?

No. In the final rule (62 FR 23833), EPA specifically exempted coal mining extraction activities. EPA defines *coal extraction* (for purposes of determining which activities are eligible for the extraction exemption), to mean the physical removal or exposure of ore, coal, minerals, waste rock, or *overburden* prior to *beneficiation*, and to encompass all extraction-related activities prior to *beneficiation*. EPA defines *beneficiation* as the preparation of ores to regulate size (including crushing and grinding) of the product, to remove unwanted constituents, or to improve the quality, purity, or grade of a desired product. Based on these definitions, certain *beneficiation* activities, such as crushing or grinding, may occur before coal enters a processing plant, and these activities are not exempt under the extraction exemption.

Coal Mining, Extraction Exemption

386. Which of the following coal mining activities included in the coal mining extraction exemption under 40 CFR Section 372:

a. Crushing for transport only.
b. Land *disposal* or discharge of oily water pumped from underground (e.g., the oil that comes from the conveyor belt carrying the coal to the surface and ultimately to the coal preparation plant).
c. Screening of coal to remove waste rock that has fallen into the coal product. (This screening occurs at the surface before transportation.)
d. Coal mine reclamation activities:
  – Ash received from off-site for use as roadfill, or structural support underground;
  – Waste *overburden* and non-waste fertilizer for land application; and
  – Waste rock used during reclamation.

In terms of identifying which activities are considered part of the coal extraction exemption, EPA has made the following determinations: listed *toxic chemicals* involved in the transportation of coal, and reclamation of the extraction site are not considered "extraction-related" activities. While these activities may involve listed *toxic chemicals*, existing exemptions should greatly reduce and simplify the type and amount of reporting required by *covered facilities* that conduct these activities. Crushing and grinding are

beneficiation steps as provided in 40 CFR Section 261.4(b)(7), which was referenced in the final rule. The following items specifically address the activities raised in the above question:

a) Crushing for transportation is not considered part of extraction and amounts of listed *toxic chemicals* involved in these activities must be considered toward threshold determinations and *release* or other *waste management* calculations.

b) Land *disposal* of materials including waste rock, ore, and oily water from underground *coal extraction* activities are considered part of extraction activities and would therefore not be subject to threshold determinations and *release* and other *waste management* calculations.

c) Coal product screening activities involve grading of coal after it has been crushed, both of which are considered *beneficiation* steps, and; therefore, would not be considered part of extraction.

d) Ash or other materials used for structural support during extraction activities would be considered part of extraction and would be eligible for the extraction exemption. *Otherwise use* of ash, *overburden*, waste rock or fertilizer for reclamation are not considered part of extraction, and amounts of listed *toxic chemicals* contained in these materials must be considered toward threshold determinations and *release* and other *waste management* calculations.

Section 3. DETERMINING WHETHER OR NOT TO REPORT: LISTED TOXIC CHEMICALS (See also Appendix A: Section 313 Policy Directive #5 - Toxic Chemical Categories)

A. General Questions

Toxic Chemical List

387. What list of toxic chemicals is subject to reporting under EPCRA Section 313?

EPCRA Section 313 defined the list of *toxic chemicals*. The initial list (with certain technical modifications and revisions) appears in the regulations (40 CFR Section 372.65) and in the instruction booklet for completing Form R. EPA, from time to time, has revised the list. The most recent instruction booklet for completing the Form R contains the updated chemical list. To obtain information on the latest additions or deletions from the list of *toxic chemicals* contact the Emergency Planning and Community Right-to-Know Information Hotline.

Toxic Chemical List

388. What is the difference between the Section 313 list of *toxic chemicals* and other EPCRA lists of regulated chemicals?

Some overlaps exist between lists of chemicals covered by different Sections of EPCRA. Section 313 focuses on *toxic chemicals* that may cause chronic health and environmental effects, although the list does contain chemicals that cause acute health effects. The Section 313 list was developed from lists of regulated *toxic chemicals* in New Jersey and Maryland. The other EPCRA lists cover chemicals of concern for emergency planning purposes. The EPA List of Lists (EPA 550-B-98-017) document identifies *toxic chemicals* that are specifically listed and must be reported under various Sections of EPCRA.

Chemical Name, Trade Name

389. Can common or trade names other than those listed in the regulations be used for submissions?

No. EPA has provided a list of standard chemical names and Chemical Abstract Service Registry numbers (CAS numbers) for all chemicals that must be reported. The regulations require the use of these standard names. Many Form Rs submitted previously could not be processed because unlisted CAS numbers or names were used.

CAS Number, Chemical Name, Mixture

390. We use a *toxic chemical* with a CAS number not on the list of Section 313 *toxic chemicals*. There are similar *toxic chemicals* on the list, but none with the same CAS number. How can I be sure I do not have to report?

Although CAS numbers are useful, a *covered facility* should also use the *toxic chemical* name to determine if a *toxic chemical* is listed on the EPCRA

Section 313 list. Be aware, however, that *mixtures* are often assigned CAS numbers. These *mixtures* may contain individually listed *toxic chemicals*. The *facility* should use all available information, including the *toxic chemical* name as well as process and chemical knowledge, to determine if a component of the *mixture* is a listed *toxic chemical* under Section 313. CAS numbers may be of limited use in this case. Also, certain specific compounds (e.g., copper chloride) are not listed individually on the EPCRA Section 313 list with a specific CAS number, but are reportable under a compound category.

Chemical Category, Activity Threshold, Metal Compounds, Release Reporting

391. How are *toxic chemical* categories handled under Section 313 threshold determinations and *release* and other *waste management* calculations?

All *toxic chemicals* in the category that are *manufactured, processed*, or *otherwise used* at a *covered facility* must be totaled and compared to the appropriate thresholds. A threshold determination for *toxic chemical* categories is based on the total weight of the compound. Except for metal compound categories and nitrate compounds, the total weight of the compound *released* or otherwise managed as waste must be reported. *Releases* and other *waste management* quantities of metal compounds are reported as the parent metal portion of the compounds. If the metal and corresponding metal compounds exceed thresholds, a joint report for metal compounds, including the parent metal, can cover both reporting requirements. Similarly, *releases* and other *waste management* quantities of nitrate compounds are reported as the nitrate portion of the compound.

Chemical Category, Category Code, CAS Number

392. If an item on the Section 313 list incorporates *toxic chemicals* with multiple CAS numbers (i.e., nickel compounds), how is the CAS number of the item described?

Do not enter a CAS number in such cases. Instead, enter the appropriate category code (provided in the instructions to the Form R) in the space for the CAS number in Part II, Section 1.1 of the Form R. The individual chemical members of a listed category are not required to be, and should not be, identified in the report.

Chemical Category, Health Effects

393. Do the *toxic chemical* categories such as nickel compounds include all compounds, even those that have not been associated with adverse health effects? What is the authority for this decision?

The EPCRA Section 313 list established by Congressional legislation included categories. EPA interprets these listings to mean all compounds of nickel, for example, regardless of whether specific toxicological problems have been identified for a specific compound in the category. However, EPA may grant, and has granted, petitions to delete specific compounds from a category if the Agency determines that the compound does not meet the listing criteria.

Threshold Determination, Chemical Conversion

394. Some *toxic chemicals released* into the *environment* react to form other *toxic chemicals*, for example, phosphorus (a listed *toxic chemical*) oxidizes in air to form phosphorus pentoxide (not a listed *toxic chemical*). Which should be reported, the transformed *toxic chemical* or the source *toxic chemical*? How would the report(s) be prepared if both the source and resulting *toxic chemical* are listed?

Report *releases* of the listed *toxic chemical*. The *facility* is not responsible for reporting a *toxic chemical* resulting from a conversion in the *environment* (e.g., outside of a *facility* air stack).

Metal Compounds, Threshold Determination

395. Do we count the nonmetal portion of metal compounds?

The nonmetal portion of metal compounds is included in threshold determinations but not in *release* and other *waste management* calculations.

Chemical Deletion, Effective Date

396. EPCRA Section 313(d) provides for the addition and deletion of chemicals to and from the list of *toxic chemicals* found at 40 CFR Section 372.65. According to EPCRA Section 313(d)(4), any revision to the list made on or after January 1 and before December 1 of any reporting year will take effect beginning with the next reporting year. Any revision made on or after December 1 and before January 1 of the next reporting year will take effect beginning with the reporting year following the next reporting year. While all additions to the list are subject to these provisions, the Agency has not applied the delayed effective dates specified in EPCRA Section 313(d)(4) for any rules deleting chemicals from the EPCRA Section 313 list. To date, the promulgated final rules delisting chemicals have been effective on the date of publication of the final rule in the Federal Register. Moreover, when EPA has issued the final rule before July 1, the Agency has relieved *facilities* of their reporting obligation for the previous reporting year in addition to obviating future reporting. Given the statutory language, why has EPA not promulgated a delayed effective date for those actions deleting substances from the list of *toxic chemicals*?

Although the statutory language outlines a delayed effective date provision, EPA interprets EPCRA Section 313(d)(4) to apply only to actions that add to the list of *toxic chemicals*. As explained in the final rule deleting di-n-octyl phthalate from the EPCRA Section 313 list, published on October 5, 1993 (58 FR 51785), the Agency believes that it may, in its discretion, make deletions effective immediately upon the determination that a chemical does not satisfy the listing criteria found in EPCRA Section 313(d)(2). Since a deletion from the list alleviates a regulatory burden, and 5 U.S.C. Section 553(d)(1) permits any substantive rule that relieves a restriction to take effect without delay, EPA is authorized to delete chemicals from the list effective immediately. The Agency believes that the purpose of EPCRA Section

313(d)(4) is to provide *covered facilities* with adequate time to incorporate newly listed chemicals into their data collection processes. Because *facilities* can immediately cease reporting on a delisted chemical, and since the chemical no longer satisfies the listing criteria, EPA has not specified a delayed effective date for deletions from the list of *toxic chemicals* under EPCRA Section 313.

B. Toxic Chemical-Specific Questions

Acids

Acids, pH, Neutralization, Release Reporting

397. A strong mineral acid solution is neutralized (i.e., the pH of the solution is adjusted to pH 6 or greater) before *release* to surface waters. How do we report this *release* on the Form R?

For purposes of EPCRA Section 313 reporting, a discharge of pH 6 or above contains no reportable amount of mineral acid. The *facility* owner/operator should report zero, not NA, in Part II, Section 5.3 of the Form R.

Coincidental Manufacture, Combustion Byproducts, Hydrochloric Acid, Metal Compounds

398. A *covered facility* has a coal-fired *boiler*. The combustion of the coal generates aerosol forms of hydrochloric acid as a byproduct. Should the aerosol forms of the HCl emissions be reported under EPCRA Section 313?

Yes. In the combustion of coal, the *facility* will be coincidentally *manufacturing* aerosol forms of hydrochloric acid, as well as hydrofluoric acid and sulfuric acid. The combustion of coal will also result in the coincidental *manufacture* of new metal compounds. The *facility* must submit a Form R if it *manufactures* more than 25,000 pounds of any of these listed *toxic chemicals*.

Coincidental Manufacturing, Coal Combustion, Incomplete Combustion

399. A *covered facility* heats coal to approximately 2,000°F to drive off the volatiles from the coal to produce an activated carbon product. Is this activity considered coal combustion such that Section 313 metal compounds are *manufactured* in this operation?

Generally, activation of carbon or other organic material involves a two-step process. The first step consists of carbonizing the organic material, which is generally carried out by subjecting the material to temperatures in the range of 500 to 700°C (approximately 930 to 1,300°F). The second step, the activation process, may be chemically performed or it may also be conducted using temperatures typically in the 750 to 1,000°C range (approximately 1,380 to 1,850°F). Both activities occur at temperatures that are below the temperature posed in the question. In any case, while these are high temperatures, these ranges are not equivalent to the temperatures that take place during combustion. Based on available information, the temperature described in the question is not high enough to cause coal combustion. For

example, furnaces may operate at temperatures above 1,400°C (approximately 2,550°F). The temperature described in the question may not result in many of the chemical conversions, such as the transformation of metal compounds, which are expected to occur during combustion. However, these temperatures may result in some conversions and the *facility* would need to determine what takes place based on their best available information and report as necessary.

Acid Aerosol, Treatment for Destruction, Hydrochloric Acid, Sulfuric Acid

400. A wastestream containing aerosol forms of hydrochloric and sulfuric acid goes up a stack. Before exiting the stack, the wastestream passes through a scrubber where the acid aerosols are captured in an aqueous solution. How is this to be reported under Section 313?

When a scrubber is used to remove sulfuric or hydrochloric acid aerosols prior to or in a stack, the acid aerosols are usually converted to the non-aerosol form. The non-aerosol forms of sulfuric and hydrochloric acid are not reportable under EPCRA Section 313 because the qualifier to the sulfuric acid and hydrochloric acid listing includes only acid aerosol forms. Sulfuric and hydrochloric acid as discrete chemicals have not actually been destroyed by the scrubber, but the form of these acids reportable under EPCRA Section 313 has been destroyed. Therefore, since sulfuric or hydrochloric acid aerosols removed by scrubbers are converted to non-reportable forms, the quantity removed by the scrubber can be reported as having been *treated for destruction*. However, all of the sulfuric acid or hydrochloric acid aerosols that are produced prior to or after the scrubber count towards that *manufacturing* threshold, and any acid aerosols that are not removed by the scrubber and continue out of the stack must be reported as a *release* to air.

Aluminum, Combustion Byproducts, Treatment for Destruction

401. At a *covered facility*, vapor is generated from molten aluminum. Upon exposure to the air at the temperatures present in the furnace, the aluminum vapor partially oxidizes and condenses to form aluminum fume. All stack emissions from the furnace are *released* as non-fibrous aluminum oxide. Should the *release* from this melting furnace be counted as aluminum fume or should the amount *released* be reported as zero since it is no longer a reportable *toxic chemical*?

The *facility* is *manufacturing* aluminum fume, a listed EPCRA Section 313 *toxic chemical*. In the furnace, the fume is then passively converted to non-fibrous aluminum oxide, a non-listed chemical. The *facility* is not actively destroying the aluminum fume. Therefore, the *facility* is not treating the toxic chemical for destruction. If the *covered facility* generates more than 25,000 pounds of aluminum fume during the course of the year, it would meet the *manufacturing* threshold for this chemical and would be subject to EPCRA Section 313 reporting. Since there are no *releases* of the reportable chemical, the *facility* should report zero for *release* and other *waste management* activities for aluminum fume.

Acid Aerosol, Acid Reuse System

402. How are sulfuric and hydrochloric acid aerosols that are generated over and over again in acid reuse systems to be reported under Section 313?

When solutions of sulfuric acid and hydrochloric acid are aerosolized the *manufacture* of a listed chemical (sulfuric acid or hydrochloric acid aerosols) has occurred. This is a result of the qualifier to the sulfuric acid and hydrochloric acid listings, which excludes non-aerosol forms and limits the reporting to aerosol forms only. The addition of the acid aerosol qualifier has an impact on certain processes that, prior to the addition of the qualifier, would not have been considered as the *manufacturing* of a listed chemical. Acid reuse systems that use aqueous solutions of sulfuric acid or hydrochloric acid to generate acid aerosols, use the acid aerosols, condense them back into solution, and then reuse the acid solution again and again are impacted by the addition of the acid aerosol qualifiers. In such processes, the continuous reuse of the acid solutions generates very large quantities of acid aerosols that technically should be counted towards the *manufacture* (the generation of the acid aerosol is the *manufacture* of sulfuric or hydrochloric acid (acid aerosol)) and *otherwise use* thresholds. This may result in many *facilities* greatly exceeding the *manufacture* and *otherwise use* reporting thresholds that, prior to the addition of the qualifier, would not have exceeded thresholds.

While it is technically correct to apply all of the quantities of acid aerosols generated in such systems towards the *manufacture* and *otherwise use* reporting thresholds, EPA did not intend to increase the reporting burden as a result of the addition of the acid aerosol qualifiers. In addition, under EPA's general approach to reuse systems, a listed *toxic chemical* is not counted toward thresholds each time it is reused but only once per reporting period. This approach would apply to sulfuric acid or hydrochloric acid reuse systems were it not for the aerosol qualifiers. Therefore, EPA is providing the following guidance to reduce the reporting burden for *covered facilities* that operate such processes and to bring the treatment of such systems into alignment with EPA's general approach to reuse.

Rather than having *covered facilities* count all quantities of acid aerosol generated in such systems towards the *manufacture* and *otherwise use* thresholds, EPA will allow *facilities* to apply the total volume of acid in these systems only once to these thresholds. For example, if an acid reuse system starts the year with 2,000 pounds of acid and 500 pounds is added during the year then the total amount applied towards acid aerosol thresholds would be 2,500 pounds.

This reflects a one time per year counting of all of the acid molecules as being in the acid aerosol form rather than counting them over and over again

each time the acid aerosol form is generated and subsequently used. Since in these acid reuse systems the acid aerosols are *manufactured* and then *otherwise used* the 10,000 pound *otherwise use* threshold would be the threshold that triggers reporting from such systems.

This guidance applies only to acid reuse systems and the reporting of sulfuric acid and hydrochloric acid aerosols under EPCRA Section 313. This guidance does not apply to any other types of processes or to any other listed chemical.

Reuse System, Activity Threshold

403. In 1999, a *covered facility's* sulfuric acid reuse system starts the year with 4,000 pounds of sulfuric acid, and the *facility* adds 8,000 pounds to the system. How should the *facility* make threshold determinations for sulfuric acid (acid aerosol)?

The method for estimating amounts of sulfuric acid (acid aerosol) and hydrochloric acid (acid aerosol) for threshold purposes is unique as compared to other listed *toxic chemicals*. In the above question, the *facility* should apply 12,000 pounds towards the *manufacturing* and *otherwise use* thresholds. To determine the amount *manufactured* in an acid reuse system, the *facility* should calculate the total volume of acid in the system. The total volume of acid is the sum of the reporting year's starting amount and the amount added during the reporting year. Because all the sulfuric acid aerosol *manufactured* is subsequently *otherwise used*, the 12,000 pounds are also applied to the *otherwise use* threshold of 10,000 pounds. Therefore, the *facility* exceeds the *otherwise use* threshold and must file a Form R or Form A. Facilities are also directed to refer to the Guidance for Reporting Sulfuric Acid (EPA-745-R-97-007; November 1997).

Acid Aerosol, Sulfuric Acid, Aerosol Form

404. Would a sulfuric acid drip system that is in contact with an ore leach pile (described as analogous to a gardener's drip hose) be manufacturing sulfuric acid in an aerosol form?

No, the sulfuric acid does not become airborne; so it is not an aerosol form of sulfuric acid and, therefore, not a reportable *toxic chemical* under EPCRA Section 313.

Acid Aerosol, Sulfuric Acid, Acid Reuse System

405. A *covered facility* subject to EPCRA Section 313 generates aerosol sulfuric acid in excess of 25,000 pounds in a calendar year. The aerosol sulfuric acid passes through a scrubber that removes and condenses the aerosol sulfuric acid. The resulting liquid sulfuric acid then undergoes chemical conversion in an on-site treatment unit. How must the owner or operator account for these activities in Part II, Sections 7 and 8 of the Form R?

When a scrubber is used to remove sulfuric acid aerosols prior to entering or in a stack, the acid aerosols are usually converted to the non-aerosol form.

The non-aerosol forms of sulfuric acid are not reportable under EPCRA Section 313 because the qualifier to the sulfuric acid listing includes only acid aerosol forms (40 CFR Section 372.65). Sulfuric acid is not actually being destroyed by the scrubber, but the form of sulfuric acid that is reportable under EPCRA Section 313 is being destroyed. Therefore, since sulfuric acid aerosols removed by scrubbers are converted to a non-reportable form, the quantity removed by the scrubber can be reported as having been *treated for destruction* under Part II, Section 7 and should be included in Section 8.6, (Quantity Treated On-Site). Since the condensed sulfuric acid (i.e., the liquid sulfuric acid) is a non-aerosol form, it is not reportable under EPCRA Section 313 and no reporting of other *waste management* activities for these non-aerosol forms is required.

Fuming Sulfuric Acid, Sulfuric Acid, Oleum

406. A *covered facility* uses fuming sulfuric acid. This particular chemical is not listed as reportable under Section 313 of EPCRA, but it is chemically similar to sulfuric acid, which is reportable. Should the *facility* report if it meets threshold amounts and is a *covered facility*?

Fuming sulfuric acid, more commonly known as oleum, is a *mixture* of sulfuric acid and sulfur trioxide. The *facility* must report on the acid aerosol forms of the sulfuric acid portion of the *mixture* in accordance with Section 372.30(b) if this portion exceeds the applicable threshold. The *facility* should also note that sulfur trioxide reacts rapidly with water to form sulfuric acid. Any sulfuric acid aerosol formed from sulfuric trioxide at the *facility* must be counted toward the *manufacturing* threshold.

Threshold Determination, Coincidental Manufacture, Combustion Byproducts, Sulfuric Acid, Hydrochloric Acid, Chemical Conversion

407. A utility *boiler*, located at a *covered facility*, burns residual oil. As a result of the burning operation, the *facility* emits sulfur dioxide (SO_2), sulfur trioxide (SO_3), and particulate sulfates through a point source. Once emitted, the sulfur trioxide readily reacts with water vapor (both in air and in flue gases) to form a sulfuric acid mist. For purposes of EPCRA Section 313, must the *facility* report on the generation of sulfuric acid?

The sulfuric acid formed in the chemical reaction of sulfur trioxide and water that often occurs in the air after *releasing* sulfur trioxide is not included in threshold determinations. The *facility* owner/operator is not responsible for tracking or reporting on the formation of a listed *toxic chemical* once a chemical is *released* from a *facility*. However, if the reaction of sulfur trioxide and water takes place prior to being emitted (e.g., in the stack), the *facility* would be required to factor the quantity of sulfuric acid mist generated towards the *manufacturing* threshold. If the threshold is exceeded, the *facility* owner/operator must report all *releases* and other *waste management* estimates of sulfuric acid aerosols from the *facility*.

Coincidental Manufacture, Hydrochloric Acid

408. Must a *facility* report itself as a *manufacturer* of hydrochloric acid aerosols, if the hydrochloric acid aerosol is formed in the stack?

Yes, assuming thresholds are exceeded, the *facility* must report for hydrochloric acid aerosol. It is irrelevant where at the *facility* the acid aerosol forms.

pH, Concentration Range, Waste Treatment

409. Listed acids such as nitric acid are commonly used throughout the manufacturing sector as product ingredients, reactants, and chemical processing aids. Often, listed acids are present in aqueous wastestreams that are neutralized on site. If the listed acid is neutralized on site, EPCRA Section 313 requires an indication on the Form R of the range of concentration of the listed *toxic chemical* in the influent wastestream. These concentrations are expressed in percentages, parts per million (ppm), or parts per billion (ppb). If the pH of a waste steam containing a listed mineral acid is quantified, can the pH data be used to calculate the total mineral acid concentration in the influent wastestream?

In cases where only one acid is present in solution, the total mineral acid concentration can be derived by using the pH value of the solution and the molecular weight and ionization constant of the acid. In order to assist the regulated community in EPCRA Section 313 reporting, EPA derived a table that lists the total acid concentration for each listed mineral acid at different pH values (Estimating Releases and Waste Treatment Efficiencies for Mineral Acid Discharges Using pH Measurements (EPA 745/F-97-003), June 1991). The concentrations are expressed in pounds per gallon (lb/gal) and can be converted to the appropriate units for reporting purposes. The concentration that must be reported is based on the amount or mass of the *toxic chemical* in the wastestream compared to the total amount or mass of the wastestream. For example, assume that a *facility* treats, by neutralization, a wastestream containing nitric acid (HNO_3) in which the pH of the influent stream is 4. A pH of 4 corresponds to a concentration of 0.000052 pounds of HNO_3 per gallon of wastestream (Estimating Releases and Waste Treatment Efficiencies for Mineral Acid Discharges Using pH Measurements, Table 1). The amount of HNO_3 in the influent wastestream can be converted using the following calculation:

Influent wastestream:

$$(0.000052 \text{ lb/gal}) \times (1 \text{ gal}/3.78 \text{ L}) \times (453{,}000 \text{ mg/lb})$$

$$= 6.2 \text{ mg/L of } HNO_3 \text{ in the wastestream}$$

Since mg/L of solutions or dispersions of a chemical in water is equivalent to ppm, 6.2 ppm of HNO_3 is the concentration in the influent wastestream.

TOXIC CHEMICALS

The Form R requires a range of influent concentration, thus the *facility* should select the appropriate range code and enter that value in the Range of Influent Concentration column in Part II, Section 7A, the On-Site Waste Treatment Methods and Efficiency section of the Form.

Chemical Qualifier, Hydrochloric Acid, Acid Aerosol, Coincidental Manufacture

410. Hydrochloric acid, also known as hydrogen chloride (CAS number 7647-01-0), is a *toxic chemical* under EPCRA Section 313. Hydrochloric acid can exist in both aqueous solution and in a gaseous, anhydrous form. On July 25, 1996, EPA modified the listing of hydrochloric acid to include only acid aerosols including mists, vapors, gas, fog and other airborne forms of any particle size (61 FR 38600). Does the modified listing of hydrochloric acid refer to both the aqueous and the anhydrous forms of this chemical?

Yes. The CAS number 7647-01-0 identifies both aqueous and anhydrous forms of hydrochloric acid. The listing modification also applies to both aqueous and anhydrous forms of hydrochloric acid.

Concentration, Nitric Acid

411. How should nitric acid (CAS number 7697-37-2) be reported under Section 313? It does not exist in a pure or anhydrous form. Commercial nitric acid is produced at a concentration of 70 percent nitric acid in water.

The listed CAS number for nitric acid specifically relates to the molecular formula HNO_3. Therefore, *facilities* are required to count the amount of nitric acid in solutions toward thresholds and *release* and other *waste management* calculations. If 100 pounds of 70 percent nitric acid is *released*, the *release* should be reported as 70 pounds of nitric acid.

Compound and Compound Categories

Compounds, Metal Compounds, Metals, Threshold Determination

412. For Section 313 reporting, a catalyst contains 61 percent total nickel, which includes 26 percent nickel metal and 35 percent nickel contained in compounds. Should the threshold determination be based on the 61 percent total nickel?

No. The 61 percent total nickel cannot be used in the threshold determinations. Nickel compounds are a listed *toxic chemical* category; therefore, the full weight of nickel compounds (not just the 35 percent nickel contained in the compounds) must be used in the threshold determination for nickel compounds.

A separate threshold determination is required for the nickel metal since nickel is a separately listed *toxic chemical* under Section 313.

Compounds, Chemical Qualifier, Cyanide Compound

413. In the Federal Register, (53 FR 4538; February 16, 1988) EPA describes cyanide compounds as X^+CN^- where $X=H^+$ or any other group where a formal dissociation may occur; examples are KCN and $Ca(CN)_2$. Are cyanide compounds that do not dissociate reportable?

Cyanide compounds that do not dissociate are not reportable. However, dissociable cyanide compounds are not limited to the simple salts. Rather, this category includes all cyanide compounds for which dissociation upon *release* to the *environment* is expected to occur.

Compounds, Metal Compounds, Compound Category, Electroplating, Concentration Range, pH, Waste Treatment

414. A *covered facility* uses chromium compounds in its electroplating operation, and as a result, a hexavalent chromate compound is generated. Are the hexavalent chromate compounds reportable under Section 313?

The hexavalent chromate compounds are members of a reportable *toxic chemical* category, chromium compounds, and have been *manufactured* by the oxidation/reduction reaction that occurred in the electroplating operation. As a result, the total amount of the hexavalent chromate compounds produced must be included in the *manufacturing* threshold for chromium compounds.

Metal Compounds, Manufacturing

415. Is the conversion from one metal compound to another metal compound within the same metal compound category considered *manufacturing* for purposes of threshold determinations and *release*, and other *waste management* calculations?

Yes. The conversion of one metal compound to another metal compound within the same metal compound category is considered the *manufacture* of a metal compound, which must be considered toward threshold determinations. This is identical to how threshold calculations are derived for listed *toxic chemicals* in non-metal compound categories. The unique aspect for metal compounds, as compared to non-metal compounds within a listed compound category, is how amounts *released* and otherwise managed as waste are reported. As stated in the final rule (62 FR 23850; May 1, 1997), "if a metal is converted to a metal compound or if a metal compound is converted to another metal compound,..., a metal compound has been *manufactured* as defined under EPCRA Section 313." However, provided that thresholds are exceeded, *covered facilities* are instructed to report only the amount of the parent metal contained in the metal compound for amounts *released* or otherwise managed as waste. If thresholds for both the elemental metal and its metal compounds have been exceeded, *covered facilities* have the option to submit one Form R that includes on their report the amounts of the elemental metal from the parent metal along with amounts of the metal portion from the metal compounds.

Compounds, Metal Compounds, Cyanide Compound, Threshold Determination, Process, Electroplating

416. An electroplating *facility* uses metal cyanide compounds in their electroplating operations. Are they *processing* or *otherwise using* those cyanide compounds? How do they determine whether they meet the threshold, and which threshold applies?

The parent metal is plated onto a substance electrochemically. The metal compounds are *processed*, and the cyanide compounds are *processed* because the metal cyanide is the source of the metal that is plated and subsequently distributed in commerce. Metal cyanides are reportable as both cyanide compounds and metal cyanides. The total compound weight is applied for threshold determinations for both categories.

Compounds, Metal Compounds, Threshold Determination, Copper Compounds

417. We manufacture and use copper wire. We also use copper compounds in various parts of our processes. The Section 313 list contains both copper and copper compounds. Should we combine these categories for our determination of thresholds and reporting? Do we report the *release* and other *waste management* of copper compounds as copper metal?

Copper and copper compounds are separate entries on the Section 313 list, and therefore threshold determinations should be made separately. Copper compounds are a listed category and will include the aggregate of all copper compounds (other than the free metal). For copper compounds, report *releases* and other *waste management* activities as copper (e.g., as the copper ion in wastewater), not as the total mass of copper compounds. If a *facility* exceeds thresholds for both the parent metal and compounds of the same metal, EPA allows the *facility* to file a combined report (e.g., one report for copper compounds and copper metal).

Compounds, Compound Category, Threshold Determination, Release Reporting, Multiple Chemical Category

418. How would a compound that falls into two reporting categories be reported (e.g., $PbCrO_3$) on the Form R?

A compound that has constituents in two listed categories would have to be included under both categories when submitting a Form R. In the example indicated, the total weight of $PbCrO_3$ must be included in determining the threshold for both lead compounds and in determining the threshold for chromium compounds. In reporting the *releases* and other *waste management* of lead, only the stoichiometric weight of the lead in $PbCrO_3$ *released* or otherwise managed as waste would be included. Likewise, only the chromium in $PbCrO_3$ that is *released* and otherwise managed as a waste would be included on the Form R.

Compounds, Metal Compounds, Threshold Determination, Lead Compounds, Chromium Compounds, Lead

419. For Section 313 reporting requirements and threshold determinations, if a *covered facility* uses lead, lead chromate, and other chromium compounds, can they be considered separately or must they be combined into categories? When reporting *releases* and other *waste management* activities, must quantities of categories be determined as well?

Threshold determinations for metal containing compounds are made separately from parent-metal threshold determinations because they are listed separately under Section 313. In the scenario presented in the question, the *facility* would apply the quantity of the lead metal *manufactured*, *processed*, or *otherwise used* to the appropriate threshold for lead. The *facility* would apply the quantities of the lead chromate *manufactured, processed,* or *otherwise used* to the appropriate threshold for lead compounds and would apply the quantities of the lead chromate and other chromium compounds *manufactured, processed,* or *otherwise used* to the appropriate threshold for chromium compounds. However, a *facility* may, once a threshold has been met individually, combine the parent metal and its metal compounds for reporting. In completing the Form R, only the weight of the parent metal (not the entire compound weight) is to be considered.

Compounds, Metal Compounds, Chromium Compounds

420. Are chromium compounds (e.g., chromic acid CAS number 11115-74-5 or chromic acetate CAS number 1066-30-4) reportable under Section 313?

All chromium compounds are reportable. They must be aggregated together for purposes of threshold and maximum amount on-site calculations. However, *release* and other *waste management* amounts should be for the chromium metal portion only.

Compounds, Metal Compounds, Release Reporting, Lead Compounds, Lead

421. A *covered facility processes* both elemental lead and lead compounds. The *facility* exceeds the 25,000 pounds per year *processing* threshold for lead compounds, but not for elemental lead, and must submit a report for lead compounds only. When calculating *releases* and other *waste management* activities from the lead compounds, the owner/operator is only required to account for the weight of the parent metal released (40 CFR Section 372.25(h)). Should the *facility* account for both *releases* of lead from activities involving lead compounds and *releases* of lead from activities involving elemental lead?

No. In the case when an activity threshold is exceeded only for lead compounds, the report is only required to be based on the *releases* and other *waste management* estimates of lead, the parent metal, from lead compounds only. *Releases* and other *waste management* estimates of lead resulting from activities involving elemental lead need not be included in the *release* and other *waste management* calculations. Conversely, if the *facility* were to

exceed an activity threshold for only elemental lead, the report would only have to be based on *releases* and other *waste management* estimates from activities involving elemental lead only.

Compounds, Metals, Metal Compounds, Form R Submissions, Lead Compounds, Lead

422. A *covered facility* has determined that it needs to report under EPCRA Section 313 for both elemental lead and lead compounds. Can this *facility* file one Form R that takes into account both the *releases* and other *waste management* activities of lead and lead compounds, or is it required to report separately?

If a *covered facility* exceeds thresholds for both the parent metal and compounds of that same metal, it is allowed to file one joint Form R (e.g., one report for both lead compounds and elemental lead). EPA allows this because the *release* and other *waste management* information reported in connection with metal compounds will be the total pounds of the parent metal *released* and otherwise managed as a waste.

Compounds, Threshold Determination, Metal Compounds

423. An oxidation/reduction reaction that occurs as part of a waste treatment operation results in the formation of 2,500 pounds of lead chromate. How must a threshold determination be made for this compound?

Lead chromate meets the criteria for both a lead compound and a chromium compound. In such cases, the total amount of the compound *manufactured, processed*, or *otherwise used* must be applied to the threshold determination for both metal compound categories. The weight of the entire compound, not the weight of the parent metal, is applied for the threshold determination of each metal compound category.

Mining, Fertilizer, Nitrate Compounds, Ammonia, Chemical Conversion

424. A mining *facility* applies a commercial fertilizer that contains dry ammonium nitrate to the land as part of a mine reclamation project. Is the *facility* required to count the ammonium nitrate toward the *manufacturing* threshold for the ammonia listing and nitrate compounds listing when it rains on the fertilizer?

No. Ammonium nitrate is only converted to reportable chemicals when in solution and in this case the solutions are not created until after the chemical has been *released* into the *environment*. Therefore, the *facility* would not have to report for this activity since facilities are not required to report on conversions that take place in the *environment*.

Fume or Dust

Compounds, Chemical Qualifier, Fume or Dust

425. There are three chemicals on the list with the qualifier "fume or dust" (zinc, aluminum, and vanadium). What exactly is a "fume" or a "dust?"

EPA does not have a regulatory definition of a fume or a dust, but considers dusts, for purposes of reporting, to consist of solid particles generated by any mechanical processing of materials including crushing, grinding, rapid impact, handling, detonation, and decrepitation of organic and inorganic materials such as rock, ore, and metal. Dusts do not tend to flocculate except under electrostatic forces. A fume is an airborne dispersion consisting of small solid particles created by condensation from the gaseous state, in distinction to a gas or vapor. Fumes arise from the heating of solids such as lead. The condensation is often accompanied by a chemical reaction, such as oxidation. Fumes flocculate and sometimes coalesce.

Compounds, Coincidental Manufacture, Fume or Dust, Processing

426. A *covered facility processes* aluminum, vanadium, and zinc. These three *toxic chemicals* are listed under Section 313 with the qualifier "fume or dust." Is this processing operation subject to reporting?

If the processing of these substances generates (i.e., *manufactures*) any fume or dust or if the three substances were *processed* or *otherwise used*, at any time, as a fume or dust, the activities would be reportable under EPCRA Section 313. The *manufacturing*, *processing*, or *otherwise use* of these substances in fume or dust form would be subject to threshold determinations.

Compounds, Fume or Dust, Vanadium Pentoxide

427. Vanadium pentoxide is not explicitly listed under Section 313, although vanadium does appear on the list. Are we correct in assuming that we don't need to report for vanadium pentoxide?

Vanadium is listed only as a fume or dust under Section 313. Vanadium compounds are not listed under EPCRA Section 313. However, as a result of using vanadium pentoxide or elemental vanadium, a fume or dust of vanadium may be *manufactured* and could be subject to Section 313 reporting.

Compounds, Chemical Qualifier, Fume or Dust, Metal Vapors, Aluminum

428. A *covered facility* coats materials with aluminum using the vacuum deposition process. Is the *facility* subject to the reporting requirements under Section 313 for aluminum fume?

No. In vacuum deposition, the aluminum is converted to the vapor state under low pressure. The vapor then condenses on the material that is being coated. A metal fume consists of finely divided particulate dispersed in a gas. Because a metal fume and a metal vapor are different physical forms of a metal, metal vapor is not considered to be a type of fume. However, any aluminum fume that is produced as a result of the condensation of the metal vapor should be applied to threshold determinations for aluminum.

Compounds, Chemical Qualifier, Aluminum, Fume or Dust, Coincidental Manufacture

429. A *covered facility manufactures* aluminum cookware. It generates aluminum dust of various particle sizes during polishing and edging of the cookware. The *facility* collects the larger particles of aluminum dust by wet cloth. Does the *facility* consider only smaller dust particles that escaped for reporting purposes?

Aluminum in the form of dust is a listed Section 313 *toxic chemical*. All of the aluminum dust (no size limit) generated should be considered toward the *manufacturing* threshold. Provided the *covered facility* meets the activity threshold for aluminum fume or dust, the amount of the aluminum dust particles that escape the *facility*'s collector system should be reported as *released*.

Compounds, Threshold Determina-tions, Fume or Dust, Zinc, Particles, Mixture

430. A *facility processes* a zinc/mercury amalgam alloy and mercuric oxide to produce batteries. The amalgam is in particulate form. The molten amalgam is injected into a cooling chamber that produces particles with desired characteristics (such as size). Since zinc is listed as "fume or dust" only, would the *facility* need to consider the zinc from the amalgam towards the applicable *processing* threshold?

Yes. EPA considers "dusts" to be solid particles generated by any mechanical processing of materials (including *mixtures*). This includes, but is not limited to, handling, crushing, grinding, and rapid impact of materials such as rock, ore, metals, and alloys. In this case, the particles produced would constitute a dust and require a threshold determination.

Miscellaneous

Mixture, Xylene (Mixed Isomers), De Minimis Exemption, Threshold Determination

431. Xylene mixed isomers are present in two of a *facility's* refined products. For EPCRA Section 313 reporting, may the isomers be reported separately? For a *mixture* of the isomers, how are thresholds and de minimis to be determined? Reported separately, the *facility* exceeds thresholds but is below de minimis concentrations.

All of the xylene isomers are individually listed under EPCRA Section 313. In addition, there is a listing for xylene (mixed isomers) that covers any combination of xylene isomers. When the threshold and de minimis concentration for each isomer in the *mixture* are exceeded independently, the *facility* may report under the individual isomer listings or under the mixed isomers listing. When the threshold and/or de minimis for each isomer in the *mixture* are not exceeded independently, but are exceeded collectively, the *facility* should report under the CAS number for xylene (mixed isomers). Therefore, if a *covered facility otherwise uses* a *mixture* containing 8,000 pounds of ortho-xylene, 4,000 pounds of meta-xylene, and 2,000 pounds of para-xylene, the *facility* would report as xylene (mixed isomers) because it exceeded the 10,000 pound *otherwise use* threshold for xylenes (mixed isomers).

Mixture, Xylene (Mixed Isomers), Concentration

432. A *covered facility processes* two of the three xylene isomers in separate streams, along with an additional stream containing a *mixture* of xylene isomers of unknown concentrations. How would the *facility* determine if an activity threshold has been exceeded? How would the *facility* report the xylene on the Form R?

The *toxic chemical* list at 40 CFR Section 372.65, contains four xylene listings (mixed isomers, ortho-, meta-, and para-xylene) that appear with their own CAS number. The CAS number specified for xylene (mixed isomers), 1330-20-7, applies to any combination of xylene isomers. The *facility* must make separate threshold determinations for each individual chemical listed at Section 372.65. If the thresholds are not exceeded for any of the individual xylene listings of Section 372.65, then the *facility* would not have to report on any *releases* of xylene at the *facility*. For example, if the *facility processes*, in separate streams, 10,000 pounds of ortho-xylene (CAS number 95-47-6), 10,000 pounds of para-xylene (CAS number 106-42-3), and 10,000 pounds of xylene in which the isomers are mixed in unknown concentrations (CAS number 1330-20-7), a threshold is not exceeded for any of the xylene listings. Therefore, no reports for xylene would be required. The quantities of the individual xylene listings *processed* by the *facility* should not be aggregated for the purposes of making threshold determinations.

If the thresholds are exceeded for two or more of the individual isomer xylene listings, the *facility* has two choices when filling out the Form R. The *facility* may file separate Form Rs for each isomer or unique isomer *mixture* listed in Section 372.65, or the *facility* may file one combined report. For example, the *facility processes*, in separate streams, 30,000 pounds of ortho-xylene, 30,000 pounds of para-xylene, and 30,000 pounds of xylene where the isomers are mixed in unknown concentrations. Because the activity threshold for each of the three xylene listings is exceeded independently, the *facility* can report *releases* and other *waste management* activities from each of three listings separately on three different Form Rs (one for ortho-xylene, one for para-xylene, and one for the mixed isomers) or the *facility* can report all xylene *releases* and other *waste management* estimates on one Form R as xylene (mixed isomers).

Glycol Ethers Category, Diethylene Glycol

433. Although the category of glycol ethers requires reporting under Section 313, does diethylene glycol require reporting?

Diethylene glycol is not subject to reporting. Glycol ethers, with the following structure, are reportable: $R - (OCH_2CH_2)_n - OR'$, where n = 1, 2, or 3, R = alkyl C7 or less, or phenyl or alkyl substituted phenyl, and R′ = H or alkyl C7 or less or OR′, consisting of a carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate. The R groups for this structure are unsubstituted alkyl or aryl groups. For diethylene glycol, neither R nor R′

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contain alkyl or aryl groups and thus it is not subject to reporting under Section 313. For more information refer to EPA's document entitled, Toxic Release Inventory: List of Toxic Chemicals Within the Glycol Ethers Category (EPA-745-R-95-006).

Glycol Ethers Category, Dipropylene Glycol

434. Are dipropylene glycol ethers having a $R'OC_3H_6OC_3H_6OR$ structure considered a glycol ether for Section 313 *toxic chemical* reporting?

Dipropylene glycol ethers are not Section 313 reportable glycol ethers since it has $(OCH_2CH_2CH_2)_n$ or $(OCH_2CH(CH_3))_n$ instead of $(OCH_2CH_2)_n$ in its structure. Propylene glycol based ethers are not covered by this category.

Glycol Ethers Category, Ethylene Glycol, Mono Butyl Ether

435. Is ethylene glycol mono butyl ether a Section 313 chemical reportable as a glycol ether?

Using the structural definition of glycol ethers as they appear in the final rule, ethylene glycol mono butyl ether is reportable under Section 313.

$R - (OCH_2CH_2)_n - OR'$

In this case R is equal to butyl, ($CH_3CH_2CH_2CH_2$-); $R' = H$; and $n = 1$.

Mixture, Polyethylene

436. Is polyethylene considered a *mixture* of ethylene and its polymer, the components of which must be counted for purposes of reporting under Section 313 of EPCRA?

Polyethylene is not a listed chemical and thus is not subject to reporting under Section 313. A *mixture* is any combination of two or more chemicals if the combination is not, in whole or in part, a result of a chemical reaction. If the combination resulted from a reaction but could have been produced without a chemical reaction, it is still treated as a *mixture*. Thus, since polythylene is the result of chemical reaction, it is not a *mixture* under EPCRA Section 313. Any EPCRA Section 313 listed *toxic chemicals* used in the *manufacture* of polyethylene should be evaluated against the proper Section 313 activity threshold.

Mixture Mineral Oil

437. A *covered facility* uses hydraulic fluid which is 95 percent mineral oil and 5 percent other unspecified components. Does the *facility* have any Section 313 chemicals to report?

Mineral oil is a highly refined *mixture* of saturated C15 to C50 hydrocarbons. Barring any information to the contrary, it is unlikely that mineral oil contains significant quantities of any Section 313 chemicals.

Vinyl Chloride, Polyvinyl Chloride

438. Are vinyl chloride, a listed *toxic chemical*, and polyvinyl chloride, not listed, the same thing?

Polyvinyl chloride is not a listed *toxic chemical* and does not need to be reported. It is a polymer of vinyl chloride. Only unreacted vinyl chloride mixed with the polymer should be included in threshold determinations and *release* and other *waste management* calculations.

Monomer, Co-polymer, ABS

439. Are *toxic chemical* monomers such as acrylonitrile, butadiene and styrene, which are contained in a plastic copolymer known as ABS, reportable under Section 313?

These chemicals are monomers that react to make the ABS copolymer that is not reportable under Section 313. However, if any unreacted acrylonitrile, butadiene, or styrene monomers are present in the ABS copolymer in excess of de minimis concentrations then they are reportable.

DEHP, MSDS, DOP

440. A *covered facility* uses a *toxic chemical* known to them as DOP, which they think is n-dioctyl phthalate. N-dioctyl phthalate has the CAS number 117-84-0 and is not on the Section 313 list. However, the *MSDS* from their supplier states that the *toxic chemical* is called DEHP or DOP and has the CAS number 117-81-7. DEHP is di(2-ethylhexyl) phthalate on the Section 313 list. Should this chemical be reported?

DOP is a commonly used acronym for both di(2-ethylhexyl) phthalate (DEHP) and n-dioctyl phthalate (DNOP). DOP is also listed as a synonym for DEHP in the Section 313 Common Synonyms document. However, as the supplier provided the acronym DEHP and the CAS number is 117-81-7, the *facility* has sufficient information to distinguish between DNOP and DEHP and thus should report for DEHP.

Asbestos, CAS Number

441. Asbestos, with CAS number 1332-21-4, is a listed *toxic chemical* under Section 313. The synonym list does not contain reportable asbestos forms. A *covered facility* uses the following forms of asbestos and would like to know if they are reportable: Actinolite (CAS number 77536-66-4), Amosite (CAS number 12172-73-5), Anthophyllite (CAS number 17068-78-9), Chrysotile (CAS number 12001-29-5), Crocidolite (CAS number 12001-28-4), and Tremolite (CAS number 77536-68-6).

The Section 313 listing for asbestos (CAS number 1332-21-4) includes specific forms of asbestos, such as those mentioned above, that have their own individual CAS numbers. Therefore, those types of asbestos are reportable as long as they are *manufactured*, *processed*, or *otherwise used* in the friable form.

Chemical Qualifier, Aluminum Oxide, Fibrous Forms

442. A *facility* was advised by one supplier that aluminum oxide, CAS number 1344-28-1, is a listed *toxic chemical* under Section 313. The *facility* was advised by another supplier that this *toxic chemical* was on the *toxic chemical* list in error. Is aluminum oxide included on the *toxic chemical* list and therefore potentially reportable under Section 313?

Only fibrous forms of aluminum oxide are reportable under Section 313. Other forms of aluminum oxide are not subject to reporting (55 FR 5220, February 14, 1990).

Chemical Qualifier, Aluminum Oxide, Fibrous Forms

443. A dinnerware manufacturer wants to know if she has to report aluminum oxide in her clay, which is a raw material for her product.

Aluminum oxide in clay is usually part of another compound or mineral, such as kaolin, and is not present as a listed *toxic chemical*. In addition, it is unlikely the clay contains man-made, fibrous forms of aluminum oxide. Naturally occurring aluminum oxide, known as corundum, has a separate CAS number, 1302-74-5, and is not reportable.

Chemical Qualifier, Aluminum Oxide, Fibrous Forms

444. Are aluminosilicates reportable as aluminum oxide (fibrous forms)?

Aluminosilicates, aluminoborosilicates, zeolites, aluminum silicate hydroxides, and other related materials are either naturally occurring or are prepared by fusion at high temperatures. As a result, these materials are not considered to be fibrous forms of aluminum oxide under Section 313 and are not subject to reporting.

Mixture, Zeolite, Aluminum Oxide

445. For Section 313 purposes, is zeolite considered to be a *mixture* that contains aluminum oxide or is it considered to be a compound that is not a reportable substance?

Zeolite is an aluminum silicate compound that is not reportable under Section 313.

Formaldehyde, Paraformalde-hyde

446. Is paraformaldehyde, CAS number 30525-89-4, reportable as formaldehyde under Section 313?

No. Paraformaldehyde is hydrated polymerized formaldehyde, a solid material that is different from formaldehyde. At ambient temperature, vaporization occurs, emitting formaldehyde gas. Though paraformaldehyde itself is not reportable, any formaldehyde *manufactured* as a gas or a solution during the *manufacture*, *processing*, or *otherwise use* of paraformaldehyde must be applied to any threshold determination for formaldehyde.

Mixture, Toluene Diisocyanate, De Minimis, Threshold Determination

447. A *facility* receives a chemical *mixture*, 70 percent of which is toluene diisocyanate (TDI). Of this 70 percent, 80 percent is 2,4-TDI, with CAS number 584-84-9, and 20 percent is 2,6-TDI, with CAS number 91-08-7. The CAS number that appears on the *MSDS* for TDI is 26471-62-5. How should the *facility* report?

CAS number 26471-62-5 covers the *mixture* of the 2,4- and 2,6-TDI isomers. The 2,4- and 2,6-TDI isomers are also individually listed under EPCRA Section 313. When the threshold quantity and de minimis concentration for each isomer in the *mixture* are exceeded independently, the *facility* may report under the individual isomer listings or under the mixed isomers listing. When the threshold quantity and/or de minimis for each isomer in the *mixture* are not exceeded independently, but are exceeded collectively, the *facility* should report under the CAS number for TDI (mixed isomers).

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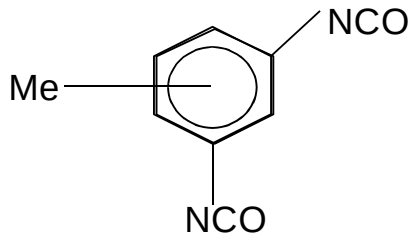
Toluene Diisocyanate, Mixture, Threshold Determination

448. According to the Chemical Abstract Service (CAS), the Chemical Abstracts Registry name for CAS number 26471-62-5 is "benzene, 1,3-diisocyanatomethyl-." The structural formula that describes this CAS number is as follows:



This name and structure imply only that the isocyanate groups must be one/three with respect to one another and that the position of the methyl group is not known. It should be noted that neither the name nor the structure imply that there is necessarily a *mixture* of chemicals. The EPCRA Section 313 list of *toxic chemicals* (40 CFR Section 372.65) includes CAS number 26471-62-5 with the name "toluene diisocyanate (mixed isomers)." This name implies no positional relationship of the isocyanate groups with respect to each other or to the methyl group. In addition, the name seems to imply that there must necessarily be a *mixture* of compounds for this listing to apply. For the purposes of EPCRA Section 313 reporting, what compounds are reportable under the CAS number 26471-62-5?

The chemical name "benzene, 1,3-diisocyanatomethyl-" is listed as a synonym for "toluene diisocyanate (mixed isomers)" under CAS number 26471-62-5 in EPA's document Common Synonyms For Chemicals Listed Under Section 313 of the Emergency Planning and Community Right-To-

Know Act, EPA 745-R-95-008, March 1995. For purposes of reporting under EPCRA Section 313, "toluene diisocyanate (mixed isomers)" includes any possible *mixture* of any toluene diisocyanates in which the isocyanate groups are separated by one carbon in the ring (i.e., are one/three to each other). This listing includes the 2,4-, 2,6-, and 3,5- isomers of toluene diisocyanate (TDI). TDI is commonly *manufactured* as a *mixture* of isomers (e.g., an 80:20 *mixture* of 2,4- and 2,6-TDI). Even if the *mixture* is made up of the specifically listed isomers (i.e., 2,4- and 2,6-TDI), the listing "toluene diisocyanate (mixed isomers)" still applies. The "mixed isomer" listing is meant to include any *mixture* that contains two or more of the toluene diisocyanate isomers (i.e., 2,4-, 2,6-, or 3,5-TDI). The specifically listed 2,4- and 2,6- TDI isomers should be reported individually if not present as a *mixture* of TDI isomers. If, however, the individual thresholds for the pure TDI isomers are exceeded, the *covered facility* may file a single report for TDI (mixed isomers) and include the total quantity *released* or otherwise managed as waste.

Chemical Qualifier, Activity Threshold, Ammonia, Aqueous, Anhydrous, Release Reporting

449. A *covered facility processes* an aqueous ammonia solution from water-dissociable ammonium salts in tanks and open vats. Evaporative losses occur at several points during *processing*. Are these evaporative losses considered *releases* of aqueous ammonia or anhydrous ammonia for purposes of EPCRA Section 313 reporting?

Evaporation and drying losses from aqueous ammonia solutions result in the *release* of anhydrous ammonia, which is 100 percent reportable under the EPCRA Section 313 ammonia listing. Although EPA modified the ammonia listing on June 30, 1995 (60 FR 34172), the modification only limits the quantity of aqueous ammonia that is reportable. The modification does not apply to anhydrous ammonia, which remains 100 percent reportable. Owners or operators must still include all anhydrous ammonia *manufactured*, *processed*, or *otherwise used* at a *covered facility* in threshold determinations and *release* and other *waste management* calculations. Anhydrous ammonia generated through the evaporation or drying of aqueous ammonia solutions derived from water-dissociable ammonium salts or other sources must be counted toward the applicable activity threshold. For example, if a *facility processes* aqueous ammonia, it has *processed* 100 percent of the aqueous ammonia in that solution. If the ammonia stays in solution, then 10 percent of the total aqueous ammonia is counted toward thresholds. If there are any evaporative losses of anhydrous ammonia, then 100 percent of those losses must be counted toward the *processing* threshold. If the *manufacturing*, *processing*, or *otherwise use* thresholds for the ammonia listing are exceeded, the *facility* must report 100 percent of these evaporative losses in Part II, Sections 5 and 8 of the Form R.

Threshold Determination, Release Reporting, Chemical Qualifier, Ammonia, Aqueous, Anhydrous

450. Ammonia is included on the EPCRA Section 313 *toxic chemical* list with the qualifier "includes anhydrous ammonia and aqueous ammonia from water dissociable ammonium salts and other sources; 10 percent of total aqueous ammonia is reportable under this listing" (40 CFR Section 372.65). As this qualifier indicates, the quantities applied to EPCRA Section 313 threshold determinations depend on the specific form of ammonia *manufactured*, *processed*, or *otherwise used*, and *release* and other *waste management* calculations also depend on the form of ammonia *released* or otherwise managed as waste. How does one distinguish between anhydrous ammonia and aqueous ammonia for the purpose of this listing? What are the differences in threshold determinations and *release* and other *waste management* calculations for the two forms of ammonia?

The term "anhydrous" means "lacking water," whereas "aqueous" means "dissolved in water." Anhydrous ammonia (in either the gas or compressed liquid state) may, however, contain a small amount of water. The presence of water in anhydrous ammonia does not constitute aqueous ammonia unless the amount of water present is sufficient to dissolve the ammonia. If ammonia is not actually dissolved in water, then the ammonia must be considered anhydrous. *Facilities* must be able to distinguish between anhydrous ammonia and aqueous ammonia when making threshold determinations and *release* and other *waste management* estimates because different percentages of the total amount of ammonia apply depending on the form of ammonia present.

If anhydrous ammonia is *manufactured, processed,* or *otherwise used,* then 100 percent of the anhydrous ammonia must be counted when determining whether an activity threshold has been exceeded. If the *facility* exceeds an activity threshold for ammonia (anhydrous and/or aqueous), then all of the anhydrous ammonia *released* and otherwise managed as wastes must be included in the *facility's release* and other *waste management* calculations.

Total aqueous ammonia includes both the ionized (NH_4^+) and un-ionized (NH_3) forms of ammonia present in aqueous solutions. When a *facility manufactures, processes,* or *otherwise uses* aqueous ammonia, it is conducting a threshold activity on 100 percent of the aqueous ammonia. However, the *facility* owner or operator counts only 10 percent of the total aqueous ammonia involved in a covered activity when making threshold determinations. Similarly, when estimating annual *releases* and other *waste management* estimates of ammonia from a *facility*, only 10 percent of the total aqueous ammonia must be included in the calculations.

Dissolving water-dissociable ammonium salts in water constitutes the *manufacturing* of aqueous ammonia. According to the ammonia qualifier, 10

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percent of the total amount of aqueous ammonia created must be applied toward the 25,000-pound *manufacture* threshold as well as the *processing* or *otherwise use* threshold, depending on the use of the aqueous ammonia at the *facility*. However, since 100 percent of the anhydrous form of ammonia is reportable under the ammonia listing, all anhydrous ammonia used to make aqueous ammonia must be applied toward either the *processing* or *otherwise use* threshold, depending on the use of the aqueous ammonia solution at the *facility*.

Threshold Determination, Concentration, Chemical Qualifier, Ammonia, Ammonium Hydroxide

451. An EPCRA Section 313 *covered facility* maintains a *Material Safety Data Sheet (MSDS)* for ammonium hydroxide (CAS number 1336-21-6). The *MSDS* lists the concentration of total ammonia in the ammonium hydroxide at 29 percent. To assist *covered facilities* in calculating total ammonia in aqueous solutions, EPA has published a guidance document titled EPCRA Section 313 Guidance for Reporting Aqueous Ammonia, which lists NH_3 equivalent weight percents for chemical sources of aqueous ammonia. Ammonium hydroxide is listed as a chemical source of aqueous ammonia consisting of 48.59 percent total aqueous ammonia (Table 1, p. 12). When calculating the weight of total aqueous ammonia from ammonium hydroxide, should a *facility* use the percentage on the *MSDS* or the percentage in the Agency's guidance document? When calculating the weight of total aqueous ammonia in other solutions of aqueous ammonia, what percentage should a *facility* use if given the choice between EPA's guidance document and solution-specific information?

The chemical ammonium hydroxide (NH_4OH) is a misnomer. It is a common name used to describe a solution of ammonia in water (i.e., aqueous ammonia), typically a concentrated solution of 28 to 30 percent ammonia. EPA has consistently responded to questions regarding the reportability of these purported ammonium hydroxide solutions under the EPCRA Section 313 ammonia listing by stating that these are 28 to 30 percent solutions of ammonia in water and that the solutions are reportable under the EPCRA Section 313 ammonia listing. For a more detailed discussion, see page 34175 of the Federal Register final rule of June 30, 1995 (60 FR 34172).

Facilities should use the percent total ammonia specified on the label of ammonium hydroxide solutions they purchase to determine the total ammonia content in these solutions. Ammonium hydroxide has the chemical formula NH_4OH; however, as mentioned above, strong evidence indicates that the species NH_4OH does not exist. Bottles of concentrated aqueous ammonia purchased from chemical supply companies are almost always labeled ammonium hydroxide. These solutions primarily consist of molecules of NH_3 dissolved in water (along with small amounts of ionized ammonia). The 48.59 percent listed in Table 1 for ammonium hydroxide is

based on the ammonia weight of the chemical formula NH_4OH, not the actual concentration of total ammonia in ammonium hydroxide solutions. The actual concentration may vary depending upon the amount of NH_3 used to make the solution. Thus, Table 1 may not accurately reflect the actual weight of total aqueous ammonia in any given solution labeled ammonium hydroxide.

The percentages, reported in Table 1 as NH_3 equivalent weight percents for chemical sources, are the precise percentages of total ammonia (expressed as NH_3 equivalent weights) contained in each chemical listed based on the molecular formula for each chemical. Except for ammonium hydroxide, these numbers are exact for the pure chemical and do not vary. *Facilities* can use these numbers to calculate how much total ammonia will be in aqueous solutions made from these chemicals. If more specific information on the actual concentration of total ammonia in an aqueous solution is available from another source, such as an *MSDS*, label, or measurement, *facilities* can use this information rather than performing the calculations prescribed in the EPCRA Section 313 Guidance for Reporting Aqueous Ammonia.

Ammonium Salts, Ammonium Chloride

452. Do ammonium salts such as ammonium chloride need to be reported under EPCRA Section?

Water dissociable ammonia salts, such as ammonium chloride, are reportable if they are placed in water. When ammonium salts are placed in water, reportable aqueous ammonia is *manufactured*. Ammonia (not ammonium salts) is on the list of *toxic chemicals* with the qualifier: "includes anhydrous ammonia and aqueous ammonia from water dissociable ammonium salts and other sources; 10 percent of total aqueous ammonia is reportable under this listing." As indicated in this qualifier, all aqueous ammonia solutions from water dissociable ammonium salts are covered by the ammonia listing. For example, ammonium chloride is a water dissociable ammonium salt. Reportable aqueous ammonia will be *manufactured* when it is placed in water. Ten percent of the total ammonia present in an aqueous solution containing ammonium chloride must be included in threshold determinations and *release* and other *waste management* calculations.

Chemical Category, Threshold Determination, Release Reporting, Delimited Category, PACs

453. On November 30, 1994 (59 FR 61432), EPA finalized the addition of 286 chemicals and chemical categories to the EPCRA Section 313 *toxic chemical* list. These additions, effective for the 1995 reporting year, include 39 chemicals as part of two delimited chemical categories. A delimited category includes a finite number of chemicals specifically designated by EPA to be included as part of that category. Are threshold determinations and *release* and other *waste management* calculations for these two delimited chemical categories different than threshold determinations and *release* and other *waste management* calculations for other EPCRA Section 313 listed chemical categories?

Threshold determinations are made in the same manner for both delimited and nondelimited categories. If a *covered facility manufactures*, *processes*, or *otherwise uses* more than one member of a listed chemical category, the total volume of all the members of the category must be counted towards the applicable activity threshold (40 CFR Section 372.27(d)). If an activity threshold is exceeded, the owner or operator of the *facility* is required to report under EPCRA Section 313. The report must cover all non-exempt activities at the *facility* involving members of the category.

The two delimited categories added on November 30, 1994, are diisocyanates and polycyclic aromatic compounds (PACs). The diisocyanates category consists of 20 specific members and the PACs category consists of 19 specific members. For reporting on delimited categories, only the members that are specifically listed as part of the category are subject to EPCRA Section 313 reporting. When reporting other nondelimited chemical categories, any unique chemical substance that contains the named category compound as part of that chemical's structure, or any compound meeting the specified molecular formula, is subject to threshold determinations.

EPA has developed guidance to facilitate accurate reporting for PACs entitled Guidance for Reporting Toxic Chemicals within the Polycyclic Aromatic Compounds Category (EPA 745-R-95-003). The guidance contains a list of Chemical Abstract Service (CAS) numbers for the individual chemicals within the PAC category and a CAS number list of some *mixtures* that might contain chemicals within the PACs category.

CAS Numbers, Radioactive Cobalt, Threshold Determination

454. Must a *facility* consider the use of the radioactive Cobalt-60 (CAS number 10198-40-0) in its threshold calculations for cobalt (CAS number 7440-48-4)?

Cobalt-60 with CAS number 10198-40-0 is not on the list of *toxic chemicals* under EPCRA Section 313. As such, Cobalt-60 is not reportable under EPCRA Section 313. The listed *toxic chemical* is cobalt with CAS number 7440-48-4.

CAS Numbers

455. The Chemical Abstract Service (CAS) maintains a computerized filing system that contains two main index files. The chemical abstract file provides bibliographic information referencing chemicals appearing in over 9,000 journals, papers, and symposiums from 1967 to the present. The chemical abstract file is an important tool for people interested in learning about the research, patents, and uses for specific chemicals. The chemical registry number file assigns CAS registry numbers to unique chemicals for purposes of identification. Assigning a CAS number to a particular chemical facilitates managing and regulating that chemical by universally identifying it with a specific number. Only one CAS number is assigned to each chemical and under

EPCRA Section 313, only one CAS number is listed per *toxic chemical*. If chemicals are to be assigned only one CAS number, why are some chemicals listed with multiple Chemical Abstract Service (CAS) numbers in 40 CFR Table 302.4 and the Title III List of Lists (EPA 550-B-98-017)?

There are two possible reasons for a chemical to have multiple numbers. The CAS numbers could refer to different forms of a chemical where each is considered unique for its particular properties and characteristics. The CAS registry number file includes the registry number, synonyms, chemical structure, and molecular formula for each chemical recorded in the file. If specific research has been done on a particular form of a chemical, a separate CAS number may be assigned to that particular form to facilitate the search process in the CAS file. For example, sodium hypochlorite is listed with two CAS numbers, 7681-52-9 and 10022-70-5. The former refers to the sodium salt form of hypochlorous acid, sodium hypochlorite, while the latter refers to the pentahydrate form of sodium hypochlorite. Both forms could be called sodium hypochlorite, thus sodium hypochlorite has, in effect, two CAS numbers.

A chemical may also be listed with multiple CAS numbers when multiple numbers have been inadvertently assigned to the same chemical. This multiple assignment can occur when forms of a chemical are originally believed to be unique, but after further review by chemists, are identified as the same chemical. In this case, all the CAS numbers are cross-referenced, allowing the chemical to be located with any assigned number. The misassigned numbers are deleted as registry numbers, but remain on file for referencing purposes. The CAS number first assigned is the more accurate number to use when denoting the chemical. Although all of the numbers will find the chemical, only the more accurate number will prompt the CAS registry file system to display the name, synonyms, and characteristics associated with the chemical. Chromic acid, listed with CAS numbers 1115-74-5 and 7738-94-5, illustrates this situation. After further review by chemists, CAS number 1115-74-5 was deleted as a registry number, but remains on file for future reference. CAS number, 7738-94-5 is the more accurate number to identify chromic acid because it was the first registry number assigned.

Chemical Category, Waste Treatment, Off-site Transfer, Barium Sulfate, Barium Chloride

456. Waste containing barium chloride is shipped off site to a RCRA treatment, storage, or disposal (TSD) *facility*. The TSD *facility* treats the barium chloride, converting it to barium sulfate. The barium sulfate is stabilized and subsequently disposed. Since barium sulfate is excluded from the EPCRA Section 313 barium compounds category, should the barium chloride be reported as shipped off site for treatment or transferred off site for *disposal*?

Barium chloride is being converted into a chemical that is not reportable under EPCRA Section 313. Therefore, the barium chloride would be considered to be treated for destruction. The barium chloride should be reported in Section 6.2 as transferred off site for treatment. M69—other waste treatment—should be used. Despite the fact that barium chloride is a metal compound, the quantity of barium chloride transferred off site should be reported in Section 8.7 rather than Section 8.1. The *waste management* of barium chloride is reported this way in Section 8 because the metal compound that barium chloride is converted to (barium sulfate) is not reportable and thus the barium chloride can be considered destroyed.

The following is effective starting January 1, 1998:

The TSD *facility* receiving the barium chloride should apply the quantity of the barium chloride that is converted to barium sulfate to the *otherwise use* threshold because it received the barium chloride from offsite for purposes of *waste management* and the facility treated the barium chloride for destruction (a listed chemical converted into a non-listed chemical). The TSD should also report the quantity of barium chloride that was treated for destruction in Section 8.6 (Quantity Treated On-site). It should also report any other *releases* or other *waste management* activities associated with the *treatment for destruction* of this toxic chemical.

Threshold Determination, Mixture

457. A covered petroleum refinery *manufactures* naphtha from crude oil. A paraffin, olefin, naphthalene and aromatics (PONA) analysis revealed that the naphtha contains 2.5 percent by weight of C9 alkylbenzenes. Only two out of a possible eight C9 alkylbenzenes are reportable under Section 313. How would this *manufacturer* calculate the Section 313 reporting threshold for the generic chemical name category of C9 alkylbenzenes in this instance?

The *facility* should not report for the generic *mixture* name, such as C9 alkylbenzenes, but for the specific chemical. Since the *facility* does not know the concentration of each chemical in the naphtha, and assuming 2.5 percent as the upper bound for each is unrealistic, the *facility* should assume that each listed C9 alkylbenzene is present and divide the concentration evenly between the eight.

CAS Number, MDI

458. A *facility processes* methylenebis(phenylisocyanate) abbreviated MDI. MDI is listed under the EPCRA Section 313 diisocyanates category with the CAS number 101-68-8. The MDI purchased by the *facility*, however, has the CAS number 26447-40-5. How should the *facility* treat this material with regard to Section 313 reporting requirements?

The EPCRA Section 313 listed chemical and the purchased chemical are not necessarily the same chemical. The purchased chemical is termed by the

Chemical Abstract Service as an incompletely defined substance that may be or may contain the listed chemical. The *facility* must use all available information (e.g., supplier notification information), to identify the amount of the listed *toxic chemical* present in the purchased material for threshold determinations and *release* and other *waste management* calculations. If this material does contain MDI, the quantity of MDI present should be included in all threshold calculations for the diisocyanates category.

C. Mixtures (see also Appendix A: Section 313 Policy Directive #4 - Compounds and Mixtures)

Mixture, Compound

459. What is the difference between a *mixture* and a compound?

When a compound is formed, the identities of the reactant chemicals are lost, but in a *mixture*, the individual components retain their own identity and could be separated again. For example, since polyethylene is a reaction product, it is not a *mixture* for EPCRA Section 313 purposes and is not subject to reporting. Steel fabricated into its solid form is considered a *mixture* because the individual metals retain their chemical identity.

Mixture, Compound, Release Reporting

460. Must a *facility* report the various *mixtures* of compounds and substances that it *manufactures*?

A *facility* must consider the specific compounds within *mixtures*, not the *mixtures* themselves, to determine whether a report must be filed. The individual listed chemicals or chemical compounds in *mixtures* are separately reported.

Mixture, CAS Number, Best Available Information

461. When a company has a *mixture* on site that does not have its own CAS number, what CAS number should be used?

The company should use the best readily available information (e.g., *MSDSs*, supplier notifications, and process and chemistry knowledge) at the *facility* to identify the listed Section 313 *toxic chemicals* in the *mixture*, in accordance with 40 CFR Section 372.30. A separate report must be filed for each *toxic chemical* for which the fraction of the *toxic chemical* in the *mixture* multiplied by the total weight of the *mixture processed* or *otherwise used* exceeds the applicable threshold. The *toxic chemicals* are treated as if they were present in pure form and each is reported under its own CAS number.

Mixture, Mixture Name, Part II Section 1

462. When should the "*mixture* component identity" field on the Form R be used?

The *mixture* component identity field is to be used only when a *facility* knows that a *mixture* it purchases and *processes* or *otherwise uses* contains a listed Section 313 *toxic chemical* but it does not know which *toxic chemical* (i.e., the supplier keeps the *toxic chemical* identity a trade secret). The

facility must use the *toxic chemical* or the *toxic chemical* category name field in all other circumstances (unless it is declaring the *toxic chemical* a trade secret *toxic chemical* and is filling out a sanitized version of the form).

Mixture, TDI (Mixed Isomers), Threshold Determination

463. A *facility* has three separate process streams, one containing 2,4-toluene diisocyanate (TDI), with CAS number 584-84-9, the second containing 2,6-TDI, with CAS number 91-08-7, and the third containing TDI (mixed isomers) with CAS number 26471-62-5. How should a *facility* calculate the thresholds and *releases* for each isomer and for *mixtures* of TDI isomers? If the *facility* knows the composition of the *mixture*, should they total the amount of the pure 2,4-TDI and 2,6-TDI with the amount in the *mixture* to determine if the threshold for the individual isomers has been met?

No. The Section 313 list of *toxic chemicals* includes listings for pure 2,4-TDI, pure 2,6-TDI and TDI (mixed isomers). The *facility* should calculate the thresholds separately for each process stream that contains the pure TDI isomers and the mixed TDI isomers. The individual TDI isomers of the mixed isomer process stream should not be applied to the thresholds of the pure isomers. If the individual thresholds for the pure TDI isomers are not met, no reporting is necessary. If the individual thresholds for the pure TDI isomers are exceeded, the *facility* may file a single report for TDI (mixed isomers) and include the total quantity *released* or otherwise managed as waste of all three process streams, or they may file three separate reports. If the thresholds for each TDI isomer in the mixed isomer process stream are not exceeded independently, but are exceeded collectively, the *facility* must report under the CAS number for TDI (mixed isomers).

Metal Alloy, Mixture

464. How is galvanized sheet metal considered for EPCRA Section 313 reporting? Are metals in alloys subject to Section 313 reporting?

Galvanized sheet metal is an alloy of several different metals. An alloy is considered a *mixture* for Form R reporting because the individual metals in the alloy retain their chemical identities. Like all other listed *toxic chemicals* in *mixtures*, alloys are subject to Form R reporting. When determining whether a *facility* meets an activity threshold, the owner/operator should only consider the weight percent of the listed chemical in the alloy.

Mixture, Threshold Determination

465. A *covered facility* brings in natural and synthetic rubber in slab form. It then adds chemicals to the rubber to change it to what they are making (i.e., tennis balls). Does the *facility* need to consider the *toxic chemicals* in the rubber it receives?

Yes. Rubber is a *mixture* for reporting purposes. Therefore, the *toxic chemical* weights must be added to the threshold determination if their concentrations are above the de minimis concentration limit (1 percent, or 0.1 percent for OSHA carcinogens). The weight added would be the weight percent of the *toxic chemical* multiplied by the weight of the rubber slab.

Section 4. COMPLETING THE FORM R: RELEASES AND WASTE MANAGEMENT CALCULATIONS

A. Releases of the Toxic Chemical

Releases

466. What is the definition of a *toxic chemical* "*release*" under EPCRA Section 313?

Under Section 329, EPCRA defines a *release* as any "spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the *environment* (including the abandonment or discarding of barrels, containers, and other closed receptacles)." Under Section 313, *covered facilities* are required to take into account in their reports all *toxic chemicals* entering each environmental medium (e.g., "routine" and "accidental" *releases*.)

Releases, Accidental Releases, EPCRA Section 304

467. What is the difference between a *release* under EPCRA Section 304 and a *release* under EPCRA Section 313? Would accidental *releases* reported under Section 304 have to be included in the Section 313 report?

Section 304 *releases* are accidental *releases* of extremely hazardous substances, requiring an emergency notification. Reporting under Section 313 includes the total amount of the *toxic chemicals,* both routine, operational and accidental *releases*. Thus, Section 304 *releases* of listed Section 313 *toxic chemicals* must be factored into *releases* reported under Section 313.

Releases, Monitoring

468. Is it true that *covered facilities* need not make any special effort to measure or monitor *releases* for Section 313 reporting and may use information that is on hand?

Yes, EPCRA Section 313 states that *covered facilities* need not conduct monitoring or other activities beyond that required by other statutory or regulatory requirements (EPCRA Section 313(g)(2)). Congress included this language to limit the burden on the affected industry for development of *release* and other required data. Without measurement or monitoring data, the *facility* is required to make reasonable estimates using its best readily available data.

Releases, Reasonable Estimates

469. Section 313(g)(2) of EPCRA states that the owner or operator of a *facility* may use readily available data. In some cases, the available data may be known to be non-representative and reasonable estimates offer more accurate *release* information. Would EPA, in this instance, favor use of the estimates rather than data?

Yes, it is preferable to use reasonable estimates using the best readily available information if available data (including monitoring data) is known to be non-representative.

Reasonable Estimates, Readily Available

470. If a *covered facility* has analytical data that will take extensive time and money to calculate emissions, can that *facility* use the maximum emission level specified in their permit to calculate their emissions?

EPCRA allows facilities to use its best readily available data to provide information required under Section 313. When data are not readily available, EPCRA allows facilities to use "reasonable estimates" of the amounts involved. An owner/operator *facility* must use his/her best judgment to determine whether analytical data are readily available. If they are not, the *facility*'s use of maximum emissions levels, as specified in its permits, may be a reasonable basis from which to form its estimates. In any event, the owner/operator should carefully document the reason for its decision making.

Reasonable Estimates, Ozone

471. Ozone is *manufactured* as a result of the generation and transmission of electric power. Must the electricity generating *facility* report the amount of ozone *manufactured*?

Yes. Amounts of ozone (a *toxic chemical*) *manufactured* at a *covered facility* must be considered toward the *facility*'s *manufacturing* threshold for ozone. If the *facility* knows that ozone is being *manufactured*, then the *facility* must use its best readily available information to provide reasonable estimates in making threshold and *release* and other *waste management* calculations.

Reasonable Estimates, Detection Limit

472. If a *covered facility* has analytical data indicating the concentration of a Section 313 chemical is below the limits of detection and the *facility* has no information on the probability of the chemical being present in that wastestream (e.g., Superfund waste), should the *facility* use half the detection limit? What documentation will EPA require if the *facility* asserts that it had no basis for expecting the Section 313 chemical to be present?

If the *facility* has no information to indicate that the chemical exists in the wastestream, it may assume that the concentration is zero. If the *facility* has reason to believe that the listed *toxic chemical* is present, it may use half of the detection limit. The *facility* should document that it looked at all readily available data in making this determination.

Basis of Estimate, Reasonable Standard

473. Is it appropriate for a covered TSDF to develop an average concentration for a Section 313 chemical contained in thousands of different wastestreams managed by the *facility*, and then use that average as a basis for threshold determinations? If so, does EPA have a recommended approach for developing such as average?

EPCRA allows *covered facilities* to use the best readily available data to provide information required under EPCRA Section 313. When data are not readily available, EPCRA allows *facilities* to use reasonable estimates of the

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amounts involved. A *facility* must use its best judgment to determine whether data are readily available. Thus, with regard to use of average concentration levels, a *facility* must use its best judgment to decide whether the raw data from which it might base any average concentration level are readily available. In any event, a *facility* should carefully document its decision making. For example, if a *facility* decides to use average concentration levels, it should document why the raw data from which the averages are based are not readily available, how it arrived at any average concentration level used, and why the average concentration level is a reasonable estimate of the amount of the *toxic chemical* in the wastestream. EPA does not have a recommended approach for determining average concentration levels.

Reasonable Estimates, Chromium

474. A covered treatment, storage, and disposal (TSD) *facility* receives a waste from off site that contains chromium. The waste profile indicates only that the wastestream contains chromium. The waste profile does not indicate if the waste contains elemental chromium or a chromium compound. Can the TSD make threshold determinations based on the assumption that the chromium contained in the wastestream is present as elemental chromium?

A *facility* must use the best readily available information to determine which listed chemicals or compounds are being *manufactured*, *processed* or *otherwise used*. If the waste profile is incomplete or inaccurate, the *facility* should look to other sources of information that it believes are more representative of the needed information. *Facilities* should document assumptions and calculations used in making their determinations.

Releases, Reporting Deadline, Best Available Information

475. Form R requires estimates of the *release* to the *environment* of listed *toxic chemicals* in specific release categories. If a *facility* is unable to complete its estimate of these *releases* by the deadline, should the company leave that entry blank and promise a future estimate, or make the best estimate possible and submit later revisions?

Any *covered facility* must report by July 1 for the previous reporting year, and the data provided should be the best estimate using the best readily available data. Records supporting the data must be kept for three years. If more accurate data are developed, the *facility* may submit revised forms. EPA can take enforcement action if they believe that the data do not represent reasonable estimates.

Reporting Requirements, Photocopying

476. A *covered facility* handles the same amount of chemicals each year, with the same emissions quantities. Is it allowable to simply change the date on the previous year's Form R, photocopy it, and send the altered document in, if no information but the date has changed?

EPA allows facilities to photocopy certain portions of a prior year's reporting form. However, EPA requires original signatures on each year's report. Prior year reports can and should be used as a basis or gauge for current year reporting, but should not be used as a substitute for current year reporting.

Releases, Disposal

477. Is the *disposal* of *toxic chemicals* in wastes in the form of dusts, shavings, or turnings that result from grinding or drilling of metal items considered a "*release* of a *toxic chemical*?"

Yes, *disposal* of dusts, shavings, or turnings containing Section 313 *toxic chemicals* is considered a *release*.

Releases, Loading Emissions

478. Tank trucks and rail cars physically enter a *facility*. While loading for transport, *toxic chemical* emissions occur. Are these emissions subject to reporting under Section 313?

Yes, as long as the *toxic chemicals* are not under active shipping papers and the loading and the *releases* occur within the *facility* boundary, the *releases* must be reported if the *facility* meets the *toxic chemical* activity, employee, and SIC code criteria.

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Releases, Fugitive Air Emissions, Lab Hoods

479. Are *releases* from lab hoods considered fugitive air emissions?

The *releases* from lab hoods are point source air emissions. Therefore, the *releases* are reportable and should be accounted for in Part II, Section 5.2 of the Form R, if the *facility* exceeds an appropriate threshold. (See also Section 2D on the Laboratory Exemption.)

Releases, Emission Factors, Best Available Information

480. A paint manufacturer needs to estimate emissions of Section 313 chemicals. How can the owner or operator estimate solvent emissions from open or partially open mixing tanks, and speciate total solvent emissions data into specific compound emissions?

Facilities should use the best readily available information. Emission factors are available in Compilation of Air Pollutant Emission Factors (*AP-42*) for estimating total VOC emissions from paint manufacturing.

Estimating Releases

481. How should a *facility* estimate sulfuric acid drifting (aerosol) out of a cooling tower? There is no accepted procedure/guidance for how to best estimate this sulfuric acid drift. Is this reportable?

Amounts of sulfuric or hydrochloric acid aerosols that drift from process steps are considered a *release* and are reportable provided the *facility* has exceeded thresholds. *Facilities* must use their best readily available information in developing estimates. This information may come from a variety of sources, and to assist facilities in determining what is reportable for sulfuric acid aerosols, EPA has published a guidance document entitled,

EPCRA Section 313 Guidance for Reporting Sulfuric Acid (EPA-745-R-97-007; November 1997). *Facilities* may also find equipment operating specification information useful in developing threshold determinations and *release* and other *waste management* calculations.

Releases, Landfill, Migration

482. Do we need to report leaking, abandoned landfills? What if we don't know if it is leaking?

Leaks from landfills need not be reported. EPA requires reporting of the amount of a *toxic chemical* placed in an on-site landfill during the year. The facility is not required to estimate migration from the landfill for years other than the reporting year.

Releases, Groundwater, Migration

483. Are groundwater *releases* required to be reported? If so, what if a *facility* has a surface impoundment which it suspects is leaking? How is the amount being *released* calculated?

Releases to underground injection wells, surface impoundments, or landfills should be reported. Estimates of amounts leaking from such *disposal* and possibly reaching groundwater should not be reported. EPA may model the potential for such leaks or migration, but does not require *facilities* to estimate such further migrations.

Threshold Determination, Outdoor Storage Pile

484. A mining *facility* stores coal or ore outside. One or more listed *toxic chemicals* are contained within the storage piles. Due to exposure and weathering influences, other listed *toxic chemicals* are *manufactured* in the storage piles and may subsequently run-off onto land or surface water. How should the *facility* consider the *manufacturing* of listed *toxic chemicals* within a storage pile?

Amounts of listed *toxic chemicals* known to be *manufactured* on-site from the storage of raw materials, *mixtures*, or *trade name products* must be considered toward the *manufacturing* threshold for those chemicals. The term *manufacture* means "to produce, prepare, *import*, or compound a toxic chemical." If the mining *facility* has knowledge that a listed toxic chemical is *manufactured* on-site, the *facility* should count the amount of the listed *toxic chemical manufactured* toward the *manufacturing* threshold.

Release Reporting, Storage, Stockpiles

485. A mining *facility* leaches metals from an outdoor ore pile and collects the leachate for further *processing*. Should the *toxic chemicals* in the pile be reported as a *release* to land on the Form R?

During the leaching, the ore pile is considered part of the *facility*'s process, and *toxic chemicals* in the pile should not be reported as a *release* to land. Once the leaching process is complete, and the ore pile is "closed," the *facility* will report the *toxic chemicals* remaining in the pile as a *release* to

land in Part II, Section 5.5.4 (Other Disposal) of the Form R. However, amounts of listed *toxic chemicals* that escape the pile during the *facility*'s leaching process and are either *released* to land or surface water, for example, must be considered toward *release* calculations if a threshold has been exceeded.

Releases, Disposal, Ultimate Disposition, Recycle

486. A *covered facility* discharges waste containing listed Section 313 metals to an on-site cooling pond. The metals accumulate and settle over time, and the water is then drained from the cooling pond, leaving the heavy metal sludge. The sludge is then dredged and sent off-site to a recycler. How should the *toxic chemicals* left in the pond, after the sludge has been removed for recycling, be reported?

A *facility* must report the ultimate disposition of listed *toxic chemicals* from the *facility* during the reporting year. Listed *toxic chemicals* remaining in the sediments after the sludge is sent off-site to a recycler are "*released* to land." Listed *toxic chemicals* sent to a receiving stream when the wastewater is drained are "*released* to water."

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Releases, Definition of Facility

487. A *covered facility* is adjacent to a lagoon which the *facility* does not own but to which it pays to discharge wastes. The *facility*, however, is in effect the operator of the lagoon. In one year, the *facility released* a listed mineral acid into the lagoon as an attempted pH control. Must the *facility* report for the *release* of the listed mineral acid, even though the process was a one-time treatment method that will not be repeated?

Yes, the *facility* must report the *release* of the listed acid if it meets the threshold criteria for reporting. The *facility* was acting as operator of the waste treatment site and must report listed chemicals *otherwise used* in excess of the threshold. Because the *facility* operates the lagoon and it is adjacent to the rest of the site, the lagoon is part of the *facility*.

Releases, Chemical Conversion, Chlorine

488. How are chlorine *releases* reported? Must chlorine, CAS number 7782-50-5, be reported if it is transformed into another chemical compound during the *release* process?

If chlorine is present in waste *released* by a *facility* it must be reported even though the chlorine may be transformed in the *environment* subsequent to the *release*. If the chlorine is transformed in the wastestream prior to any *releases*, the *facility* must still report if an activity threshold is met, but the amount reported may be zero.

Releases, Acids, Release Reporting, Release to Land, Chemical Conversion

489. A *facility* mines magnesium-rich brine from an on-site well. After extracting the magnesium, it disposes of the brine in on-site *disposal* wells. In order to keep the *disposal* well formation clean and usable, the *facility* pumps 280,000 pounds of a reportable mineral acid into the wells. The *facility* considers this an *otherwise use* of the acid. Since the acid would be neutralized before it migrates off-site, is it also a *release* to land?

Yes. The *facility* must consider their use of a reportable acid as an on-site *release* to land even though subsequent to the *release* the acid may be neutralized in the *process* of cleaning the well. EPA does not allow *facilities* to reduce the quantity reported as *released* to the *environment* based on conversions of a chemical in the *environment* after the chemical has been *released* by the *facility*.

Releases, Point Source Air Emissions, Fugitive Air Emissions

490. Our *facility* paints metal cabinets and the paint solvents contain a listed *toxic chemical*. The system consists of a closed, vacuum vented painting room and a closed oven room vented by an oven stack. Are *releases* from the vent to the outside of the building over the painting room considered "*releases* from building ventilation systems" and therefore reported as fugitive emissions?

No, fugitive *releases* are emissions that are not in a confined directional air flow. Since your building vent system over the painting room is a confined air stream, it can be combined with the oven stack as a stack or point emission in Part II Section 5.2 of the Form R.

Emission Factors, Pulp and Paper Mills

491. Many pulp and paper mills burn wood for on-site electricity and may trigger *manufacturing* thresholds when one naturally occurring compound changes to another (e.g., copper or manganese compounds change to copper or manganese oxides). Does EPA publish emission factors for metals *manufactured* from the burning of trees?

Emission factors provided in Section 1.6 "Wood Waste Combustion in Boilers of EPA's document *AP-42*, Compilation of Air Pollutant Emission Factors can be used to calculate emissions for metal *manufactured* from the burning of trees. However, if a *facility* has better readily available information that would enable the *facility* to more accurately calculate the emissions generated, the *facility* should use that information.

Releases, Pipes, Release Reporting

492. Where does one report routine leaks from pipes? Would these be reported as *disposed* to land?

Reporting leaks from pipes requires determining where the *released toxic chemical* goes. For example, a *toxic chemical* that evaporates would be reported as a fugitive air emission in Part II, Section 5.1 of the Form R. A

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nonvolatile material leaking into land, or any material leaking from an underground pipe, would be reported as a *release* to land and entered in Part II, Section 5.5.4 "Other *Disposal*." In either case, the *toxic chemical* would also be reported in Section 8.1.

Releases, Combustion Unit Efficiency, Release Calculation

493. In calculating *releases* from incinerators, *boilers*, *industrial furnaces* and like units, is it sufficient to base the amount *released* on the efficiency of the unit?

Release calculations based solely on the efficiency of the unit may not be sufficient. *Facilities* must use the best readily available information. For example, the 99.99 percent efficiency of an incinerator may not refer to the destruction and removal of the chemical being reported on the Form R. If that is the case, the efficiency may have no relation to the *release* quantity of the chemical being reported. Even if the surrogate waste is the chemical being reported, the 99.99 percent efficiency may not only include the quantity of the chemical destroyed by combustion, but may also include the quantity of the chemical that is physically removed. The quantity of the chemical removed can include undestroyed chemical in the ash, and undestroyed chemical discharged from air pollution control devices like scrubbers, precipitators, baghouses, etc. Furthermore, *releases* of the chemical due to faulty equipment upstream from the feeding point of the combustion device can also be counted as quantity removed and included in the 99.99 percent efficiency calculation. As a result, *release* calculations based solely on the efficiency of the unit might count the chemical removed as destroyed. This will result in under-reporting of the quantity of the chemical *released* to the *environment*.

The *facility* should also examine its operating records to account for chemical *releases* during upset conditions such as those *released* from an emergency dump stack.

Releases, Combustion Unit Efficiency, Metals, Treatment for Destruction

494. Why does EPA not allow *covered facilities* to use the efficiency of a combustion unit (e.g., incinerator, *industrial furnace* or *boiler*) to calculate *releases* of metals from the unit?

Metals cannot be destroyed by combustion. Therefore, the efficiency of a combustion unit has no relation to the *releases* of metals from the unit.

Releases, Asbestos, Definition of Friable

495. A covered manufacturing *facility* uses more than 10,000 pounds of friable asbestos in a diaphragm cell process during the course of a reporting year. During the process, material containing friable asbestos is washed in a treatment unit where it coagulates and is removed by a pressure filter. The filter cake containing asbestos is wetted with ethylene glycol, and the resulting filter cake/ethylene glycol *mixture* is

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subsequently landfilled on-site in a closed container. Should the *facility* report the placement of this asbestos in a landfill as a "*release* to land" on the Form R?

EPA interprets "friable" under EPCRA Section 313 "...as being crumbled, pulverized, or reducible to a powder with hand pressure" (53 FR 4519; February 16, 1988). *Facilities* are required to report *releases* or other *waste management* of only the friable form of asbestos. The *facility* will report zero *releases* of friable asbestos to land because the ethylene glycol/asbestos *mixture* is not considered to contain friable asbestos since the asbestos contained therein is wet (i.e., with ethylene glycol). The *facility* would report the amount of friable asbestos that is treated in Part II, Section 8.6. Note that because ethylene glycol is also a listed *toxic chemical*, the *facility* would also need to consider this chemical for threshold determinations and *release* and other *waste management* calculations.

Releases, Byproduct, Chemical Identity, Chemical Conversion, Release Reporting

496. Do the Section 313 reporting requirements overlook the possibility that a substance can lose its chemical identity as a byproduct in a reaction, and that the difference between "input and output" volumes may not always be due to a *release*?

EPA does recognize that a *toxic chemical* can lose its chemical identity in a reaction by being converted into a new chemical. The *facility* must still account for the amount they either *manufacture* or *process* regardless of whether the listed *toxic chemical* is converted to another *toxic chemical* in the process. *Releases* and other *waste management* estimates must then be calculated for any part of the process involving the Section 313 listed *toxic chemical*. In addition, if the byproduct created is a listed *toxic chemical*, the *facility* must consider it toward the *manufacturing* threshold.

Releases, Monitoring, Detection Limit

497. If a *facility* monitors for a *toxic chemical* and the measurement is below the limit of detection of the method, can they report zero *releases*?

The *facility* must use reasonable judgment as to the presence and amount of the listed *toxic chemical* based on the best readily available information. An indication that a reportable chemical is below detection is not equivalent to stating that the chemical is not present. If the reportable Section 313 chemical is known to be present, a concentration equivalent to half the detection limit should be used. The *facility* should not estimate *releases* based solely on monitoring devices, but the facility should also rely on its knowledge of specific conditions at the plant.

Releases, Emission Factors, Basis of Estimate

498. If a company measures its own leaks (valve, flange, pump, etc.) and determines a new fugitive factor, is the code "E" or "M" or "O"?

The company should use the code M if it measured *releases* of the *toxic chemical* from its equipment at the *facility* to determine its *release* amount.

"E" is used only for published emission factors which are chemical specific. However, in this case, the company would use "O" which is used if it measured leaks generally or applied non-published factors developed at other *facilities*.

Releases, Basis of Estimate

499. If total *releases* are obtained using a combination of estimating techniques, how do we report "Basis of Estimate" in Section 5, Column B?

Report the basis of estimate code associated with the technique used to calculate the major portion of each *release* entry. See examples in the current Form R instructions.

Releases, Emission Factors

500. Are SOCMI (Synthetic Organic Chemicals Manufacturing Industry) emission factors applicable to the petroleum refining industry as well as to organic chemical manufacturers?

Yes, SOCMI fugitive emission factors can be used for the petroleum refining industry even though they are based upon synthetic organic chemicals manufacturing. The refinery user would have to correct for differences in concentrations of the *mixtures*, because SOCMI factors are based upon pure substances being *released*.

Basis of Estimate, Emission Factors

501. Are emission factors published by other than EPA sources reported as an "E" or an "O"?

Published emission factors by sources other than EPA that contain chemical specific emission rates may be reported as "E". Published emission factors that are not chemical specific are indicated as "O".

Releases, Basis of Estimate, Emission Factors

502. EPA's fugitive emission factors for equipment leaks for the Synthetic Organic Chemicals Manufacturing Industry (SOCMI) and some air emission factors listed in EPA's document *AP-42*, Compilation of Air Pollutant Emission Factors, are not chemical specific. Should the basis of estimate code be entered as "E" or "O"?

Use "O" for non-chemical-specific emission factors.

Estimating Releases, Section 8

503. A *covered facility* has estimated fugitive emissions to be 52 pounds and, based on their lack of precision in this estimate, have reported it as range code B (11–499 pounds) in Section 5 of the Form R. When reporting the quantity *released* in Section 8.1, what quantity should they use to represent their fugitive emissions when adding up all *releases*: 52 (the calculated result) or 255 (the midpoint of the range)?

The air emissions reported in Section 8.1 should be 52 pounds unless the *facility* has better information about their emissions. *Facilities* are not

allowed to use range codes in Section 8 of the Form R. In this instance, the owner or operator seems to have estimated their fugitive emissions from data relevant to the listed toxic chemical and the activities occurring at their *facility*.

Releases, Fugitive Air Emissions, Emission Factors

504. The emission factors used to estimate *releases* to air from leaks in pipes are time dependent. What amount of time should be used to determine fugitive emissions from emission factors?

In using emission factors to determine fugitive emissions to the air from leaks in pipes, a *facility* must use the total amount of time over which a pipe contains the listed *toxic chemical*, since a *release* will occur whether a *toxic chemical* is moving or stagnant in the pipe.

Stormwater, Rainwater Run-off

505. Should we report the composition of stormwater as it falls from the sky or do we report its composition once the rainwater has run off soil?

The composition should be counted once the rainwater has run onto and off equipment, concrete pads, etc. as a portion of the total *facility release* to surface water.

NA vs. 0, VOC, Spill, Zero Releases

506. If a *covered facility* which exceeds a threshold for a volatile *toxic chemical* spills ten pounds of it (e.g., dichloromethane), should the *facility* report NA or zero for *releases* to the land?

The *facility* should not report NA for the *releases* to the land, if the *facility* spills a toxic chemical on the ground. If the *facility* spills ten pounds of a relatively volatile chemical such as dichloromethane (CAS number 75-09-2) with a high vapor pressure (435 mm Hg) and low adsorption coefficient (K_{oc} = 28), virtually all ten pounds would be expected to volatilize to air. In this case, the ten pounds would be reported in Section 5.1 and zero pounds under section 5.5. NA should only be used in this section to indicate that there have been no *releases* to land. Although one may expect all of the volatile chemical to volatilize, the zero in Section 5.5 indicates that there was an opportunity for the toxic chemical to remain on the land.

Releases, Air Emissions, Storage Tanks

507. How does one use the storage tank equations in Appendix C of EPA's technical guidance entitled Estimating Releases and Waste Treatment Efficiencies (1999 version) to estimate air emissions for a specific *toxic chemical* in a liquid *mixture*?

You must estimate emissions of the total *mixture* using average molecular weight and vapor pressure for the *mixture*, then multiply by the mole fraction of the *toxic chemical* in the gaseous emission. The required formulas are found in the referenced technical guidance document but are not listed in a step-by-step procedure.

Releases, Fugitive Air Emissions, Storage Drums

508. How does a *facility* owner or operator estimate fugitive or working losses from drums contained in a warehouse or storage *facility*?

Fugitive emissions from drums in storage at a *covered facility* may include emissions from opening and emptying the drums. The *facility* may consider each drum as a small tank and estimate the amount of *toxic chemical* contained in the vapor space using methods such as partial pressure determinations found in EPA's technical guidance document, Estimating Releases and Waste Treatment Efficiencies (1999 version) for the Form R.

Releases, Emission Factors, Estimating Emissions, Unknown Composition

509. Is there any recommended approach for estimating emissions from *facilities* whose raw material is of a constantly varying and unknown composition? For example, tar plants receive crude coal tar in batches. No analysis is done on incoming raw materials or on products (or on intermediates) at such *facilities*.

If available, data on the average composition for the specific material or published data on similar substances should be used.

Releases, Off-site Transfer, Point Source Air Emissions

510. A covered manufacturing *facility* sends a *toxic chemical* in a waste to an off-site RCRA regulated treatment, storage, and *disposal facility* (TSD) for recycling. Are emissions discharged by the off-site TSD included as point source emissions on the manufacturing *facility's* Form R or are they not reported?

The owner or operator of the manufacturing *facility* should report the *toxic chemical* as sent off-site for recycling in Section 6.2 (Transfers to Other Off-Site Locations) and in Section 8.5 (Quantity Recycled Off-Site). The manufacturing *facility* owner or operator is only responsible for reporting *toxic chemical releases* and other *waste management* activities from his/her own *facility*. If the TSD that recycles the manufacturer's waste is subject to EPCRA Section 313 reporting, the TSD owner or operator would report *releases* resulting from the recycling activity.

Releases, ppm

511. If the calculated threshold of a listed *toxic chemical* is based on the mass utilization of the solution, would the emission of a million pounds of wastewater stream containing 1 ppm of the *toxic chemical* be the actual mass of the chemical or the mass of the wastewater?

Parts per million (ppm) of a *toxic chemical* in wastewater indicates the concentration of a *toxic chemical*, *not* the actual total mass of the *toxic chemical*.

Only the actual mass of the *toxic chemical* being released should be reported. A million pounds of wastewater stream containing 1 ppm of the *toxic chemical* is equivalent to one pound of the *toxic chemical*.

Releases, Air Emissions, Toluene, Partial Vapor Pressure

512. We manufacture paint and one of the chemicals we use is toluene. We used the Estimating Releases and Waste Treatment Efficiencies guidance document but the answer given is for toluene and mineral spirits and thus is much too high. Can we use the six percent present in the paint *mixture* times the number of paint mixtures and report that?

The partial vapor pressure of toluene in formulations, which is a function of its vapor fraction and mole fraction (not weight percent), can be used. See Appendix C, of Estimating Releases and Waste Treatment Efficiencies (1999 version).

Releases, Air Emissions, Horizontal Storage Tanks

513. How should a *covered facility* estimate emissions from horizontal storage tanks? The AP-42 equations were developed for vertical tanks.

For fixed roof tanks, the working loss equation for vertical tanks can be used. For breathing losses, one can still use the vertical tank equation, except that an effective tank diameter must be substituted for D in the equation. D is the square root of {(4)(area of liquid surface)}/π. H is the same as for vertical tanks.

Releases, Estimating Releases, Chlorine, Water Treatment, Waste Treatment

514. How can one estimate emissions of chlorine from use in cooling water treatment? We have tried to estimate the emissions for some cooling water systems based on the amount of water evaporation, wind drift and the amount of chlorine used, but the *releases* seem too high.

Estimating emissions based on the amount used overestimates *releases* since chlorine is only slightly soluble in water, it reacts with chemicals in the water and it dissipates in side reactions. Multiplying measured residual chlorine by recirculation rate by lost water fraction may also overestimate *releases* (residual includes other forms of chlorine), but may be the only way to make a reasonable estimate. Please refer to EPA's EPCRA Section 313 Reporting Guidance for Food Processors (EPA 745-R-98-011; August 1998).

Releases, Waste Treatment, Release to Land, Absorbent, Water Treatment

515. If a reportable chemical were spilled outside a building at a *facility* and an absorbent (e.g., kitty litter) was used to absorb the *toxic chemicals*, would the use of the absorbent be listed as a treatment and be reported in Part II, Section 8 of the Form R?

No, the use of the absorbent would not be considered treatment for Section 8 of the Form R but it would be treatment of the wastestream in Section 7A of the Form R. Only if the *toxic chemical* was destroyed, such that it was no longer the chemical subject to EPCRA Section 313, would that activity be considered treatment in Section 8. If the absorbent were drummed and sent to a landfill, that would be listed as a transfer to an off-site location for *disposal*. Any amount of the *toxic chemical* left on the ground must be accounted for as a *release* to land and reported in Part II, Sections 8.1 and 5.5.

Releases, Basis of Estimate, Zero Releases, NA vs. 0

516. For *releases* and other *waste management* activities that are reported as zero, what should be reported as a basis of estimate? If we put "NA" (i.e., there's no potential for *release*) is it necessary to put "NA" in "the basis of estimate" column of the Form R?

If you report NA, leave the basis of estimate box blank or enter NA. If you report zero *releases* then you need to provide a basis of estimate.

Releases, Release to Water

517. A *covered facility* discharges wastewater containing a listed *toxic chemical* to a stream on-site. This stream, however, is only present during certain times of the year when there is heavy rainfall. Should this *release* be reported as a *release* to water or a *release* to land?

If the stream is a named, recognizable waterway, then the *facility* should report the discharge as a *release* to water in Part II, Section 5.3 and report the name of the receiving stream in the same Section. If the *release* is not to a named, recognizable waterway, the *release* should be reported as a *release* to land.

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Releases, Release Reporting, Release to Land, Disposal, Containment Area

518. If a *covered facility* had a cement lining or other leak restricting device in the area where they store *toxic chemical* containers and a *release* from the storage area of the stored *toxic chemicals* occurs, how is this reported on the Form R?

If the *facility* does not have specific measures for land filling, land farming, or land *disposal*, then for the purposes of the Form R, the *releases* would be entered on Part II, Section 5.5 4 (Other *Disposal*). This would apply to amounts *released* that were not cleaned up and removed from the site or otherwise treated and *disposed* on-site.

Releases, Release Reporting, Containment Area

519. If a *toxic chemical* is *released* into a containment area made entirely of concrete (i.e., there is no contact of the *toxic chemical* with the ground, or the area is designed to catch such materials in the event of an accidental spill), how should this be reported on the Form R?

The material does not have to be reported as *released*, if the concrete containment area is part of regular processing operations (or is designed to catch such materials in the event of an accidental spill, etc.). However, any material that is not further used (e.g., there are fugitive air emissions or transfers off-site) must be reported in the appropriate sections on the Form R.

Releases, Release Reporting, Landfill, Remediation

520. For *release* reporting under Section 313, would a *covered facility* need to include a listed *toxic chemical*, such as lead, from remediation activities where contaminated soil is dug up and removed to a hazardous waste landfill?

If the threshold for lead has been exceeded elsewhere at the *facility*, the amount of lead in the contaminated soil would be included in the *release* reporting. If the ultimate *disposal* is removing the soil to a hazardous waste landfill off-site, then this would be reported in Part II, Section 6.2 of the Form R as a transfer to an off-site location for *disposal*, rather than an on-site *release* to land. In addition, beginning with reporting year 1991, *releases* and other off-site *waste management* associated with remedial actions are also reportable in Part II, Section 8.8 of the Form R.

Releases, Estimating Releases, Reporting Acids, pH

521. A wastestream containing a reportable acid is neutralized to a pH of 5.5 and then *released* to a river. How does one calculate the amount of acid that is *released* to the river?

For purposes of reporting under EPCRA Section 313, EPA considers a reportable acid wastestream that has been neutralized to a pH above 6 to be completely neutralized. However, if the pH is below this level (e.g., 5.5), calculate the amount of acid *released* based on the amount of base it would take to raise the pH of the wastestream to 7 (not 6). For more information on pH measurements, EPA has published Estimating Releases and Waste Treatment Efficiencies for Mineral Acid Discharges Using pH Measurements (EPA 745/F-97-003).

Releases, Release Reporting, Acid Neutralization, pH

522. How would a *facility* report under Section 313 on a wastestream which is neutralized to a pH above 6 before discharged to a POTW?

Covered facilities that use Section 313 chemicals for pH adjustments and neutralization must report if they meet the 10,000 pound *otherwise use* threshold, even if these chemicals are consumed and no *releases* result. The listed *toxic chemical* is reported as zero pounds discharged to the POTW in Section 6.1 (Discharges to Publicly Owned Treatment Works) and the entire amount neutralized is reported in Section 8.6 (Treated On-Site). The neutralization process is reported under Section 7A of the Form R (On-Site Waste Treatment Methods and Efficiency).

Releases, pH, Acid Neutralization, Mineral Acids, NA vs. 0

523. In Part II, Section 6.1 of the Form R (discharges to POTW), if the *facility* monitors a reportable acid in waste and the pH is above 6 (considered to be 100 percent neutralized), would the *release* reported be zero or NA?

Since there is a potential for discharge of the particular *toxic chemical* to the POTW, the discharges to the POTW on Part II, Section 6.1 of the Form R would be reported as zero rather than NA.

Releases, POTW, Part II Section 6.1

524. A *covered facility* uses a *mixture* containing a *toxic chemical*. During daily use, the employees become contaminated with the *mixture* containing the listed *toxic chemical*. When they finish working with the chemical, they wash it off their hands and down the drain. Would this

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be a *release* to a POTW even if the *facility* does not have a permit to discharge the listed *toxic chemical* to the POTW?

The quantity of toxic chemical washed down the drain would need to be reported as a transfer to a POTW in Section 6.1, regardless of the existence of a discharge permit.

Releases, Release to Land, Ultimate Disposition

525. A manufacturing *facility otherwise used* benzene in excess of a reporting threshold during each of reporting years 1995 and 1996. In 1995, the *facility* generated wastes containing benzene and placed these wastes in an on-site lagoon. The benzene on this waste was reported as a *release* to land on the Form R for benzene for reporting year 1995. In 1996, benzene from the sludge from the on-site lagoon was transferred to an on-site landfill. During both the original placement in the lagoon and the subsequent transfer to the landfill, benzene was *released* to air. For the purpose of reporting under EPCRA Section 313, does the owner or operator need to report *releases* to an on-site landfill and/or fugitive air emissions of benzene on the Form R?

The *facility* should not have reported all of the benzene which was placed in the on-site lagoon as a *release* to land. The majority of the benzene will evaporate. The purpose of sending a waste to a lagoon is so that the volatiles (in this case benzene) will evaporate and the solids will settle. The *facility* should have determined, to the best of its ability, what percentage of the benzene would evaporate during that reporting year. It should have reported this amount as a fugitive air emission. The balance should have been reported as a *release* to land. Both the amount reported as a fugitive air emission and the amount reported as a *release* to land should have been reported for 1995, the year when the wastes containing the benzene were placed in the on-site lagoon. When completing the Form R for benzene for reporting year 1996, the *facility* would not report as a *release* to land any benzene in sludge that was transferred from the on-site lagoon to the on-site landfill as this material was already reported as a *release* to land on the Form R for the previous year. However, the *facility* must report on the Form R for benzene for reporting year 1996 any air emissions of benzene that occurred as a result of transferring the sludge from the on-site lagoon to the on-site landfill if the *facility* met the threshold for benzene.

Release Reporting, Ultimate Disposition

526. If a *facility* in one of the newly added industries, which begins reporting for activities conducted in 1998, has information on the amount of seepage from a landfill in 1998, do they report this amount as a *release* to land, since they were not required to report the initial *disposal* to land in the previous year?

No. Facilities are required to report only the amounts that are *disposed* during the reporting year in which they are *disposed*, provided certain thresholds

have been met and the *facility* does not conduct any further activities involving amounts previously *disposed*. Amounts that move within the same media, such as seepage from a landfill to surrounding soils, do not have to be included in *release* estimates in subsequent years. EPA requires reporting of the amount of toxic chemical placed in an on-site landfill during the year. EPA does not require the facility to estimate migration from the landfill in subsequent years, provided the *facility* does not conduct activities that further involve the listed toxic chemical *disposed*.

Release Reporting, Ultimate Disposition

527. In 1999, a *facility disposes* of a waste containing benzene in an on-site landfill, but does not exceed an activity threshold for benzene. The *facility* does not report the amount of benzene *released* to the landfill in 1999. In 2000, the *facility* exceeds a threshold for benzene. If some of the benzene released to land in 1999 seeps from the landfill to groundwater (i.e., migration of previously disposed materials), does the *facility* report the amount of benzene that seeped into groundwater during 1999?

No. EPA requires reporting of the amount of a toxic chemical placed in an on-site landfill during the reporting year in which these amounts are *disposed*. Amounts *disposed* in previous years are not reportable in subsequent submissions provided no additional activity is performed with these amounts.

Joint Venture, Off-site Transfer, Storage, Ultimate Disposition

528. Company A owns and operates a *covered facility*. Company B, a 50-50 joint venture between Company A and Company C, is located within the same site but is owned and operated by a separate person. Company B transfers drums containing *toxic chemicals* to storage pads at Company A for storage and preparation for off-site transfer. Company B's wastes are manifested separately from Company A's wastes and Company B knows the ultimate off-site destination and handling method. Should Company B report the *toxic chemicals* transferred to Company A as an off-site transfer to Company A or to the ultimate destination?

If Company B is a 50-50 joint venture between Companies A&C, it is not owned, operated or controlled by Company A and therefore is a separate *facility* from Company A. Since Company B knows the ultimate disposition of the *toxic chemical*, Company B should report the off-site location as Company A in Part II, Sections 6.2 but should report the type of *waste management* activity that will ultimately be performed in Part II, Sections 6.2 and 8 on the Form R. If Company B had not known the ultimate disposition of the waste, it would report the *toxic chemicals* in waste as an off-site transfer for storage only, using *waste management* code M10 in Part II, Section 6.2 and report the *toxic chemical* as *released* in Section 8.1 of the Form R.

Release Reporting, Waste Reuse

529. If waste rock placed in a pile at the end of one reporting year is considered a *release* to land, and is *processed* in subsequent years, should the tailings/closed dump resulting from the subsequent *processing* be reported again as a *release* to land?

Yes. *Covered facilities* must consider amounts *manufactured*, *processed*, or *otherwise used* toward threshold determinations each year. Provided these amounts are not associated with exempt activities and reporting thresholds have been exceeded, amounts *released*, including *disposed*, are reportable during the year in which the releases occur. If an amount of a listed toxic chemical previously *disposed* of is *manufactured*, *processed*, or *otherwise used* in a subsequent year then the *facility* should consider these amounts as it would new materials brought on-site, and report any *waste management* activities that are associated with *toxic chemicals* for which thresholds have been exceeded.

Release Reporting, Temporary Storage

530. Is ash placed on-site in a pile waiting to be sold during construction season considered a *release* to land for the reporting year prior to its transfer?

Amounts of listed *toxic chemicals* placed on land are considered *released* under EPCRA Section 313. However, for reporting purposes, material that is placed on-site during a reporting year does not have to be reported as a *release* to land on-site if the pile was only used for temporary storage during the reporting year. EPA will consider the pile used for temporary storage if: (1) the *facility* routinely made off-site transfers of material from the pile during that reporting year; or (2) the *facility* had a contract in place to transfer the material before the end of the reporting year and transferred the material containing listed *toxic chemicals* off-site before that year's report was submitted or by July 1, whichever comes first. However, quantities of the toxic chemical that volitalize or leach into the ground as a result of the on-site temporary storage must be counted as *released* on the Form R.

Releases, Release Reporting, Stockpiles, Storage

531. A manufacturing *facility* that produces electricity by burning coal stores the coal in an on-site stockpile that is exposed to the outside atmosphere. The *facility* meets the threshold criteria (40 CFR Section 372.22) for filing a Form R for the *toxic chemical* benzene. Since the stockpiled coal contains benzene and is exposed to the outside atmosphere, would all the benzene in the coal need to be reported on the Form R as a *release* to land on-site?

No. A *facility* does not have to report *toxic chemicals* contained in an on-site stockpile of material that is intended for *otherwise use* on-site as a *release* to land on-site. However, any *toxic chemical* that escaped to air or remains in the soil from the stockpile material (e.g., evaporative losses to air, material leached to the ground, etc.) must be reported as *released* to the *environment*

on-site. Once a *covered facility* meets the criteria for filing a Form R under EPCRA Section 313 for a *toxic chemical* (such as benzene), all *releases* of that chemical at the *facility* are to be reported. Because, in this instance, storage is associated with the *otherwise use* of the coal, *releases* from the stock pile will be eligible for the de minimis exemption.

Releases, Storage Tanks, Point Source Air Emissions, Fugitive Air Emissions

532. Why are *releases* from storage tanks considered point source air emissions for Section 313 reporting while *releases* from similar operations (i.e., tank trucks and railcars) are considered fugitive emissions?

Storage tanks and railcars or tank trucks are similar operations. However, it is the nature of *releases* rather than their source that is most important in their classification for reporting. Because emissions from railcars and tank trucks are most often small, scattered, and the result of manual transfer operations, they are considered fugitive. Emissions from storage tanks, meanwhile, are most often considered point source because they are usually from vents, ducts, or other confined air streams. If a *covered facility* has sufficient reason to believe that the nature of *releases* from rail cars and tank trucks are similar to those of storage tanks, they may report them as point source emissions, or vice versa. The *facility* must, however, document all assumptions and estimates made to support their reasoning.

Releases, Release Reporting, Transportation Exemption, RQ, EPCRA Section 304

533. A *covered facility* receives a shipment of gasoline from a tank truck. The loading dock is located within the *facility* boundaries. The tank truck delivers gasoline through a hose into the tank operated by the *facility*. While stationed at the dock, the valve of the tank truck ruptures and the gasoline leaks from the hose of the tank truck. This *release* occurs before the shipping papers are signed off by the *facility* operator. Gasoline contains listed Section 313 *toxic chemicals* such as benzene. If an activity threshold for benzene is met, would the *facility* be required to report this quantity of benzene *released* on the Form R?

No. In the above case, the chemicals in the tank truck are considered under active shipping until the shipping papers are signed at the loading dock. Section 327 of EPCRA states that "(e)xcept as provided in Section 304, this title does not apply to the transportation, including the storage incident to such transportation, of any substance or *toxic chemical* subject to the requirements of this title, including the transportation and distribution of natural gas." In the above scenario, the material in the tank truck is considered to fall under the transportation exemption, and *releases* from this truck would be exempt from reporting under Section 313. This *release*, however, would be reportable under Section 304 of EPCRA, if the quantity of any extremely hazardous substance (EHS) or CERCLA hazardous substance released exceeds the reportable quantity (RQ) within a period of 24 hours. EPA would encourage the *facility* to include the amount in its Form R in

order to provide the public with the full picture of benzene *releases* that occurred at the facility for that reporting year.

Releases, Release Reporting, Vessels, Facility, Barge Terminal

534. A *covered facility* has a barge terminal where listed *toxic chemicals* may be loaded to a barge. If an activity threshold is met for one of these chemicals, are *releases* from the barge reportable?

Releases from the *covered facility* (i.e., barge terminal) must be reported. This would include *releases* from buildings, equipment, and storage at the terminal. The barge terminal ends where the equipment physically meets the barge. *Releases* from the barge itself (e.g., air displacement of volatiles) are not reportable since barges are not covered under the definition of a *facility* (EPCRA Section 329(4)).

Releases, Release Reporting, Release to Land, Disposal, Storage

535. A *facility* has an on-site concrete basin used as a collection pond for 80 percent of the *facility*'s wastewater. No NPDES permit was assigned to this concrete basin. The wastewater is temporarily collected in the basin and sent to an off-site biological treatment plant. How would the *facility* report *releases* of listed *toxic chemicals* placed in the concrete basin on the Form R?

The amount of listed *toxic chemical* collected in the basin would be considered on-site storage. However, any leaching into the ground or volatile air emissions would be reported as *releases* to land and air, respectively, in Part II, Sections, 5.5.4 (Other *Disposal*) and 5.1 (Fugitive or Non-Point Air Emissions) of the Form R. Also, if the *toxic chemical* is sent off-site to the treatment *facility* during the reporting year, it is reported as an off-site transfer in Section 6.2 of the Form R.

Releases, Release Reporting, Underground Injection, Waste Disposal, Otherwise Use

536. A *covered toxic chemical manufacturer* (SIC code 28) receives other *facilities*' wastes containing listed *toxic chemicals* and *disposes* of them in their deep well. Does the receiving *facility* need to report these *toxic chemicals*?

Starting with reporting year (RY) 1998, this is a reportable activity and the quantity disposed of would be applied to the *otherwise use* threshold. However, prior to RY 1998 the receiving and *disposing* of *toxic chemicals* would not be factored into a threshold determination because it does not fit any definition of *process* or *otherwise use*. However, even prior to RY 1998, if the manufacturing *facility manufactures*, *processes*, or *otherwise uses* the same listed *toxic chemical* above the threshold amount, the *disposal* of other *facilities*' wastes containing this listed *toxic chemical* would be reported as a *release* on the Form R even though the amount of the listed *toxic chemical* in these wastes was not included in the threshold determination.

Releases, Ultimate Disposition, Air Emissions

537. A *covered facility processes* items containing *toxic chemicals*. During *processing*, dusts are *released* to air within the *facility* and some of this dust settles out within the *facility* (on rafters, equipment, floors and in adjacent rooms). If a *processing* threshold is met, how would the *facility* report the *releases* of the *toxic chemicals* present in the dust on the Form R in Section 5?

The *facility* must account for the amount of the listed *toxic chemical* released to various environmental media. Reporting of *releases* is based on the entire reporting year. If during the year an amount in dusts that settle out are collected and *disposed* of, then this would be reported in an amount *disposed* of on-site or off-site in the appropriate Section of the Form R (e.g., if the dusts are sent off-site for *disposal* they would be reported in Part II, Section 6.2). Any amount of *toxic chemical* in dusts that remain airborne would be reported as a fugitive *release* (Part II, Section 5.1 of the Form R). Amounts *released* that settle outside of a building on *facility* structures or equipment that are not collected and *disposed* of should be reported in Part II, Section 5.5.4 of the Form R as a *release* to land on-site.

Releases, Ultimate Disposition, Asbestos, Double Counting, Release Reporting

538. A *toxic chemical* (e.g., friable asbestos) is emitted as an air particulate which deposits on the *facility* roof, such that it will be washed into a NPDES permitted pond or swept into a solid waste pit or landfill. Will the *release* be reported as a *release* to land or water, but not air? This would prevent a *toxic chemical* from being reported twice, once as an air emission, and once as a water/land emission.

If the *facility* can develop a reasonable estimate of that part of a *release* to air that is deposited within the *facility* (and subsequently collected or deposited in an on-site landfill or surface impoundment), then these quantities can be separated from the air *release* figure(s) and reported as *released* to land on-site. The remaining air *releases* not deposited on the *facility* would be reported as *releases* to air.

Releases, Particulates, Air Releases

539. A *covered facility* emits particulate containing a listed toxic chemical from a stack on-site. Some of the particulate lands on-site and some of the particulate lands on an off-site property. Should the *covered facility* report the emitted particulate in Sections 5.5.4 (Other *Disposal*) and 6.2 (Transfer Off-site for *Disposal*) or in Section 5.2 (Stack or Point Source Air Emissions)?

If the *facility* has reasonable estimates about what percent of stack particulate emission lands on-site, this quantity of toxic chemical would be reported in Part II, Section 5.5.4 (Other *Disposal*) and the remaining amount of *toxic chemical* (including the amount deposited on an off-site property) would be reported in Part II, Section 5.2 (Stack or Point Source Air Emissions).

Releases, Release to Land, Disposal, Remediation, Part II Section 8.8

540. A *covered facility* that exceeds an activity threshold for lead brings in lead-contaminated soil from a CERCLA remedial action off-site, mixes it with on-site remediation waste (that also contains lead), and places the combined waste in an on-site landfill. How is this reported on the Form R? It is pretty clear that all of the lead will be reported in Part II, Section 5.5.1, and that the lead in the on-site remediation waste gets reported in Part II, Section 8.8. But would the lead in the remediation waste brought in from off-site also be reported in Part II, Section 8.8? Or 8.1? Or perhaps not at all?

The amount of lead-contaminated soil brought on-site, from off-site, mixed with on-site remediation waste, and placed in an on-site landfill, would be reported in Part II, Section 5.5.1 and Section 8.1, but NOT Section 8.8. This is not remediation material, because it was not generated on-site, but merely brought on-site for treatment. The on-site remediation waste would be reported in Section 8.8. In addition, beginning with reporting year 1998, the *covered facility* would also consider this quantity towards its *otherwise use* threshold.

Releases, Releases to Land, Disposal, Off-site Transfer, Release Reporting, Waste Pile

541. A *covered facility* continually places material containing a *toxic chemical* on the land in a pile during a reporting year for *disposal*. The *facility* is intending to have the pile hauled off-site during the next reporting year. Must the *facility* report the listed *toxic chemical* in the pile as *released* to land for the reporting year in which it places the material in the pile?

Material that is added to a pile during a reporting year does not have to be reported, for that reporting year, as a reportable *release* to land on-site if the pile is used only for temporary storage. EPA will consider the pile used for temporary storage if the *facility* routinely made off-site transfers of material from the pile during that reporting year. The *facility* must transfer the *toxic chemical* off-site before that year's report is submitted or by July 1, whichever comes first.

If a *facility* did not make such routine transfers during a reporting year in which material was added to the pile, EPA will consider the pile used for *disposal* and the quantity of listed *toxic chemical* placed on the pile during that reporting year and present at the end of that year must be reported, as a *release* to land, regardless of the *facility*'s intention to transfer the material off-site in an ensuing year. If, in an ensuing year, such material is transferred off-site, the movement would be reported as a transfer off-site (assuming a threshold for the chemical transferred has been exceeded during that reporting year).

Temporary Storage, Documentation

542. A metal mine stockpiles waste rock during the reporting year and has plans to leach this waste rock in the following year. What type of documentation (if any) would EPA accept from the mine to show that the waste rock will be *processed,* and therefore not have to be reported as a *release* to land during the reporting year? For example, the *facility* may have drawn plans for the leaching pad, have contracts with a supplier for materials used to construct the pad, or have a permit modification for the leach pad but the start date is in March of the following year.

Waste rock containing *toxic chemicals* that is added to stockpiles during a reporting year does not have to be reported for that reporting year, as a reportable *release* to land on-site, if the stockpile was only used for temporary storage. EPA will consider the pile used for temporary storage if the *facility* routinely made off-site transfers or *processed* on-site waste rock from the stockpile during the reporting year, has good documentation of the transfers or amounts *processed*, or has contracts in place to transfer the materials prior to that year's reporting deadline, and removes or *processes* all of the listed *toxic chemicals* from the stockpile before that year's report is submitted or by July 1, whichever comes first. Listed *toxic chemicals* placed in piles during the previous year that remain after the July 1 reporting deadline must be considered toward the facility's *release* and other *waste management* calculations, provided that thresholds for those chemicals have been exceeded.

Waste Ash, Release to Land, Release Reporting

543. In January of a reporting year, *a covered facility* places ash containing 11,000 pounds of an EPCRA Section 313 listed *toxic chemical* into a landfill that already contains 3,000 pounds of a previously *disposed toxic chemical* for a total of 14,000 pounds in the landfill. In August of the same reporting year, the *facility* removes waste ash from the landfill which contains 5,000 pounds of the *toxic chemical* added in January and 3,000 pounds of the toxic chemical added during a previous reporting year. The removed waste ash (8,000 pounds of toxic chemical) is distributed in commerce for a beneficial reuse (e.g., they sell the waste ash, including the toxic chemical, for direct incorporation into concrete). How should the *facility* report *releases* of the toxic chemical for the reporting year?

Provided that the *facility* exceeded a threshold for the *toxic chemicals*, the *facility* should report a *release* of 6,000 pounds of the toxic chemical as landfilled on-site in Part II, Section 5.5.1B (*Disposal* to Land On-site) and as *release* in Section 8.1 (Quantity *Released*). Eight thousand pounds of the toxic chemical (i.e., 5,000 pounds deposited in January and the 3,000 pounds deposited in a prior reporting year) were *processed* and should be counted towards the *processing* threshold for the *facility* for the reporting year. EPA recognizes that by placing the toxic chemical into the landfill, the *facility* has

released the toxic chemical. Nevertheless, EPA will allow facilities to consider quantities that are temporarily stored in a landfill and removed during the same reporting year to not be reported as *release* in Part II, Sections 5 and 8.

Releases, Off-site Transfer, Direct Reuse

544. An iron/steel mill has 5 to 8 percent of a listed *toxic chemical* in their waste slag. The slag is shipped off-site where it is directly reused as cement material. One common use is for roadbed material under railroad tracks. Is the reuse as cement material reportable on the Form R as an off-site transfer?

The listed *toxic chemical* in the slag that is sent off-site for further use as cement material is not reported as an off-site transfer in Part II, Section 6.2 of the Form R. However, the facility must consider the quantities of *toxic chemical* repackaged and shipped off-site for reuse toward the facility's *processing* threshold.

Releases, Release Reporting, RCRA-empty, Off-site Transfer

545. A *covered facility* sends a 55-gallon drum containing less than one inch of a listed *toxic chemical* off site for *disposal*. For purposes of the RCRA hazardous waste regulations, the container is considered an empty container as defined in 40 CFR Section 261.7 (i.e., RCRA-empty). Must the *facility* report the listed *toxic chemical* contained in the RCRA-empty container as an off-site transfer for purposes of *disposal* on the Form R even though it is not considered to contain hazardous waste under RCRA?

Yes. The definition of an empty container pursuant to 40 CFR Section 261.7 does not apply to EPCRA Section 313. Even though the residue remaining in a container rendered RCRA-empty is no longer considered a hazardous waste under federal RCRA regulations, it is still considered a *toxic chemical* under EPCRA Section 313. The status of a listed *toxic chemical* as a nonhazardous waste under RCRA has no impact on the applicability of EPCRA regulations on that chemical.

Under EPCRA Section 329, the term *release* is defined as "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or *disposing* into the *environment* (including the abandonment or discarding of barrels, containers, and other closed receptacles) of any *toxic chemical*." In Part II, Section 8.1 of the Form R, EPA requires *facilities* to report all *releases* of listed *toxic chemicals*, except those quantities released to the *environment* as a result of remedial actions, catastrophic events, or one-time events not associated with production processes. *Disposal* of a RCRA-empty container which contains any amount of a listed *toxic chemical* is generally reportable in Section 8.1 when transferred from or *disposed* at an EPCRA Section 313 *covered facility*. If, however, the *facility* has total reportable amounts of the chemical not

exceeding 500 pounds, it may be eligible for the higher alternate reporting threshold in 40 CFR Section 327.27.

Releases, Otherwise Use, Release to Land, Land Treatment, Nitrate Compounds

546. Are *toxic chemicals*, such as nitrate compounds from waste treatment systems, that are used for farming at a *facility* to be reported as a *release* to land and is this an *otherwise use* activity?

The use of listed *toxic chemicals* such as nitrate compounds for farming is to be reported as a *release* to land under EPCRA Section 313. Listed *toxic chemicals* applied to land during use for farming constitute a *release* to an environmental medium (land) and are to be reported as such. This is consistent with the instructions for Section 5.5 of the Form R which state that land treatment/application farming is a *disposal* method that is considered a "*release* to land." Thus, whether or not this use is intended to be a *disposal* method, the total quantity *released* to land during use for farming should be reported as a *release* to land under Section 5.5.2 of the Form R. The amount of a listed *toxic chemical* used for farming at a *covered facility* must also to be applied towards the *otherwise use* reporting threshold.

Releases, Off-site Transfer

547. A *covered facility* sends many solvent wastes off-site for recycling. However, the receiving *facility* may incinerate some solvents instead. This depends on the disposer, and the generator is always notified. Is it acceptable to report this as a transfer to a waste broker (recycling) (M93)?

When reporting off-site transfers of waste in Part II, Section 6.2 of the Form R, it is acceptable to enter M93 in Section 6.2.C only if you do not know the final disposition of the listed *toxic chemical*. A reporting *facility* must also identify whether the listed *toxic chemical* was sent off-site for treatment, energy recovery or recycling in Part II, Section 8 of the Form R.

Releases, Point Source Air Emissions, De Minimis Exemption

548. If a *covered facility processes* steel and *releases* chromium up the stack, do they have to report?

Yes, if the chromium content in the steel exceeds de minimis concentration levels and the reporting threshold is met, the *facility* is required to report under EPCRA Section 313 for chromium.

Releases, Article Exemption, Release Reporting

549. A *covered facility* builds and repairs ships. During its welding operations, the *facility* uses a filler material to bind steel plates. This welding operation *releases* minor quantities of a *toxic chemical*. How are estimates of *toxic chemical releases* to be made?

If *releases* of the *toxic chemical* from the steel plate *processing* are recycled or reused or if the total amount released is 0.5 pound or less for the reporting year, then the *releases* are exempt from reporting under the *article* exemption.

If the *article* exemption does not apply, the *covered facility* must include *releases* from the welding operation if thresholds are exceeded. EPA has developed tables to be used in estimating *releases* of metal in fumes for various types of welding and one for cutting mild steel. These tables can be found in Clarification and Guidance for the Metal Fabrication Industry (1998 version).

Releases, Point Source Air Emissions, Recycle, Phosphoric Acid

550. During the *manufacture* of phosphoric acid, traces of the listed *toxic chemical* are pumped along with solid material to gypsum stacks. The phosphoric acid percolates through the stack slowly and is recirculated back to the manufacturing process. Is the manufacturer required to report the presence of the chemical in the gypsum stacks as a *release*?

EPA considers this to be a recirculation of the process water. The *facility* is not required to report the presence of the chemical in a process water recirculation system as a *release*. If process water containing the *toxic chemical* escapes the recirculation system and enters the *environment*, then it would be necessary to report such *releases* of the chemical.

Releases, Release Reporting, Underground Injection, Permits, UIC

551. Should only underground injections that are covered by Underground Injection Control Wells (UIC) permits be reported?

Covered facilities must report all underground injection of *toxic chemicals* regardless of permit status.

Releases, Release Reporting, Reuse

552. A *covered facility manufactures* a listed *toxic chemical* in a reactor. Attached to the reactor is a water cooled condenser, the function of which is to condense escaping unreacted starting material and reaction solvent (e.g., toluene) and to return it directly to the reactor. The *facility* used a threshold amount of toluene during the calender year and must file a Form R for toluene. How would the *facility* report the above activity on the Form R?

The amount of the *toxic chemical manufactured* would be considered toward the *facility's* chemical activity threshold. However, in this situation, the listed *toxic chemical* does not undergo any recovery steps, it merely changes physical *state* and is directly reused. Processes that directly reuse a listed *toxic chemical* on-site are not reported on the Form R as recycled in Part II, Section 8.6.

Releases, Air Emissions, Storage, Mixture

553. For estimating air emissions of specific chemicals from floating roof tanks that contain *mixtures*, how does one calculate the average vapor molecular weight and true vapor pressure to use in AP-42 equations? Does one calculate emissions for the *mixture* then adjust by weight percentage later or vice versa?

Covered facilities should calculate emissions of the *mixture* then adjust for concentration. Convert chemical fractions from weight to mole, calculate the *mixture*'s true vapor pressure, calculate the chemical's vapor mole fraction, calculate the average vapor molecular weight, and use storage tank equations to calculate *mixture* emissions. Then calculate the gaseous weight fraction and multiply by total *mixture* emissions to get each chemical's emissions. *Facilities* may choose to refer to EPA's technical guidance entitled Estimating Releases and Waste Treatment Efficiencies (1999 version)

B. Transfers to Off-site Locations for Further Waste Management

Off-site Transfer, Waste Broker, Recycle

554. How should a *covered facility* report a transfer in which it sends wastes containing a *toxic chemical* off-site to a waste broker who in turn sends the wastes to a recycling *facility*?

Covered facilities are required to report information on off-site transfers for purposes of recycling in both Sections 6 and 8 of the Form R. In Section 6, the *facility* should report the final disposition of which it has knowledge of the *toxic chemical* in the waste. When a *facility* knows that a *toxic chemical* in wastes sent to a broker is ultimately being recycled, but does not know the location of the recycler, the waste broker is considered the final destination, and the transfer should be reported as M93 (transfer to waste broker-recycling) along with the location of the waste broker. If the location of the recycler to whom the broker sends wastes containing the *toxic chemical* is known, the recycler is considered the final destination, and the transfer should be reported as recycling with the appropriate code. The location of the recycler, not the waste broker, should be reported. The *facility* would also report the amount of the listed *toxic chemical* sent off-site for recycling in Section 8.5 (Quantity Recycled Off-Site).

Off-site Transfer

555. The Form R instructions require the listing of different types of on-site waste treatment for a particular wastestream. Does this apply to sequential treatment of a *toxic chemical* sent off-site? Should the same estimate for amount sent off-site be entered for both waste treatment steps or just the final treatment step?

The reporting *facility* is not required to list sequential waste treatment steps for waste sent off-site. The *facility* should report in Part II, Section 6.2 the one code that best describes the primary type of *waste management* activity occurring within the sequence and report the total quantity of the listed *toxic chemical* sent to this off-site location.

Fertilizer, Off-site Disposal, Land Treatment

556. If Facility A transfers a *toxic chemical* in waste off-site to another *facility* who applies the waste to land for treatment, must Facility A report the amount sent off-site on the Form R? Should Facility A also report volatilization of the toxic chemical, that occurs off-site during application to land, as a fugitive air release, in Part II, Section 5.1?

Facility A must report the amount of *toxic chemical* in waste sent off-site for *disposal* as an off-site transfer for *disposal*. The *facility* should report this amount in Part II, Section 6.2, using *disposal* code M73, and in Section 8.1. The *facility* should not report the amount *released* to air during off-site application to land, since this activity did not occur on-site. In Part II, Section 5.1, *facilities* should only report amounts of *toxic chemicals* that are *released* on-site.

Off-site Transfer, Ultimate Disposition, Residue, Recycle

557. A residue of a listed *toxic chemical* is present in empty drums that are sent to an off-site *facility* where the drums are recycled, but the listed *toxic chemical* is not recycled. The *facility* has no information as to how the listed *toxic chemical* in the drum is managed. How should the *facility* report this activity?

Though the drums are recycled, the final disposition of the *toxic chemical* is unknown. Because this *facility* does not know how the *toxic chemical* is managed, the *toxic chemical* should be reported as an unknown *disposal*, code M99 (Unknown *Disposal*) in Part II, Section 6.2.C and quantity *released* in Section 8.1.

Off-site Transfer, Residue

558. A *covered facility* receives listed *toxic chemicals* in a tank car. Once emptied, the car remains at the *facility* for a period of time before being returned to the supplier. Does the residue in the tank car that leaves the *facility* have to be counted as an off-site transfer for Section 313?

If the *facility* knows the car will be refilled, the residue is not counted as an off-site transfer. If the *facility* knows it will be cleaned out and the quantity *disposed* or otherwise managed as waste, it must be counted as an off-site transfer for *disposal*.

Off-site Transfer, Recycle

559. If a waste is sent to an off-site *facility* to be recycled or reclaimed, does the material meet the requirements for being recycled or reclaimed for the purposes of Section 313 regardless of what the off-site recycling *facility* actually does with the waste?

In order to report the listed *toxic chemical* as recycled off-site, the reporting *facility* must have positive knowledge that the listed *toxic chemical* being reported is actually being recycled by the off-site *facility*.

Fertilizer, Product, Direct Reuse

560. Facility A produces a byproduct containing a *toxic chemical*. The *facility* gives some of the byproduct away, and sells some of the byproduct. In both cases, the off-site *facility* uses the byproduct as fertilizer for farming. Should Facility A report the amount of toxic chemical in the byproduct given away or sold, on the Form R?

If the toxic chemical in the byproduct is sent off-site to be directly reused as a fertilizer, then the transfer would not be considered a transfer off-site for *waste management* purposes, and Facility A would not report, as a transfer off-site for *waste management*, the amount sold/given away. However, because the *facility* distributed the toxic chemical into commerce, the *facility* must consider the quantity of toxic chemical shipped off-site for direct reuse (i.e., both the amounts given away and sold) as fertilizer as *processed* for threshold determinations.

Off-site Transfer, POTW, Release to Water

561. A *covered facility* treated its wastewater on-site and discharged it to a pipe which runs through a POTW and then on to a stream. The POTW does not treat the waste but it monitors the wastewater and allows it to pass into the stream if it meets treatment standards. If it does not meet standards, the POTW shuts a valve in the pipe and the wastewater is *released* to a water body under the POTW's NPDES permit. How should the wastewater be listed on the Form R?

The *facility* should consider the wastewater as a transfer off-site to the POTW since the POTW is ultimately responsible for the *release*. The POTW has the authority to allow or prevent that *release* and it enters the stream under their NPDES permit. Because the *covered facility* knows that the POTW does not treat (destroy) the listed *toxic chemical* but allows it to pass through into the stream, the *facility* should also report the quantity sent off-site in Part II, Section 8.1 (Quantity Released).

Off-site Transfer, Threshold Determination, Recycle

562. How should a *covered facility* treat a toxic chemical in a solvent sent off-site for distillation and returned to the *facility* for reuse?

The amount of a *toxic chemical* in the solvent sent to another *facility* for distillation is reported as a transfer of the *toxic chemical* to an off-site location for recycling (i.e., it should be reported in Part II, Sections 6.2 and 8.5 of the Form R). The quantity of the solvent returned to you must be treated as if it were a quantity of the *toxic chemical* purchased from any other supplier and must be used for threshold determination.

Activity Threshold, Off-site Transfer, Energy Recovery

563. A TSD *facility* receives waste from off site containing a listed *toxic chemical*, blends the waste with a fuel to increase its heat value, repackages the blended fuel in different container(s), and then transfers the waste off site to a cement kiln that burns the waste. Is this *facility manufacturing*, *processing*, or *otherwise using* the *toxic chemical* contained in this waste received from off site for the purposes of further *waste management*?

No. The repackaging and subsequent transfer off-site of EPCRA Section 313 *toxic chemicals* in waste fuel for burning for energy recovery is not, in itself, a covered *manufacturing*, *processing*, or *otherwise use* threshold activity as those terms are defined in the EPCRA Section 313 regulations (40 CFR Part 372). Therefore, *covered facilities* are not required to consider the repackaging and subsequent transfer off-site of *toxic chemicals* for energy recovery to any type of *boiler* or *industrial furnace* (as defined in 40 CFR Section 372.3) toward threshold calculations. Similarly, *toxic chemicals* in waste that are repackaged and sent off-site for *disposal* or for *treatment for destruction* would likewise not be considered toward a *facility*'s *manufacturing*, *processing*, or *otherwise use* threshold determination. *Covered facilities* should keep in mind, however, that if they exceed an activity threshold elsewhere at the *facility* for the listed chemical contained in the waste fuel, the *facility* should report the quantity of the *toxic chemical* in the waste fuel sent off-site for energy recovery in Part II, Section 6.2 and Section 8 of the Form R.

RELEASE/WASTE MANAGEMENT

Off-site Transfer

564. A covered printer uses solvent to clean presses and sends soiled rags to a launderer. Is the listed *toxic chemical* in the material sent to the launderer considered waste transferred to an off-site location? Which *disposal* code should be used?

The material sent to the launderer is considered an off-site transfer. The *facility* could use code M90 (Other Off-site Management) or M99 (Unknown Disposal) in Part II, Section 6.2.C of the Form R if it does not know the final disposition of the *toxic chemical* in the rags.

Off-site Transfer, Part II Section 6.2, Waste Broker, RCRA ID Number

565. A *covered facility* sends waste off-site to another *facility*. During the reporting year, the off-site transfer *facility* is bought by another company. The off-site transfer *facility* name changes but the RCRA identification number and *facility* address remains the same. What name should be reported as the off-site transfer *facility*?

The *facility* should give the name of the off-site transfer *facility* as it was known on December 31 of the reporting year; that information being the most accurate and up-to-date information known.

Off-site Transfer, RCRA ID Number, Landfill

566. What RCRA identification number does a *facility* list if it sends a non-hazardous waste containing a Section 313 *toxic chemical* to a solid waste landfill?

If an off-site location such as a solid waste landfill does not have a RCRA identification number, the *facility* would enter "NA" in the space provided. If the *facility* does have such a RCRA identification number, it must list the number, if known, even though the waste being transferred may not be a regulated RCRA hazardous waste.

Off-site Transfer, Release Reporting, Part II Section 6.2

567. A *covered facility* produces 200,000 pounds of a listed *toxic chemical* in waste annually. Of that amount, the *facility* treats 100,000 pounds on-site and sends 100,000 pounds to an off-site treatment plant that has a 99.9 percent efficiency. Can the *facility* factor in the efficiency when it reports the off-site transfer amount in Part II, Section 6.2 of the Form R?

Section 6.2 of the Form R requires you to report the actual amount of listed *toxic chemical* you send off-site. The efficiency would be taken into account by the off-site *facility* if they are reporting under Section 313. The 100,000 pounds of the *toxic chemical* that are treated on-site should be reported in Part II, Section 7A and in Section 8.

Off-site Transfer, Fuel Blending, Heat Value, Energy Recovery, Metals, Ultimate Disposition

568. A *covered facility* sends a *toxic chemical* in a paint thinner waste to a firm for fuel blending purposes. Should the amount of toluene and xylene in the waste be reported on the Form R, Part II, Section 6 as a transfer off-site?

A *toxic chemical* in a wastestream sent off-site for waste fuel blending is considered combusted for energy recovery if the listed *toxic chemical* has a significant heat value and is combusted in an energy recovery device. EPA believes that waste blended into fuel will be combusted in an integrated energy recovery device. Where both elements are met, the quantity of the *toxic chemical* must be reported as an off-site transfer for purposes of energy recovery on the Form R. However, other reportable *toxic chemicals* in the waste (e.g., metal pigments) that are incombustible or that do not add significant heat value to energy recovery upon combustion must be reported as off-site transfers for purposes of waste treatment or *disposal*, as appropriate. Please note that metals cannot be treated or combusted for energy recovery purposes and, therefore, should be reported as *disposed* in Section 8 of the Form R, unless the *facility* has knowledge the metals are being recycled.

Energy Recovery, Electricity Generating Facility, Coal Tar

569. Do EGFs that burn coal tar with their coal/oil report this amount in Part II, Section 8 of the Form R as energy recovery?

No. While coal tar is a by-product of destructive distillation in the production of coke, it is not a waste. Therefore, EPA would not interpret its combustion to be a *waste management* activity and it would not be reportable in Section 8 of the Form R

Off-site Transfer, Facility

570. A petrochemical company generates a wastestream which contains a *toxic chemical*. The wastestream is treated at a treatment plant that is located within the boundaries of the petrochemical *facility*. The treatment plant is neither owned nor operated by the petrochemical company. An agreement has been made between the petrochemical company and the treatment plant that the petrochemical company is responsible for *disposal* of the sludge generated by the treatment plant (e.g., by transferring the sludge to a landfill). The treatment plant has a NPDES permit and the remaining waste is discharged to a receiving stream. (In other words, some of the listed *toxic chemical* sent to the treatment plant returns to the petrochemical plant in sludge and is subsequently sent to an off-site landfill. The remainder of the listed *toxic chemical*, which does not return to the petrochemical plant in sludge, is sent directly to a receiving stream). How should the petrochemical plant report these off-site transfers of *toxic chemicals* in wastes? Should the petrochemical plant report the treatment occurring at the treatment plant in Part II, Section 7A (Waste Treatment Methods and Efficiencies) of the Form R?

Even though the treatment plant is located within the boundaries of the petrochemical plant, it is neither owned nor operated by the same person as the petrochemical plant. Therefore, the treatment plant and the petrochemical plant are separate *facilities*. Since the petrochemical plant does not directly treat the waste, it is not responsible for filling out Part II, Section 7A (Waste Treatment Methods and Efficiencies), on its Form R for the *toxic chemical*.

The petrochemical plant reports only two off-site transfers: (1) the total amount of *toxic chemical* that is sent to the treatment plant (along with the name and address of the treatment plant); and (2) the amount of listed *toxic chemical* that is sent to a landfill in sludge (along with the name and address of the landfill). This can be interpreted as reporting a portion of the *toxic chemical* twice, but since the treatment plant is a separate *facility*, the total amount sent to the treatment plant has to be reported as an off-site transfer. The petrochemical plant does not need to report the receiving stream since the waste is not discharged directly from the petrochemical plant to the receiving stream.

Reporting Criteria, Threshold Determination

571. Who is responsible for EPCRA Section 313 reporting if a covered solvent recovery service arrives at a *covered facility* and either recycles ethylene glycol antifreeze on-site with a mobile recovery unit or removes the ethylene glycol antifreeze for off-site recycling?

All *covered facilities* are responsible for EPCRA Section 313 reporting obligations of the *toxic chemical* while the *toxic chemical* is at a *facility*, including while the chemical is in an on-site mobile recovery unit. Although this *facility* may not directly operate the mobile solvent recovery unit, the *facility* controls the unit's operations while on-site because it has contracted or paid a fee for the unit's services. Therefore, if the mobile unit recovers *toxic chemicals* from the solvents on-site the *facility* would include those *toxic chemicals* in its *facility*-wide *release* and other *waste management* calculations.

If the mobile solvent recovery unit removes *toxic chemicals* from the *facility* for off-site recycling, the *facility* would report the amount of the chemicals sent off-site as an off-site transfer for recycling. However, the *facility* must account for any *releases* of the toxic chemical from the unit while it remains on site. Finally, those *toxic chemicals* that are transferred off-site are considered *processed* and therefore, must be applied toward the *facility*'s *processing* threshold.

pH, Off-site Transfer, Neutralization, Off-site Landfill, Acids

572. A *covered facility* generates a wastestream in the form of a filter press cake that contains nitric acid, a *toxic chemical*. Before the filter cake is sent to an off-site landfill for *disposal*, the nitric acid in the filter cake is neutralized to pH 7. How should the *facility* report the *disposal* of this nitric acid on its Form R?

Because the nitric acid is neutralized to a pH 6 or above during on-site treatment, no nitric acid is present in the filter cake sent off-site for *disposal*. Therefore, the off-site transfer would not be reported in the Form R for nitric acid. The on-site waste treatment of the nitric acid must be reported in Part II, Section 7A (On-Site Waste Treatment Methods and Efficiency) and in Section 8.6 (Quantity Treated On-Site). In addition, the *facility* must determine if the neutralization of the nitric acid in the filter cake results in the *manufacture* of a water dissociable nitrate compound category in an aqueous solution, which is a listed category under EPCRA Section 313.

C. Waste Treatment Methods and Efficiency

Waste Treatment, Part II Section 7A

573. Does Section 7A (On-Site Waste Treatment Methods and Efficiency), of the Form R apply only to the *facility* completing the report?

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Yes, this Section of the Form R applies only to the treatment of wastestreams containing *toxic chemicals* that occur on-site at the reporting *facility*.

Waste Treatment, Part II Section 7A

574. Where multiple sources are combined for waste treatment, should each source be listed in the Part II, Section 7 of the Form R with a common efficiency, or should only the combined wastestream be shown?

Report only the combined (or aggregate) wastestream and report the treatment and its efficiency. However, a wastestream that is treated before combination with other wastes, which are then subsequently treated, should be reported on a separate line.

Waste Treatment, Sequential Process, Influent Concentra-tion, Part II Section 7A

575. A *covered facility* has a sequential waste treatment process in which the influent concentration and treatment efficiency for each step is known. How should they report in Section 7A of the Form R?

The *facility* should report influent concentration for the first step and report overall treatment efficiency for the entire process as per the Form R instructions.

Waste Treatment, Sequential Process, Part II Section 7A

576. If a wastewater treatment system contains an oil skimmer or other phase separation treatment, is this reported as a sequential waste treatment step for each of the separated phases, or just for one phase?

The separation step is a sequential waste treatment step for one liquid phase (the one with the larger volume, typically the water phase). The other phase must be considered a new wastestream and must be listed separately on the form if treated subsequent to its separation.

Waste Treatment, Acids, pH, Complete Neutralization

577. We send our sludge to a biological treatment device on-site. The microbes in the system exist in buffered solution. As a result, the *toxic chemical* (a mineral acid) in the sludge is neutralized (pH 7.3). How do I account for biological and neutralization treatment in one process in Part II, Section 7A of the Form R? After that, the waste goes to settling ponds where solids settle out. Is this also a sequential treatment step?

First, list the biological treatment, even though it does nothing to the *toxic chemical*, and then enter the neutralization treatment, which has a 100 percent efficiency since pH 7.3 is considered complete neutralization for an acid. As for the settling ponds, the *toxic chemical* ceased to exist upon complete neutralization, so this step does not need to be included in Part II, Section 7A of the Form R for the mineral acid. However, any coincidental *manufacture* of *toxic chemicals* during this process should be considered towards the *manufacturing* threshold determination.

Waste Treatment, Treatment for Destruction, Incineration, Treatment Efficiency

578. A *covered facility* has a liquid wastestream containing a *toxic chemical* which is incinerated. The incineration destroys 99.9 percent of the chemical. However, 0.1 percent is *released* to air. Does the *facility* need to report this wastestream in the waste treatment Section of the Form R?

If the threshold is met, the *facility* must report this liquid wastestream as *treated for destruction* in Part II, Section 7 of the Form R. The listed *toxic chemical* remaining after incineration in the gaseous wastestream must be reported as stack or point source air emissions in Part II, Section 5.2 of the Form R. The amount of the listed *toxic chemical* destroyed is also reported in Part II, Section 8.6 of the Form R, and the stack or point source air emissions are also reported in Part II, Section 8.1 of the Form R.

Waste Treatment, Treatment for Destruction, Facility Maintenance Exemption, Composting, Landfill Cover

579. On-site wastewater treatment plant sludges which may contain trace amounts of Section 313 *toxic chemicals* are composted on-site on concrete pads. The finished compost is then used as daily cover for the on-site sanitary landfill and for landscaping around the site. Is this considered land treatment, land impoundment, or not a *release*?

Some listed *toxic chemicals* in the composted material may degrade such that the chemical is *treated for destruction* in the compost. In those cases, the listed *toxic chemical* should be reported as treated on-site (in Part II, Sections 7A (On-site Waste Treatment and Efficiencies) and 8.6 (Quantity Treated On-site)). If the listed *toxic chemical* is not destroyed, the amounts applied to the on-site sanitary landfill as cover should be reported in Part II, Section 5.5.1B (Other Landfills) and in Section 8.1 (Quantity Released) on the Form R. Although any quantities used as landfill cover would not be exempt from reporting, the amount used for landscaping on-site is exempt under the *facility* grounds maintenance exemption (40 CFR Section 372.38(c)(2)).

Nitrate Compounds, Release to Land, Waste Treatment, Recycle, Chemical Conversion

580. Are *toxic chemicals*, such as nitrate compounds, that are used as fertilizer for growing crops considered to be recycled or treated since they are taken up by the crops and recirculated back into the *environment*? Can a *covered facility* reduce the amount of *toxic chemicals* reported as *released* to land by the amount the crops take up?

Although during such use nitrate compounds or other *toxic chemicals* may be taken up by plants and cycled back into the ecosystem, such use is not considered treatment or recycling under EPCRA Section 313. The *toxic chemicals* are reported as *released* to land on the Form R. EPA does not allow *facilities* to reduce the quantity reported as *released* to the *environment* based on conversions of a chemical in the *environment* after the chemical has been *released* by the *facility*.

Waste Treatment, Acids, Neutralization

581. We have two wastestreams, one containing "an unlisted caustic material" and the other phosphoric acid, that are combined for neutralization. The combined wastestream then stays in the settling pond until the solid settles out. The water is sent to a POTW, the solid to a landfill. How should we report on these *toxic chemicals*? When does a *toxic chemical* cease to exist by neutralization?

Neutralization is the treatment method for phosphoric acid. If the pH is 6 or above then the efficiency is 100 percent (i.e., no phosphoric acid is *released*) and no off-site transfer should be reported. If the waste is acidic, (i.e., pH below 6) report the transfer of phosphoric acid sent off-site and calculate efficiency from the input and the remaining acid.

Waste Treatment, Acids, Neutralization

582. If a covered acid, such as phosphoric acid, is spilled onto a concrete pad and immediately neutralized with a base. How is this reported on the Form R? How would the spill be reported if it were spilled directly on the land and neutralized?

If the acid spilled on the concrete pad is 100 percent neutralized, the *facility* would only report any non-neutralized air *releases* of the *toxic chemical* in Part II, Sections 5 and 8 on the Form R. If the spill were *released* directly to land before being neutralized, only the amount of the chemical that seeped into the land (i.e., not neutralized) and any air *releases* occurring as a result of the spill would be reported in Part II, Sections 5 and 8 on the form. Note that if the spill is considered a one time, non-routine event, the entire amount spilled (that is not neutralized) should be reported in Part II, Section 8.8 of the Form R.

Waste Treatment, Release Reporting, Auxiliary Scrubber

583. How is an auxiliary scrubber that is designed and used only to mitigate emergency *releases* reported?

The influent concentration and treatment efficiency of the scrubber as it operates during an emergency event should be reported. The emergency scrubber is not considered to be sequential treatment with a scrubber which treats routine emissions from the same process, unless the two units function in series on a single waste system.

Waste Treatment, Release Reporting, Metal Compounds, Influent Concentra-tion, Metals

584. In Part II, Section 7A of the Form R, should *covered facilities* report the influent concentration to a treatment system for metal compounds in a wastestream for the parent metal only? How do I consider treatment efficiencies for metal compounds?

For metal compounds, the calculation of the reportable concentration and waste treatment efficiency must be based on the weight of the parent metal, not on the weight of the metal compounds. Metals are not destroyed, only physically removed or chemically converted from one form to another. The

waste treatment efficiency reported must represent only the physical removal from the wastestream (except for incineration) not the percent conversion from one form to another. If a listed waste treatment method converts but does not remove a metal (e.g., chrome reduction), the method must be reported with a waste treatment efficiency of zero.

Waste Treatment, Part II Section 7A, Treatment Efficiency, Best Available Information

585. A wastestream containing glycol ethers is sent through several treatment steps, none of which are specifically intended to remove the glycol ethers. During the settling process, some of the glycol ethers present in the wastestream unintentionally evaporate into the ambient air. Should the *facility* owner or operator report the glycol ether as being treated and, if so, what waste treatment efficiency estimate is reported?

Any *releases* of a *toxic chemical*, even during treatment, must be estimated and reported in Part II, Section 5 of the Form R. Part II, Section 7 of the Form R must be completed if a wastestream containing the glycol ethers is treated, regardless of whether the treatment methods actually remove the glycol ethers. If, for whatever reason, glycol ethers are removed during the treatment of a wastestream, the owner or operator should use the best readily available information to determine how much of the glycol ethers are removed during the treatment process and use this information to estimate a "treatment efficiency" for the *toxic chemical*.

Waste Treatment, Storage Tanks, Air Emissions, Part II Section 7A

586. A *covered facility* owner or operator has a conservation vent on a bulk storage tank. The conservation vent prevents emissions from the tank during material loading, unloading, and storage. Should this conservation vent be listed in Part II, Section 7A of the Form R as a waste treatment method since it is reducing the *toxic chemical* emissions from the tank?

No. Part II, Section 7 of the Form R is only for the description of waste treatments that occur on-site. In the above scenario, the conservation vent functions as a preventive device. The conservation vent does not function as a waste treatment step. (Another example of a preventative device is a floating roof storage tank, the function of which would not be considered waste treatment).

D. Waste Management

Activity Threshold, Waste Management Activities

587. If a *covered facility* counts the amount of a listed *toxic chemical* towards an activity threshold, is it automatically exempted from reporting this amount as undergoing a *waste management* activity on the Form R?

No. If, for example, a *facility* combusts a *toxic chemical* in a waste for energy recovery, the owner or operator would consider the amount combusted for energy recovery towards the *otherwise use* threshold. If the *facility* exceeds a

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threshold for this chemical, the owner or operator would also report the method and amount of energy recovery in Part II, Sections 7 and 8 on the Form R

Waste Management Activities, Recycle, Reuse, Metals

588. If a *covered facility* sends metal scraps containing chromium off-site to be remelted and subsequently reused, does it report the amount of *toxic chemical* in the metal as recycled off-site?

Assuming no contaminants are removed during the melting process, the chromium in the metal scraps is not actually being recovered but merely melted and reused. Therefore, the amount of the *toxic chemical* in the metal scraps would not be reportable in Part II, Sections 6.2 or 8 of the Form R. However, because the *facility* is repackaging and distributing the *toxic chemicals* in commerce, it should consider these amounts of the *toxic chemical* towards the *facility*'s *processing* threshold. If the *covered facility* exceeds a chemical activity threshold, it is required to file a TRI Report for that chemical.

PACs, Energy Recovery

589. EPCRA Section 313 listed polyaromatic compounds (PACs) are used as binders for coke in carbon anodes. The anodes are baked in a ring furnace and the PACs are combusted. The heating value of the PACs allow for a reduction in the use of natural gas. Should the amount of PACs combusted be reported as burned for energy recovery on the Form R?

In this scenario, EPCRA Section 313 chemicals are being burned in the process, not in a *waste management* activity. *Toxic chemicals* reported as *released* or otherwise managed as waste on the Form R, including quantities reported for energy recovery, should not include chemicals consumed during processing activities. Therefore, the PACs combusted as part of the process in a ring furnace, should not be included as combusted for energy recovery under EPCRA Section 313. These quantities should, however, be considered when making the *facility's otherwise use* threshold.

Waste Management Activities, Release Reporting, Waste Treatment, POTW, Metals, Part II Section 8

590. If I send ten pounds of chromium (or any metal) to a POTW or other wastewater treatment *facility* where should I report the ten pounds in Section 8 of the Form R?

Because metals cannot be destroyed, they should not be reported as treated in Part II, Section 8.6 or 8.7 of the Form R. If you do not know what the POTW does with the metal constituents they receive, you should assume they are *released* and report the ten pounds sent to a POTW in Part II, Section 8.1 on the Form R.

Waste Management Activities, Waste Treatment, Source Reduction, Part II Section 8.10

591. Would RCRA permitted incineration of a listed *toxic chemical* count as a source reduction activity under Part II, Section 8.10 of the Form R?

Section 8.10 of the Form R is for reporting actions or techniques that prevent a *toxic chemical* from becoming a waste to be disposed, treated, combusted for energy recovery, or recycled. Incineration is considered waste treatment (assuming there is no energy recovery) and is reportable under Part II, Sections 6.2.C or 7A, as well as Section 8.6 or 8.7, depending on whether it is performed on- or off-site. It should not, however, be reported as a source reduction activity in Part II, Section 8.10.

Waste Management Activities, Release Reporting, Remediation, Part II Section 8.8

592. Is dredging a lagoon (or surface impoundment) containing a *toxic chemical* once every five years (routine procedure) considered a remedial action under the Pollution Prevention Act? If so, how should *releases* from the dredging be reported in Section 8.8 of the Form R?

Because the dredging of the lagoon (or surface impoundment) occurs routinely every five years, it is not considered a remedial action under the Pollution Prevention Act, and accordingly, *releases* from the dredging should not be reported as *releases* from remedial actions. Instead, *releases* and other *waste management* quantities of the *toxic chemical* resulting from dredging would be reported in Sections 5 or 6 and in Section 8 of the Form R, depending on the ultimate disposition of the chemical.

Waste Management Activities, Production Ratio, Activity Index, Batch Processor, Part II Section 8.9

593. For the purposes of reporting in Part II, Section 8.9 of the Form R, a *facility* must provide a ratio of the reporting year production to prior year production, or provide an activity index based on a variable other than production that is the primary influence on the quantity of the reported *toxic chemical* recycled, combusted for energy recovery, treated, or *released* (including *disposed*). How should one-time or batch processors determine an activity index or production ratio for reporting in Section 8.9 of the Form R?

A one-time processor in its first year of using a listed *toxic chemical* should report "NA" in Section 8.9 of the Form R. If a one-time processor uses a *toxic chemical* on a yearly basis but in different products, applications, and quantities, then a production ratio based on production or application involving the *toxic chemical* should be calculated as follows: production involving the *toxic chemical* in the current year divided by production involving the *toxic chemical* in the prior year.

Batch processors should calculate a ratio based on campaigns involving the *toxic chemical* from year to year as follows: campaign production in the current year divided by the campaign production in the prior year.

Production Ratio, Activity Index, Part II Section 8.9

594. Can a *covered facility* within the seven newly added industry sectors report "NA" in Part II, Section 8.9 (Production Ratio or Activity Index) of the Form R, for reporting year 1998?

For reporting year 1998 only, *facilities* in the seven newly added industries may use "NA" in Part II, Section 8.9 (Production Ratio or Activity Index) of the Form R. In future years, these newly added *facilities* may only use "NA" in this section if the reported toxic chemical was not *manufactured, processed* or *otherwise used* in the year prior to the reporting year. All other *facilities* covered by EPCRA Section 313 may only use "NA" for the 1998 reporting year, and all future years, if the reported toxic chemical was not *manufactured*, *processed* or *otherwise used* in the year prior to the reporting year.

NA, Part II Section 8A

595. Are *covered facilities* in one of the seven newly added industry sectors required to provide an estimate in column A, Section 8 (Prior Year Estimate) of the Form R in reporting year 1998?

No. For reporting year 1998 only, *covered facilities* in one of the seven newly added industry sectors are not required to provide an estimate for the prior year in column A, Section 8 of the Form R. However, if the *facility* has information to develop an estimate, then reporting the estimate may provide valuable information that may clarify the *facility's* yearly estimates.

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Waste Management Activities, Source Reduction, Economic Reasons

596. If a *covered facility* modifies a process for economic reasons resulting in a waste reduction, should this be reported as source reduction?

Yes. Any changes that result in less of the listed *toxic chemical* being generated in waste may be included. Codes are provided to identify changes such as equipment and technology modifications, as well as process changes, procedure modifications, and improved housekeeping.

Waste Management Activities, NA vs. 0, Part II Section 8.8, Catastrophic One-Time Event

597. On the Form R, a *covered facility* owner/operator must provide information about routine and non-routine *releases* for each reported *toxic chemical*. Specifically, in Part II, Section 8.8, an owner/operator must report the quantity of any *release* of a *toxic chemical* into the *environment* or transferred off-site as a result of a remedial action, catastrophic event, or one-time event not associated with production processes. If the *facility* did not experience any such *release* or transfer, must the owner/operator report zero, or may the owner/operator report NA" in Section 8.8?

While either notation, NA or zero, may be entered in Part II, Section 8.8 of the Form R, they are not synonymous. If a remedial action, catastrophic event, or one-time event not associated with production processes results in a

release into the *environment* or an off-site transfer of the listed *toxic chemical* and the annual aggregate *release* was less than 0.5 pound, then a *facility* owner/operator should enter zero in Section 8.8. An owner/operator should only report NA for Section 8.8 on the Form R if no *release* or transfer occurred as a result of these activities.

Release Reporting, Catastrophic One-Time Event, Part II Section 8.8

598. Are *releases* due to a pipe rupture that was caused by premature failure of the pipe (no direct cause known) considered a catastrophic *release* and reportable in Part II, Section 8.8?

Releases reported in Part II, Section 8.8 of the Form R should be the result of a remedial action, a catastrophic event or a one time release not associated with normal or routine production processes. In general, pipes have an expected lifespan. If a pipe ruptures during its expected lifespan for no known reason, the *release* should be considered a one-time *release* not associated with normal or routine production processes and should be reported in Section 8.8. However, if the pipe bursts because it was in use after its expected lifespan, it should not be considered a one-time *release* because it should have been replaced.

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Section 5. FORM A AND FORM R SUBMISSIONS

A. Form A (Alternate Threshold Reporting)

Form A Criteria

599. EPA published a final rule in the Federal Register on November 30, 1994 (59 FR 61488), which created an alternate threshold of one million pounds for certain *facilities*. How can a *facility* that exceeds one of the original thresholds qualify for the alternate threshold?

Facilities which have a *total annual reportable amount* of no greater than 500 pounds for a listed *toxic chemical* may qualify for the 1 million pound alternate threshold for that chemical, beginning with the 1995 reporting year. For purposes of the alternate threshold, the *total annual reportable amount* includes *toxic chemicals* listed at 40 CFR Section 372.65 which are *released* (including *disposed*), treated, recycled, and burned for energy recovery at the *facility* and amounts transferred from the *facility* to off-site locations for the purposes of recycling, energy recovery, treatment, and/or *disposal*. These amounts correspond to column B, Sections 8.1 through 8.7 of the reporting Form R. If a *facility's* combined *total annual reportable amount* does not exceed 500 pounds for a specific *toxic chemical*, the *facility* can qualify for reduced reporting requirements unless the amount of that *toxic chemical manufactured, processed*, or *otherwise used* within the reporting year exceeds one million pounds.

Covered facilities that qualify for the alternate threshold are not exempt from reporting, but must fulfill certain requirements. In lieu of submitting a Form R, the owner/operator of a *facility* must submit an annual certification statement (Form A) indicating that the *facility* met the requirements for use of the alternate threshold for a specific chemical. The *facility* must also maintain, and make available upon request, records substantiating the claim. The Form A includes basic information regarding the *facility's* identification, the chemical in question, and a statement of accuracy to be signed by a *senior management official* of the *facility*.

Form A

600. What is the Form A and who may submit this form?

The Form A provides certain *covered facilities* the option of submitting a substantially shorter form with a reduced reporting burden. *Facilities* which meet the SIC code, employee, and chemical activity thresholds but who do not exceed one million pounds *manufactured, processed*, or *otherwise used* and the *facility's total annual reportable amount* does not exceed 500 pounds for the *toxic chemical*, may submit an annual certification statement (Form A) instead of a Form R for the *toxic chemical*.

Form A, Release Reporting, RQ

601. What is the *total annual reportable amount* and is it the same as an RQ (Reportable Quantity)?

No, they are not the same. The *total annual reportable amount* applies to EPCRA Section 313 listed *toxic chemicals* and is *facility* specific. A *facility*'s *total annual reportable amount* is equal to the combined total quantities *released* at the *facility* (including *disposed*), *treated for destruction* at the *facility* (as represented by amounts destroyed or converted by treatment processes), recovered at the *facility* as a result of recycle operations, combusted for the purpose of energy recovery at the *facility*, and amounts transferred from the *facility* to off-site locations for the purpose of recycle, energy recovery, treatment, and/or *release* (including *disposal*). The *total annual reportable amount* is not the same as a reportable quantity (RQ). An RQ is chemical specific and applies to Extremely Hazardous Substances (EHS) or CERCLA Hazardous Substances. In the case of an accidental *release*, a *facility* owner/operator would refer to a chemical's RQ to determine if the *facility* has *released* enough such that reporting to a Local Emergency Planning Committee, SERC, and the National Reporting Center is required under EPCRA Section 304 and CERCLA Section 103.

Form A, Documentation

602. If I qualify and file a Form A, must I submit any other documentation to EPA and the *state* or tribal authority?

No. If a *covered facility* meets the criteria and files the Form A, the owner/operator need not submit any other documentation to EPA and the *state* or tribal authority. However, the *facility* must maintain all documentation supporting their Form A submission.

Form A, Effective Date

603. If my *facility* meets the Form A criteria on reporting years prior to 1995, may I withdraw my Form Rs and submit Form As instead?

No. *Facilities* may use the Form A beginning with the 1995 reporting year. *Facilities* may not use this form for prior years.

Form A Criteria

604. If I meet the criteria for filing a Form A for one *toxic chemical*, may I use it for all of the *toxic chemicals* covered at my *facility*?

No. Like the Form R, the Form A is *toxic chemical* specific. A *facility* must not *manufacture*, *process*, or *otherwise use* more than one million pounds of the specific *toxic chemical* and the *total annual reportable amount* for the *toxic chemical* must be less than 500 pounds. In some instances, a *facility* may submit the Form A for some chemicals and the Form R for other chemicals.

B. Form R Submissions

Form R, Deadline Extension

605. Are there any extensions that a *facility* can get for filing the Form R?

EPCRA Section 313(a) mandates that *covered facilities* report to EPA by July 1 of each year. On occasion, however, EPA has extended the date for submitting the Form R. If EPA chooses to extend the deadline, *facilities* should verify with their *state* representative that the *state* will also extend their reporting deadline. No extensions are ever made on an individual *facility* basis. If EPA extends the deadline a notice of this is published in the Federal Register.

Form R, Electronic Form R

606. Can commercially developed electronic versions of the Forms be submitted for compliance with Section 313?

The Agency encourages submission of Forms using the EPA software provided with the Form R package. The Agency has also approved the facsimile outputs of certain privately developed software packages. A list of the providers of software packages is made available by EPA. Contact the EPCRA Information Hotline for more information ((800) 424-9346 or (703) 412-9810).

Form R, Reporting Deadline, Weekends

607. Form R is to be submitted on or before July 1 of the year following the reporting year. When is the official due date if July 1 falls on a Saturday or a Sunday?

If the reporting deadline falls on a Saturday or Sunday, the EPA will accept the forms which are postmarked on the following Monday (i.e., the next business day).

Form R, Signature, Certification

608. The instructions state that photocopied versions of Part I may be submitted. Does this mean that a senior official at a *facility*, certifying the validity of the forms, only has to sign one submission? Are *facilities* required to include an original signature on forms going to the *state* or Indian Country as well as to EPA?

No. The final rule (February 16, 1988; 53 FR 4500) states that each unique *toxic chemical* submission must contain an original signature. The purpose of the requirement is to ensure that the certifying official has reviewed each *toxic chemical* submission. A photocopied signature or no signature does not fulfill this purpose. An original signature on the certification statement is not required for the copy that is sent to the *state*. However, if the *state* requires an original signature under their *state* Right-To-Know laws, then the *facility* must comply.

Form R, Certification Statement, Senior Management Official

609. May a representative from a consulting firm that prepares a Form R or Form A for a *covered facility* sign the certification in lieu of the *covered facility*'s owner/operator?

No. A representative from a consulting firm preparing a Form R or a Form A for a *covered facility* cannot sign the certification in Part I, Section 3 of either the Form R or the Form A. The certification must be signed by the owner/operator, or a *senior management official* employed by the *facility* subject to EPCRA Section 313 *toxic chemical release* inventory reporting. *Senior management official* means an official with management responsibility for the person or persons completing the report, or with management responsibility for the manager of environmental programs for the *facility* or *establishments*, or with management responsibility for the corporation owning or operating the *facility* or *establishments* responsible for certifying similar reports under the other environmental regulatory requirements (40 CFR Section 372.3).

Form R, Certification, Signature

610. Can a plant manager of a *covered facility* or a designee sign the certification statement on the Form R? That is, can a plant manager qualify as a *senior management official*?

Section 313 requires that a senior official with management authority over the person or persons filling out the form certify the accuracy and completeness of the form. This person could be a plant or *facility* manager rather than a senior corporate executive and should be the senior person in a position to attest to the accuracy of the information provided.

Form R, Senior Management Official, Certification

611. If a *covered facility* has a manager who is the originator of the data in the Form R report, would he/she sign the form or would it be the *facility* manager to whom this manager reports?

Senior management official means "an official with management responsibility for the person or persons completing the report, or the manager of environmental programs for the *facility* or *establishments*, or for the corporation owning or operating the *facility* or *establishments* responsible for certifying similar reports under other environmental regulatory requirements" (40 CFR Section 372.3). Your *facility* must make the determination regarding who meets this definition.

Form R, Mailing Address, Part I Section 4.1

612. A *facility* regulated under EPCRA Section 313 uses a post office box number or a mailing address different from its physical address to receive its mail. When the physical location is listed as the mailing address, the mail is returned to the sender by the post office. For reporting on the Form R Part I, Section 4.1, what should the *facility* list as its mailing address?

Since reporting year 1991, Form R contains a separate field for mailing addresses. The *facility* should enter its mailing address in this field if it is different from the *facility's* physical address. The *facility* must always enter its physical address in the appropriate Section of the Form R. EPA encourages *facilities* to notify EPA of address changes in advance.

Form R, Facility, Facility Reporting, Location Change, Reporting Requirements

613. Company Y sold its timber preserving chemical manufacturing business to Firm X in September, transferring only the operating rights of the business. After the sale, all manufacturing operations were moved to Firm X's production *facility* in another city. In February of the following year, Company Y was converted to a warehousing *facility* (SIC code 4225). What is Company Y's reporting obligation under Section 313?

Though manufacturing operations ceased in September of the reportable year, Company Y must submit, no later than July 1 of the subsequent year, a Form R for any listed *toxic chemical manufactured*, *processed*, or *otherwise used*, at Company Y's facility, in excess of threshold levels within the reportable year. No reporting is required for the following reporting year and subsequent reporting years as long as the *facility* operations are not classified within a *covered SIC code*.

Form R, Facility, Facility Name Change, Parent Company Name

614. The owner/operator of a *covered facility* is preparing Form Rs for a *facility*. The *facility* and its parent company both changed their names after the reporting year. What names should be reported by the owner/operator (for both the *facility* and the parent company) on the Form Rs covering the reporting year?

The *facility* should report the names used by the *facility* and parent company during that reporting year. When the owner/operator submits Form Rs for the next reporting year, these reports should reflect the names used by the *facility* and parent company during the new reporting year. (Note: the TRI *Facility* identification number will not change.)

Form R, TRI Facility Identification Number, Change of Ownership

615. The owner/operator of Poultry Products submits a Form R in 1996 and receives a TRI identification number. The following year Poultry Products is bought by Allen Family Foods and reports the new name on its 1997 Form R. Is the TRI identification number changed to reflect the change in *facility* name?

No, the TRI identification number is established by the first Form R submitted by the *facility*. This identification number is retained by the *facility* even if the *facility* changes ownership and name. This identification number will stay with this *facility* as long as the *facility* location does not change. The TRI identification number remains the same even if the *facility* changes names, production processes, SIC codes, etc.

Form R, TRI Facility Identification Number, Change of Ownership

616. A portion of a *covered facility* is sold in July 1997 to a new owner. For reporting on the Form R for the year 1997, what TRI *facility* identification numbers should be used by the reporting *facilities* (40 CFR Section 372)?

For purposes of reporting on the Form R, the portion of the *facility* that was not sold during the year would maintain the TRI identification number originally assigned to the *facility*. The *facility* under new ownership would, however, indicate in Part I, Section 4.1 that the report is a first time submission by the *facility*. Once the reports have been submitted by the new *facility*, a new identification number will be assigned to the *facility* for use in subsequent years.

Form R, Public Contact, Part I Section 4.4

617. Can the "public contact" listed on Part I, Section 4.4 be located elsewhere in the parent organization and not at the *facility*?

Yes. The public contact listed on Part I, Section 4.4 does not have to be located at the *covered facility*.

Form R, Public Contact, Technical Contact, Part I Section 4.4

618. If the public contact item (Part I, Section 4.4) is left blank, can the *facility* later use a public contact to speak to the news media on behalf of the technical contact?

If a public contact is not identified, EPA will enter the technical contact into the database as a public contact. Thus, this person would receive public inquiries. You may, of course, use any person you choose to respond to such inquiries.

Form R, Technical Contact

619. Regarding the technical contact, can this person be a different person for (a) each *toxic chemical*? (b) each separate part of a *facility*?

Yes. A *facility* can identify different technical contacts for different *toxic chemicals* or different *establishments* within the *facility*, preferably with one "technical contact" listed on each form. Up to two names can be entered into the technical contact field on the database, but only one technical contact phone number can be listed.

Form R, SIC Code, Multi-establishment, Part I Section 4.5

620. The instructions for completing Form R indicate that the report should contain only *covered SIC codes* in Part I, Section 4.5 on page 1. A *facility* has the option of reporting as an entire *facility* or as separate *establishments*. If an *establishment* filled out a separate Form R, what SIC code would be used in Part I, Section 4.5? Would a SIC code be entered for an *establishment* not in *covered SIC codes*?

When a *facility* opts to file separate Form Rs for each *establishment* it should list in Part I, Section 4.5 of each Form R submitted the SIC code only of the *establishment* being reported on that Form R. If the *establishment's* SIC

code is not within a *covered SIC code*, that *establishment* can either list the SIC code or enter NA. The listing of SIC codes outside the *covered SIC codes* is not required in the Form R instructions.

Form R, Dun & Bradstreet Number, Part I Section 4.7

621. If a *covered facility* does not have a Dun & Bradstreet number but the parent corporation does, should this number be reported?

Report the Dun and Bradstreet Number for the *facility*. If a *facility* does not have a Dun and Bradstreet Number, enter "NA" in Part I, Section 4.7. The corporate Dun and Bradstreet Number should be entered in Part I, Section 5.2 relating to parent company information.

Form R, Multi-establishment Dun & Bradstreet Number

622. If two plants are separate *establishments* under the same site management, must they have separate Dun & Bradstreet numbers?

They may have separate Dun & Bradstreet numbers, especially if they are distinctly separate business units. However, different divisions of a company located at the same *facility* usually do not have separate Dun & Bradstreet numbers.

Form R, Latitude/ Longitude

623. Our *facility* operations cover a large area. What longitude should be reported for our *facility* and how can we locate this information?

Report the latitude and longitude for a location central to the operations for which you are reporting. You may find this information on your NPDES permit. See the instructions for completing Form R for a detailed description on how to determine latitude and longitude from United States Geological Survey (USGS) maps of your *facility* location.

Form R, NPDES Permit, Part I Section 4.9

624. If a *covered facility* has a NPDES permit, but does not discharge *toxic chemicals* to surface water, does the *facility* have to fill in Part I, Section 4.9?

Yes. This information is part of the *facility* identification section of the Form R and is intended for use in obtaining other information about the *facility*.

Parent Company, Multiple Owners, Part I Section 5.1

625. An electricity generating *facility* (EGF) is comprised of multiple independent owners. Each individual owner runs his/her own separate operation, but each has a financial interest in the operation of the entire *facility*. What name should be entered as the parent company in Part I, Section 5.1 of the Form R? Should the *facility* report under one holding company name?

The electricity generating *facility* should enter in Part I, Section 5.1 of the Form R the name of the holding or parent company, consortium, joint venture, or other entity that owns, operates, or controls the *facility*.

Part I, Section 5.1, Parent Company Name

626. A *covered facility* sells one of its *establishments* to a new owner. The operator of the newly sold *establishment*, however, does not change. The same operator operates the newly sold *establishment* and the rest of the *facility*. Although the *facility* makes its threshold determinations based on the activities at the entire *facility* (including the newly sold *establishment*), the *facility* chooses to report separately for the different *establishment*s. What parent name should the newly sold *establishment* use, the parent name of the owner or the parent name of the operator (i.e., the same as the rest of the *facility*)?

All *establishment*s of a *covered facility* must report the parent name of the *facility*. Therefore, in the instance described above, the newly sold *establishment* should use the parent name of the *facility* operator (i.e., the same parent name the rest of the *facility* is using.)

Form R, NPDES Permit, Releases to Receiving Stream, Part I Section 4.9

627. If a *covered facility* enters an NPDES permit number on the Form R but does not discharge the *toxic chemical* to a receiving stream, must it also enter a receiving stream name?

No. If there are no *releases* of the *toxic chemical* to the receiving stream noted in the NPDES permit, the *facility* would not need to list the stream name. However, the NPDES permit number must be supplied whether or not there are *releases* of the specific reported chemical to a receiving stream or water body.

FORM R SUBMISSIONS

Form R, Maximum Amount On-site, Threshold Determination

628. In determining the maximum amount on-site and thresholds, do *covered facilities* count water in a solution (e.g., an aqueous solution of ammonium nitrate)?

No. Exclude the water in solutions when calculating the maximum amount of the *toxic chemical* on-site and in making threshold determinations.

Form R Submissions, Part II Section 3

629. A metal mining *facility manufactures*, *processes*, and *otherwise uses* cyanide compounds, but only exceeds the *otherwise use* threshold. How should this *facility* complete Part II, Section 3 of the Form R?

Even though the *covered facility* only exceeds the *otherwise use* threshold, it is required to identify all *manufacturing*, *processing*, and *otherwise use* activities and check at least one box in Part II, Sections 3.1, 3.2, and 3.3. The Forms and Instructions document directs *facilities* to check all the boxes in Section 3 that apply. Note that once a threshold has been exceeded for a listed *toxic chemical*, the *facility* must report *releases* and other *waste management* activities associated with all nonexempt activities at the *facility*, and not just those associated with *otherwise use* activities.

Form R, Maximum Amount On-site, Part II Section 4, Threshold Determination

630. For Part II, Section 4 of the Form R, a *covered facility* must calculate the maximum amount of a *toxic chemical* on-site at any one time during the reporting year. The *facility* must add up the amounts of the *toxic chemical* present at all locations within the entire *facility* (e.g., storage tanks, process vessels, on-site shipping containers). Must the *facility* include the amount of the *toxic chemical* in a wastestream or in scrap metal prior to being smelted when determining the maximum amount on-site?

Yes. When determining the maximum amount on-site for Part II, Section 4 of the Form R, the *facility* must aggregate all nonexempt quantities of the *toxic chemical*. *Toxic chemicals* present in waste as well as in scrap metal are not exempt from reporting on the Form R and thus must be included when calculating the maximum amount on-site for Part II, Section 4.

Form R, Maximum Amount On-site, Previous On-site Disposal

631. How do *covered facilities* that operate landfills report maximum amount of a chemical on site? Does this data element take into account amounts of a chemical that have been *disposed* of in prior years?

To comply with EPCRA's maximum amount on site requirement, *facilities* should report in data element 4.1, Part II, of the Form R, the maximum quantity of the toxic chemical present at the *facility* during the reporting year. *Facilities* should include amounts of the chemical in storage tanks, process vessels, on site shipping containers, and any other amount of the chemical at the *facility*. However, *facilities* do not have to count amounts of the toxic chemical that it disposed of in on site landfills in previous years.

Form R, Maximum Amount On-site, Part II Section 4, Threshold Determination

632. Part II, Section 4 of the Form R records the maximum amount of a *toxic chemical* on site at any time during the reporting year. When determining this amount, *covered facilities* must aggregate all nonexempt quantities of the *toxic chemical*. Does this amount include concentrations of the *toxic chemical* present in products?

Yes. *Covered facilities* must indicate the maximum amount of the *toxic chemical* on-site at any one time during the reporting year. The maximum amount on-site includes raw materials, in-process materials, product inventory, and quantities present in wastes. Owners or operators must total all quantities of the nonexempt amounts of the *toxic chemical* present at the *facility* when completing Part II, Section 4.1 of the Form R.

Form R, Maximum Amount On-site, Part II Section 4

633. How should *facilities* estimate the maximum quantity on-site for hydrochloric acid (aerosol), *manufactured* as a by-product of the combustion process and vented directly to a stack?

When determining the maximum amount on-site for Part II, Section 4 of the Form R, only the reportable form of a chemical (e.g., aerosol) is to be

considered. The quantity of the hydrochloric acid (aerosol) could be estimated by determining the volume of the air stream that could contain hydrochloric acid (aerosol), as well as the concentration of the acid in the air stream. In this case, the volume would be the interior volume of the equipment from where it is *manufactured* (e.g., *boiler*) to where it is *released* (e.g., stack). Keep in mind that the range codes used for the maximum quantity on-site are quite broad, and therefore, a precise calculation may not always be required. *Facilities* are also directed to refer to the Guidance for Reporting Sulfuric Acid (EPA-745-R-97-007; November 1997).

Form R, Maximum Amount On-site, Fume or Dust, Part II Section 4, Threshold Determination

634. The list of *toxic chemicals* under EPCRA Section 313 contains three substances with a "fume or dust" qualifier (aluminum, zinc, and vanadium). For purposes of reporting the maximum amount on-site (Part II, Section 4 of the Form R), should *covered facilities* only report the maximum amount of fume or dust on-site or the maximum amount of all forms of the chemical on-site at any one time?

When determining the maximum amount on-site for Part II, Section 4 of the Form R, only the reportable form of a chemical (e.g., fume or dust) is to be considered.

Form R, Maximum Amount On-site, Part II Section 4, Multi-establishment, Threshold Determination

635. In Part II, Section 4.1 of the Form R, *covered facilities* must enter a range code indicating the maximum quantity of a *toxic chemical* on-site at any time during the reporting year. If a *facility* is reporting by *establishment*, should the quantity reported in Section 4.1 represent the maximum quantity at the *establishment* or the maximum quantity for the entire *facility*?

If a Form R is being submitted for "part of a *facility*" (i.e., an *establishment* or group of *establishments*), the range code selected for the maximum amount of a *toxic chemical* on-site should be reflective of the *establishment* or group of *establishments*, and not of the entire *facility*.

Form R, Releases to Receiving Streams, Part II Section 5.3

636. How should a *facility* go about designating the name of a receiving stream?

Facility owner/operators must report the name of each stream to which *toxic chemicals* being reported are directly discharged. You should report the name of the receiving stream or water body as it appears on the NPDES permit for the *facility*. If the stream is not named in a permit, enter the name of the off-site stream or water body by which it is publicly known or enter the first publicly named water body to which the receiving waters are a tributary, if the receiving waters are unnamed. You should not list a series of streams through which the *toxic chemical* flows, but only the first water body it enters from your *facility*. Do not enter names of streams to which off-site treatment plants discharge. Enter "NA" in Section 5.3.1, if you do not discharge the listed *toxic chemical* to surface water bodies.

Form R, Releases to Receiving Streams, Part II Section 5.3

637. A *covered facility* determines that it can estimate stormwater *releases* of a *toxic chemical* from the *facility*. However, such *releases* go to a city-owned storm sewer system and the *facility* has no direct knowledge of the receiving stream or surface water body to which the *toxic chemicals* are ultimately *released*. What do they report as the "stream or water body name" on Part II, Section 5.3 of the Form R?

The *facility* would put "city-owned storm sewer" or the equivalent because this is all they know. To leave the stream or water body name item blank or put "NA" would be identified as an error when the Form R is entered into the computerized database of Section 313 data.

Form R, Releases to Receiving Streams, Part II Section 5.3.1

638. A *covered facility* owner/operator's NPDES permit lists not only the first stream into which they discharge their waste, but also the subsequent streams it will flow through. The first three streams are listed on the permit as "unnamed creek." The fourth listed stream is the first with a name, Grove Creek. Since the *facility* does not discharge directly into Grove Creek, what should they list in Section 5.3.1 for receiving stream or water body name on the Form R?

Since Grove Creek is the first named receiving stream, it should be listed in Part II, Section 5.3.1 even though the waste is not directly discharged into it.

Form R, Blank Data Elements: NA

639. In some sections of the Form R, *facilities* are asked to report "NA" if that section does not apply to a submission. Are blank spaces left on the form the equivalent of "NA?"

No. A *facility* must enter "NA" to inform the Agency that the submitter has not just overlooked a section of the Form R.

Form R Submissions, NA

640. A *covered facility* is required to file a Form R for benzene. The *facility* did not have any known accidental spills or *releases* to land of benzene during the calendar year. Is it appropriate for the *facility* to report "NA" in Part II, Section 5.5.4, (Other *Disposal*)?

No. It is only appropriate to report "NA" when there is no possibility that a *release* could have occurred to a specific media or off-site location. In Part II, Section 5.5.4, the *facility* is required to report any amount of a listed *toxic chemical released* to land that does not fit the categories of landfills, land treatment, or surface impoundments. This includes any spills or leaks of the listed *toxic chemical* to land. While there were no known spills or leaks to land of benzene, the possibility did exist that a *release* could have occurred. In this situation, the *facility* should report 0 in Section 5.5.4 and provide a basis of estimate (see the current Toxic Chemical Release Inventory Reporting Forms and Instructions).

Form R, Significant Figures

641. Please explain the "two significant figures" reporting guideline.

Estimates are not required to be reported to a greater accuracy than two significant figures (e.g., 4224 may be entered as 4200). The number of significant figures is the number of non-zero digits. One significant digit may be reported if the estimation techniques used do not support two digit accuracy.

Form R, Release Estimate, Significant Figures

642. When reporting *release* estimates on the Form R, EPA recommends *release* estimates be rounded to no more than two significant figures. Should *release* estimates always be reported in whole numbers, or should decimal places be reported in certain instances?

When reporting *release* and other *waste management* estimates on the Form R, always report using whole numbers (i.e., round to the nearest pound).

Reporting Requirements, Recordkeeping

643. What are the EPCRA Section 313 recordkeeping requirements for *facilities* that do not exceed thresholds?

If a *facility* does not exceed an activity threshold for any listed toxic chemical, or is not in a *covered SIC code*, or does not have ten or more full time employees, it is not required under EPCRA Section 313 to maintain any records associated with its uses, *releases*, or other *waste management* activities involving listed *toxic chemicals*. Such facilities, however, may want to keep records of the amounts of listed *toxic chemicals* they *manufacture*, *process*, or *otherwise use* in order to defend against any claim that they failed to report.

Form R, Audit Provisions

644. Are specific audit provisions in the regulations? What about resolving differences of opinion, (i.e., does the auditor have final judgment)?

Specific audit provisions are not in the EPCRA Section 313 regulations. The Agency, however, has the responsibility to assure that the data submitted are based on reasonable estimates. Audit results will be used to identify problems with calculating *releases* and other *waste management* quantities. In resolving differences of opinion, we expect that a final judgment will be made by the Agency. Also note that EPA has finalized a self-audit policy (December 12, 1995; 60 FR 66706) for *facilities* who choose to conduct their own audits.

Form R, Enforcement

645. The enforcement requirements of EPCRA (Section 325), state that the civil and administrative penalties for Section 313 noncompliance shall not exceed $25,000 for each violation. Is a noncompliance violation determined on a per *facility* or per *toxic chemical* basis? Also, is that penalty assessed on a per day basis?

Section 325(c)(i) states: "any person who violates any requirements of Section 313 shall be liable to the United States for a civil penalty in an account not to exceed $25,000 for each such violation," for each day a violation continues. Therefore, the *facility* can be assessed a penalty for each Form R not submitted or submitted incorrectly, and the penalty can be assessed on a per day basis. EPA accesses penalties on a per *toxic chemical* per *facility* basis which may include per day penalties, depending on the circumstances of the violation. An Enforcement Response Policy (ERP) is available for EPCRA Section 313 and it describes the types of violations and associated penalties (current version). Also note that the Department of Treasury recently increased the fines from $25,000 to $27,500 for violations occurring after January 30, 1997; (December 31, 1996; 61 FR 69360).

Form R, Signature, NOTE

646. A *facility* received a Notice of Technical Error (NOTE) stating that they did not have an original signature on the Form R submitted to EPA. How should the *facility* respond to this NOTE?

EPA must have an original signature on file. A *facility* must resubmit a completed Form R with an original signature, and this new form should be attached to the NOTE and returned to EPA and to the facility's *state* contact.

Form R, Form R Submissions

647. Can a *facility* submit one original copy of Part I (*facility* Identification Information) with several copies of Part II (Chemical Specification Information) for different listed *toxic chemicals*?

No. Submission of multiple copies of Part II, with only one copy of Part I, would be considered noncompliance. The final rule clearly requires that each completed submission contains all parts of the Form R (including Part II).

Form R, Reporting Requirements, Negative Declaration

648. If a *facility* is not required to report under EPCRA Section 313, is there any form that is available to report that EPCRA Section 313 does not pertain to this *facility*?

There is no negative declaration form available to facilities not covered by EPCRA Section 313.

Form R, Form R Submissions

649. How can a *facility* be assured that the Agency has received a submitted form?

To be notified of receipt of submissions, *facilities* should send forms using the U.S. Postal Service "Return Receipt Request" mail service. The Agency will not respond to cover letters requesting acknowledgment.

Recordkeeping, Electronic Data

650. A covered RCRA Subtitle C hazardous waste *facility* uses data from hard copies of manifests, waste profiles, purchasing orders, inventory orders, etc. to determine thresholds and calculate *releases* and other *waste management* activities. The *covered facility* transfers all of the data from the paper sources into its computer system, and then discards the hard copies. The *facility* keeps the computerized data for three years from the date of submission of its Form R. Can electronic data be used (in conjunction with other data) to satisfy the recordkeeping requirements at 40 CFR Section 372.10, or must the *facility* maintain copies of the original documentation?

Insofar as 40 CFR Section 372.10 is concerned, some electronic data that has been scanned may be used to satisfy recordkeeping requirements. *Facilities* should employ adequate safeguards to prevent changes to the data after the data have been scanned and the documents stored electronically should capture all of the information required by 40 CFR Section 372.10. For example, this section of the regulations states, in part, that "Each person subject to the reporting requirements . . . must retain the following records for a period of 3 years from the date of the submission of a report . . .[3][vi] receipts or manifests associated with the transfer of each toxic chemical in waste to off-site locations." While the scanning and electronic storage of the entire receipt or manifest would satisfy the recordkeeping requirements of 40 CFR Section 372.10, the data entry of portions of the receipts or manifests into spreadsheets or databases might result in the loss, or erroneous entry, of pertinent information that is required by 40 CFR Section 372.10.

Form R, Source Reduction, Data Sources

651. Where can *facilities* obtain source reduction figures from previous years?

Facilities should use the best readily available information they have. For example, they may use inventory data, reuse data, engineering reports on process modification, and product development studies.

Information Access

652. A *facility* would like to receive information on who requested their Section 313 Form R's. Can they request this information from the EPCRA Reporting Center?

No. The request for the names cannot be made to the EPCRA Reporting Center. EPA purposely does not keep a record of individuals or organizations that make requests to the EPCRA Reporting Center. This protects the anonymity of the requestor.

C. Form R Withdrawals

Withdrawal

653. Has EPA allowed *facilities* to withdraw Form Rs submitted under EPCRA Section 313?

Yes. EPA has permitted *facilities* that have filed a Form R under EPCRA Section 313 to request that EPA withdraw the Form R data from EPA's database (i.e., the Toxics Release Inventory System (TRIS)) and from the public version of the database.

Form A, Form R, Withdrawal

654. What is the procedure for requesting a withdrawal of a Form R or Form A submission?

In order to have a submission removed from the Toxics Release Inventory (TRI) database, a *facility* must send a letter to both the EPCRA Reporting Center and the appropriate *state* agency requesting that the submission be withdrawn from the EPA database. The letter should be marked "Attention: Withdrawal Request" and should explain the reason for the request (e.g., the *toxic chemical* was below threshold, or the *facility* qualifies for an exemption). The withdrawal request should also include the following information: the reporting year, chemical name, a technical contact name and phone number, and the name and phone number of the requester if it is not the same as the technical contact. It is only necessary to submit a withdrawal request letter. A copy of the Form R or Form A should NOT be included. The request should be sent to the EPCRA Reporting Center (at the address found in the most recent version of the Toxic Chemical Release Inventory Reporting Forms and Instructions) and the appropriate *state* agency.

Withdrawal

655. What is the effect of a withdrawal?

If EPA approves the request, the data contained in the Form R, that is the subject of the request, is deleted from EPA's database and from the public database when it is updated the next time. However, the Form R submission itself, the withdrawal request, and EPA's approval are retained in a miscellaneous document file.

Withdrawal, EPA Review

656. What information does EPA consider when reviewing requests to withdraw a Form R?

When EPA reviews a request to withdraw a Form R submitted under EPCRA Section 313, the only information that the Agency considers, is the information contained in the withdrawal request and/or the Form R that was submitted.

Withdrawal, EPA Contact

657. To approve a withdrawal request, has EPA ever contacted the submitter of the withdrawal request?

In a few cases, EPA has contacted the submitter of the withdrawal request to clarify certain aspects of the information submitted on the Form R or on the request for withdrawal of the Form R.

Withdrawal, Validity

658. In approving a withdrawal request, does EPA verify the validity of a request to withdraw a Form R through inspections or audits?

No. For purposes of approving a withdrawal request, EPA has never attempted to verify the validity of a request for withdrawal by inspecting the *facility* or auditing the information filed with the Form R or withdrawal request. Therefore, when EPA approves a withdrawal request EPA is merely granting the request on the basis of the representations and information provided by the submitter in its request and, in some cases, on its Form R.

Withdrawal, EPA Approval

659. Is EPA's approval of a request to withdraw a Form R a determination by the Agency that the submitter was not required to report under EPCRA Section 313?

No. EPA's approval of a withdrawal request does not communicate an Agency determination that the submitter was not required to file the Form R that is the subject of the withdrawal request. EPA's approval merely grants the request. An inspector would need to visit the *facility* and review the *facility's* records for EPA to determine that a Form R, in fact, did not need to be filed. However, as noted above, for purposes of approving a withdrawal request, EPA has never attempted to verify the validity of a withdrawal request through inspections or audits.

Withdrawal, Withdrawal Requirements

660. A *covered facility* mistakenly determined a *toxic chemical* to be *otherwise used*, rather than *processed*, at their *facility*. As a result, the *facility* reported the listed *toxic chemical* on the Form R with 15,000 pounds used during the previous reporting year. Since they will not be reporting this *toxic chemical* for the next reporting year, is there any need to withdraw the previous year's reporting forms to prevent an enforcement contact by EPA?

The *facility* is not required to withdraw the report. A *facility* may request to withdraw a form submitted unnecessarily (i.e., a legitimate case of over reporting). Since the *facility* over-reported as a result of a threshold determination error, it should thoroughly document the mistake in its recordkeeping for that Form R. No documentation, in addition to the withdrawal request, need be sent to the *state* or EPA at this time.

Withdrawal, Form R Revisions

661. If a *covered facility* finds that it has submitted the forms with minor errors (e.g., boxes incorrectly checked, NA in the wrong place, all pages were not sent for each *toxic chemical* even if the pages should be blank), should the forms be resubmitted or should the *facility* wait for EPA to send error notices requesting revisions?

As soon as the errors are discovered, the *facility* should resubmit the form to the same address (i.e., the EPCRA Reporting Center). The box that says "Enter 'X' here if this is a revision" (in the upper right hand corner of Page 1) should be checked. The data elements that are different from the initial report should be made and circled in dark ink. The original, incorrect elements should be crossed out.

Form R, Form A, Form R Revisions

662. What is the procedure for voluntarily revising previously submitted Forms R or Form A reports?

Voluntary revisions (as opposed to revisions required to correct errors that prohibit further Form R/Form A processing) must be submitted to the EPCRA Reporting Center and the appropriate *state* agency. Although hard copy (i.e., paper) revisions are acceptable, EPA encourages *covered facilities* to submit all revisions on a diskette, by using EPA's Automated Toxic Chemical Release Inventory Reporting Software (ATRS) package, even if the original submission was on hard copy. A cover letter with *facility* information (e.g., reporting year, chemical name, document control number if known, original date of submission) and an explanation of the reason for the revision is helpful, but is not required. Standard revisions (i.e., revising a Form R with another Form R, or revising a Form A with another Form A) may be completed in one of two ways:

(1) The *facility* may submit the Form R or Form A revision on a diskette by entering an "X" in the field named "Enter 'X' here if this is a revision." If the original was submitted on hard copy, the *facility* should complete an electronic version of the entire Form R that reflects the revisions. If the original was submitted on a diskette, the *facility* should simply modify the appropriate fields of the original ATRS submission. The diskette should include ONLY those Forms R or Forms A that have been revised, not the original form. The owner/operator or *senior management official* must sign and date the ATRS certification cover letter.

(2) The *facility* may submit the Form R or Form A revision on hard copy by entering an X in the space marked "Enter 'X' here if this is a revision" and enter the corrected information next to the original information. Corrections should be made in blue or black ink only, NEVER in red ink. The owner/operator or *senior management official* must re-sign and re-date the certification on page one.

Form R Revisions, Receipt of New Information

663. A covered treatment, storage, and *disposal* (TSD) *facility* receives a corrected waste profile in September for a type of waste that the *facility* has been receiving since January 1. The corrected waste profile indicates that a listed *toxic chemical* is in the wastestream at a higher concentration than was indicated on previous waste profiles. Must the TSD *facility* revise its threshold determinations and *release* and other *waste management* calculations back to the beginning of the reporting year or only from the date (September) that the corrected information was received?

The *facility* must revise its threshold determinations and *release* and other *waste management* calculations back to the beginning of the year, if the *facility* receives information that they believe is more accurate in depicting amounts of *toxic chemicals* that they manage. *Covered facilities* are required to use their best readily available information as provided by EPCRA Section 313(g)(2). If facilities obtain information that they believe is better than the information that they applied for previous report submissions, the *facility* may submit a revision for prior periods provided that they document the basis for the revision.

Form R, Form A, Form R Revisions

664. What is the procedure for replacing a Form A with a Form R and vice versa?

A Form R submitted after a Form A for the same chemical and reporting year is considered to be a late submission of a Form R and a request for a withdrawal of the previously filed Form A. Although hard copy submissions are acceptable, EPA encourages *facilities* to submit all submissions on a diskette by using EPA's ATRS software package, even if the original submission was on hard copy.

A Form A submitted to replace a previously filed Form R is treated as both a withdrawal request and a replacement for the original Form R, and is subject to EPA review and approval. EPA encourages *facilities* to submit all Forms A on a diskette by using EPA's ATRS software package, even if the original Form R submission was on hard copy. A cover letter with *facility* information (e.g., reporting year, chemical name, document control number if known, original date of submission) and an explanation of the reason for the replacement is helpful, but is not required. Submitters who wish to submit a replacement Form A should use the following procedure:

(1) Send a completed diskette or hard copy version of the Form A to the EPCRA Reporting Center and the appropriate *state* agency. Please do not include a copy of the original Form R.

(2) Do NOT mark the revision box on the first page of the Form A, since submitting a withdrawal request and replacement Form A is not considered to be a voluntary revision. Rather, they are withdrawal requests and replacements of the previously filed Form R subject to EPA review and approval. EPA will evaluate whether or not to accept the revision (i.e., replacement Form A). The owner/operator or *senior management official* must re-sign and re-date the ATRS certification cover letter (in the case of an ATRS diskette submission) or the certification on page one (in the case of hard copy submission).

Form R, Form R Revisions

665. By what date must withdrawals and revisions be completed?

There is no deadline for withdrawals and submissions. However, voluntary revisions and withdrawal requests must be submitted by October 15th of the same year as the reporting deadline in order for the revised or withdrawn data to be reflected in the corresponding TRI public data release.

Withdrawal, Chemical Deletion

666. EPCRA Section 313(d) provides for the addition and deletion of chemicals from the list of *toxic chemicals* found at 40 CFR Section 372.65. When a *toxic chemical* is deleted, and the final action is effective upon publication in the Federal Register, thereby relieving *covered facilities* from EPCRA Section 313 reporting requirements for the newly deleted chemical from the date of publication forward. If a *facility* submits a Form R for a newly deleted chemical, must the *facility* submit a formal written withdrawal request to the Agency?

Covered facilities need not submit a formal written withdrawal request because the Agency does not enter a Form R received for a newly delisted *toxic chemical* into the TRI database. *Facilities* that submit Form Rs for that chemical will receive a Notice of Data Change informing the *facility* that the data on the Form R was not entered into the database due to the chemical's deletion from the *toxic chemical* list. The Agency does not, however, remove from the database information from Form R reports submitted for years during which the *toxic chemical* was listed as an EPCRA Section 313 *toxic chemical*.

In the case where only certain forms of a *toxic chemical* are delisted, the Agency will not automatically exclude the Form Rs because the Agency cannot determine for which form of the chemical the threshold determinations and reported data were based. For example, non-aerosol forms of sulfuric acid were delisted on June 30, 1995 (60 FR 34182), making aerosol forms the only EPCRA Section 313 reportable forms of sulfuric acid. In this case, without written clarification from the *facility* and review of the data submitted, the Agency cannot assume Form Rs submitted for sulfuric acid for reporting year 1994 represent reporting for only non-aerosol forms of

sulfuric acid. Therefore, the Agency will enter the data as received, unless the *facility* submits a written revision or withdrawal request, as appropriate.

Withdrawal, Inappropriate

667. A *covered facility* submitted a Form R for isopropyl alcohol, CAS number 67-63-0, but does not *manufacture* the *toxic chemical* by the strong acid process. How should the *facility* notify EPA about the correction?

The *facility* should submit a withdrawal request to the EPA's EPCRA Reporting Center clearly stating why the original isopropyl alcohol submission should be removed. In this request, the *facility* should give the reporting year and the name of the chemical in question as well as a contact name and phone number. EPA will take action on the request based on the information provided by the *facility*. If EPA approves the withdrawal request, the data will be removed from the EPA database, TRIS. The *facility* will be notified whether the request is approved or not. The request should also be copied and sent to the *state*/Indian Country for their information.

Section 6. SUPPLIER NOTIFICATION (See Appendix A: Section 313 Policy Directive #9 Supplier Notification)

Supplier Notification, Notification Date

668. By what exact date must supplier notification be done?

A supplier must notify each customer of any *toxic chemical* present in a *mixture* or *trade name product* with at least the first shipment of the *mixture* or *trade name product* in each reporting year (40 CFR Section 372.45(c)(1)).

Supplier Notification, De minimis Exemption

669. Is a *facility* subject to supplier notification requirements if it distributes products containing more than the de minimis level of a listed metal compound?

Yes, if you are in SIC codes 20 through 39 and you distribute these products to other *facilities* in *covered SIC codes*, you are subject to the supplier notification requirements. *Articles* and consumer products are exempt from supplier notification. However, if the supplier has knowledge that *articles* are distributed to customers whose use will negate the *article* exemption, he/she should provide notification of *toxic chemicals* present in the *articles*.

Supplier Notification, De minimis Exemption

670. Does a supplier have to tell a customer that a *toxic chemical* is present below the de minimis level (1.0 percent; or 0.1 percent for OSHA carcinogens)?

No. This information is not required.

Supplier Notification, SIC Code

671. Do supplier notification requirements apply only to a situation where the customer is in SIC code 20 through 39 and has more than 10 employees?

A company in SIC codes 20 through 39 is responsible for providing supplier notification to all *facilities* in *covered SIC codes* (including the newly added industries) with 10 or more employees, and to customers who, in turn, may sell or distribute to *facilities* in a *covered SIC code*. Such a customer may be a wholesale distributor who is not in a *covered SIC code* but sells to other *facilities* in a *covered SIC code*. *Facilities* in a *covered SIC code* but not in SIC codes 20 through 39, however, are not required to initiate supplier notification.

Supplier Notification, Mixture, Chemical Conversion

672. Are some *mixtures* of *toxic chemicals* exempted from the supplier notification requirements? A *mixture* as defined in EPCRA Section 313 does not include a combination of *toxic chemicals* produced as the result of a chemical reaction (40 CFR Section 372.3).

Mixtures are not exempt from supplier notification unless the amount of the *toxic chemical* in the *mixture* is below de minimis levels. A *mixture* is defined as a combination of two or more chemicals if the chemicals are not

part of a wastestream and they were not combined as a result of a chemical reaction. However, if this combination was formed by a chemical reaction but could have been formed without one, it is also considered a *mixture*. Any other combination formed by a chemical reaction is not considered a *mixture*. If a *toxic chemical* is present in a *mixture* at a concentration below the de minimis level, this quantity of the substance is exempt from Section 313 supplier notification requirements.

Mixture, Supplier Notifications

673. Is supplier notification required for *mixtures* of water and a listed acid if the *facility* distributes the *mixture* under the name of the acid? Note that EPA interprets *mixture* to exclude, for example, a water and phosphoric acid *mixture* distributed as phosphoric acid.

Supplier notification would be required for *mixtures* of water and an acid as with any other *mixture*, regardless of the name it is distributed under if the concentration of the Section 313 chemical in the *mixture* is greater than the de minimis level.

Supplier Notification

674. 40 CFR Section 372.45(b)(l) states that to fulfill the supplier notification requirement the notification shall include "a statement that the *mixture* or *trade name product* contains a *toxic chemical* or *toxic chemicals* subject to the reporting requirements of Section 313..." Does a *facility* have to include the word "toxic" in its notifications?

The word "toxic" does not have to appear in the statement to fulfill the requirement of 40 CFR Section 372.45(b)(1). However, the statement should clearly state that the *toxic chemical* is subject to EPCRA Section 313.

Supplier Notification, Sales Samples

675. Are sales samples covered for purposes of supplier notification?

Sales samples are covered unless they meet one of the stated exemptions in 40 CFR Section 372.45(d) of the regulation, such as *articles* or products distributed to the general public.

Supplier Notification, Consumer Product Exemption

676. A company that makes conveyors for bottling *facilities* also sells small cans of spray paint to them for use in touch-ups of the paint on the conveyors. The paint is not distributed to or used by the general public. Is the company exempt from supplier notification under the consumer product exemption because the paint is packaged and used like a consumer item? (40 CFR Section 372.45(d)(2)(iii))

No. The exemption does not apply because the paint is not packaged for distribution to the general public.

Supplier Notification, Distributors

677. Is supplier notification required for distributors in SIC codes other than 20 through 39 which do not *manufacture* or *process* listed *toxic chemicals* or *mixtures* containing *toxic chemicals*?

Distributors in SIC codes outside of 20 through 39 who do not *manufacture* or *process toxic chemicals* are not required to prepare notices that the *mixture* or *trade name products* which they distribute contain a *toxic chemical*. They should, however, pass along such notices prepared by their supplier to any *facility* in a *covered SIC code* who purchases a *mixture* or *trade name product* containing a *toxic chemical*.

Supplier Notification, Distributors

678. If a distributor does not receive supplier notification from his/her supplier, will he/she be in violation for not sending the supplier notification with his/her first shipments to other *covered facilities* or *facilities* who will in turn send the shipments to covered *facilities*?

No, if the secondary supplier does not receive the information, he/she cannot develop a notice.

Supplier Notification, Negative Declaration

679. A manufacturer lists *toxic chemicals* on Section II of the *MSDS* under hazardous ingredients. It is possible that none of the chemicals listed are subject to Section 313 reporting. Is the supplier required to state that none of the chemicals are subject to 313 reporting, removing the need for customers to audit Section II?

A manufacturer is required, and a supplier should include, the Section 313 statement in their *MSDS* if one or more of the chemicals in the *mixture* or *trade name product* are listed Section 313 *toxic chemicals*. The *facility* is not required to make a "negative declaration" that none of the components in the *mixture* are subject to Section 313. A manufacturer or supplier may, however, provide this statement on his/her own initiative.

Supplier Notification, Distributors

680. To what extent is a *facility* covered under 40 CFR Section 372.45 required to determine if the *facility* receiving a shipment distributes the *toxic chemical* to a manufacturer?

The *facility* should use the best readily available information. The manufacturer of the *mixture* must send the supplier notification to the middle man distributor if he/she has a reasonable basis to conclude that the distributor provides the product to *covered facilities*. Such a conclusion could be based on the nature of the product and its intended market.

Supplier Notification, Reasonable Estimates

681. What burden must the *covered facility* undertake to verify the accuracy/completeness of information provided to it under the requirements of supplier notification?

A *facility* must use the best readily available information in making threshold determinations and *release* and other *waste management* calculations. If the *facility* has an indication that information provided by the supplier is unreasonable, they should look to other sources of information that they believe are more representative of any listed *toxic chemicals* and their

concentrations contained in *mixtures* or *trade name products* received from their suppliers. *Facilities* must document assumptions and calculations used in making threshold determinations and *release* and other *waste management* calculations.

Supplier Notification, Distributors

682. Is supplier notification required for products produced by a *facility* and then distributed directly to a manufacturing *facility* or through a distributor to another manufacturer?

Yes, supplier notification is required in both instances. The intent is to provide a notification that will be passed on by the non-covered distributor. That distributor may be transhipping, relabeling or even repackaging, but because they are not in the *covered SIC codes*, they are not required to develop and distribute such notice. They are encouraged to pass the notice through to their customers.

Supplier Notification, Auxiliary Facility

683. A company distributes *toxic chemicals* through satellite *facilities*. *MSDSs* are distributed from a central *facility*. The *MSDSs* arrive either prior to or after the shipment of the *toxic chemical*. Is it acceptable for the supplier notification to be attached to the *MSDS* and for current distribution operations to remain the same? If not, must the supplier notification be sent in the same package as the chemical?

No, the requirement states that the notice must accompany at least the first shipment during the year to a customer. If the *MSDS* does not accompany that shipment then the supplier notification must still be sent in the package. The *MSDS*, however, also must incorporate or have attached to it the supplier notification information.

Supplier Notification, Repackaging

684. A *covered facility* repackages and distributes some *toxic chemicals manufactured* by other companies. Is the *facility* responsible only for passing on the manufacturer's information to its customers or is it required to provide supplier notification?

The repackaging *facility* must provide supplier notification to its customers only if it is in SIC codes 20 through 39. If the only information the *facility* knows is from the *MSDS*, all it can do is provide this same information to its customers. If the *facility* knows the product contents or concentrations are different from what appears on the supplier's notice, the *facility* must provide the more accurate information to its customers. EPA suggests, but does not require, that the repackager inform the supplier of the inaccuracy in their *MSDS.*

If the *facility* is not in SIC codes 20 through 39 but instead, is a *covered facility* in a newly added industry beginning in 1998, it would not be required to initiate supplier notification. It should, however, pass along such notices

prepared by their supplier to any *facility* in a *covered SIC code* who purchases a *mixture* or *trade name product* containing a *toxic chemical*.

Supplier Notification, Trade Name, Generic Name, Part II Section 1

685. *MSDSs* for the solvents we use give trade names or generic names only. Do we have to contact the manufacturer for more information to report under Part II of the Form R?

If a trade name or generic name is provided and if the presence of a Section 313 *toxic chemical* is known, then that can be reported in Part II, Section 2 of the Form R. Suppliers are required to provide the identity of the listed *toxic chemical* (CAS number and *toxic chemical* name) and concentration in *mixtures*. The *manufacturer* may claim the information trade secret, but must provide a name that is descriptive of the *toxic chemical*, provide at least an upper bound concentration in the *mixture*, and indicate that the *mixture* contains a *toxic chemical* (40 CFR Section 372.45(e)).

Supplier Notification, CAS Number

686. I own a small chemical company that supplies some Section 313 *toxic chemicals* to customers. My customers are requesting *MSDS* information and want the CAS number for every toxic chemical in my *mixtures*. I thought I only had to supply that information for the listed *toxic chemicals*.

If you wish, you may provide them with the CAS numbers for all of the toxic chemicals in your *mixtures*, but under Section 313 you are only required to provide information on the listed *toxic chemicals* (i.e., those *toxic chemicals* and chemical categories subject to reporting under Section 313).

Supplier Notification, MSDS

687. Is a company required to contact suppliers if an *MSDS* sheet does not contain complete or consistent language and/or information?

No. The company must use the best readily available information, but the EPCRA regulations do not require them to contact the supplier. If, however, the company does voluntarily contact the supplier and the supplier provides more detailed information, then that becomes the best readily available information and the *facility* must use it.

Supplier Notification, MSDS

688. A *covered facility* produces industrial non-consumer products and includes supplier notification information on the product label. Is this sufficient? Must the *MSDS* be distributed as the primary vehicle of notification?

Inclusion of Section 313 supplier notification information on the product label will satisfy the notification requirements. However, the regulations state that if the products are required to have an *MSDS* then the supplier notification must be included with the *MSDS* for those non-consumer products. The *MSDS*, however, does not have to be distributed as the primary vehicle of notification.

Supplier Notification, MSDS

689. The supplier notification provision requires that the notice be attached to the *MSDS* for the first shipment, if an *MSDS* is required. What options would a *facility* have to give this notice if no *MSDS* were required under OSHA for the shipment?

The *facility* may use a number of other mechanisms such as a letter, a label, or a written notice within whatever shipping papers accompany the shipment.

Supplier Notification, MSDS

690. EPCRA Section 313 supplier notifications must be attached to the *MSDS* and must not be detached. However, *MSDSs* must be submitted only one time unless changes are made, while the supplier notification must be submitted annually. How should this inconsistency be handled?

The supplier notification is to be part of the *MSDS* if the product is required to have an *MSDS*. If an *MSDS* is not required for the product, the notice must be in writing. Thus, in subsequent years, the supplier should submit the notification in writing.

Supplier Notification, Notification Letter

691. Would an annual notification by letter to customers satisfy the supplier notification provisions under 40 CFR Part 372, Subpart C?

Once customers have been supplied with the *MSDS* containing the Section 313 information, then it would be acceptable for a *facility* to refer to the *MSDS* by letter in subsequent years, provided the customer has the most current version of the *MSDS*. The letter must accompany the first shipment of the *mixture* or *trade name product* for the year. Also, the supplier notification regulations require that a new notification be provided when the presence or composition of a listed *toxic chemical* in the product changes.

SUPPLIER NOTIFICATION

Supplier Notification, Pesticides

692. Is supplier notification required for pesticide products packaged for distribution to the general public?

If the pesticides products are distributed for use by the general public, supplier notification is not required (40 CFR Section 372.45(d)(2)(iii)).

Supplier Notification, Mixture, Chemical Category

693. If a *mixture* contains a listed *toxic chemical* compound that is a member of a reportable Section 313 *toxic chemical* category, how should that be addressed on the supplier notification? Is it acceptable to provide the percent of the parent metal?

If a *mixture* contains a *toxic chemical* compound (e.g., 12 percent zinc oxide) that is a member of a reportable chemical category (e.g., zinc compounds), the supplier is required to notify his/her customers that the *mixture* contains a zinc compound at 12 percent by weight. Supplying only the weight percent of the parent metal (zinc) does not fulfill the requirement, but may be

provided to aid receiving *facilities* in estimating *releases* and other *waste management*. The customer must be told the weight percent of the entire compound for threshold determinations.

Supplier Notification, Pure Chemical, Trade Name

694. Do the supplier notification requirements under 40 CFR Section 372.45 require notification for a shipment of a pure (i.e., 100 percent) *toxic chemical* that has not been assigned a trade name?

A manufacturer is not required to provide supplier notification for a pure *toxic chemical* (i.e., a product labeled with the listed Section 313 chemical or identified by CAS number). The identity of the *toxic chemical* will be known based on label information and CAS numbers as long as a trade name is not used. Supplier notification applies to *mixtures* and *trade name products*.

Supplier Notification, Import

695. How will the supplier notification work for *imported* products? Do exporters from Japan have to comply?

No. Foreign suppliers are not required to comply with supplier notification. However, under the Toxic Substance Control Act (TSCA), an importer must certify that the chemicals in the *imported mixture*, as well as pure substances, meet the TSCA requirements. Therefore, the importer should have requested content and composition data on *imported mixtures*.

Supplier Notification, Waste

696. A *covered facility* sends empty drums containing *toxic chemicals* residue to a drum recycler (within a *covered SIC code*). Must the *facility* provide supplier notification?

No. The supplier notification requirement only applies to *mixtures* and *trade name products* that are supplied or distributed. The only *toxic chemicals* being transferred are in the form of waste, and notification does not apply to wastes.

Supplier Notification, Intracompany Transfer

697. Do transfers of products or materials from one of our company's *facilities* to another *facility* require supplier notification?

Yes. The language of the regulations covers material that it "sells or otherwise distributes." In this sense, the "otherwise distributes" language would apply to intra-company transfers. However, if the company has developed an internal communications procedure that alerts their other *facilities* to the presence and content of *toxic chemicals* in their products, then the Agency would accept this as satisfying the supplier notification requirement.

Supplier Notification, Multi-establishment, SIC Code

698. A *multi-establishment facility* is not covered (i.e., does not meet the SIC code criterion) but one of the *establishments* within the *facility* is within a *covered SIC code*. Does the language "*facility* or *establishment*" in the supplier notification part of the EPCRA Section 313 regulations subject this one *establishment* to the supplier notification provisions?

No. EPA has determined as a matter of policy that the phrase "or *establishment*" does not extend coverage of the supplier notification provisions beyond that of a *facility* as defined by 40 CFR Section 372.22 (b) of the regulations. Therefore, in the case of a multi-*establishment facility* not subject to the regulations, an *establishment* in a *covered SIC code* within that *facility* would not be required to provide Section 313 supplier notification. However, the Agency encourages such an *establishment* to comply voluntarily so that its customers will have the information necessary to make proper compliance determinations under the Section 313 rules. The "or *establishment*" language provides an option similar to that available to *establishments* that submit reports as a part of a *covered facility*. For example, if only one *establishment* in a *covered facility* is actually distributing a product containing a *toxic chemical* then that *establishment* may assume the supplier notification responsibility for that *facility*.

Supplier Notification, Manufacture

699. Is a *facility* owner/operator responsible for preparing EPCRA Section 313 supplier notification information for a *mixture* or *trade name product* which contains a listed *toxic chemical* that they did not *manufacture*?

The owner/operator may be responsible. The requirement for developing supplier notification for a *mixture* or *trade name product* containing a listed *toxic chemical* is the responsibility of the *facility* in SIC codes 20 through 39 that *manufactures* or *processes* a Section 313 *toxic chemical* and sells or otherwise distributes a *mixture* or *trade name product* containing that *toxic chemical*.

SUPPLIER NOTIFICATION

Supplier Notification, Activity Threshold

700. A manufacturing *facility otherwise uses* nitric acid to clean reaction vessels. The same *facility* also buys nitric acid solution (bought as "Trade Name X") and resells it to other customers (no repackaging or relabeling of the solution takes place). Is the owner/operator of the manufacturing *facility* in SIC codes 20 through 39 required to develop supplier notification for the nitric acid it sells under 40 CFR Section 372.45?

No. A manufacturing *facility* in SIC codes 20 through 39 is required to prepare and distribute supplier notification if it "...*manufactures* (including *imports*) or *processes* a *toxic chemical*..." and ... "sells or otherwise distributes a *mixture* or *trade name product* containing the *toxic chemical*..." to a *facility* that is required to file Form Rs or to a person who may sell or

otherwise distribute such *mixture* or *trade name product* to a *covered facility* (40 CFR Section 372.45(a)(2) and (3)). In the above example, the manufacturing *facility* does not *manufacture*, *import*, or *process* nitric acid (it only *otherwise uses* nitric acid) and so it is not required to develop supplier notification for the nitric acid it sells. However, if a supplier notification is provided with Trade Name X nitric acid solution, the manufacturing *facility* is encouraged to pass this information along to its customers. (Note: if a supplier notification is incorporated in or attached to the *MSDS* received by the manufacturing *facility* with the Trade Name X nitric acid solution it buys, "...any copying and redistribution of the *MSDS* shall include copying and redistribution of the notice attached to copies of the *MSDS* subsequently redistributed." (40 CFR Section 372.45(c)(5))

Supplier Notification, Pure Chemical, Concentration

701. Under 40 CFR Section 372.45, supplier notification is required for *mixtures* and *trade name products* containing listed *toxic chemicals*. The notification is not required for *toxic chemicals* labeled as pure. If a *facility* covered by the supplier notification requirements receives a substance which is labeled as a *toxic chemical* but no concentration is given, are they required to notify the recipient when selling or otherwise distributing the substance?

No. Supplier notification is not required for pure substances labeled as the *toxic chemical*. If a substance is labeled as a *toxic chemical* and no concentration is given, then the processor (supplier) and the recipient of the *toxic chemical* should consider it to have a concentration of 100 percent.

Supplier Notification, Article Exemption

702. A chemical manufacturing *facility* distributes an item to its customers. Some of the customers use the item in such a way that allows them to claim the *article* exemption (40 CFR Section 372.38(b)). However, some of the customers use the supplied item in such a way that negates the *article* exemption. When should the manufacturer provide a supplier notification for the items it distributes since it is not required to provide such a notification for *articles* (40 CFR Section 372.45(d)(1)(i)), and may not know the end result of the distributed items?

If the manufacturer knows that normal *processing* or *otherwise use* of the item by recipients would not negate its *article* status, no notification is necessary. If, however, the manufacturer believes the recipient may use an item in such a way that negates its *article* status, the manufacturer must provide a notification to that recipient.

Supplier Notification, Applicability, Article Exemption, Electroplating

703. A company manufactures metal parts which it sends to an electroplating job shop to be plated, and which are then returned. Is this manufacturing company considered to be a "supplier" and thus subject to supplier notification?

No, if the metal parts can be considered *articles*. In that case, the manufacturing company is not considered to be a supplier to the electroplator and does not need to meet the requirements for supplier notification.

Supplier Notification, Article Exemption

704. A *facility* manufactures paper products. Is the *facility* subject to the supplier notification provision of Section 313?

A paper product can generally be considered an *article*. Supplier notification would be required only if the *release* of a *toxic chemical* occurred upon further *processing* or *otherwise use* by a *covered* manufacturing *facility* of those products. This *release* would negate the *article* status of the product.

Supplier Notification, Paint, Janitorial Products

705. Are manufacturers shipping "maintenance products" such as paint or janitorial products exempt from supplier notification since they are exempt from threshold determinations by the receiving *facility*?

No. These manufacturers are still required to provide the supplier notification.

Supplier Notification, Consumer Product Exemption

706. Company A packages a listed chemical as a root destroyer and sells it to Company B, who then sells it directly to the public. (Company B does not use the product commercially and is not in a *covered SIC code*.) Is this considered a consumer product and thus considered to be exempt from supplier notification provisions (40 CFR Section 372.45(d)(2)(iii))?

Yes, the product is exempt from supplier notification because it is being packaged for sale to the public. Even if the product were being used commercially by Company B, no supplier notification would be required because Company B is not in the *covered SIC codes*.

Supplier Notification, Concentration

707. When a manufacturer considers the actual weight percent concentration of a *toxic chemical* in a *mixture* to be a trade secret, the Section 313 final rule states that an upper bound concentration can be used, but can be no larger than necessary to adequately protect the trade secret. Does that mean that a lower bound (i.e., not less than 5 percent) or a range (5-10 percent) is not acceptable in a supplier notification?

A lower bound is not acceptable. A range that includes the upper bound concentration is acceptable. An upper bound was chosen so the user would not underestimate the quantity for purposes of threshold and *release* determinations and other *waste management* calculations.

Supplier Notification, Corporate Headquarters

708. A manufacturing *facility* is required to provide a Section 313 supplier notification for a *mixture*. One of the *facilities* receiving the supplier notification has requested that its notification go to that *facility's* corporate headquarters, and the headquarters has guaranteed that they will deliver the notification to the *facility*. By sending the notification to the corporate headquarters, is the manufacturing *facility* fulfilling its supplier notification requirement even though the manufacturing *facility* is not directly giving the notification to the *facility* to which it supplies the chemical?

As long as the corporate headquarters can guarantee that the receiving *facility* will obtain the notification by the first shipment in the reporting year, the manufacturing *facility* is fulfilling its supplier notification requirement by sending the notification to the corporate headquarters as requested.

Supplier Notification, De minimis Exemption, Chemical Compounds

709. A manufacturing *facility* distributes a *mixture* containing three different manganese compounds. Each manganese compound, taken separately, would be below the de minimis level for Section 313 reporting. However, if the three manganese compounds are added together, the de minimis level is exceeded. Is this *facility* required to fulfill the supplier notification requirement (40 CFR Section 372.45) for this *mixture*?

The compounds are included in the manganese compound category. Therefore, the *facility* must add together the weight percent of all manganese compounds when making de minimis and threshold determinations. Since the percent of manganese compounds exceeds the de minimis level, the *facility* would have to fulfill the supplier notification requirements for this *mixture*.

Supplier Notification, Concentration

710. A *facility* in SIC code 28 distributes a product containing nitric acid, a listed *toxic chemical*, to other *covered facilities* and therefore is required to provide these other *covered facilities* with supplier notification. The concentration of nitric acid in the product varies from batch to batch. The *facility* knows the concentration of nitric acid in each batch. Can this *facility* give a range of concentrations for the nitric acid in this product in order to fulfill its supplier notification requirement?

No. Every time a concentration of a *toxic chemical* in a *mixture* changes, the supplier must provide an updated notification with the new concentration. Therefore, this *facility* cannot provide a concentration range value in order to fulfill the notification requirement. Instead, the *facility* must provide a new notification with each product that has a different concentration of the *toxic chemical*.

Supplier Notification, Concentration

711. Is there any margin of error allowed in the weight percent listed in a supplier notification (i.e., ± 0.5 percent)?

The Agency does not specify any margin of error or degree of precision in the percentage figures for the notice.

Supplier Notification, Trade Secret

712. A *facility* is required to provide the supplier notification (40 CFR Section 372.45) for some of its products that contain *toxic chemical(s)*. The products contain antimony compounds, a listed *toxic chemical* category. However, the *facility* considers the chemical names of the antimony compounds in their products a trade secret. Does this *facility* have to give the exact chemical names of these antimony compounds in order to fulfill the supplier notification requirement?

No, this *facility's* antimony compounds are not specifically listed in the Section 313 *toxic chemicals* list. However, they do fall into the antimony compounds category. Since the name of the *toxic chemical* is not listed, the *facility* does not need to provide the chemical name to fulfill the supplier notification requirement. This *facility* needs to identify that the products contain an antimony compound subject to Section 313, the concentration of the compound in the *mixture*, and the stoichiometric amount of antimony in the compound.

Supplier Notification, Trade Secret

713. Regarding supplier notification, when a *facility* decides that it will consider a *toxic chemical* component of a product as a trade secret, is it required to fill out and submit a substantiation form under provisions of Section 322?

No. The trade secret conditions in the supplier notification provisions of the regulations apply to applicable *state* law, not to EPCRA Section 322. *Facilities* are, however, required to keep a record of the reasons for considering specific chemical identity or composition a trade secret.

Supplier Notification, Consumer Product Exemption

714. The preamble to the Section 313 final rule (53 FR 4510; February 16, 1988) states that consumer product exemptions similar to those found in the OSHA Hazard Communication Standard (HCS) and the regulations implementing Sections 311 and 312 of EPCRA are incorporated into the Section 313 supplier notification provision (53 FR 4510). The consumer product exemptions under OSHA HCS and EPCRA Sections 311 and 312 are broader than the exemption that is listed in the Section 313 final rule.

The regulations implementing Section 313 exempts from supplier notification, "(a)ny consumer product as the term is defined in the Consumer Product Safety Act packaged for distribution to the general public" (40 CFR Section 372.45(d)(iii)).

OSHA HCS has a broader exemption that includes consumer products or hazardous substances that will be used in the workplace in the same manner as normal consumer use, and which results in a duration and frequency of exposure that is not greater than exposures experienced by consumers (52 FR 31878; August 17, 1987).

Section 311(e) expands the consumer product exemption to include substances to the extent they are present in the same form and concentrations as a product packaged for distribution and use by the general public (40 CFR Section 370.2 "Hazardous Chemicals").

A *facility* manufactures 16-ounce boxes of a detergent that contains a Section 313 *toxic chemical*. The *facility* primarily distributes its detergent to consumers, however, it distributes to some *covered facilities* also used by industry. The Consumer Product Safety Act defines the detergent as a consumer product.

The manufacturer distributes the 16-ounce boxes of detergent to three *facilities* within a *covered SIC code*. Each *facility* uses the detergent in a different way. The first *facility* exclusively uses the detergent to supply the company lunchroom for the employees to wash their dishes. The second *facility* uses the detergent in industrial size washers to clean metal *articles*. The third *facility* uses the detergent to clean and degrease their distillation towers.

To which of these facilities would the *manufacturer* be required to provide supplier notification?

The manufacturer would not be required to include supplier notification with the shipment of the 16-ounce boxes of detergent sent to any of these *facilities*.

For the product to be exempt from supplier notification under 40 CFR Section 372.45(d)(2)(iii), it must be packaged for distribution to the general public. This detergent is being distributed to *covered facilities* in the same form that it is packaged for distribution to the general public (i.e., the 16-ounce box). Therefore, no supplier notification is required. If the same detergent was sold to manufacturing *facilities* in drums or other "industrial quantity" packages, then supplier notification would be required, regardless of the end use at the *facility*.

Supplier Notification

715. The requirements for supplier notification for *mixtures* or *trade name products* containing listed *toxic chemicals*, are found in 40 CFR Section 372.45. The requirements specify in Section 372.45(a) that supplier notification is required for persons who meet the following criteria:

1. Is in SIC codes 20 through 39;

2. *Manufactures* (including *imports*) or *processes* a toxic chemical; and

3. Sells or otherwise distributes a *mixture* or *trade name product* containing the toxic chemical.

When the second criterion says a *toxic chemical,* does this refer to the *toxic chemical* being distributed or to any *toxic chemical* which is *manufactured* or *processed* at the *facility*? For example, a person *processes* benzene at their *facility* and also distributes a *mixture* containing xylene which they buy from another *facility*. The xylene is simply redistributed, not *processed,* by the *facility*. Is a supplier notification required for the *mixture* which contains xylene because the *facility processed* benzene?

When the second criterion says a *toxic chemical,* it is referring to the *toxic chemical* in the *mixture* that is being distributed from the *facility*. Therefore, a *facility* owner/operator would not be responsible for preparing a supplier notification for a *mixture* that contains a *toxic chemical* that he/she did not *manufacture* or *process*. The requirement for developing a supplier notification for a *mixture* is ultimately the responsibility of the *facility* which *processed* or *manufactured* the *toxic chemical* in the *mixture*. The *facility* that is redistributing the *toxic chemical* is not repackaging it and thus is not *processing* it.

Supplier Notification, Deleted Chemicals

SUPPLIER NOTIFICATION

716. The regulations at 40 CFR Section 372.45(c)(1) state that "the person shall provide the written notice described in paragraph (b) of this Section to each recipient of the *mixture* or *trade name product* with at least the first shipment of each *mixture* or *trade name product* to each recipient in each reporting year beginning January 1, 1989." Is the supplier required to notify customers if a Section 313 *toxic chemical* that is present in the *mixture* is later delisted by EPA, since the chemical is no longer a Section 313 *toxic chemical*?

As stated in 40 CFR Section 372.45(c)(l), the supplier is only required to notify recipients if the *mixture* or *trade name product* contains a listed *toxic chemical*. The supplier is not responsible for providing modified notice as an immediate result of the Agency's delisting activity. If the *mixture* contains other Section 313 *toxic chemicals*, then the supplier would simply delete the delisted chemical from the next year's notification.

Supplier Notification, Effective Date, New Chemicals

717. When must I begin providing a supplier notification (40 CFR Section 372.45) for a newly added chemical?

For a chemical added on or after January 1 and before December 1 of any reporting year, supplier notifications are to be provided with the first shipment of the chemical in the following reporting year and every year thereafter. For example, a chemical added on April l, 1998, requires a notification beginning with the first shipment of the chemical in the 1999 reporting year.

For a chemical added on or after December 1 of any reporting year and before January l of the next reporting year, supplier notifications are to be provided with the first shipment of the chemical in the year following the next reporting year and every year thereafter. For example, a chemical added on December 10, 1998, requires a notification beginning with the first shipment of the chemical in the 2000 reporting year.

Supplier Notification, Mass Mailing

718. Could a manufacturer do a mass mailing of notifications to all customers at one time in the beginning of the year instead of sending an individual supplier notification with each shipment?

Yes. Note that the regulations require that supplier notification be made to each customer by "at least the first shipment," so the timing of the mass mailing is important. Also, the notification must be included with the *MSDS* if one is required for the product. The supplier also must be cautious of formulation changes that could occur between the mass mailing and the actual first shipment.

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Section 7. TRADE SECRETS

Trade Secret, Chemical Identity

719. How can the identity of a listed *toxic chemical* be protected from disclosure for trade secrecy purposes?

Section 313 allows only the specific identity of a *toxic chemical* to be claimed as a trade secret. The rest of the Form R must be completed. This information is accessible to the public, including information on *releases* and other *waste management* of the *toxic chemical*. For trade secrecy claims, two versions of the Form R (one identifying the *toxic chemical*, the other containing only a generic chemical identity) and two versions of a trade secret substantiation form (July 28, 1988; 53 FR 28772) must be completed and sent to EPA.

Trade Secret, Part I Section 2.1

720. On the Form R, if I do not check the "Trade Secrets" box in Part I, Section 2.1, what other blocks can I leave blank? Do I still have to fill in the CAS number?

If the *toxic chemical* for which you are reporting is not a trade secret, you may leave the boxes in Section 2.2 blank. The CAS number, however, must be filled in along with the *toxic chemical* name (Part II, Section 1.1 and 1.2). If you are reporting for a *toxic chemical* category, no CAS number applies. If you are claiming that the *toxic chemical* is a trade secret you must enter the generic name in Part II, Section 1.3.

Trade Secret, Confidentiality Agreement, Public Disclosure

721. For claiming trade secrets under EPCRA Section 313, would disclosure, without a confidentially agreement to the *state* and/or city having jurisdiction, negate a *toxic chemical* identity's trade secret status under federal provisions?

In general, disclosure of information claimed as trade secret to a federal, *state* or local government officer or employee, or to the reporter's own employee, would not negate the claim of trade secrecy. However, disclosure of a *toxic chemical* identity to any other person without a confidentiality agreement would negate the *toxic chemical* identity's trade secret status under federal provisions. Where a trade secret claim is made, *state* governors are permitted to request that EPA provide access to all materials relating to this claim. The decision to provide information to any *state* employee is left to the governor's discretion.

Trade Secret, Public Disclosure, Confidentiality Agreement, Foreign Government

722. A company with both domestic and foreign operations wishes to claim on a Form R that the identity of a *toxic chemical* that it *processes* is a trade secret. The company has entered into confidentiality agreements with all nongovernment entities that have knowledge of the identity and/or usage of the *toxic chemical*. These confidentiality agreements prevent the nongovernment entities from disclosing information about the chemical's identity or usage. The company, however, has not

entered into a confidentiality agreement with one of the foreign governments where it operates because the government is required by its laws to keep information regarding foreign business interests confidential. If the company discloses the identity of the chemical to this foreign government, is it required to report this disclosure on a Trade Secret Substantiation Form?

Yes. Because the company has not entered into a tangible confidentiality agreement with the foreign government, it must report the disclosure on the Trade Secret Substantiation Form. In other words, it should check "yes" when answering question 3.2 on the form. However, because the foreign government's laws guarantee confidentiality of the TRI chemical's identity and usage, regardless of the existence of a confidentiality agreement, the identity of the chemical is protected. The company should explain this when answering question 3.1 on the form.

APPENDIX A. SECTION 313 POLICY DIRECTIVES

This appendix contains in-depth descriptions of some of the more complex issues involved in EPCRA Section 313 reporting.

The questions and answers contained in the body of this document address specific situations. For some issues, such as the de minimis and *article* exemptions, however, multiple factors become involved in determining threshold determinations and *release* and other *waste management* calculations. These issues have generated many inquiries and requests for clarification from regulated *facilities*. The directives contained in this appendix provide comprehensive written interpretations of such issues. While the information contained in these directives is the most up-to-date guidance available from EPA, no new policy information is contained in this appendix that is not represented in other EPA documents.

If you feel you have specific circumstances or situations for which you need additional EPA guidance, contact your Regional EPCRA Section 313 coordinator or call the Emergency Planning and Community Right-to-Know Information Hotline at (800) 424-9346 or (703) 412-9810.

DIRECTIVE #1 – ARTICLE EXEMPTION

Listed *toxic chemicals* contained in *articles* that are *processed* or *otherwise used* at a *covered facility* are exempt from threshold determinations and *release* and other *waste management* calculations. The exemption applies when the *facility* receives the *article* from another *facility*. The exemption only applies to the quantity of the *toxic chemical* present in the *article*. If the *toxic chemical* is *manufactured*, *processed*, or *otherwise used* at the *covered facility* other than as part of the *article*, in excess of an applicable threshold quantity, the *facility* is required to report for those non-exempted quantities (40 CFR Section 372.38(b)). For a *toxic chemical* in an item to be exempt as part of an *article*, the item must meet all of the following three criteria in the Section 313 *article* definition; that is, the item must be one:

i) that is formed to a specific shape or design during manufacture;

ii) that has end use functions dependent in whole or in part upon its shape or design; and

iii) that does not release a *toxic chemical* under the normal circumstances of *processing* or *otherwise use* of the item at the *facility*.

If, as a result of *processing* or *otherwise use*, an item retains its initial thickness or diameter, in whole or in part, it meets the first part of the definition. If the item's basic dimensional characteristics are totally altered during *processing* or *otherwise use*, the item does not meet the first part of the definition. An example of items that do not meet the definition would be items which are cold extruded, such as lead ingots which are formed into wire or rods. On the other hand, cutting a manufactured item into pieces which are recognizable as the *article* would not change the original dimensions as long as the diameter and the thickness of the item remained the same; the *article* exemption would continue to apply. Metal wire may be bent and sheet metal may be cut, punched, stamped, or pressed without losing their *article* status as long as the diameter of the wire or tubing or the thickness of the sheet are not totally changed.

An important aspect of the *article* exemption is what constitutes a release of a *toxic chemical*. Any *processing* or *otherwise use* of an *article* that results in a release negates the exemption. Cutting, grinding, melting, or other *processing* of a manufactured item could result in a release of a *toxic chemical* during normal conditions of *processing* or *otherwise use* and, therefore, negate the exemption as an *article*.

However, if the *processing* or *otherwise use* of all like manufactured items at a *facility* results in a total release of 0.5 pounds or less of a *toxic chemical* in a reporting year, EPA will allow this release quantity to be rounded to zero and the manufactured items remain exempt as *articles*. *Facilities* should round off and report all estimates to the nearest whole number. The 0.5 pound limit does not apply to each individual *article*, but applies to the sum of all releases from *processing* or *otherwise use* of all like *articles*. If all the releases of like *articles* over a reporting year are completely captured and sent for recycling/reuse on-site or off-site, the items may remain exempt as *articles*. Any amount that is released and is not recycled/reused will count toward the 0.5 pound per year cut-off value.

DIRECTIVE #2 – DE MINIMIS EXEMPTION

The de minimis exemption allows *covered facilities* to disregard certain minimal concentrations of chemicals in *mixtures* or *trade name products* they *process* or *otherwise use* when making threshold determinations and *release* and other *waste management* calculations. The de minimis exemption does not apply to the *manufacture* of a *toxic chemical* except if that *toxic chemical* is *manufactured* as an impurity and remains in the product distributed in commerce, or if the *toxic chemical* is *imported* below the appropriate de minimis level. The de minimis exemption does not apply to a byproduct *manufactured* coincidentally as a result of *manufacturing, processing, otherwise use,* or any *waste management* activities.

When determining whether the de minimis exemption applies to a listed *toxic chemical*, the owner/operator should consider only the concentration of the *toxic chemical* in *mixtures* and *trade name products* in process streams in which the *toxic chemical* is undergoing a reportable activity. If the *toxic chemical* in a process stream is *manufactured* as an impurity, *imported, processed,* or *otherwise used* and is below the appropriate de minimis concentration level, then the quantity of the *toxic chemical* in that process stream does not have to be applied to threshold determinations nor included in *release* or other *waste management* calculations. If a *toxic chemical* in a process stream is below the appropriate de minimis level, all *releases* and other *waste management* activities associated with the *toxic chemical* in that stream are exempt from EPCRA Section 313 reporting. It is possible to meet an activity (e.g., *processing*) threshold for a *toxic chemical* on a *facility*-wide basis, but not be required to calculate *releases* or other *waste management* quantities associated with a particular process because that process involves only *mixtures* or *trade name products* containing the *toxic chemical* below the de minimis level.

Once a *toxic chemical* concentration is above the appropriate de minimis level in the process stream, threshold determinations and *release* and other *waste management* calculations must be made, even if the chemical later falls below the de minimis level in the same process stream. Thus, all *releases* and other quantities managed as waste that occur after the de minimis level has been exceeded are subject to reporting. If a *toxic chemical* in a *mixture* or *trade name product* above de minimis is brought on-site, the de minimis exemption never applies.

The 0.1 percent de minimis levels are dictated by determinations made by the National Toxicology Program (NTP), Annual Report on Carcinogens, the International Agency for Research and Cancer (IARC)

Monographs, or 29 CFR part 1910, subpart Z. Therefore, once a chemical's status under NTP, IARC, or 29 CFR part 1910, subpart Z indicates that the chemical is a carcinogen or potential carcinogen, the reporting *facility* may disregard levels of the chemical below the 0.1 percent de minimis concentration provided that the other criteria for the de minimis exemption is met. De minimis levels for chemical categories apply to the total concentration of all chemicals in the category within a *mixture*, not the concentration of each individual category member within the *mixture*. All other listed *toxic chemicals* have a one percent (1.0 percent) de minimis level.

1. De Minimis Application to the Processing or Otherwise Use of a Mixture

The de minimis exemption applies only to the *processing* or *otherwise using*, of a listed *toxic chemical* in a *mixture*. Threshold determinations and *release* and other *waste management* calculations begin at the point where the chemical exceeds de minimis. If a listed *toxic chemical* is present in a *mixture* at a concentration below the de minimis level, this quantity of the substance does not have to be included for threshold determination, *release* and other *waste management* reporting, or supplier notification requirements. The exemption will apply as long as the *mixture* containing de minimis amounts of a *toxic chemical* never goes above the de minimis limit. Also, see the two examples below in which a *manufacturing* activity would qualify for the de minimis exemption.

Examples of Process and Otherwise Use Scenarios

There are many cases in which the de minimis limit is crossed or recrossed within a *process* or *otherwise use* scenario. The following examples are meant to illuminate these complex reporting scenarios. These applications are further described in the general section of the Toxic Chemical Release Inventory Reporting Forms and Instructions.

A. Example of Increasing Process Concentration to Above De Minimis Levels

A manufacturing *facility* receives toluene which contains less than the de minimis concentration of chlorobenzene. Through distillation, the chlorobenzene content in process streams is increased over the de minimis concentration of 1 percent. From the point at which the chlorobenzene concentration exceeds 1 percent in process streams, the amount present must be factored into threshold determinations and *release* and other *waste management* calculations. The *facility* does not need to consider the amount of chlorobenzene in the raw material, i.e., when below de minimis levels, when making threshold determinations. The *facility* does not have to report emissions of chlorobenzene from storage tanks or any other equipment where the chlorobenzene content is less than 1 percent.

B. Example of Fluctuating Process Concentration

A manufacturer produces an ink product which contains toluene, a listed *toxic chemical* below the de minimis level. The process used causes the percentage of toluene in the *mixture* to fluctuate: it rises above the de minimis level for a time but drops below the level as the process winds down. The *facility* must consider the chemical toward threshold determinations from the point at which it first exceeds the de minimis limit. Once the de minimis limit has been crossed the exemption cannot be taken.

C. Example of Concentration Levels that Straddle the De minimis Level

A *facility processes* 9,500,000 lbs. of *mixtures* containing 0.25–1.25 percent manganese. Manganese is subject to 1 percent de minimis concentration exemption. The amount of *mixture* subject to reporting is:

9,500,000 × (1.2 – 0.99)/(1.2 – 0.25) = 2,000,000 lbs. non-exempt *mixture*

The average concentration above de minimis is 1.1 percent.

2,900,000 × 0.011 manganese = 22,000 lbs manganese (below threshold)

In this example, because the *facility*'s information pertaining to the *toxic chemical* is available to two digits past the decimal point, the *facility* used 0.99 to determine the amount of the *toxic chemical* below the de minimis level. If the *facility* has information pertaining to the chemical that is available only to one digit past the decimal point, the *facility* should use 0.9.

2. De Minimis Application in the Manufacture of the Listed Chemical in a Mixture

The de minimis exemption generally does not apply to the *manufacture* of a *toxic chemical*. The de minimis exemption may apply to *mixture*s and *trade name products* containing *toxic chemicals* that are *imported* into the United States. Another exception applies to *toxic chemicals* that are coincidentally *manufactured* as impurities that remain in the product distributed in commerce at below the de minimis levels. In that case, the amount remaining in the product is exempt from threshold determinations. If the chemical is separated from the final product, thereby classifying the chemical as a byproduct, it cannot qualify for the exemption. Any amount that is separated, or is separate from the product, is considered a byproduct and is subject to threshold determinations and *release* and other *waste management* calculations. Any amount of a *toxic chemical* that is *manufactured* in a wastestream must be accounted for on the Form R.

A. Example of Coincidental Manufacture as a Product Impurity

Toluene 2,4-diisocyanate reacts with water to form trace quantities of 2,4-diaminotoluene. The resulting product contains 99 percent toluene 2,4-diisocyanate and 0.05 percent 2,4-diaminotoluene. The 2,4-diaminotoluene would not be subject to Section 313 reporting nor would supplier notification be required because the concentration of 2,4-diaminotoluene is below its de minimis concentration of 0.1 percent in the product. Coincidental *manufacture*/production refers only to production of a chemical via a chemical reaction. It would not include separation of a byproduct from a purchased *mixture* during a processing operation.

B. Example of Coincidental *Manufacture* as a Commercial Byproduct and Impurity

Chloroform is a reaction byproduct in the production of carbon tetrachloride. It is removed by distillation to a concentration of less than 150 ppm (0.0150 percent) remaining in the carbon tetrachloride. The separated chloroform at 90 percent concentration is sold as a byproduct. Chloroform is subject to a 0.1 percent (1,000 ppm) de minimis level. Any amount of chloroform *manufactured* and separated as byproduct must be included in threshold determinations because the de minimis exemption does not apply to *manufacture* of a chemical byproduct. *Releases* of chloroform prior to and during purification of the carbon tetrachloride should be reported. The de minimis level can, however, be applied to the chloroform remaining in the carbon tetrachloride as an impurity. Because the concentration of chloroform remaining in the carbon tetrachloride is below the de minimis level, this quantity of chloroform is exempt from threshold determinations, *release* and other *waste management* reporting, and supplier notification.

C. Example of Coincidental Manufacture as a Waste Byproduct

A small amount of formaldehyde is *manufactured* as a reaction byproduct during the production of phthalic anhydride. The formaldehyde is separated from the phthalic anhydride as a waste gas and burned, leaving no formaldehyde in the phthalic anhydride. The amount of formaldehyde produced and removed as waste must be included in threshold determinations and *release* and other *waste management* calculations even if the formaldehyde is present below the de minimis level in the process stream where it was *manufactured* or in the wastestream which it was separated.

The de minimis exemption also does not apply to situations where the *manufactured* chemical is *released* or transferred to wastestreams and thereby diluted to below the de minimis level.

3. De Minimis Levels Impact Supplier Notification Requirements

If the *toxic chemical* in a *mixture* or *trade name product* is present below the de minimis level for that *toxic chemical*, supplier notification is not required for that chemical.

DIRECTIVE #3 – MOTOR VEHICLE EXEMPTION

The use of "products containing *toxic chemicals* for the purpose of maintaining motor vehicles operated by the *facility*" is exempt from threshold determinations and *release* and other *waste management* reporting under Section 313. This exemption includes *toxic chemicals* found in gasoline, diesel fuel, brake and transmission fluids, oils and lubricants, antifreeze, batteries, cleaning solutions, and solvents in paint used for touch up, as long as the products are used to maintain the vehicle operated by the *facility*. Motor vehicles include cars, trucks, some cranes, forklifts, locomotive engines, and aircraft.

1. Motor Vehicle Use Exemption Applies Only to Otherwise Use of Chemical

The exemption applies only to the *otherwise use* of these chemicals, not their *manufacturing* or *processing* for distribution in commerce. For example, *manufacturing* gasoline is not exempt from reporting. Similarly, an automobile manufacturer who places transmission fluids in automobiles before shipping the automobiles would be *processing* the listed *toxic chemical* because the fluid is being incorporated into an item that the *facility* distributes in commerce.

Releases from the storage of fuel or motor vehicle maintenance products are exempt from reporting by virtue of the fact that their use is exempt. For example, *releases* of listed *toxic chemicals* in gasoline stored on-site for use by company owned vehicles are exempt from inclusion in *facility*-wide *release* and other *waste management* determinations for those chemicals.

2. Motor Vehicle Use Exemption Does Not Apply to Stationary Equipment

The motor vehicle exemption does not apply to the use of lubricants for stationary process equipment such as pumps or compressors. Likewise, fuels used for furnaces, boilers, heaters, or any stationary source of energy are not exempt.

DIRECTIVE #4 – COMPOUNDS AND MIXTURES

1. Definition of Compounds

A "compound" is a distinct chemical that results from the reaction of two or more other chemicals. In the formation of a compound, the reactant chemicals lose their individual chemical identities. Polymers formed as nonreversible reaction products are an example of compounds.

2. Definition of Mixtures

A *mixture* is any combination of two or more distinct chemicals if the combination is not the result of a chemical reaction. In a *mixture*, the individual components retain their identities. *Mixtures* include any combination of a chemical and associated impurities. Alloys are *mixtures* because the individual metals in the alloy retain their chemical identities. Wastes are not *mixtures.*

3. Mixtures Must be Considered for Section 313 Reporting

Threshold determinations and *release* and other *waste management* calculations for Section 313 reporting must include the amount of the listed *toxic chemical* present above the de minimis level in all *mixtures processed* or *otherwise used* by the *facility*. If a listed *toxic chemical* is present in a *mixture* at or above the de minimis level, only the amount of the *toxic chemical*, and not the *mixture* itself, is used for threshold determinations and *release* and other *waste management* calculations.

4. Supplier Notification and Concentration Ranges Provide Information for Reporting

The supplier notification requirements under 40 CFR Section 372.45 are designed to provide chemical users with information on the identity and concentrations of listed *toxic chemicals* present in the *mixtures* that they use. There can still be situations, however, when a *facility* may not have this information for a *mixture*. If the *facility* knows that a *mixture* contains a *toxic chemical* but no concentration information is provided by the supplier, then the *facility* does not have to consider the amount of the *toxic chemical* present in that *mixture* for purposes of threshold determinations and *release* and other *waste management* calculations. If only a range of concentrations is available for a *toxic chemical* present in a *mixture*, the owner/operator should use the midpoint of the "minimum" and "maximum" percentages in order to determine the amount to apply toward thresholds. If a *facility* owner/operator only knows the lower bound concentration of a *toxic chemical* present in a *mixture*, the owner/operator should assume the upper bound concentration is

100 percent, and compute an average based on these lower and upper bound concentration estimates to determine whether thresholds have been exceeded. If there are other known components present in the *mixture*, the *facility* owner/operator should subtract out the percentage of these components to determine what a reasonable "maximum" percentage of the *toxic chemical* could be.

DIRECTIVE #5 – TOXIC CHEMICAL CATEGORIES

1. All Compounds in a Listed Chemical Category are Aggregated for Threshold Determinations

Toxic chemical categories listed under EPCRA Section 313 require a different approach when making threshold determinations and *release* and other *waste management* calculations. For a chemical that is included in a listed metal compound category, the total weight of that chemical compound, not just the parent metal, is used in making threshold determinations. A *facility* will need to calculate the total weight of all compounds that are in the category, sum the amounts involved throughout the *facility* in each threshold activity, and compare the totals to the applicable thresholds. A compound in a listed chemical category that is present in a *mixture* below the de minimis concentration, based on the total weight of the compound, is exempt from threshold calculations under Section 1. Again, all individual members of a compound category must be totaled to determine if that compound category has exceeded the de minimis concentration in a *mixture*.

2. Make Threshold Determinations for Listed Toxic Chemicals Separately from the Listed Chemical Category

The Section 313 list contains some listed substances that are also members of a listed chemical category. Threshold determinations for a specifically listed *toxic chemical* are calculated separately from the threshold determinations for the chemical category. For example, 2-Methoxyethanol, which is specifically listed on the Section 313 list, is also a member of the glycol ether compound category. Because the chemical is specifically listed, a *facility* must make a threshold determination for 2-Methoxyethanol and a separate threshold determination for all other glycol ethers meeting the criteria for that chemical category that are not specifically listed under Section 313.

3. Calculate Releases and Other Waste Management Based on Parent Metal for Metal Compound Categories

Once a reporting threshold is met for a metal compound, *releases* and other *waste management* of compounds are calculated based on the pounds of the parent metal *released* or otherwise managed as waste rather than the total weight of the compound. EPA adopted this approach because of the difficulty in calculating *releases* of potentially numerous compounds within a metal compound category, recognizing that methods and data for monitoring the parent metal often exist while those for the compound(s) rarely will.

4. Optional Form R Submission for Parent Metal and Associated Metal Compound Category

If both the parent metal and associated metal compound category exceed their respective thresholds, one Form R, covering all *releases* and other *waste management* of the parent metal from activities involving both the chemical and the chemical category, may be filed. For example, if a *facility processes* 30,000 pounds of lead and *otherwise uses* 13,000 pounds of lead oxide, the *facility* could submit one Form R for lead and lead compounds. On this Form R, the *facility* would report all activities involving lead and lead compounds and all *releases* and other *waste management* of the parent metal lead. This option, preferred by EPA, is available to *facilities*, although separate reports may be filed if desired.

5. Calculate Releases and Other Waste Management Based on Nitrate Ion for Nitrate Compounds

Once a reporting threshold is met for the water dissociable nitrate compound category, *releases* and other *waste management* estimates are calculated based on the pounds of the nitrate ion in aqueous solution rather than the total weight of the compound. EPA adopted this approach because most monitoring data available only measure the dissociated nitrate ion *released* and not the amount of the total nitrate compounds from which the nitrate ion dissociated. Reporting the amount of total water dissociable nitrate compound in wastes would be complicated when more than one substance contributes to the nitrate ion content of the waste and when the nitrate compound is converted to a different substance due to waste treatment or other processes.

DIRECTIVE #6 – PCBs THRESHOLD DETERMINATION AND RELEASE AND OTHER WASTE MANAGEMENT REPORTING

Polychlorinated biphenyls (PCBs) are a listed chemical under Section 313.

1. PCBs in Articles are Exempt

EPA has stated that transformers are *articles* (and thus exempt from threshold determinations), but that the *release* or removal of fluid from the transformer negates the *article* status. The *article* status of only those transformers that have fluids removed (e.g., servicing or retrofilling), or have fluids escape are affected. However, the PCBs are still not considered if no new PCB-containing fluid is added, since the threshold determination is based on fluid added, not lost.

EPA has stated that disposal or removal of *articles* does not constitute a *release*. Therefore, disposal on-site, or off-site transfer of the whole transformer with fluid content undisturbed, does not negate the *article* status. The transformer is not included in threshold determinations and does not have to be reported as a *release* or an off-site transfer of PCBs for purposes of Section 313 reporting.

When calculating the threshold for *otherwise use*, a *facility* must consider only the amount of PCBs added to transformers during the reporting year (e.g., "topping off" a transformer), not the amount of working fluid contained in the transformer.

2. Coincidental Manufacture of PCBs is Subject to EPCRA Section 313

Facilities involved in coincidental *manufacture* of PCBs and further *processing* of *mixtures* containing PCBs (in excess of the 0.1 percent de minimis level) must count the amount *manufactured* or *processed* toward these thresholds.

3. Treatment or Disposal of PCBs May Require EPCRA Section 313 Reporting

Facilities in the SIC codes 20 through 39, as well as the newly *covered SIC codes*, may be subject to Section 313 reporting if they treat or dispose of PCBs. Effective January 1, 1998, the interpretation of activities considered *otherwise used* includes *treatment for destruction*, *disposal*, and *waste stabilization* when the *covered facility* engaged in these activities receives materials containing any chemical (not limited to EPCRA Section 313 listed *toxic chemicals*) from off-site (regardless of whether the generating and receiving *facilities* have common ownership) for purposes of further *waste management*.

Processing represents a potentially covered activity. However, *facilities* are not likely to be incorporating PCBs into items distributed in commerce or to be using PCBs as starting or intermediate material for the production of other chemical substances that are distributed in commerce, or used on site.

DIRECTIVE #7 – DEFINITION OF OTHERWISE USE (Effective Reporting Year 1998)

On May 1, 1997, EPA published a final rule to expand the universe of industry groups subject to EPCRA Section 313 and PPA Section 6607 (62 FR 23834; May 1, 1997). In this rule, which became effective January 1, 1998 (for the 1998 reporting year, Form R reports due by July 1, 1999), EPA finalized a revised interpretation of the term *otherwise use*.

1. Current Interpretation of Otherwise Use

Until January 1, 1998, the definition of *otherwise use* means "any use of a *toxic chemical* that is not covered by the terms *manufacture* or *process* and includes use of a *toxic chemical* contained in a *mixture* or *trade name product*. Relabeling or redistributing a container of a *toxic chemical* where no repackaging occurs does not constitute *otherwise use* or *processing* of the *toxic chemical*." EPA has generally interpreted this term to include *toxic chemicals* that are not intentionally incorporated into a product distributed in commerce. This would include any activity involving a listed *toxic chemical* at a *facility* that does not fall under the definitions of *manufacture* or *process*. Some examples of *toxic chemicals otherwise used* include solvents, catalysts, coolants, lubricants and fuels. **Historically, EPA has instructed *facilities* that the *disposal* of a *toxic chemical,* in and of itself, does not constitute *manufacture, process,* or *otherwise use.***

2. Revised Interpretation of Otherwise Use

In the May 1, 1997 final rule, EPA modified its definition of activities considered *otherwise used* as it applies to EPCRA Section 313 activity thresholds to include on-site *treatment for destruction*, *disposal*, and *stabilization* when the *covered facility* engaged in these activities receives materials containing any chemical (not limited to EPCRA Section 313 listed *toxic chemicals*) from off-site (regardless of whether the generating and receiving *facilities* have common ownership) for the purposes of further *waste management* activities. Specifically, EPA has defined the term *otherwise use* to include "any use of a *toxic chemical"* contained in a *mixture* or other *trade name product* or waste, that is not covered by the terms *manufacture* or *process*. *Otherwise use* of a *toxic chemical* does not include disposal, stabilization (without subsequent distribution in commerce), or treatment for destruction, unless:

(1) The *toxic chemical* that was disposed, stabilized, or treated for destruction was received from off-site for the purposes of further *waste management*; or

(2) The *toxic chemical* that was *disposed*, *stabilized*, or *treated for destruction* was *manufactured* as a result of *waste management* activities on materials received from off-site for the purposes of further *waste management* activities. Relabeling or redistributing of the *toxic chemical* where no repackaging occurs does not constitute *otherwise use* or *processing* of the *toxic chemical*.

3. Examples of the Revised Interpretation of Otherwise Use

The following are examples of the revised interpretation of *otherwise use* as finalized in the May 1, 1997, final rule. These examples assume that the *facility* meets the EPCRA Section 313 employee and SIC code criteria.

Example 1: A *facility* receives a material containing 22,000 pounds of chemical A. Chemical A is an EPCRA Section 313 listed *toxic chemical*. The *facility* treats chemical A for destruction. Included among the various activities covered by EPA's revised interpretation of *otherwise use* is the *treatment for destruction* of a *toxic chemical* received by the *facility* from off-site. Because the *facility* received and treated chemical A for destruction, the treated amount of chemical A would be included in the calculation of the amount of chemical A *otherwise used* at the *facility*. In this case, 22,000 pounds of chemical A would be considered *otherwise used*. Thus, because the *facility otherwise used* chemical A above the 10,000 pound statutory threshold for *otherwise use*, the *facility* would be required to report all *releases* and other *waste management* activities involving chemical A.

Example 1A: A *facility* receives a material containing 22,000 pounds of chemical A, and chemical A is an EPCRA Section 313 listed *toxic chemical*. The *facility* stabilizes chemical A. Stabilization is included among the various activities covered by EPA's revised interpretation of *otherwise use* of a *toxic chemical* received by the *facility* from off-site. Because the *facility* received and stabilized chemical A, the amount of stabilized chemical A would be included in the calculation of the amount of chemical *otherwise used* at the *facility*. In this case, 22,000 pounds of chemical A would be considered *otherwise used*. Thus, because the *facility otherwise used* chemical A above the 10,000 pound statutory threshold for *otherwise use*, the *facility* would be required to report all *releases* and other *waste management* activities involving chemical A.

Example 1B: A *facility* receives a material containing 18,000 pounds of chemical A, and chemical A is an EPCRA Section 313 listed *toxic chemical*. The *facility* stabilizes 9,000 pounds of chemical A and disposes of the other 9,000 pounds of chemical A. Included among the various activities covered by EPA's revised interpretation of *otherwise use* are stabilization and *disposal* of a *toxic chemical* received by a *facility* from off-site. Because the

facility received the 18,000 pounds of chemical A from off-site, the amount of chemical A that is subsequently stabilized or *disposed* is considered *otherwise used*, and would be included in the calculation of the amount of chemical A *otherwise used* at the *facility* for the purpose of threshold determination. The *facility* would need to add the amount of chemical A that is involved in all *otherwise use* activities to determine whether the *otherwise use* threshold of 10,000 has been exceeded. In this case, 18,000 pounds of chemical A would be considered *otherwise used*. Thus, because the *facility otherwise used* chemical A above the 10,000 pound statutory threshold for *otherwise use*, the *facility* would be required to report all *releases* and other *waste management* activities involving chemical A.

Example 2: Assume now that the same *facility*, in treating chemical A for destruction, *manufactures* 11,000 pounds of chemical B. Chemical B is also an EPCRA Section 313 listed *toxic chemical*. This *manufacture* of chemical B is below the *manufacture* reporting threshold. However, the *facility* disposes of chemical B on-site. Included among the various activities covered by EPA's revised interpretation of *otherwise use* is the *disposal* of a *toxic chemical* that is produced from the management of a waste that is received by the *facility* from off-site. In this example, because the *facility* received an off-site material containing a chemical that is *treated for destruction* (i.e., chemical A), and during that treatment produced and subsequently disposed of chemical B, the disposal of chemical B under EPA's revised interpretation would be considered *otherwise used*. Because the *facility disposed* of, or *otherwise used*, 11,000 pounds of chemical B, the 10,000 pound statutory threshold for *otherwise use* is met. Thus, the *facility* would need to report all *releases* and other *waste management* activities involving chemical B.

Example 2A: Now assume that the situation in Example 2 is the same (and the *facility* is still below the *manufacturing* threshold for chemical B,) except the *facility* does not *dispose* of chemical B on-site, but incorporates the entire 11,000 pounds of chemical B into a product that is sold to another *facility*. The *facility* neither *treats for destruction*, stabilizes, nor *disposes* of chemical B and, therefore, does not *otherwise use* chemical B. However, in this example, chemical B is also considered *processed*. Therefore, the 11,000 pounds of chemical B are counted towards the 25,000 pound *process* threshold for that chemical at the *facility*.

Example 2B: As in the above two examples, 11,000 pounds of chemical B are *manufactured* from the treatment of chemical A (and chemical A was received from an off-site *facility*). The *facility* is still below the *manufacturing* threshold for chemical B. However, the *facility* disposes of 6,000 pounds of chemical B and uses 5,000 pounds of chemical B in a nonincorporative *manufacturing* activity at the *facility*. Both of these

activities are considered to be *otherwise use* activities. The *disposal* of chemical B is included among the various activities covered by EPA's revised interpretation of *otherwise use* described in the proposal to expand the types of *facilities* covered under EPCRA Section 313. Any non-incorporative use of a *toxic chemical* at a *covered facility* that is not otherwise exempt is an *otherwise use* activity under the current interpretation. The *facility* would add the amounts of chemical B involved in both *otherwise use* activities at the *facility* to determine whether it exceeds the 10,000 *otherwise use* threshold. Since the total amount of chemical B that is *otherwise used* is 11,000 pounds, the *facility* would need to report all *releases* and *waste management* activity involving chemical B.

Example 3: A *facility* produces on-site a material containing 22,000 pounds of chemical C. Chemical C is not an EPCRA Section 313 listed *toxic chemical*. Also, chemical C was not *manufactured* as a result of managing a waste received from off-site. The *facility* treats chemical C for destruction and during treatment, *manufactures* 11,000 pounds of chemical D. Chemical D is an EPCRA Section 313 listed *toxic chemical*. The *facility* subsequently *disposes* of chemical D. In this example, although the *facility disposes* of chemical D, the 11,000 pounds of chemical D is not considered *otherwise used* under EPA's revised definition because the material from which chemical D was produced (i.e., the material containing the 22,000 pounds of chemical C) was not received by the *facility* from off-site. Thus, in disposing of chemical D, the *facility* does not exceed the 10,000 pound statutory threshold for *otherwise use*. The *facility*, however, must count the amount of chemical D *manufactured* toward the *manufacturing* threshold.

Example 3A: Assume instead that chemical C (which is not an EPCRA Section 313 listed *toxic chemical*) was received from off-site or was created in *waste management* activities conducted on materials received from off-site. In this situation, the disposal of chemical D would be considered an *otherwise use* activity involving chemical D. Therefore, the *disposal* of the 11,000 pounds of chemical D would exceed the 10,000 pound statutory threshold for *otherwise use*, and the *facility* would need to report all *releases* and *waste management* activities involving chemical D.

Example 3B: Chemical D is an EPCRA Section 313 chemical that is *manufactured* from chemical C during a *waste management* activity at the *facility*. (Chemical C is produced on-site and is not an EPCRA Section 313 listed *toxic chemical*.) In this example, the *facility* uses the entire 11,000 pounds of chemical D to neutralize a wastestream at the *facility*. Under the current definition of *otherwise use*, chemical D is considered *otherwise used*. Therefore, the *facility* exceeds the *otherwise use* threshold and the *facility* would report all *releases* and *waste management* activity involving chemical D.

Example 4: A *facility* receives 24,000 pounds of chemical E, which is not an EPCRA Section 313 *toxic chemical*. Chemical E undergoes a *processing* activity at the *facility*. This activity is not a *waste management* activity. During the *processing* of chemical E, 11,000 pounds of chemical F is *manufactured* as a byproduct. Chemical F is an EPCRA Section 313 listed *toxic chemical*. The 11,000 pounds of chemical F is then *disposed*. According to the current and the revised interpretation of the *otherwise use* definition, the *facility* has not *otherwise used* chemical F. Since chemical E was not received by the *facility* for the purpose of *waste management*, the subsequent *disposal* of chemical F is not an *otherwise use* activity under the revised interpretation of *otherwise use*. Under the current interpretation of *otherwise use*, the activity of disposal under these circumstances does not constitute a reportable activity for the purposes of threshold determinations. The *facility*, however, would have to count the amount of chemical F *manufactured* toward the *manufacturing* threshold.

Example 5: A *facility processes* 24,000 pounds of chemical E, an EPCRA Section 313 *toxic chemical*. This activity is not a *waste management* activity. During the *processing* of chemical E, 11,000 pounds of chemical E exits the *process* in the *facility*'s waste. Because chemical E has a high BTU/lb value, the *facility* combusts the wastestream containing chemical E in an energy recovery unit on-site. Under EPA's current and revised guidance on *otherwise use*, an EPCRA Section 313 *toxic chemical* that is a constituent of waste-derived fuel combusted in an energy recovery device is *otherwise used* by the *facility*, regardless of the origin of the waste-derived fuel. Therefore, when combusted for energy recovery on-site, chemical E, a constituent of the waste derived fuel, is considered *otherwise used* under the current definition of *otherwise use*. Because the *facility* combusts 11,000 pounds of the *toxic chemical*, the *facility* has exceeded the *otherwise use* activity threshold.

DIRECTIVE #8 – AMMONIA AND AMMONIUM SALTS

Background

On June 30, 1995, EPA finalized four actions in response to a petition to delete ammonium sulfate (solution) from the list of *toxic chemicals* subject to reporting under EPCRA Section 313, 42 U.S.C. 11001: (1) deleting ammonium sulfate (solution) from the EPCRA Section 313 list of *toxic chemicals*; (2) requiring that threshold determinations and *release* and other *waste management* estimates for aqueous ammonia be based on 10 percent of the total aqueous ammonia present in aqueous solutions of ammonia; (3) modifying the ammonia listing by adding the following qualifier: ammonia (includes anhydrous ammonia and aqueous ammonia from water dissociable ammonium salts and other sources; 10 percent of total aqueous ammonia is reportable under this listing); and (4) deleting ammonium nitrate (solution) as a separately listed chemical on the EPCRA Section 313 list of *toxic chemicals*. All actions were effective for the 1994 reporting year for reports due July 1, 1995 and for subsequent years, with the exception of the deletion of ammonium nitrate (solution) as a separately listed chemical, which was effective for the 1995 reporting year for reports due July 1, 1996 and for subsequent years. The ammonia listing is subject to the one percent de minimis concentration. Thus, *mixtures* and *trade name products* containing aqueous ammonia at a concentration in excess of one percent should be factored into threshold determinations and *release* and other *waste management* estimates. EPA has developed a guidance document for reporting aqueous ammonia under the ammonia listing which provides detailed information and examples including a list of some water dissociable ammonium salts.

Guidance for Reporting Aqueous Ammonia

Anhydrous ammonia is ammonia that is not dissolved in water and aqueous ammonia is ammonia that is dissolved in water. Aqueous solutions of ammonia contain both un-ionized ammonia (NH_3) and ionized ammonia (NH_4^+). Total aqueous ammonia is the sum of these two forms of ammonia. For the purposes of reporting under the ammonia listing for aqueous ammonia, water dissociable ammonium salts means that the ammonium ion dissociates from its counter ion when in solution.

1. Determining Threshold and Release Quantities for Ammonia

If a *covered facility manufactures*, *processes*, or *otherwise uses* anhydrous ammonia, the quantity applied towards threshold determinations for the ammonia listing is the total quantity of the anhydrous ammonia *manufactured, processed,* or *otherwise used*. The quantity reported when

calculating the amount of ammonia that is *released* or otherwise managed as waste is the total quantity of anhydrous ammonia *released* or managed as waste.

If a *facility manufactures*, *processes*, or *otherwise uses* aqueous ammonia, the quantity applied toward threshold determinations for the ammonia listing is 10 percent of the total quantity of the aqueous ammonia *manufactured*, *processed*, or *otherwise used*. The quantity reported when calculating the amount of ammonia that is *released*, transferred, or otherwise managed as waste is 10 percent of the total quantity of aqueous ammonia *released* or managed as waste.

If the *facility manufactures*, *processes*, or *otherwise uses* anhydrous ammonia in quantities that exceed the appropriate threshold and subsequently dissolves some or all of the anhydrous ammonia in water (i.e., generating aqueous ammonia), then the following applies: (1) threshold determinations are based on 100 percent of the anhydrous; (2) *release* and other *waste management* quantities for the aqueous ammonia are calculated as 10 percent of total aqueous ammonia; and (3) *release* and other *waste management* quantities for the anhydrous ammonia are calculated as 100 percent of the anhydrous ammonia.

If a *facility* dissolves a water dissociable ammonium salt in water, that *facility* has *manufactured* aqueous ammonia and 10 percent of the total aqueous ammonia *manufactured* from these salts is to be included in *manufacture* threshold determinations under the ammonia listing.

If aqueous ammonia from water dissociable ammonium salts is *processed* or *otherwise used*, then 10 percent of the total aqueous ammonia is to be included in all *processing* and *otherwise use* threshold determinations under the ammonia listing.

If anhydrous ammonia evaporates from an aqueous ammonia solution that has been *manufactured*, *processed*, or *otherwise used*, then 100 percent of the anhydrous ammonia that evaporates from such solutions must be included in threshold determinations and *release* and other *waste management* calculations.

Since total aqueous ammonia is the sum of the two forms of ammonia (NH_3 and NH_4^+) present in aqueous solutions, a precise calculation of the weight of total aqueous ammonia would require determining the ratio of the two forms of ammonia present using the pH and temperature of the solution. The weight of total aqueous ammonia can be more easily calculated by assuming that aqueous ammonia is comprised entirely of the NH_4^+ form or the NH_3 form. For the purpose of determining threshold and *release* and other *waste*

management quantities under EPCRA Section 313, EPA recommends that total aqueous ammonia be calculated in terms of NH_3 equivalents (i.e., for determining weights, assume total ammonia is comprised entirely of the NH_3 form). This method is simpler than using pH and temperature data to determine the ratio of the two forms present, and is consistent with the presentation of total ammonia toxicity in a separate EPA document, Ambient Water Quality Criteria for Ammonia (EPA document #440/5-85-001, January 1985).

2. Chemical Sources of Aqueous Ammonia

Aqueous ammonia may be generated in solution from a variety of sources that include the *release* of anhydrous ammonia to water and the dissociation of ammonium salts in water. Water dissociable ammonium salts are not reportable in their entirety under the ammonia listing; these salts are reportable to the extent that they dissociate in water, and only 10 percent of the total aqueous ammonia that results when these salts dissociate is reportable. If these salts are not placed in water, they are not reportable.

If ammonium salts are purchased neat (dry), or as solids by a *facility*, then placed in water by that *facility*, the *facility* is *manufacturing* aqueous ammonia. If the source of aqueous ammonia is anhydrous ammonia that has been dissolved in water, total aqueous ammonia (calculated in terms of NH_3 equivalents) is equal to the quantity of anhydrous ammonia *manufactured, processed*, or *otherwise used.*

3. Reporting Aqueous Ammonia Generated from the Dissociation of Ammonium Salts (Other Than Ammonium Nitrate)

If the source of aqueous ammonia is the dissociation of ammonium salts in water, total aqueous ammonia (calculated in terms of NH_3 equivalents) is calculated from the weight percent (wt percent) of the NH_3 equivalents of the ammonium salt. The NH_3 equivalent wt percent of an ammonium salt is calculated using the following equation:

NH_3 equivalent wt percent = (NH_3 equivalent weight)/(MW ammonium salt) × 100.

If the source of aqueous ammonia is a monovalent compound (such as ammonium chloride, NH_4Cl, ammonium nitrate, NH_4NO_3, or ammonium bicarbonate, NH_4HCO_3), the NH_3 equivalent weight is equal to the MW of NH_3 (17.03 kg/kmol). If divalent compounds are involved (such as ammonium carbonate ($(NH_4)_2CO_3$)), then the NH_3 equivalent weight is equal to the MW of NH_3 multiplied by two. Similarly, if trivalent compounds are

involved, then the NH_3 equivalent weight is equal to the MW of NH_3 multiplied by three.

4. Reporting Aqueous Ammonia Generated from the Dissociation of Ammonium Nitrate

Some sources of aqueous ammonia may be reportable under other EPCRA Section 313 category listings. Ammonium nitrate (solution) is relevant to reporting under the ammonia listing to the extent that 10 percent of the total aqueous ammonia that results when ammonium nitrate dissociates is reported when determining thresholds and calculating *releases* and other *waste management* activities. However, under the nitrate compounds category listing, ammonium nitrate (and other mixed salts containing ammonium and nitrate) must be reported in its entirety. When reporting ammonium nitrate under this category listing, the total nitrate compound, including both the nitrate ion portion and the ammonium counter ion, is included when determining threshold quantities. However, only the nitrate ion portion is included when determining the amount of ammonium nitrate that is *released*, transferred, or otherwise managed in wastes. The calculations involved in determining threshold and *release* and other *waste management* quantities for reporting under the nitrate compounds category listing are described in a separate directive, List of Toxic Chemicals within the Water Dissociable Nitrate Compounds Category and Guidance for Reporting (EPA document #745-R-96-004, Revised May 1996).

DIRECTIVE #9 – SUPPLIER NOTIFICATION REQUIREMENTS

Because manufacturers reporting under Section 313 must be aware of the *toxic chemical* composition of the products they use to be able to calculate *releases* and other *waste management* accurately, EPA requires some suppliers of *mixtures* or *trade name products* containing one or more of the listed Section 313 *toxic chemicals* to notify their customers. This requirement has been in effect since January 1, 1989.

1. Who Must Provide Notification

You are covered by supplier notification requirements if you own or operate a *facility* which meets all of the following criteria:

- Your *facility* is in Standard Industrial Classification (SIC) codes 20-39;
- You *manufacture* (*import*) or *process* a listed *toxic chemical*; and
- You sell or otherwise distribute a *mixture* or *trade name product* containing the *toxic chemical* to either:
  - A *facility* in a *covered SIC code*; or
  - A *facility* that then may sell the same *mixture* or *trade name product* to a *facility* in a *covered SIC code*.

You may be covered by the supplier notification rules even if you are not covered by the Section 313 *release* reporting requirements. The EPCRA Section 313 *release* reporting requirements are triggered if a *facility* is in a *covered SIC code*, has ten or more *full-time employees*, and exceeds a chemical activity threshold. However, if you have fewer than 10 *full-time employees* or do not *manufacture* or *process* any of the *toxic chemicals* in sufficient quantities to trigger the *release* and other *waste management* reporting requirements, you may still be required to notify your customers.

Note that beginning with the 1998 reporting year, seven new industries will be covered by most of the TRI reporting requirements. These new industries will not be required to comply with most of the supplier notification requirements. Industries whose primary SIC code is not within 20 through 39 are not required to initiate the distribution of notifications for *toxic chemicals* in *mixtures* or trade name products that they send to their customers. However, if these *facilities* receive notifications from their suppliers about *toxic chemicals* in *mixtures* or *trade name products*, they should forward the notifications with the *toxic chemicals* they send to other covered users.

2. Who Must Be Notified

For each *mixture* or *trade name product* that contains a listed *toxic chemical*, you must notify all customers in a *covered SIC code* or distributors who in turn may sell that product to *facilities* in a *covered SIC code*. Unless you know otherwise, you should assume that the chain of distribution includes *facilities* in a *covered SIC code*.

An example would be if you sold a lacquer containing toluene to distributors who then sell the product to other manufacturers. The distributors are not in a *covered SIC code*, but because they may sell the product to companies in *covered SIC codes*, they must be notified so that they may pass the notice along to their customers.

The language of the supplier notification requirements covers *mixtures* or *trade name products* that are sold or otherwise distributed. The "otherwise distributes" language applies to intra-company transfers. However, if the company has developed an internal communications procedure that alerts their other *facilities* to the presence and content of covered *toxic chemicals* in their products, then EPA would accept this.

3. Supplier Notification Must Include the Following Information:

- A statement that the *mixture* or *trade name product* contains a *toxic chemical* or *chemicals* subject to the reporting requirements of EPCRA Section 313 (40 CFR Section 372);

- The name of each *toxic chemical* and the associated Chemical Abstracts Service (CAS) registry number of each chemical if applicable. (CAS numbers are not used for chemical categories, since they can represent several individual *toxic chemicals*.)

- The percentage, by weight, of each *toxic chemical* (or all *toxic chemicals* within a listed category) contained in the *mixture* or *trade name product*.

For example, if a *mixture* contains a chemical (i.e., 12 percent zinc oxide) that is a member of a reportable *toxic chemical* category (i.e., zinc compounds), the notification must indicate that the *mixture* contains a zinc compound at 12 percent by weight. Supplying only the weight percent of the parent metal (zinc) does not fulfill the requirement. The customer must be told the weight percent of the entire compound within a listed *toxic chemical* category present in the *mixture*.

4. How the Notification Must Be Made

The required notification must be provided at least annually in writing. Acceptable forms of notice include letters, product labeling, and product literature distributed to customers. If you are required to prepare and distribute a *Material Safety Data Sheet (MSDS)* for the *mixture* under the Occupational Safety and Health Act (OSHA) Hazard Communication Standard, your supplier notification must be attached to the *MSDS* or the *MSDS* must be modified to include the required information.

You must make it clear to your customers that any copies or redistribution of the *MSDS* or other form of notification must include the supplier notification notice. In other words, your customers should understand that they are to include the supplier notification if they give your *MSDS* to their customers.

5. When Notification Must Be Provided

In general, you must notify each customer receiving a *mixture* or *trade name product* containing a listed *toxic chemical* with the first shipment of each reporting year. You may send the notice with subsequent shipments as well, but it is required that you send it with the first shipment each year. Once customers have been provided with an *MSDS* containing the Section 313 information, you may refer to the *MSDS* by a written letter in subsequent years (as long as the *MSDS* is current).

If EPA adds *toxic chemicals* to the Section 313 list, and your products contain the newly listed *toxic chemicals*, notify your customers with the first shipment made during the next reporting year following EPA's final decision to add the chemical to the list. For example, if EPA adds chemical ABC to the list in September 1997, supplier notification for chemical ABC would begin with the first shipment in 1998.

You must send a new or revised notice to your customers if you:

- Change a *mixture* or *trade name product* by adding, removing, or changing the percentage by weight of a listed *toxic chemical*.

- Discover that your previous notification did not properly identify the *toxic chemicals* in the *mixture* or correctly indicate the percentage by weight.

If you discover that the prior notification was inaccurate, you must:

- Supply a new or revised notification within 30 days of a change in the product or the discovery of misidentified *toxic chemical*(s) in the *mixture* or incorrect percentages by weight; and

- Identify in the notification the prior shipments of the *mixture* or product in that reporting year to which the new notification applies (e.g., if the revised notification is made on August 12, indicate which shipments were affected during the period January 1 – August 12).

6. When Notifications Are Not Required

Supplier notification is not required for a pure *toxic chemical* unless a trade name is used. The identity of the *toxic chemical* will be known based on label information. Also, you are not required to make a negative declaration. That is, you are not required to indicate that a product contains no Section 313 *toxic chemicals*.

Supplier notification is also not required if:

- Your *mixture* or *trade name product* contains the *toxic chemical* in percentages by weight of less than the following levels (these are known as de minimis levels):
  - 0.1 percent if the *toxic chemical* is defined as an "OSHA carcinogen"
  - 1 percent for all other *toxic chemicals*.

De minimis levels for each *toxic chemical* and chemical category are listed in the Toxic Chemical Release Inventory Reporting Forms and Instructions.

- Your *mixture* or *trade name product* is one of the following:
  - An *article* that does not *release* a listed *toxic chemical* under normal conditions of *processing* or *otherwise use* (see 40 CFR Section 372.3).
  - Foods, drugs, cosmetics, alcoholic beverages, tobacco, or tobacco products packaged for distribution to the general public.
  - Any consumer product, as the term is defined in the Consumer Product Safety Act, packaged for distribution to the general public. For example, if you mix or package one-gallon cans of paint designed for use by the general public, notification is not required.
- You are sending a waste off-site for further *waste management*. The supplier notification requirements only apply to *mixture* and *trade name products*. They do not apply to wastes.

- You are initiating distribution of a *mixture* or *trade name product* containing one or more *toxic chemicals* and your *facility* is in any of the newly *covered SIC codes* including *facilities* whose SIC code is within SIC major group codes 10 (except 1011, 1081, and 1094), 12 (except 1241); industry codes 4911, 4931, or 4939 (limited to *facilities* that combust coal and/or oil for the purpose of generating power for distribution in commerce); or 4953 (limited to *facilities* regulated under the Resource Conservation and Recovery Act, subtitle C, 42 U.S.C. Section 6921 et seq.) or 5169, or 5171, or 7389 (limited to *facilities* primarily engaged in solvent recovery services on a contract or fee basis).

7. Trade Secrets

Chemical suppliers may consider the chemical name or the specific concentration of a Section 313 *toxic chemical* in a *mixture* or *trade name product* to be a trade secret. If you consider the:

- Specific identity of a *toxic chemical* to be a trade secret, the notice must contain a generic chemical name that is descriptive of the structure of that *toxic chemical*. For example, decabromodiphenyl oxide could be described as a halogenated aromatic.

- Specific percentage by weight of a *toxic chemical* in the *mixture* or *trade name product* to be a trade secret, your notice must contain a statement that the *toxic chemical* is present at a concentration that does not exceed a specified upper bound. For example, if a *mixture* contains 12 percent toluene and you consider the percentage a trade secret, the notification may state that the *mixture* contains toluene at no more than 15 percent by weight. The upper bound value chosen must be no larger than necessary to adequately protect the trade secret.

If you claim this information to be trade secret, you must have documentation that provides the basis for your claim (40 CFR Section 350.5).

8. Recordkeeping Requirements

The following records are required to be kept for three years:

- Notifications sent to recipients of your *mixture* or *trade name product*;

- All supporting materials used to develop the notice;

- If claiming a specific *toxic chemical* identity a trade secret, why the *toxic chemical* identity is considered a trade secret and the appropriateness of the generic chemical name provided in the notification (40 CFR Section 350.5); and

- If claiming a specific concentration a trade secret, explanations of why a specific concentration is considered a trade secret and the basis for the upper bound concentration limit (40 CFR Section 350.5).

This information must be readily available for inspection by EPA.

Sample Notification Letter

January 2, 1998

Mr. Edward Burke
Furniture Company of North Carolina
1000 Main Street
Anytown, North Carolina 99999

Dear Mr. Burke:

This letter is to inform you that a product that we sell to you, Furniture Lacquer KXZ-1390, contains one or more chemicals subject to Section 313 of the Emergency Planning and Community Right to Know Act (EPCRA). We are required to notify you of the presence of these chemicals in the product under EPCRA Section 313. This law requires certain manufacturers to report on annual emissions and other waste management of specified toxic chemicals and chemical categories. Our product contains:

- Toluene, Chemical Abstract Service (CAS) number 108-88-3, 20 percent; and

- Zinc compounds, 15 percent.

If you are unsure whether you are subject to the reporting requirements of EPCRA Section 313, or need more information, call EPA's EPCRA Hotline at (800) 424-9346 or (703) 412-9810. Your other suppliers should also be notifying you about EPCRA Section 313 toxic chemicals in the mixtures and trade name products they sell to you.

Finally, please note that if you repackage or otherwise redistribute this product to industrial customers, a notice similar to this one must be sent to those customers.

Emma Sinclair
Sales Manager
Furniture Products

SAMPLE

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APPENDIX B. GLOSSARY

AP-42 - is the EPA document, Compilation of Air Pollutant Emission Factors, which contains information on over 200 stationary source categories. This information includes brief descriptions of processes used, potential sources of air emissions from the processes, and in many cases, common methods used to control these air emissions. Methodology for estimating the quantity of air pollutant emissions are presented as Emission Factors. This document can be obtained by calling the Government Printing Office (GPO) at (202) 512-1800, or by visiting the EPA's Technology Transfer web site, http://www.epa.gov/ttn/chief.

Article - the term in 40 CFR Section 372.3, is defined as a *manufactured* item: (1) which is formed to a specific shape or design during *manufacture*; (2) which has end use functions dependent in whole or in part upon shape or design; and (3) which does not *release* a *toxic chemical* under normal conditions of *processing* or use of that item at the facility or *establishments*.

Beneficiation - the preparation of ores to regulate the size (including crushing and grinding) of the product, to remove unwanted constituents, or to improve the quality, purity, or grade of a desired product (40 CFR Section 372.3).

Boiler - an enclosed device using controlled flame combustion and having the following characteristics:

(1)(i) The unit must have physical provisions for recovering and exporting thermal energy in the form of steam, heated fluids, or heated gases; and

(ii) The unit's combustion chamber and primary energy recovery sections(s) must be of integral design. To be of integral design, the combustion chamber and the primary energy recovery section(s) (such as waterwalls and superheaters) must be physically formed into one manufactured or assembled unit. A unit in which the combustion chamber and the primary energy recovery section(s) are joined only by ducts or connections carrying flue gas is not integrally designed; however, secondary energy recovery equipment (such as economizers or air preheaters) need not be physically formed into the same unit as the combustion chamber and the primary energy recovery section. The following units are not precluded from being boilers solely because they are not of integral design: process heaters (units that transfer energy directly to a process stream), and fluidized bed combustion units; and

(iii) While in operation, the unit must maintain a thermal energy recovery efficiency of at least 60 percent, calculated in terms of the recovered energy compared with the thermal value of the fuel; and

(iv) The unit must export and utilize at least 75 percent of the recovered energy, calculated on an annual basis. In this calculation, no credit shall be

given for recovered heat used internally in the same unit. (Examples of internal use are the preheating of fuel or combustion air, and the driving of induced or forced draft fans or feedwater pumps); or

(2) The unit is one which the Regional Administrator has determined, on a case-by-case basis, to be a boiler, after considering the standards in 40 CFR Section 260.32 of this chapter (40 CFR Section 372.3).

Coal Extraction - the physical removal or exposure of ore, coal, minerals, waste rock, or overburden prior to beneficiation, and encompasses all extraction-related activities prior to beneficiation. Extraction does not include beneficiation (including coal preparation), mineral *processing*, in situ leaching or any further activities (40 CFR Section 372.3).

Covered Facility - a *facility*, as defined in 40 CFR Section 372.3, that has 10 or more *full-time employees*, is in a *covered SIC code* (see below), and meets the activity threshold for *manufacturing*, *processing*, or *otherwise using* a listed *toxic chemical* (see below).

Covered SIC Code - prior to January 1, 1998, means SIC codes 20 through 39 (manufacturing *facilities*). Beginning January 1, 1998, a covered SIC code means SIC codes in major group codes 10 (except 1011, 1081, and 1094), 12 (except 1241), or 20-39; industry codes 4911, 4931, or 4939 (limited to *facilities* that combust coal and/or oil for the purpose of generating power for distribution in commerce); or 4953 (limited to *facilities* regulated under the Resource Conservation and Recovery Act, subtitle C, 42 U.S.C. Section 6921 et seq.) or 5169, or 5171, or 7389 (limited to *facilities* primarily engaged in solvent recovery services on a contract or fee basis).

Customs Territory - the 50 states, the District of Columbia, and Puerto Rico (40 CFR Section 372.3).

Disposal - any underground injection, placement in landfills/surface impoundments, land treatment, or other intentional land disposal (40 CFR Section 372.3).

Environment - includes water, air, and land and the interrelationship which exists among and between water, air and land and all living things (EPCRA Section 329(2)).

Establishment - an economic unit, generally at a single physical location, where business is conducted, or where services or industrial operations are performed (40 CFR Section 372.3).

Facility - all buildings, equipment, structures and other stationary items which are located on a single site or on contiguous or adjacent sites and

which are owned or operated by the same person (or by any person which controls, is controlled by or under common control with such person). A *facility* may contain more than one *establishment* (40 CFR Section 372.3).

Full-time Employee - a person who works 2,000 hours per year of full-time equivalent employment. A *facility* would calculate the number of *full-time employees* by totaling the hours worked during the calendar year by all employees, including contract employees, and dividing the total by 2,000 hours (40 CER Section 372.3).

Import - to cause a chemical to be *imported* into the *customs territory* of the United States. For purposes of the definition, to cause means to intend that the chemical be *imported* and to control the identity of the *imported* chemical and the amount of the *imported* chemical (40 CFR Section 372.3).

Industrial Furnace - any of the following enclosed devices that are integral components of manufacturing *processes* and that use thermal treatment to accomplish recovery of materials or energy:

(1) Cement kilns.
(2) Lime kilns.
(3) Aggregate kilns.
(4) Phosphate kilns.
(5) Coke ovens.
(6) Blast furnaces.
(7) Smelting, melting and refining furnaces (including pyrometallurgical devices such as cupolas, reverberator furnaces, sintering machine, roasters, and foundry furnaces).
(8) Titanium dioxide chloride process oxidation reactors.
(9) Methane reforming furnaces.
(10) Pulping liquor recovery furnaces.
(11) Combustion devices used in the recovery of sulfur values from spent sulfuric acid.
(12) Halogen acid furnaces (HAFs) for the production of acid from halogenated hazardous waste generated by chemical production *facilities* where the furnace is located on the site of a chemical production *facility*, the acid product has a halogen acid content of at least 3 percent, the acid product is used in a manufacturing *process*, and, except for hazardous waste burned as fuel, hazardous waste fed to the furnace has a minimum halogen content of 20 percent as-generated.
(13) Such other devices as the Administrator may, after notice and comment, add to this list on the basis of one or more of the following factors:
(i) The design and use of the device primarily to accomplish recovery of material products;
(ii) The use of the device to burn or reduce raw materials to make a material product;

(iii) The use of the device to burn or reduce secondary materials as effective substitutes for raw materials, in *processes* using raw materials as principal feedstocks;

(iv) The use of the device to burn or reduce secondary materials as ingredients in an industrial *process* to make a material product;

(v) The use of the device in common industrial practice to produce a material product; and

(vi) Other factors, as appropriate (40 CFR Section 372.3).

Manufacture - to produce, prepare, *import*, or compound a *toxic chemical*. *Manufacture* also applies to a *toxic chemical* that is produced coincidentally during the *manufacture*, *processing*, use, or disposal of another chemical or *mixture* of chemicals, including a *toxic chemical* that is separated from that other chemical or *mixture* of chemicals as a byproduct, and a *toxic chemical* that remains in that other chemical or *mixture* of chemicals as an impurity (40 CFR Section 372.3).

Material Safety Data Sheet (MSDS) - the form required to be developed under 29 CFR Section 1910.1200(g), as that section may be amended from time to time (EPCRA Section 329(6)).

Mixture - any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction. However, if the combination was produced by a chemical reaction, but could have been produced without a chemical reaction, it is also treated as a *mixture*. A *mixture* also includes any combination which consists of a chemical and associated impurities (40 CFR Section 372.3). A waste is not considered a *mixture* for EPCRA Section 313 reporting purposes.

Otherwise Use - any use of a *toxic chemical* that is not covered by the terms *manufacture* or *process*, and includes use of a *toxic chemical* contained in a *mixtures* or *trade name product*. Relabeling or redistributing a container of a *toxic chemical* where no repackaging of the *toxic chemical* occurs does not constitute use or *processing* of the *toxic chemical*.

Beginning in the 1998 reporting year (as of January 1, 1998), the definition of *otherwise use* was modified to read:

Otherwise use - any use of a *toxic chemical*, including a *toxic chemical* contained in a *mixture* or other *trade name product* or waste, that is not covered by the terms *manufacture* or *process*. *Otherwise use* of a *toxic chemical* does not include disposal, stabilization (without subsequent distribution in commerce), or treatment for destruction unless:

(1) the *toxic chemical* that was disposed, stabilized or treated for destruction was received from off-site for the purposes of further *waste management;* or

(2) the *toxic chemical* that was disposed, stabilized, or treated for destruction was manufactured as a result of *waste management* activities on materials received from off-site for the purposes of further *waste management* activities. Relabeling or redistributing of the *toxic chemical* where no repackaging of the *toxic chemical* occurs does not constitute *otherwise use* or *processing* of the *toxic chemical* (40 CFR Section 372.3).

Overburden - the unconsolidated material that overlies a deposit of useful materials or ores. It does not include any portion of ore or waste rock (40 CFR Section 372.3).

Process - the term *process* means the preparation of a *toxic chemical,* after its *manufacture* for distribution in commerce: (1) in the same form or physical state as, or in a different form or physical state from, that in which it was received by the person so preparing such substance, or (2) as part of an *article* containing the *toxic chemical. Process* also applies to the *processing* of a *toxic chemical* contained in a *mixture* or *trade name product* (40 CFR Section 372.3).

RCRA approved test method - includes Test Method 9095 (Paint Filter Liquids Test) in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW-846, Third Edition, September 1986, as amended by Update I, November 15, 1992 (40 CFR Section 372.3).

Release - any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles) of any *toxic chemicals* (40 CFR Section 372.3).

Senior Management Official -an official with management responsibility for the person or persons completing the report, or the manager of environmental programs for the *facility* or *establishment,* or for the corporation owning or operating the *facility* or *establishments* responsible for certifying similar reports under other environmental regulatory requirements (40 CFR Section 372.3).

State - any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, and any other territory or possession over which the United States has jurisdiction (40 CFR Section 372.3).

Total Annual Reportable Amount - a *facility's total annual reportable amount* is equal to the combined total quantities *released* at *the facility* (including disposal), treated at *the facility* (as represented by amounts destroyed or converted by treatment *processes*), recovered at *the facility* as a result of recycle operations, combusted for the purpose of energy recovery at *the facility*, and amounts transferred from the *facility* to off-site locations for the purpose of recycling, energy recovery, treatment, and/or disposal (See 40 CFR Section 372.27(a)).

Toxic chemical - a chemical or chemical category listed in 40 CFR Section 372.65 (40 CFR Section 372.3).

Trade name product - a chemical or *mixture* of chemicals that is distributed to other persons and that incorporates a *toxic chemical* compound that is not identified by the applicable chemical name or Chemical Abstract Service Registry number list in 40 CFR Section 372.65 (40 CFR Section 372.3).

Treatment for destruction - the destruction of a *toxic chemical* in waste such that the substance is no longer the *toxic chemical* subject to reporting under EPCRA Section 313. *Treatment for destruction* does not include the destruction of a *toxic chemical* in waste where the *toxic chemical* has a heat value greater than 5,000 British thermal units and is combusted in any device that is an industrial furnace or boiler (40 CFR Section 372.3).

Tribal Emergency Response Commission or TERC - the commission responsible for carrying out the provisions of EPCRA in the same manner as a State Emergency Response Commission (SERC) on federally recognized tribal lands.

Waste management - EPA interprets *waste management* to include the following activities: recycling, combustion for energy recovery, treatment for destruction, waste stabilization, and *release*, including disposal. *Waste management* does not include the storage, container transfer, or tank transfer if no recycling, combustion for energy, treatment for destruction, waste stabilization, or *release* of the chemical occurs at the *facility* (See 62 FR 23834; 23850; May 1, 1997).

Waste stabilization - any physical or chemical *process* used to either reduce the mobility of hazardous constituents in a hazardous waste or eliminate free liquid as determined by a RCRA approved test method for evaluating solid waste as defined in this section. A *waste stabilization process* includes mixing the hazardous waste with binders or other materials, and curing the resulting hazardous waste and binder *mixture*. Other synonymous terms used to refer to this *process* are "stabilization," "waste fixation," or "waste solidification" (40 CFR Section 372.3).

APPENDIX C. INCORRECT GUIDANCE ON EPCRA SECTION 313

The following EPA letters are incorrect and should not be used for reporting under EPCRA Section 313. Please do not refer to these documents when making threshold determinations and *release* and other *waste management* calculations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

June 14, 1991

MEMORANDUM

SUBJECT: Clarification of the Article Exemption

FROM: Sam Sasnett, Director
Toxic Release Inventory Management Staff
(TS—779)

TO: Robert W. Hicklin
Section 313 Enforcement Coordinator
USEPA Region 6 (6T-PT)

This correspondence is in response to your memo (received 5/31/91) related to issues involving the article exemption under the Emergency Planning and Community Right-to—Know Act (EPCRA; 40 CFR 372.38(b)). In response to some of the many issues you raised, I have the following comments:

- **Recycling Efficiency -** For the toxic chemicals in like items to remain exempt from threshold and release calculations, the processing and use of these like items at a facility during a calendar year must result in a release of less than 0.5 pounds for any given toxic chemical. (The 0.5 value is chosen as the cut off value since, according to our guidelines, less than this amount may be rounded to 0 or no release.) However, if all the released material is collected for recycling or reuse, either on- or off—site, the article exemption is not negated.

  As you point out in your memo, recycling strategies are not (for a variety of reasons) likely to be 100% efficient. Nevertheless, the important aspect to consider when deciding whether or not to count a particular release towards the 0.5 pound cut-off value is the comprehensiveness and aggressiveness of the owner/operator in attempting to recycle/recover as much released material as possible. If the owner/operator has instituted a comprehensive and aggressive program for the recycle/recovery of all released material, then small amounts of toxic chemical that are not, in fact, recycled/recovered due to the imperfect efficiency of virtually any recycling/recovery system should not count towards the 0.5 pound cut-off value.

INCORRECT GUIDANCE UNDER SECTION 313

For example, a metal fabricator has instituted a comprehensive and aggressive recycling/recovery program to collect dust, fumes, chips, etc. from processing of like items for purposes of recycling/recovery. However, a small amount of released material clings to the workers' clothes and leaves the facility by this route every day of the year (this is not known to the owner/operator). Even though the additive amount of a given toxic chemical leaving the facility on clothing may be greater than or equal to 0.5 pounds in a particular year, the article exemption for the like items is not negated because the owner/operator has instituted a comprehensive and aggressive recycling/recovery program and should not be penalized because of the inability of the system to capture l00% of the releases. The applicability of the article exemption would, on the other hand, be called into question if, say, the larger chips were collected and recycled/recovered while dust was simply swept up and placed in a dumpster.

Thus, a distinction must be made between a manufacturer who has instituted a comprehensive and aggressive recycling/recovery program but still has minor releases due to the inability of virtually any recycling/recovery system to capture all releases and a manufacturer who has releases for which no comprehensive and aggressive recycling/recovery attempt is clearly being made.

- **Distribution in Commerce as Release** — In your memo you state that "Judge Greene is saying that any material released into commerce is a release of the constituent compounds to the environment". I do not read this in the Order that accompanied your memo. Material that is processed to make a product is not considered released to the environment once it is distributed in commerce. Likewise, the disposal of an article does not constitute a release to the environment.

Again, let me reiterate that to determine whether the article exemption holds for a given situation, one must determine (in addition to the other criteria outlined for the exemption) whether the release of a toxic chemical from the like items has occurred. In making this determination, one must consider whether an aggressive and comprehensive recycling/recovery program is being pursued by a facility to recycle/recover all releases. Where such a program is not in place, the releases are counted towards the 0.5 pound cut-off value. Should this value be reached, the like items are not articles and the toxic

INCORRECT GUIDANCE ON EPCRA SECTION 313

chemicals contained in the items are subject to threshold and release determinations. Finally, we consider the article exemption and the guidance issued on this subject to be valid. As such, the Regions should continue to allow the article exemption.

I hope this has cleared up any questions you may have had. If you have any further questions related to this matter, please call me at FTS 382—3821.

cc: Regional EPCRA § 313 Coordinators

INCORRECT GUIDANCE ON EPCRA SECTION 313

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

July 1, 1992

Ms. Brenda J. Boykin
Shaw, Pittman, Potts, & Trowbridge
2300 N Street, N. W.
Washington, D.C. 20037

Dear Ms. Boykin:

This letter is in response to your written request dated June 11, 1992 concerning the applicability of the article exemption for Toxic Release Inventory (TRI) reporting for a facility that manufactures bronze gears. The bronze contains copper, a listed TRI chemical.

As I understand from your letter and our conversation of May 6 and meeting of June 24, 1992, the facility in question receives bronze blanks about 3" in diameter by 1.5" thick in the middle which slope to about 1" diameter at each end. Teeth are cut into the middle edge about 0.25" deep and a keyhole is cut into the center hole of each blank. No dust or fumes are created during the cutting, but small chips are created which are collected and then sent off-site for recycling. As the blanks are being cut, the chips fall into a round open collection bin which surrounds the cutting machine.

One criterion of the article definition is that the item's end use function is dependent in whole or in part upon its shape or design during end use. Because the thickness and end diameters of the blank do not change during processing and the only size change is small cuts to the middle edge of the blank, EPA agrees that the processing of the blanks meets this criterion and that the end use function of the gears are dependent, in part, upon the shape and initial size of the blank before processing.

Another criterion of the exemption is that the item does not release a toxic chemical under normal circumstances of processing or use of the item at the facility. In a directive (page A-2) in the 1990 TRI Reporting Package, EPA has further clarified that if all waste material from the processing or use of the item is recycled, the article status is maintained. That is, the article exemption will apply if the facility has an aggressive and comprehensive recycling program for the toxic chemical waste produced during the processing or use of the items. The facility

INCORRECT GUIDANCE ON EPCRA SECTION 313

should carefully document its rationale for claiming the article exemption including measures undertaken to recycle as much as possible of the processing and use wastes as possible. It appears from your description and photographs of the recycling process that the facility does have an aggressive and comprehensive recycling program in place. However, be aware that this determination is subject to review by the EPA Regional Office in the event of an inspection.

The facility should also consider whether air releases occur from any subsequent operations such as grinding or polishing, if such operations take place at all. If there is not a recovery program in place for these emissions, then the article exemption may not apply.

Please call me at (202) 260-2250 if you have any further questions.

Sincerely,

Kathleen Franklin
Chemical Engineering Branch
Economics and Technology Division
(TS-779)

INCORRECT GUIDANCE ON EPCRA SECTION 313

cc: Sam Sasnett (TS-779)
Tami McNamara (TS-779)
Ken Mitchell (TS-779)
Section 313 Regional Coordinators on attached list
EPCRA Hotline

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

June 24, 1991

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

Russell H. Jones
Kerr-McGee Chemical Corporation
P.O. Box 25861 (MT-1601)
Oklahoma City, OK 73125

Dear Mr. Jones:

This letter is in response to your request of June 6, 1991 for written confirmation on various reporting issues related to Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA).

You are correct in your understanding that concentrations of listed toxic chemicals below de minimis levels in ore imported into the United States are not reportable if the chemicals simply pass through the process and are discharged in the waste or tailings stream. Reporting is not required in this case because the chemicals would not meet the definitions of manufacture, process, or otherwise use. However, if beneficiation is applied to recover a listed toxic chemical from the ore and the manufacturing threshold is exceeded reporting would be required.

Concentrations of listed toxic chemicals above the de minimis levels in ore imported into the United States are not reportable if the chemicals simply pass through the process and are discharged in the waste or tailings stream for the same reasons stated above. However, if the waste material is subsequently sold, releases of toxic chemicals associated with the quantity sold would be reportable if they met the applicable processing threshold. This reporting requirement would also apply to wastes derived from materials that are not imported.

Supplier notification may be required for the waste material sold or the product if the material contains a toxic chemical above the de minimis level. The supplier notification requirements (40 CFR 372.45) apply if you distribute to other facilities within SIC codes 20—39 or to a company that sells to a covered facility.

INCORRECT GUIDANCE ON EPCRA SECTION 313

I hope this letter provides the confirmation you requested. Please feel free to contact me at 202—382-3821 or Tami McNamara of my staff at 202-382-5997 if you have any further questions regarding this matter.

Sincerely,

Sam Sasnett, Director
Toxic Chemical Release Inventory
Management Staff

INCORRECT GUIDANCE ON EPCRA SECTION 313

APPENDIX D. RECENT EPA GUIDANCE

In addition to the questions and answers included in this document, the following EPA interpretive guidance letter may be used when making threshold determinations and *release* and other *waste management* calculations under EPCRA Section 313.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

Sept. 23, 1998

Richard G. Stoll
Freedman, Levy, Kroll & Simonds
1050 Connecticut Ave., NW
Washington, DC 20036

Dear Mr Stoll:

This letter fulfills, in part, EPA's commitment regarding resolution of the Cement Kiln Recycling Coalition (CKRC) case against EPA (Cement Kiln Recycling Coalition v. EPA, (D.D.C., No 1-98CV00171)) challenging portions of the Emergency Planning and Community Right-to-Know Act (EPCRA) section 313 facility expansion rule (62 FR 23834; May 1, 1997) and guidance. This letter pertains to claim number III of that case. Specifically this response addresses whether the act of transferring toxic chemicals in waste fuels off-site to be burned at cement kilns for energy recovery constitutes a covered threshold activity under EPCRA section 313.

For your information, the repackaging and subsequent transfer off-site of EPCRA section 313 toxic chemicals in waste fuel for burning for energy recovery is not, in itself, a covered "manufacturing," "processing," or "otherwise use" threshold activity as those terms are defined in the EPCRA section 313 regulations (40 CFR part 372). Therefore, EPA is clarifying that EPCRA section 313 covered facilities are not required to consider the repackaging and subsequent transfer off-site of toxic chemicals for energy recovery to any type of boiler or industrial furnace (as defined in 40 CFR section 372.3) toward threshold calculations. Similarly toxic chemicals in waste that are repackaged and sent off-site for disposal or for treatment for destruction would likewise not be considered toward a facility's "manufacturing," "processing," or "otherwise use" threshold determination. Covered facilities should keep in mind, however, that if they exceed an activity threshold elsewhere at the facility for the listed chemical contained in the waste fuel, the facility should report the quantity of the toxic chemical in the waste fuel sent off-site for energy recovery in the appropriate sections of 6.2 and 8 of the Form R.

Although the simple repackaging and transfer off-site of a toxic chemical in waste for the purposes of energy recovery does not constitute a covered threshold activity, other closely related activities may need to be considered toward thresholds. For example, if a covered facility burns a waste-fuel *on-site*, this activity would constitute an "otherwise use" of each listed toxic chemical in the waste-fuel. Thus, these listed toxic chemicals would be subject to the "otherwise use" threshold determinations. In addition, toxic chemicals that are coincidentally manufactured as a result of repackaging must be considered toward the facility's 25,000 pound "manufacturing"

threshold. Also as of January 1, 1998, if a covered facility receives a toxic chemical from off-site for the purposes of waste management and subsequently disposes, stabilizes or treats the toxic chemical for destruction on-site, the covered facility must consider this quantity of the toxic chemical toward the "otherwise use" threshold.

This letter supersedes any previous EPA guidance on this topic. I hope this information clarifies how facilities should consider toxic chemicals in waste fuels for threshold determinations and release and other waste management calculations for section 313 of EPCRA. If you have any other questions, or desire further information, please call me at 202-260-9592.

Sincerely,

Maria J. Doa, Ph.D., Chief
Toxics Release Inventory Branch

cc. Amber Aranda
Sara Hisel McCoy

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A

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Environmental Protection Agency
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EPCRA Section 313 Questions and Answers

Addendum to the Revised 1998 Version as of December 2004

Q&A

Addendum

Section 313 of the Emergency Planning and Community Right-to-Know Act

Toxic Chemical Release Inventory

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INTRODUCTION AND DISCLAIMER

In December, 1998, the Environmental Protection Agency (EPA) published a revised Emergency Planning and Community Right-to-Know Act (EPCRA) Section 313 Questions and Answers Document (1998 Q & A Document)(EPA 745-B-98-004). The EPCRA Section 313 program is also referred to as the Toxics Release Inventory or TRI. Under Section 313, certain *facilities* are required to report *releases* and other *waste management* quantities of specific chemicals listed in 40 CFR part 372. *Facilities* that meet all three of the following criteria are subject to EPCRA Section 313 *release* and other *waste management* reporting:

- the *facility* has 10 or more *full-time employee* equivalents (*i.e.*, a total of 20,000 hours or greater; *see* 40 CFR 372.3);
- the *facility* is included in *Standard Industrial Classification* (SIC) *Codes* 10 (except 1011, 1081, and 1094), 12 (except 1241), 20–39, 4911 (limited to facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce), 4931 (limited to facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce), 4939 (limited to facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce), 4953 (limited to facilities regulated under RCRA Subtitle C, 42 U.S.C. section 6921 *et seq*.), 5169, 5171, and 7389 (limited to facilities primarily engaged in solvents recovery services on a contract or fee basis), or, under Executive Order 13148, federal facilities regardless of their SIC code; and
- the *facility manufactured* (defined to include *imported*), *processed*, or *otherwise used*, in the course of a calendar year, any *toxic chemical* in quantities greater than the set threshold.

Under Section 313 the Form R or Form A Certification Statement must be submitted annually to EPA and to designated *State* (or Tribal) agencies. Reports are due by July 1 of each year and cover activities at the *facility* during the previous calendar year.

Copies of EPA's Form R and Form A and the instructions for completing the Forms, and related guidance documents are available from the TRI Homepage (http://www.epa.gov/tri), or you may call (202) 564-9554 or send an e-mail to TRIDOCS@epa.gov. Additional information may be obtained by accessing EPA's TRI Homepage on the Internet at http://www.epa.gov/tri or calling the EPCRA Call Center (*see* the TRI Homepage for contact information).

Since the 1998 Q & A Document was published, the Agency has promulgated two regulations that affect the TRI program. On October

29, 1999, EPA finalized proposed amendments to 40 C.F.R. part 372 (see 64 Fed. Reg. 58666) that, among other things, lowered reporting thresholds for certain persistent bioaccumlative toxic (PBT) chemicals and added new PBT chemicals to the Section 313 toxic chemical list. (PBT Rule). On January 17, 2001, EPA finalized proposed amendments to 40 C.F.R. part 372 (see 66 Fed. Reg. 4500) that, among other things, lowered the reporting thresholds for lead and lead compounds which are subject to Section 313 reporting requirements. (Lead Rule).

In addition, on April 26, 2000, Executive Order 13148 (E.O. 13148) was published in the Federal Register (65 FR 24595). E.O. 13148 supersedes Executive Order 12856, which was published in the Federal Register on August 3, 1993 (58 FR 41981).

There has also been a legal decision since 1998 that pertains to the criteria that multi-establishment facilities must use to determine whether the facility is in a SIC Code that is subject to TRI reporting requirements. The decision was issued in In Re: Coast Wood Preserving, Inc., EPCRA Appeal No. 02-01 (May 6, 2003). Further, in Barrick Goldstrike, Inc. v. Browner, 260 F.Supp.2d 28 (D.D.C. 2003), the court issued a ruling that affects *de minimis* exemption eligibility. Qs & As concerning the mining industry were not addressed in this document in light of the decisions in Barrick and National Mining Association v. U.S. Environmental Protection Agency (Civil No. 97-N-2665; D. Colo.). EPA's analysis of those decisions can be found at http://www.epa.gov/tri under “Featured Topics.”

As a result of E.O. 13148, and the regulatory actions and the legal decisions noted above, some of the Qs & As and Directives contained in the 1998 Q & A Document now are inaccurate or may be misleading. EPA has identified such Qs & As and Directives in this Addendum to the 1998 EPCRA Section 313 Questions and Answers Document (Addendum) and has revised them as appropriate so that the guidance reflected therein is accurate and consistent with current legal interpretations and the Executive Order. The Qs & As and Directives contained in this Addendum supersede the corresponding Qs & As and Directives contained in the 1998 Q & A Document. EPA is including a crosswalk document in the Addendum to assist the regulated community and other interested parties in identifying the Qs & As and Directives in the 1998 Q & A Document that have been superseded by this Addendum and to explain the changes made to them.

In most cases, only minor revisions were necessary to ensure that the 1998 Qs & As and Directives are accurate and consistent with current legal interpretations and the Executive Order. For example, many questions and/or answers were revised to clarify that the 10,000 pound *otherwise use* threshold and the 25,000 pound *manufacturing* and *processing* thresholds apply only to non-PBT chemicals. In one case, the 1998 version of Q & A

427 regarding vanadium compounds simply could not be squared with the regulations and therefore, there is no corresponding Q & A in this Addendum and the crosswalk in the Addendum states that this Q & A has been deleted and is no longer valid guidance.

In Coast Wood Preserving, the Environmental Appeals Board (EAB) concluded that EPA did not provide fair notice of its interpretation of 40 C.F.R. § 372.22(b)(3) that, in determining the appropriate SIC code for a multi-establishment *facility*, the value added by each establishment is the appropriate basis for comparing the relative economic contributions of each *establishment* at the *facility*. The revisions that were made to the 1998 Qs & As that are affected by the EAB's decision in Coast Wood Preserving clarify that, under 40 C.F.R. § 372.22(b)(3), *facilities* should use value-added as the basis for comparing the relative economic contributions of each *establishment* in a multi-establishment *facility*. In Barrick, the court concluded that a toxic chemical does not need to be involved in a threshold activity (i.e., *manufacture*, *process*, or *otherwise use*) to be eligible for the *de minimis* exemption. Qs & As and Directives in the 1998 Q & A that indicate that involvement in a threshold activity is a prerequisite to *de minimis* exemption eligibility have been revised accordingly.

The Agency developed this document to facilitate *facility* reporting and to provide additional explanation of the reporting requirements. This document supplements the instructions for completing the Form R and the Alternate Threshold Certification Statement (Form A). This document is intended solely for guidance and does not alter any statutory or regulatory requirements. The document should be used in conjunction with the statute and regulations but does not supersede them. The guidance provided in this document addresses the very specific circumstances stated in each question. Accordingly, the reader should consult other applicable documents (e.g., the statute, the Code of Federal Regulations (CFR), relevant preamble language, and the current Toxic Chemical Release Inventory Reporting Forms and Instructions) when determining whether a *facility* is subject to EPCRA Section 313 reporting requirements, and how the *facility* should report *releases* and other *waste management* quantities of *toxic chemicals*. If a conflict exists between guidance provided in this document and the statutory or regulatory requirements, the conflict must be resolved in favor of the statute or regulation.

EPA recognizes that activities involving *toxic chemicals* may vary significantly from one *facility* to another. Because it is not possible to address in a guidance document the specific circumstances that exist at each *facility* that may be subject to Section 313 reporting requirements, EPA intends to apply this guidance in a flexible manner. Similarly, individual *facilities* may find that the guidance provided in this document is inapplicable to their processes or circumstances, and that alternative

approaches or information are more accurate and/or more appropriate for meeting the statutory and regulatory requirements of EPCRA Section 313. *Facilities* should therefore use facility-specific information and process knowledge, where available, to meet the requirements of EPCRA Section 313.

There may be instances where the 1998 Q & A Document and this Addendum do not sufficiently address a *facility's* concerns (e.g., an issue with a *facility's* specific *manufacturing* process) with the reporting requirements of EPCRA section 313. In those instances, the *facility* should contact EPA or consult with professional counsel for compliance assistance. *Facilities* are also encouraged to contact the Agency with any additional or clarifying questions about the guidance provided in this document, or if the *facility* believes that EPA has incorrectly characterized a particular process or recommendation.

CROSSWALK TABLE BETWEEN 1998 EPCRA SECTION 313 QUESTIONS AND ANSWERS AND THE ADDENDUM

1998 Q&A	Addendum Q&A	Description of Update to 1998 Q&A
2	1	This Q&A has been modified to reflect that the Form A Certification Statement may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.27, the Form A Certification Statement may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
65	2	These Qs & As clarify EPA's interpretation of 40 CFR section 372.22(b)(3) that multi-establishment facilities should use "value added" as the basis for comparing the relative values of different establishments when determining the primary SIC code for the entire facility. The concept of "value added" has been applied to these Qs & As. (*See* Toxic Chemical Release Reporting final rule (53 FR 4500, 4501, February 16, 1988) and In Re: Coast Wood Preserving, Inc., EPCRA Appeal No. 02-01 (May 6, 2003)).
67	3	
68 on pg. 20	4	
69	5	
72	6	
73	7	
80	8	This Q&A has been modified to reflect that EO 12856 has been superseded by EO 13148 (65 FR 24595, April 26, 2000).
89	9	The activity thresholds are lower for PBT chemicals listed at 40 CFR section 372.28 and therefore, Qs & As throughout the 1998 Q&A Document have been modified to account for the lower thresholds for PBT chemicals. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
96	10	
97	11	
107	12	
109	13	This Q&A has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).

EPCRA Section 313 Questions and Answers Addendum

1998 Q&A	Addendum Q&A	Description of Update to 1998 Q&A
117	14	Activity thresholds are lower for PBT chemicals listed at 40 CFR section 372.28 and therefore, Qs & As throughout the 1998 Q&A Document have been modified to account for the lower thresholds for PBT chemicals. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
118	15	
120	16	
121	17	
122	18	
126	19	
129	20	
132	21	
145	22	Activity thresholds are lower for PBT chemicals listed at 40 CFR section 372.28 and therefore, Qs & As throughout the 1998 Q&A Document have been modified to account for the lower thresholds for PBT chemicals. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
165	23	Activity thresholds are lower for PBT chemicals listed at 40 CFR section 372.28 and therefore, Qs & As throughout the 1998 Q&A Document have been modified to account for the lower thresholds for PBT chemicals. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
166	24	
169	25	This Q&A has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).

1998 Q&A	Addendum Q&A	Description of Update to 1998 Q&A
170	26	Activity thresholds are lower for PBT chemicals listed at 40 CFR section 372.28 and therefore, Qs & As throughout the 1998 Q&A Document have been modified to account for the lower thresholds for PBT chemicals. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
173	27	
185	28	
192	29	
193	30	
197	31	
200	32	
201	33	
220	34	Activity thresholds are lower for PBT chemicals listed at 40 CFR section 372.28 and therefore, Qs & As throughout the 1998 Q&A Document have been modified to account for the lower thresholds for PBT chemicals. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
221	35	
226	36	These Qs & As clarify EPA's interpretation of 40 CFR section 372.22(b)(3) that multi-establishment facilities should use "value added" as the basis for comparing the relative values of different establishments when determining the primary SIC code for the entire facility. The concept of "value added" has been applied to these Qs & As. (*See* Toxic Chemical Release Reporting final rule (53 FR 4500, 4501, February 16, 1988) and In Re: Coast Wood Preserving, Inc., EPCRA Appeal No. 02-01 (May 6, 2003)).
230	37	
274	38	Activity thresholds are lower for PBT chemicals listed at 40 CFR section 372.28 and therefore, Qs & As throughout the 1998 Q&A Document have been modified to account for the lower thresholds for PBT chemicals. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
313	39	

1998 Q&A	Addendum Q&A	Description of Update to 1998 Q&A
315	40	This Q&A has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)). In addition, reference to the threshold activities as a prerequisite to *de minimis* exemption eligibility has been removed from this Q&A.
316	41	This Q&A has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
317	42	These Qs & As have been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)). In addition, reference to the threshold activities as a prerequisite to *de minimis* exemption eligibility has been removed from this Q&A.
318	43	
321	44	This Q&A has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).

1998 Q&A	Addendum Q&A	Description of Update to 1998 Q&A
323	45	This Q&A has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)). In addition, reference to the threshold activities as a prerequisite to *de minimis* exemption eligibility has been removed from this Q&A.
325	46	These Qs & As have been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
326	47	
327	48	
328	49	This Q&A has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)). In addition, the answer of 200,000 lbs in 1998 Q&A 328 represented a mathematical error and has been changed to 2,000,000 lbs in the Addendum.
329	50	These Qs & As have been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
330	51	
331	52	

1998 Q&A	Addendum Q&A	Description of Update to 1998 Q&A
334	53	This Q&A has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)). In addition, reference to the threshold activities as a prerequisite to *de minimis* exemption eligibility has been removed from this Q&A.
336	54	These Qs & As have been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
337	55	
339	56	
340	57	This Q&A has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)). The example of polycyclic aromatic compounds (PACs) category in the 1998 Q&A was changed to arsenic compounds because PACs are classified as a PBT chemical category listed at 40 CFR 372.28 and therefore, are not eligible for the *de minimis* exemption.

1998 Q&A	Addendum Q&A	Description of Update to 1998 Q&A
354	58	Activity thresholds are lower for PBT chemicals listed at 40 CFR section 372.28 and therefore, Qs & As throughout the 1998 Q&A Document have been modified to account for the lower thresholds for PBT chemicals. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
365	59	
375	60	
376	61	
379	62	
398	63	
421	64	
425	65	These Qs & As have been modified to reflect that pursuant to the PBT chemical rulemaking the qualifier for vanadium has changed from "fume or dust" to "except when contained in an alloy." In addition, pursuant to the PBT chemical rulemaking the category of vanadium compounds has been added to the list of toxic chemicals at 40 CFR section 372.65, but not as a PBT chemical category. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999)). 1998 Q&A 427 is no longer valid guidance in light of the regulatory changes.
426	66	
427	Deleted	
453	67	This Q&A has been modified to reflect the change from two to three delimited categories based on the addition of dioxin and dioxin-like compounds to the list of toxic chemicals pursuant to the PBT chemical rulemaking. This Q&A has also been modified to reflect the addition of two members to the PACs category pursuant to the PBT chemical rulemaking. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999)).
465	68	This Q&A has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
522	69	Activity thresholds are lower for PBT chemicals listed at 40 CFR section 372.28 and therefore, Qs & As throughout the 1998 Q&A Document have been modified to account for the lower thresholds for PBT chemicals. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).

1998 Q&A	Addendum Q&A	Description of Update to 1998 Q&A
531	70	This Q&A has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)). In addition, reference to the threshold activities as a prerequisite to *de minimis* exemption eligibility have been removed from this Q&A.
545	71	This Q&A has been modified to reflect that the Form A Certification Statement may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.27, the Form A Certification Statement may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
597	72	Pursuant to the PBT chemical rulemakings, this Q&A has been modified to reflect that PBT chemicals should be reported at a level of precision supported by the accuracy of the underlying data and the estimation techniques on which the estimate is based. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
599	73	These Qs & As have been modified to reflect that the Form A Certification Statement may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.27, the Form A Certification Statement may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)). Additional text was added to Q & A # 75 in the Addendum to clarify that more than one toxic chemical can be reported on a single Form A.
600	74	
604	75	

1998 Q&A	Addendum Q&A	Description of Update to 1998 Q&A
634	76	This Q&A has been modified to reflect that the qualifier for vanadium has changed from "fume or dust" to "except when contained in an alloy" pursuant to the PBT chemical rulemaking. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999)).
641	77	Pursuant to the PBT chemical rulemakings, these Qs & As have been modified to reflect that PBT chemicals should be reported at a level of precision supported by the accuracy of the underlying data and the estimation techniques on which the estimate is based. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
642	78	
Directive 2	Directive 2	This Directive has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)). In addition, reference to the threshold activities as a prerequisite to *de minimis* exemption eligibility has been removed from this Directive.
Directive 4	Directive 4	This Directive has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)). In addition, reference to the threshold activities as a prerequisite to *de minimis* exemption eligibility has been removed from this Directive.

1998 Q&A	Addendum Q&A	Description of Update to 1998 Q&A
Directive 5	Directive 5	This Directive has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)). Additional text was added to section 2 of this Directive to clarify that individually listed glycol ether compounds such as 2-methoxyethanol are not included in the glycol ether compound category for purposes of section 313 reporting.
Directive 6	Directive 6	This Directive has been modified to reflect that the *de minimis* exemption may only be considered for non-PBT chemicals listed at 40 CFR section 372.65. Pursuant to 40 CFR section 372.38(a), the *de minimis* exemption may not be considered for the PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).
Directive 7	Directive 7	This Directive has been modified to reflect that the activity thresholds are lower for PBT chemicals listed at 40 CFR section 372.28. (*See* Persistent Bioaccumulative Toxic (PBT) Chemicals final rule (64 FR 58666, October 29, 1999) and Lead and Lead Compounds final rule (66 FR 4500, January 17, 2001)).

Reporting Criteria, Form R, Form A, Alternate Threshold

1. Is a *facility* which meets the employee and *toxic chemical* activity thresholds and is in a *covered SIC code* required to report if it had no *releases* of the *toxic chemical* during the reporting year?

Yes, even if it *release*s no *toxic chemicals* into the *environment* and does not conduct any other *waste management* activities involving the listed *toxic chemical*, the *facility* must submit either the Form R or Form A (Alternate Threshold Certification Statement). If the *facility* meets the employee and chemical activity thresholds and is in a *covered SIC code*, but its annual reportable amount of a non-PBT chemical does not exceed 500 pounds and the *facility* has not *manufactured, processed*, or *otherwise used* more than one million pounds of the *toxic chemical*, the *facility* may submit the Form A (a two-page certification statement) instead of the Form R. However, if the *facility* exceeds either the 500 or one million pound limits, it must report on the Form R. (See Section 5A of this document on Alternate Threshold Reporting.)

Primary SIC Code, Multi-establishment

2. What is the definition of primary SIC code? How can there be more than one SIC code for a *facility*?

A primary SIC code generally represents those goods produced or services performed by an *establishment* that have the highest value added. Form R and the Alternate Certification Statement (Form A) provide space for more than one SIC code because a *facility* may be made up of several *establishments* each of which may have a different primary SIC code.

Multi-establishment, Definition of Facility, Establishment, SIC Code

3. Clarify the application of SIC codes for *facility* versus *establishment*?

The SIC code system classifies businesses on the basis of an *establishment*, which is generally a single business unit at one location. Many Section 313 *covered facilities* will be equivalent to an *establishment*. If the *facility's* SIC code is a *covered SIC code*, the *facility* has met the SIC code criterion for reporting under EPCRA Section 313. However, a reporting *facility* can encompass several *establishments* located on a single site or on contiguous or adjacent sites owned or operated by the same entity. Therefore, a Section 313 *facility* can be a *multi-establishment* complex. To determine if a *multi-establishment* complex is a *covered facility*, the owner/operator must determine the complex's primary SIC code based on the relative value added of products and services provided by the various *establishments*. If the primary SIC code for the *facility is a covered SIC code*, the *facility* has met the SIC code criterion.

SIC Code, Multi-establishment

4. Suppose a *facility* consists of several *establishments*, some of which have primary SIC codes within the *covered SIC codes* and some of which have primary SIC codes outside that range. How would this *facility* determine if it is covered by EPCRA Section 313?

To determine if a *facility* is covered by EPCRA Section 313, the *facility* must determine if it meets the SIC code criterion. To make this determination, the *facility* must report if those *establishments* that are in the *covered SIC codes* have a combined value added of more than 50 percent of the total value added of services provided or products shipped or produced by the whole *facility*, or if one of those *covered SIC code establishments* has a value added of services or products shipped or produced that is greater than the value added of any other *establishment* in the *facility* (40 CFR Section 372.22(b)(3)). If the *facility* determines that the *establishment*s meet this test, the entire *facility* has met the SIC code criterion. If the entire *facility* also meets the employee and chemical activity thresholds (based on all *establishment*s at the *facility*), then the entire *facility* would be subject to EPCRA Section 313 reporting.

Primary SIC Code, Multi-activity Facility

5. SIC Code 7389 (business services, not elsewhere classified) contains many diverse activities. How does a *facility* that conducts more than one activity in SIC 7389 determine if it is primarily engaged in solvent recovery, and therefore, covered under EPCRA Section 313?

A *facility* that conducts several uniquely different activities that are within SIC code 7389 should identify the value added of the goods or services that each activity contributes. A *facility* is considered to be "primarily engaged" in solvent recovery if the goods or services produced by the solvent recovery activity have a value added of more than 50 percent of the total value added of all goods and services produced at the *facility*, or if the value added of the goods and services produced by the solvent recovery activity of the *facility* are greater than the value added of the goods and services produced by any other activity at the *facility*.

Primary SIC Code, Multi-establishment

6. A multi-*establishment facility* grows wheat and mills it into flour. At the agriculture portion of the *facility*, all of the wheat grain is grown, harvested and placed into a silo. After leaving the silo, 20 percent of the wheat grain is sold, while the remaining 80 percent of the wheat grain is milled into flour and packaged. If the *facility* farms and sells more than it mills into flour and sells, is it a *covered facility*? What is the primary SIC code of this *facility*?

In order to make the *facility* coverage determination, the *facility* must compare the value added of products shipped and/or produced at the two different *establishments* (i.e., agriculture versus the flour processing). The

value added of the product produced at the agricultural *establishment* (SIC code 0111, not in a *covered SIC code*) is the market value of all the wheat grain harvested during the reporting year. The value added of the product from the milling/packaging *establishment* (in SIC code 2041, a *covered SIC code*) is the value added of the products shipped and/or produced minus the market value of the wheat grain used to produce the flour. In other words, you do not double count the value of the wheat grain as part of the value added of the products from the flour processing operation. If the value-added of milled flour products is greater than the market value of harvested grain, then the *facility's* primary SIC code would be within a *covered SIC code* and the facility would be subject to reporting under EPCRA Section 313.

Primary SIC Code, Multi-establishment, Off-site Services

7. A *facility* has two *establishment*s, one in SIC code 35 (a *covered SIC code*), and one in SIC code 70 (not a *covered SIC code*). In determining the *facility*'s primary SIC code, the *facility* must determine the value added of the services provided and/or products shipped from or produced by each *establishment*. Some of the employees who support the *establishment* in SIC code 70 work entirely off-site, either at home or at clients' sites. Should the *facility* consider this off-site work when determining the value added of the services provided by SIC code 70?

Yes. In determining the primary SIC code, the *facility* should consider the value added of services provided by each *establishment*, including services provided by employees who work for that *establishment* at home or who service that *establishment*'s products at clients' sites.

GOCOs, Definition of Facility, Right-of-Way

8. The definition of *facility* under EPCRA Section 329(4) includes "all buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person (or by any person which controls, is controlled by, or under common control with, such person)." Two Government-Owned, Contractor-Operated (GOCO) sites are separated by a street. The GOCOs are owned by the same federal agency, but operated by different contractors. When, as required by Executive Order (EO) 13148, the federal agency is making threshold determinations under EPCRA Section 313, must it consider the two GOCOs as part of the same federal *facility*?

Yes. The two GOCOs are considered to be a single federal *facility* for the purposes of EPCRA Section 313 threshold determinations and *release* and other *waste management* reporting as required by EO 13148. EPA has interpreted "contiguous or adjacent sites" to include sites separated only by a public right-of-way. Therefore, the two GOCOs are considered to occupy sites that are contiguous or adjacent. Each GOCO should provide any

information required by the federal *facility* in making threshold determinations and reporting *releases* and other *waste management* under EPCRA Section 313.

EO 13148 does not alter any separate obligation(s) a GOCO may have under EPCRA and the Pollution Prevention Act (PPA). Private contractors operating at federal *facilities* must continue to meet any legal reporting requirements they have under EPCRA and PPA. Thus, a GOCO that operates a *covered facility* under 40 CFR Section 372.22 must file a Form R or an Alternate Certification Statement (Form A) for each *toxic chemical* for which the *facility* exceeds an activity threshold as specified in 40 CFR Section 372.25.

EO 13148 (65 FR 24595, April 26, 2000) supersedes EO 12856 (August 1993).

Activity Threshold, Storage

9. A coal mine receives a flotation agent containing a Section 313 chemical in December of 1998, but does not use it until January of 1999. Is the amount of *toxic chemical* in the flotation agent considered for threshold determinations in the 1998 reporting year?

No. Storage in itself of a *toxic chemical* is not considered a *manufacturing*, *processing*, or *otherwise use* activity and, therefore, is not subject to threshold determinations. However, the *facility* is required to include any amounts *released* or otherwise managed as waste that occur during storage of the listed *toxic chemical*, provided a threshold for the same chemical has been exceeded elsewhere at the *facility*. When the *toxic chemical* is used in 1999, the *facility* will include the amount of *toxic chemical* used towards the applicable *otherwise use* or *processing* threshold, whichever is appropriate.

Manufacture, Import, Threshold Determination

10. If a *covered facility manufactures* 19,000 pounds, *processes* 18,000 pounds, and *imports* 7,000 pounds of *toxic chemical* X (a non-PBT chemical) during the reporting year, is it required to report for *toxic chemical* X?

Yes. For the reporting year, the *facility* would have to report for *toxic chemical* X because it would have exceeded the *manufacture* threshold of 25,000 pounds (19,000 (*manufactured*) + 7,000 (*imported*) = 26,000). Note that *importing* constitutes *manufacturing*, and therefore, the amounts must be added together for threshold determinations.

Threshold Determination

11. Are the thresholds for *manufacture* and *process* considered separately? That is, if a *covered facility manufactures* 24,000 pounds of *toxic chemical* A (a non-PBT chemical) and *processes* 24,000 pounds of *toxic chemical* A, does the *facility* need to report for *toxic chemical* A?

No. The *facility* does not have to report because it has not independently exceeded either threshold. Thresholds are considered separately for *manufacture*, *process*, and *otherwise use* of the same *toxic chemical*. Assuming that no individual threshold is met for chemical A (i.e., *manufacturing*, *processing*, or *otherwise use*), the *facility* does not trigger reporting for chemical A.

Threshold Determination, Metal Alloy, Mixture

12. How does a *facility* determine the threshold for reporting of a listed *toxic chemical* (such as chromium) in a solid piece of steel which it *processes*?

Since steel is a *mixture* (and not a compound), the *processing* threshold determination is made based on the total amount of each *toxic chemical* present in the steel. If the *toxic chemical* is present in a known concentration, the amount present can be calculated by multiplying the weight of the steel by the weight percent of the listed *toxic chemical*. The threshold for *processing* chromium is 25,000 pounds.

Threshold Determination, Metal Alloy, Article Exemption, De Minimis Exemption

13. Regarding non-PBT metals in *mixtures*, such as chromium in an alloy (stainless steel), how are thresholds and *releases* and other *waste management* activities accounted for in a foundry type operation where all of the metals are melted down? Could the de minimis and *article* exemptions be applied?

For threshold purposes, if the listed non-PBT chemicals in the metals are *processed*, *otherwise used*, *manufactured* as an impurity (that remains with the product), or *imported* below the de minimis levels, then the de minimis exemption may be taken for that metal in the alloy. However, the *article* exemption cannot be taken for this type of foundry operation since in founding, a metal is melted down and poured into a mold. Consequently, the resulting metal is not recognizable as its original form.

Activity Threshold

14. If I *manufacture* 74,000 pounds of a non-PBT *toxic chemical* and *otherwise use* 9,000 pounds, am I covered?

Yes. The *facility* has exceeded the *manufacturing* threshold of 25,000 pounds for the *toxic chemical*. *Releases* and other *waste management* from all activities including the 9,000 lbs *otherwise used* of the *toxic chemical* at the *facility* are reportable.

Reclamation, Processing, Distribution in Commerce

15. Is the reclamation of elemental mercury from mercury retorting (e.g., recycled fluorescent lamps, contaminated phosphor powder, mercury batteries, and other sources) and the subsequent sale of the recovered mercury (e.g., for use in thermometers and other equipment) subject to the 10 pound *processing* threshold?

Yes. Mercury retorted from wastes and subsequently distributed into commerce should be counted towards the 10 pound *processing* threshold.

Otherwise Use, Off-site Waste

16. A *covered facility* receives a waste containing 13,000 pounds of a listed, non-PBT chemical. The *facility* disposes of 5,000 pounds of the *toxic chemical* and stabilizes the other 8,000 pounds of the chemical. Does the *facility* meet a Section 313 chemical activity?

Until January 1, 1998, this *facility* would not be *manufacturing*, *processing* or *otherwise using* the listed *toxic chemical*. However, beginning January 1, 1998, the *facility* would be *otherwise using* the *toxic chemical*. Because the *facility* received the 13,000 pounds of the *toxic chemical* in wastes received from off-site for the purposes of further *waste management*, the amount of the *toxic chemical* that is subsequently *stabilized* or *disposed* on-site is considered *otherwise used* at the *facility* for the purpose of threshold determinations. The *facility* would need to add the amount of the *toxic chemical* that is involved in all *otherwise use* activities to determine whether the *otherwise use* threshold of 10,000 pounds for non-PBT chemicals has been exceeded. In this case, 13,000 pounds of the chemical would be considered *otherwise used*.

Definition of Otherwise Use, Activity Threshold, Coincidental Manufacture, Off-site Waste

17. A *covered facility*, in treating for destruction listed *toxic chemical* A (a non-PBT chemical), which it receives from off-site, *manufactures* 11,000 pounds of chemical B, another listed non-PBT chemical. The *facility* subsequently disposes of chemical B on-site. Would the *facility* meet the *manufacture* or *otherwise use* threshold for chemical B?

This *manufacture* of chemical B is below the *manufacturing* activity threshold of 25,000 pounds. However, after January 1, 1998, the *facility* would also be *otherwise using toxic chemicals* A and B. Included in activities covered by EPA's revised interpretation of *otherwise use* is the *disposal* of a *toxic chemical* that is produced from the management of a waste that is received by the *facility*. In this example, because the *facility* received from off-site a waste containing a chemical that is treated for destruction (i.e., chemical A) and during that treatment produced and subsequently disposed of chemical B, the *disposal* of chemical B under EPA's revised interpretation would be considered *otherwise used* as well as the treatment for destruction of chemical A. Because the *facility* disposed of, or *otherwise used*, 11,000 pounds of chemical B, the 10,000 pound statutory threshold for the *otherwise use* of non-PBT chemicals has been met. Thus, the *facility* would need to report all *releases* of, and *waste management* activities involving chemical B. If the *facility* treats for destruction more than 10,000 lbs of chemical A, it would also report for this *toxic chemical*.

Activity Threshold, Otherwise Use

18. A *covered facility manufactures* 11,000 pounds of chemical A, a listed non-PBT chemical from the treatment of another *toxic chemical* which was received from off-site. The *facility* disposes of 6,000 pounds of chemical A and uses 5,000 pounds of chemical A in a non-incorporative, manufacturing activity at the *facility*. Does this *facility* meet an activity threshold?

Prior to January 1, 1998, this *facility* would not meet the *manufacturing* threshold of 25,000 pounds for chemical A nor would it have met the *otherwise use* threshold of 10,000 pounds because it only *otherwise used* 5,000 pounds. However, after January 1, 1998, the *facility* would meet the *otherwise use* threshold for chemical A. Both the on-site *disposal* and the non-incorporative activities are considered to be *otherwise use* activities. The on-site *disposal* of chemical A is included among the various activities covered by EPA's revised interpretation of *otherwise use*. The *facility* would add the amounts of chemical A involved in both *otherwise use* activities at the *facility* to determine whether they exceed the 10,000 pound *otherwise use* threshold for non-PBT chemicals. Since the total amount of chemical A that is *otherwise used* is 11,000 pounds, the *facility* would need to report on all *releases* and *other waste management* activities involving chemical A.

Activity Threshold, Otherwise Use, Neutralization

19. A *covered facility* adds a listed acid to wastewater to neutralize the wastewater prior to discharge. Is this activity *manufacturing, processing,* or *otherwise using* the *toxic chemical*?

Because the listed acid is not incorporated into the final product and distributed in commerce, nor is it created at the *facility*, the *toxic chemical* is *otherwise used*.

Otherwise Use, Treatment for Destruction, Phase Separation

20. If a *toxic chemical* is derived from the phase separation of wastes received from off site and that chemical is subsequently incorporated into a product at the *facility* and then distributed into commerce, has the toxic chemical been *processed* or *otherwise used*?

If a facility receives materials containing *toxic chemicals* from off-site for further *waste management* and the *toxic chemicals* are *treated for destruction*, stabilized, or *disposed* on-site, the *facility* would be *otherwise using* the *toxic chemicals*. However, during phase separation the *toxic chemical* in the waste is not actually destroyed. Furthermore, the *toxic chemical* is incorporated into a product at the *facility* and is further distributed in commerce (e.g., retorted mercury sold for reuse in thermometers and mercury switches). Thus, as long as the *toxic chemical* coming from the waste is not stabilized, *treated for destruction*, or *disposed*, it would not be *otherwise used* because it is neither *treated for destruction* nor *disposed* on site. Because it is distributed in commerce, it would be *processed*. Once a *facility* exceeds a threshold for a particular *toxic chemical*, amounts of that chemical that are *released* or otherwise managed as a waste must be calculated for all on-site activities.

Otherwise Use, Threshold Determination, Fumigants

21. Must *releases* of listed *toxic chemicals* used as fumigants be reported if the other criteria and thresholds are met?

Yes. Fumigant use would be subject to the *otherwise use* threshold.

Activity Threshold, Process, Otherwise Use, Adhesive, Process vs. Otherwise Use

22. A *facility* covered under EPCRA Section 313 *manufactures* shoes. During production the *facility* uses adhesives that contain solvents such as toluene. Due to the inefficiency of the *process*, 20 percent of the solvent remains behind in the shoes when they are sold in commerce. Would the *facility* count the amount of solvent remaining in the shoes toward the *processing* threshold?

No. The amount of solvent used in the adhesive would count toward the *otherwise use* threshold. Since the *toxic chemical* does not function as a component of the shoe, it would not be considered *processed*. Thus, the *facility* would file if it meets an *otherwise use* threshold for the *toxic chemical* in the adhesive.

Activity Threshold, Otherwise Use, Solvents

23. If a solvent that is a listed *toxic chemical* is used to clean an apparatus but does not become part of the final product, is the chemical covered for reporting purposes under EPCRA Section 313?

If a solvent is not incorporated into a product distributed in commerce, then for the purposes of Section 313, it would be considered *otherwise used*. It would be subject to reporting if used in quantities exceeding the *otherwise use* threshold.

Activity Threshold, Otherwise Use

24. A *covered facility* uses paint thinners in its operations. The thinners are evaporated or baked out of the finished painted products. Are those chemicals subject to Section 313 regulations?

If the chemical evaporates or is baked out of a finished coating, it has been *otherwise used*.

Activity Threshold, Process, Repackage

25. Does the placing of a bulk liquid containing a small percentage of a Section 313 *toxic chemical* into small bottles for consumer sale constitute a reportable/threshold activity of the *mixture*?

Yes, repackaging for distribution in commerce is a type of *processing* (40 CFR Section 372.3). If the bulk liquid contains a Section 313 listed non-PBT chemical in excess of the de minimis level or a listed PBT chemical at any concentration, the *toxic chemical* in the liquid would have to be factored into

calculations in determining whether the *processing* threshold is exceeded for that *toxic chemical*.

Repackaging, Processing

26. A *covered facility* receives a chemical in bulk and repackages it into smaller containers that are sent to consumers. Are amounts repackaged considered toward an activity threshold?

Amounts of the *toxic chemical* that a *covered facility* repackages for distribution in commerce must be considered toward the *processing* threshold.

Activity Threshold, Process, Otherwise Use, Paint

27. Paint containing listed *toxic chemicals* is applied to a product and becomes part of an *article*. Does the *processing* threshold apply? What about the volatile *toxic chemicals* from the painting operation - are they *otherwise used*?

Yes. This is a case in which different listed *toxic chemicals* in the same *mixture* may have different uses and therefore, different thresholds. The listed *toxic chemicals* that are incorporated as part of the coating are *processed*, whereas the volatile solvents in the paint are *otherwise used* because their function is such that they do not become incorporated into the *article*.

Coincidental Manufacture, Byproduct, Threshold Determination, Concentration Information

28. A listed *toxic chemical* is *manufactured* as part of a *mixture* which is a byproduct. The *facility* does not know the specific concentration of the listed *toxic chemical* in this byproduct. For determining the threshold for Section 313, does the *facility* include this byproduct without knowing the specific concentration of the listed *toxic chemical*?

Because the reporting *facility* is *manufacturing* the *toxic chemical mixture* on-site, the *facility* is required to calculate the amount of the *toxic chemical* coincidentally *manufactured* during the reporting year based upon a reasonable estimate of the percentage of the *toxic chemical* in the *mixture*. This quantity is aggregated to determine if the *facility* exceeds the threshold for *manufacturing.*

Activity Threshold, Process, Fuel

29. A *covered facility* manufactures and repairs airplanes. Prior to beginning any repair work, any fuel remaining in the airplane's fuel tanks is emptied by service personnel at the *facility*. After the repairs are completed, the airplane is refueled with fuel removed from the airplane's fuel tanks and/or new fuel. Should the owner/operator of the manufacturing and repair *facility* consider the *toxic chemicals* present in the fuel when making Section 313 threshold and *release* and other *waste management* calculations?

Yes. For purposes of EPCRA Section 313 threshold determinations and *release* and other *waste management* calculations, the listed *toxic chemicals* present in the fuel are considered to be *processed* because they are being repackaged and further distributed in commerce. Thus, the listed *toxic chemicals* present in the fuel are subject to the *processing* threshold.

Otherwise Use, Threshold Determination, Refractory Brick

30. Refractory brick containing lead is installed in a reaction vessel. Is the lead in the brick considered *otherwise used* for purposes of EPCRA Section 313? Also, are *releases* of lead from the brick during the previous reporting year subject to *release* reporting on the Form R if no new bricks are added during the reporting year?

The lead contained in the bricks is considered *otherwise used* since it is not incorporated into the final product. The *facility* would count the amount of lead in the bricks that are added to the reaction vessel only for the year in which the bricks are installed. In answer to the second question, if the 100 pound threshold is exceeded, then all *releases* and other *waste management* of lead would be reported from both the newly added bricks and those installed in previous years. Neither the lead contained in the refractory bricks in the inventory (i.e., not yet installed), nor the lead in place, contained in bricks (i.e., installed in a previous year) are to be included in threshold determinations for the reporting year in question. If no bricks are installed during the reporting year, and lead is not used elsewhere at the *facility*, then a report would not be required.

Activity Threshold, Process, Reclamation, Solvents

31. A reclamation *facility* receives waste solvents containing an EPCRA Section 313 *toxic chemical* from a separate *facility* that generated the wastes (the generating *facility*). The reclamation *facility* reclaims the listed *toxic chemical* and returns it, as a product, to the generating *facility*. For the purpose of EPCRA Section 313 threshold determinations, is the reclamation *facility processing* the listed *toxic chemical*?

Yes. By reclaiming the listed *toxic chemical* and returning it to the generator, the reclamation *facility* has prepared the chemical for distribution in commerce by incorporating the chemical into a product (i.e., the reclaimed *toxic chemical*). Therefore, the reclamation *facility* is *processing* the *toxic chemical* in the waste solvent it receives. Assuming the reclamation *facility* is a *covered facility*, it is required to report under EPCRA Section 313 for the *toxic chemical* if it exceeds an activity threshold (e.g., *processing*) during the course of a reporting year.

Process, Intracompany Transfer, Formalde-hyde, Economic Benefit

32. A *facility* covered under EPCRA Section 313 uses formaldehyde as an ingredient in feedstock. The feedstock is sent for use to another *facility* under common ownership. The preparing *facility* does not receive direct compensation for the product, nor is the product distributed to the general public. Does such a transfer of a listed *toxic chemical*, after its preparation, to another *facility* under common ownership constitute distribution in commerce and thus need to be considered in threshold determinations for reporting under EPCRA Section 313?

Yes. Under EPCRA, *process* means the preparation of a listed *toxic chemical*, after its *manufacture*, for distribution in commerce (40 CFR Section 372.3). Distribution in commerce includes any distributive activity in which benefit is gained by the transfer, even if there is no direct monetary gain. Listed *toxic chemicals* that are shipped from one *facility* to another *facility* under common ownership are considered to be distributed in commerce. Although the chemical in the product is not distributed to the general public, the preparing *facility* does derive economic benefit by transferring the listed *toxic chemical*, as both *facilities* are under common ownership. The amount of listed *toxic chemical* prepared at the *facility* must be counted towards the *processing* threshold.

Process, Intracompany Transfer, Economic Benefit

33. Company A stores oil at their Storage Facility 1. Company A transfers oil from Storage Facility 1 to their Storage Facility 2 (a separate *facility* for EPCRA Section 313 purposes). From Storage Facility 2, the oil is distributed to customers. Does the transfer from Storage Facility 1 to Storage Facility 2 constitute *processing* on the part of Storage Facility 1?

Yes. Under EPCRA Section 313, *processing* means the preparation of a listed *toxic chemical* after its *manufacture*, for distribution in commerce (40 CFR Section 372.3). Distribution in commerce includes any distributive activity in which benefit is gained by the transfer, even if there is no direct monetary gain. Listed *toxic chemicals* that are shipped from one *facility* to another *facility* under common ownership are considered to be distributed in commerce. Although the chemical in the product is not distributed to the general public, the preparing *facility* does derive economic benefit by transferring the listed toxic chemical, as both facilities are under common ownership. The amount of listed *toxic chemical* prepared at the *facility* must be counted towards the *processing* threshold.

Import, Purchasing Agent

34. The corporate office for a chemical distribution company directly purchases products which will be shipped to several of its chemical distribution facilities. The corporate purchasing department purchases one of these products, which contains a section 313 chemical, from a foreign source. The product is shipped directly to one of its chemical distribution *facilities*. Did the individual *facility* cause the *importation* of

the section 313 chemical thereby requiring it to apply the *manufacturing* threshold to the quantities of this material received by the *facility* in the reporting year?

If the chemical distribution *facility* that actually received the product did not have any input regarding the quantity or identity of the *toxic chemical*, the *facility* did not cause the *importation* of the *toxic chemical* in the product and does not have to apply the listed chemical in the product to its *manufacturing* threshold. To be considered an *importer* the *facility* receiving the material from a foreign source must have *imported* or "caused the material to be imported." If the ordering *facility* receives the shipment, then the ordering *facility* has *imported* the listed *toxic chemicals* and must consider these amounts toward their *manufacturing* thresholds. However, if the ordering *facility*, on its own initiative, directs another *facility* to receive the shipment, and that other *facility* has no input in deciding whether it will receive the toxic chemical, then the receiving *facility* has not *imported* the shipment and the ordering *facility* has also not *imported* the shipment for purposes of EPCRA Section 313 because the listed *toxic chemicals* were not brought on site of the ordering *facility*.

Import, Broker

35. A *facility* did not specify a source for a material broker to obtain a listed *toxic chemical*, but the *facility* learns that the only U.S. *manufacturer* of the chemical has gone out of business. Therefore, is the *facility importing* the chemical, making the *facility* subject to the *manufacturing* threshold?

Yes. The *facility* knows that it has caused the listed *toxic chemical* to be *imported* to the U.S. because there are no U.S. sources. Therefore, the amount of the chemical that is caused to be *imported* by the *facility* through a broker must be included within the *manufacturing* threshold determination for that listed *toxic chemical*.

Auxiliary Facility, SIC Code

36. An auxiliary wastewater treatment plant, which is not a RCRA Subtitle C *facility*, has taken on the SIC code of a *covered facility* because it primarily services a *covered facility*. Does the *facility* where the treatment plant is located have to report even if the rest of the *establishments* at that *facility* are not in the *covered SIC codes*?

A *facility* must report only if it meets the employee, SIC code and activity criteria. As long as the SIC code for the wastewater treatment plant is not the primary SIC code for the facility, the SIC code criterion is not met. Therefore, the *facility* as a whole need not report. The *covered facility* producing the listed *toxic chemical* in the waste must report the off-site transfer to the *facility* containing the wastewater treatment plant.

Auxiliary Facility, SIC Code, Multi-establishment, Laboratory

37. Is my *facility* covered by EPCRA Section 313 if the value added of laboratory research at my *facility* is greater than 50 percent of the total value added of goods and services produced at my *facility*?

If the research laboratory is a separate *establishment* from the other activities at the *facility* and its SIC code is not in a *covered SIC code*, then the 50 percent test is used to determine if the whole *facility* is in the *covered SIC codes* (40 CFR Section 372.22). In this case, the *facility* would not be subject to reporting because the primary SIC code is not within the *covered SIC code*s. However, if the laboratory is within the *covered SIC code*s because it is an auxiliary *establishment* providing research to support operations in the *covered SIC code*s, then the *facility* would be covered by Section 313.

Structural Component Exemption, Fuel

38. An EPCRA Section 313 *covered facility* uses a fuel-powered paint sprayer for the sole purpose of painting the *facility's* structure. The listed *toxic chemicals* within the paint used to maintain the *facility's* appearance are exempt from EPCRA Section 313 threshold determination and *release* and other *waste management* reporting requirements under the structural component exemption (40 CFR Section 372.38(c)(1)). The fuel used to power the paint sprayer also contains listed *toxic chemicals* reportable under EPCRA Section 313. Must the listed *toxic chemicals* in the fuel be applied toward the *otherwise use* threshold?

No. The listed *toxic chemicals* are exempt from EPCRA Section 313 threshold determinations and *release* and other *waste management* reporting requirements. Although the structural component exemption most commonly applies to *toxic chemicals* incorporated into a *facility's* physical structure, the exemption also extends to *toxic chemicals* whose sole use derives from or is associated with an exempt use. Examples of *toxic chemicals* exempt in this manner include solvents used to clean paint brushes that were used to paint a *facility's* structure and fumes generated from the welding of non-process related pipes during installation at a *facility*. Be aware that the combustion of fuels may coincidentally *manufacture* Section 313 *toxic chemicals*. Such coincidental *manufacture* is not eligible for de minimis limitations (see the directive on de minimis) or the structural component exemption and amounts produced must be compared against the *manufacturing* threshold. The EPA publication, Toxic Air Pollutant Emission Factor - A Compilation of Selected Air Toxic Compounds and Sources (EPA 45/2-88-006a) contains emission factors for many specific compounds emitted during fuel combustion.

Laboratory Activity Exemption, Process

39. After *otherwise using* an EPCRA Section 313 *toxic chemical* in a laboratory setting under the supervision of a technically qualified individual, a *covered facility* sends the *toxic chemical* in waste off-site to be recycled. The *facility* also *processes* the same chemical elsewhere but below the *processing* threshold. The *facility* is eligible for the laboratory activity exemption for the amount of the listed *toxic chemical otherwise*

***used*, *processed*, and *manufactured* in the laboratory and amounts of the listed *toxic chemical released* from the laboratory. (40 CFR Section 372.38(d)) Is the *facility* required to count the amount of the listed *toxic chemical* sent off-site for recycling from the laboratory toward the *processing* threshold?**

Covered facilities manufacturing, *processing* or *otherwise using* a *toxic chemical* in a laboratory setting under the supervision of a technically qualified individual, need not consider those quantities of the *toxic chemical* when determining EPCRA Section 313 chemical activity thresholds and calculating *releases* and other *waste management* amounts. The *facility* is eligible for the laboratory activity exemption for the amount of listed *toxic chemical otherwise used*, *processed*, and *manufactured* in the laboratory and amounts of the listed *toxic chemical released* or otherwise managed as waste from the laboratory. The *covered facility* is not required to count the amount of listed *toxic chemical* laboratory waste sent off-site for recycling toward the *processing* threshold. Any other non-exempt quantities of the *toxic chemical manufactured*, *processed* or *otherwise used* on-site, however, should be considered towards the appropriate threshold to see if the *facility* triggers reporting for that *toxic chemical*.

De Minimis Exemption, Trade Name Product

40. Please explain the de minimis concentration limitation under Section 313, and its application to *mixtures* and *trade name products* (40 CFR Section 372.38(a))?

The de minimis exemption allows *covered facilities* to disregard certain minimal concentrations of listed non-PBT chemicals in *mixtures* or *trade name products* when making threshold determinations and *release* and other *waste management* determinations. The de minimis exemption does not apply to the *manufacture* of a listed *toxic chemical* except if that listed *toxic chemical* is *manufactured* as an impurity and remains in the product distributed in commerce below the appropriate de minimis level or is *imported* below de minimis concentrations. The de minimis exemption does not apply to a byproduct *manufactured* coincidentally as a result of *manufacturing*, *processing*, *otherwise use*, or any *waste management* activity. The de minimis exemption does not apply to the PBT chemicals listed at 40 CFR section 372.28.

When determining whether the de minimis exemption applies to a listed non-PBT chemical, the owner/operator should consider only the concentration of the listed *toxic chemical* in *mixtures* and *trade name products*. If the listed non-PBT chemical in a *mixture* or *trade name product* is *manufactured* as an impurity or *imported*, *processed*, or *otherwise used* and is below the appropriate de minimis concentration level, then the quantity of the listed *toxic chemical* in that *mixture* or *trade name product* does not have to be applied to threshold determinations nor included in *release* or other *waste management* calculations. If a listed non-PBT chemical in a *mixture* or *trade name product* meets the de minimis exemption, all *releases* and other *waste*

management activities associated with the listed *toxic chemical* in that *mixture* or *trade name product* are exempt from EPCRA Section 313 reporting. It is possible to meet an activity (e.g., *processing*) threshold for a *toxic chemical* on a *facility*-wide basis, but not be required to calculate *releases* or other *waste management* quantities associated with a particular *mixture* or *trade name product* because that *mixture* or *trade name product* contains the non-PBT chemical below the de minimis level.

Once a listed *toxic chemical* concentration is above the appropriate de minimis concentration, threshold determinations and *release* and other *waste management* calculations must be made, even if the chemical later falls below the de minimis level in the same process stream. Thus, all *releases* and other quantities managed as waste that occur after the de minimis level has been exceeded are subject to reporting. If a listed *toxic chemical* in a *mixture* or *trade name product* above the de minimis level is brought on-site, the de minimis exemption never applies.

The de minimis concentration level is consistent with the OSHA Hazard Communication Standard requirements for development of *Material Safety Data Sheets* (*MSDS*s). The de minimis level is 1.0 percent except if the listed *toxic chemical* is an OSHA-defined carcinogen. The de minimis level for OSHA-defined carcinogens is 0.1 percent. For *mixtures* or other *trade name products* that contain one or more members of a listed Section 313 *toxic chemical* category, the de minimis level applies to the aggregate concentration of all such members and not to each individually. The list of *toxic chemicals* in the publication Toxic Chemical Release Inventory Reporting Forms and Instructions for the current reporting year contains the de minimis values for each of the non-PBT chemicals and chemical categories.

This de minimis exemption applies solely to *mixtures* and other *trade name products*. EPA's long-standing interpretation has been that *mixture* does not include waste. Therefore, the de minimis exemption cannot be applied to *toxic chemicals* in a waste.

De Minimis Exemption, Otherwise Use

41. A metal mining *facility* receives ash that it directly incorporates in concrete which it then uses on-site to form cement blocks. Is this direct use of ash eligible for the de minimis exemption?

The use of ash as a component of a *mixture* (concrete) that is *otherwise used* on-site to construct cement blocks constitutes an *otherwise use* of a material containing listed *toxic chemicals* and such amounts must be counted toward the *facility*'s *otherwise use* of those chemicals. In this case, the ash is not considered a waste because it is not managed as a waste. Thus, the listed non-PBT chemicals contained in the ash are eligible for the de minimis exemption if they do not exceed the de minimis concentrations.

De Minimis Exemption, Solvent Recovery

42. A *covered facility* receives a spent solvent, recovers the solvent and sells the recovered solvent in commerce. Is the recovered solvent considered a waste, and if not, is the reusable solvent considered a product? At what point might the solvent be eligible for the de minimis exemption?

The recovery *facility* must consider the amount of the material that it feeds into the recycling operation toward the *facility*'s *processing* threshold. The solvent is part of a waste (not usable in the form received) and therefore the amount *processed* is not eligible for the de minimis exemption until the recovery is complete and the solvent is no longer subject to further *waste management* activities. Once the recovery is complete, the solvent is no longer a waste and thus the recovery *facility* may take the de minimis exemption for amounts of non-PBT chemicals subsequently prepared for distribution in commerce. The purchasing *facility* considers the recovered solvent as a new product and its subsequent use of the solvent may be eligible for the de minimis exemption. However, if the amount of solvent processed prior to the point of which it was eligible for the de minimis exemption was enough to exceed a reporting threshold, the fact that the solvent subsequently became eligible for the de minimis exemption does not remove the reporting requirement.

De Minimis Exemption, Mixture, Impurity, Waste, Byproduct

43. Does the de minimis exemption apply regardless of whether a listed non-PBT chemical is present in a *mixture* as an impurity or separated out as a byproduct? Does it apply to *toxic chemicals* in waste?

The de minimis exemption may be considered for non-PBT chemicals that are *manufactured* as impurities that remain in the product for distribution. The de minimis exemption does not apply to listed *toxic chemicals* that are *manufactured* as a byproduct regardless of whether the byproduct is a waste.

De Minimis Exemption, Metal Compounds

44. Does the de minimis exemption apply to the parent metal component of a compound in a *mixture* for Section 313 reporting?

No. For threshold determinations, the weight percent of the whole compound in the *mixture* is used. In general, the de minimis value for compounds is one percent, unless the particular compound is itself an OSHA carcinogen and then the de minimis level is 0.1 percent. The de minimis exemption does not apply to the PBT chemicals listed at 40 CFR section 372.28.

De Minimis Exemption

45. We are taking part in an experimental shale oil extraction process. When the shale is extracted, concentrations of a non-PBT chemical are present in trace amounts in the shale far below the de minimis concentration. Does the de minimis exemption apply?

Yes, the de minimis exemption applies to the listed non-PBT chemical present in the shale.

De Minimis Exemption, De Minimis Level, Carcinogen

46. What is the basis for determining that a *toxic chemical* is subject to the 0.1 percent de minimis level rather than the 1.0 percent de minimis level, and when do changes in *toxic chemical* de minimis levels take effect?

In the final rule (53 FR 4500, Feb. 16, 1988) that implements the reporting requirements of EPCRA Section 313, EPA adopts a de minimis exemption which permits *facilities* to disregard de minimis levels of listed non-PBT chemicals for threshold determinations and *release* and other *waste management* calculations. The regulations adopt a 0.1 percent de minimis level for chemicals that are carcinogens, as defined in 29 CFR Section 1910.1200(d)(4),as follows:

"(4) Chemical manufacturers, importers and employers evaluating chemicals shall treat the following sources as establishing that a chemical is a carcinogen or potential carcinogen for hazard communication purposes:

(I) National Toxicology Program (NTP), Annual Report on Carcinogens (latest edition);

(ii) International Agency for Research on Cancer (IARC) Monographs (latest editions); or

(iii) 29 CFR Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration."

Therefore, once a chemical's status under NTP, IARC, or 29 CFR Part 1910, Subpart Z, indicates that the chemical is a carcinogen or potential carcinogen, the reporting *facility* may disregard levels of the chemical below the 0.1 percent de minimis concentration, provided that the other criteria for the de minimis exemption are met. For convenience purposes, EPA refers to these chemicals as the "OSHA carcinogens."

If in reporting year "A," IARC or NTP classifies a chemical as a probable or known carcinogen (thus lowering the EPCRA Section 313 de minimis concentration from 1.0 to 0.1 percent), the lower de minimis concentration for the purposes of reporting would be applicable starting with reporting year "A+1." For example, vinyl acetate was classified as a group 2B chemical by IARC in 1995, so the lower de minimis level of 0.1 percent applied starting with the 1996 reporting year (i.e., it was effective as of January 1, 1996, for reports due July 1, 1997).

Suppliers would need to notify their customers of such changes with the first shipment in the year in which the change is applicable to reporting. If, as in the vinyl acetate example, the classification changes in 1995, then the

supplier would notify customers with the first shipment on or after January 1, 1996.

De Minimis Exemption, Release Reporting

47. If a *covered facility* has process streams with less than 1 percent (or 0.1 percent for carcinogens) of a listed non-PBT chemical, do fugitive *releases* from these streams have to be included in *release* calculations?

The de minimis exemption applies to process streams when a starting material for the process is a *mixture* containing less than 1 percent (or 0.1 percent) of a listed non-PBT chemical. If the process stream is exempt under de minimis, *releases* from the stream are not reported on the Form R.

De Minimis Exemption, Concentration Range

48. A *covered facility* uses a chemical *mixture* that contains a listed Section 313 non-PBT chemical. The concentration of the listed *toxic chemical* is given as a range on the *Material Safety Data Sheet (MSDS)*. If the maximum and minimum concentrations are above and below the de minimis concentration level, how can the *facility* determine quantities for Section 313 compliance?

The amount of the listed *toxic chemical* in the *mixture* that is at or above the de minimis level, and therefore counts towards the threshold, can be assumed to be proportional to the ratio of the amount at or above de minimis concentration to the amount of the total concentration range. The concentration of the chemical in the *mixture* that is not exempt is the average of the de minimis level and the maximum concentrations.

For example, assume that a *facility manufactures* 10 million pounds of a *mixture* containing 0.25–1.20 percent of a *toxic chemical* that is subject to a 1 percent de minimis level. The quantity of the *mixture* subject to reporting is:

$$\frac{10{,}000{,}000 \text{ lbs} \times (1.20 - 0.99)}{(1.20 - 0.25)} = 2{,}210{,}526 \text{ lbs}$$

Non-exempt *mixture*

This 2,210,526 pounds of non-exempt *mixture* is multiplied by the average concentration above the de minimis, which is 1.1 percent, or

$$\frac{1.20 + 0.99}{2} = 0.011$$

$$2{,}210{,}526 \times 0.011 = 24{,}316 \text{ pounds}$$

In this example, the amount of chemical that counts toward a threshold is 24,316 pounds.

De Minimis Exemption, Concentration Range

49. A *covered facility processes* a *mixture* of chemicals which includes a non-carcinogenic listed non-PBT chemical present between concentrations of 0.5–1.0 percent, as stated on the *MSDS* provided with the *mixture*. Is the listed *toxic chemical* in the *mixture* eligible for the

de minimis exemption? If not, how would a *facility* make a threshold determination for a *toxic chemical* whose concentration ranges from below the de minimis level to the de minimis level?

A listed *toxic chemical* with a concentration range that has an upper bound equal to the de minimis level is not exempt from reporting under EPCRA Section 313. The exception applies only if the chemical concentration is below the de minimis level. The amount of the listed *toxic chemical* in the *mixture* that is at or above the de minimis level, and therefore counts towards the threshold, is proportional to the ratio of the amount at or above the de minimis concentration to the amount of the total concentration range. The concentration of the chemical in the *mixture* that is not exempt is the average of the de minimis level and the maximum concentration, which in this case is the same. The fraction of the listed *toxic chemical* that is not exempt is the fraction that is at the de minimis level, i.e., 1 percent. The fraction that is exempt is that below the de minimis level, which is 0.5 percent – 0.9 percent (one significant figure).

For example, assume that a *facility manufactures* 10 million pounds of a *mixture* containing 0.5-1.0 percent of a *toxic chemical* that is subject to a 1 percent de minimis exemption. The quantity of the *mixture* subject to reporting is:

$$\frac{10{,}000{,}000 \text{ lbs} \times (1.0 - 0.9)}{(1.0 - 0.5)} = 2{,}000{,}000 \text{ lbs}$$

Non-exempt *mixture*

De Minimis Exemption, Waste

50. A raw material contains less than the de minimis level of a listed non-PBT chemical. During *processing* of the listed *toxic chemical*, its concentration remains below de minimis. However, the concentration of the listed *toxic chemical* in the wastestream that results from that *processing* activity is above the de minimis concentration level for that *toxic chemical*. The wastestream containing that listed *toxic chemical* is *disposed* in an on-site landfill. Should the *toxic chemical* handled in the process line be included in the *facility's* threshold determination? Do the quantities of the listed *toxic chemical* in wastestreams that are generated from this process require reporting? What about the listed *toxic chemical* present in the wastestream that is above the de minimis level?

No. The de minimis exemption can be applied to the listed non-PBT chemical in the raw material that is *processed*. Because the de minimis exemption can be taken, the quantities *processed* do not have to be applied to the *processing* threshold for that *toxic chemical* at the *facility* and quantities of the listed *toxic chemical* that are *released* or otherwise managed as waste as a result of this specific *processing* activity are exempt from *release* and other *waste management* calculations. The exemption applies even if the listed *toxic chemical* is concentrated above the de minimis level in the wastestream resulting from that *processing* activity.

Ash, De Minimis

51. A *covered facility* combusts coal in a combustion unit. The coal contains a non-PBT chemical below de minimis amounts. During combustion, chemicals are *manufactured*. The ash containing the *toxic chemicals* is generated from the combustion of the coal. The ash is then sold to another *facility* for direct reuse in the *manufacture* of concrete blocks. If the *toxic chemicals* in the ash are below the appropriate de minimis concentration, are they eligible for the de minimis exemption?

The *toxic chemical* in the coal being combusted should be considered towards the *facility's otherwise use* threshold and this activity is eligible for the de minimis exemption. The *toxic chemicals* that are *manufactured* as a result of the combustion *process* are byproducts and therefore not eligible for the de minimis exemption. The chemicals in the ash that is sold for direct reuse off-site are considered *processed*. After combustion, when the *facility* is preparing the *toxic chemicals* in ash for distribution in commerce, the non-PBT chemicals are eligible for the de minimis exemption.

De Minimis Exemption, Byproduct

52. A small quantity of a listed *toxic chemical* is *manufactured* in a wastestream. Are *facility* owners/operators required to include the amount of the listed *toxic chemical* present in the wastestream as part of the threshold determination if the concentration of the listed *toxic chemical* in the wastestream is below the de minimis level?

Yes. This de minimis exemption applies solely to non-PBT chemicals in mixtures. EPA's long-standing interpretation has been that *mixture* does not include waste. Also, generally, de minimis does not apply to listed *toxic chemicals* that a *facility manufactures*. The de minimis exemption cannot be applied to listed *toxic chemicals manufactured* as a byproduct.

De Minimis Exemption, Waste

53. A *covered facility otherwise uses* a *toxic chemical* that is above the de minimis concentration in a *mixture*. How does the de minimis exemption apply to listed *toxic chemical* residues from this use contained within used or spent containers that the *facility* sends off-site for *disposal*?

The de minimis exemption cannot be applied to quantities of the listed *toxic chemical* in used or spent containers that are sent off-site for *disposal* because these quantities are being managed as a waste and the de minimis exemption does not apply to wastes. The de minimis exemption can be applied to a listed non-PBT chemical in a *mixture* or *trade name products* that is *processed*, *otherwise used*, *manufactured* as an impurity (that remains with the product), or *imported*, provided that the listed *toxic chemical* is present in the *mixture* or *trade name product* below the de minimis concentration level.

De Minimis Exemption, Petroleum Refining

54. In petroleum refining processes, *mixtures* such as crude oils, petroleum products, and refinery process streams may contain trace amounts of listed *toxic chemicals*. During the refining process, these *mixtures* may undergo *beneficiation* activities which would result in the listed *toxic chemicals* being concentrated to levels that exceed the de minimis levels. Would the de minimis exemption apply to these processes?

The de minimis exemption would apply to the non-PBT chemicals until they are concentrated above the applicable de minimis level. For purposes of threshold determinations and *release* and other *waste management* calculations, the *facility* would account for a listed *toxic chemical* from the first point in the process in which the concentration of the *toxic chemical* meets or exceeds the applicable de minimis level for that *toxic chemical*, in the process *mixture*.

De Minimis Exemption, Air Releases, Storage Tanks

55. As a petroleum refiner, do we have to estimate air *releases* of chemicals from storage tanks containing crude oil if the concentration of the chemical is below de minimis level? We understand that the amounts of these chemicals would be counted towards threshold since, after storage, we are extracting and purifying them to concentrations above de minimis.

Facilities that receive chemicals into the plant at concentrations below de minimis have to report *releases* and other *waste management* activities from that point in the process when the chemical's concentration exceeds de minimis level. This *facility* would not have to report air emissions from their crude oil tanks for the chemicals present in oil below de minimis. For those above de minimis, they must report *releases* and other *waste management* activities. The de minimis exemption does not apply to the PBT chemicals listed at 40 CFR section 372.28.

Ammonia, De Minimis Exemption

56. A *covered facility* places ammonium chloride in water, and *manufactures* aqueous ammonia for use on-site. Does the de minimis exemption apply to this activity?

No. The *facility* cannot take the de minimis exemption for this activity because the *facility manufactured* aqueous ammonia. The de minimis exemption does not apply to the *manufacture* of a non-PBT chemical, unless the *toxic chemical* is *manufactured* as an impurity and remains in the product distributed in commerce. Since the *facility* used the aqueous ammonia on-site and the ammonia is not an impurity that remains in a product distributed in commerce, the de minimis exemption does not apply.

De Minimis Exemption, Compound Category, Delimited Category

57. When determining the de minimis level for members of an EPCRA Section 313 category, the total weight of all the members of the category in the *mixture* must be counted and compared to the applicable de minimis level. How would a *facility* determine the de minimis level for a *mixture* containing members of a category, such as the arsenic compounds category, where there are different de minimis levels within the category?

For categories in which there are different de minimis levels within the category, two calculations are done. First, the weight of all members of the category in the *mixture* that have a 0.1 percent de minimis is determined and compared to the 0.1 percent de minimis level. Second, the weight of all members of the category in the *mixture* (both those with 0.1 percent and 1.0 percent de minimis) is determined and compared to the 1.0 percent de minimis. If only the first de minimis calculation is exceeded then only those chemicals with the 0.1 percent de minimis must be included in threshold and *release* and other *waste management* determinations. Therefore, category members with the 1.0 percent de minimis would be excluded from threshold and *release* and other *waste management* determinations if only the first de minimis calculation is exceeded. If the second de minimis calculation is exceeded then all of the category members in the *mixture* must be included in threshold determinations and *release* and other *waste management* calculations. The de minimis exemption does not apply to the PBT chemicals listed at 40 CFR section 372.28.

Article Exemption, Process, Batteries

58. If an automobile manufacturer receives finished car batteries and places these batteries into the cars they sell, must the automobile manufacturer report the lead which is incorporated in the battery?

If the car battery is completely sealed while present at the *facility*, it would be considered an *article*, and thus would be exempt from EPCRA Section 313 reporting. If lead is released from the batteries under normal *processing* at the *facility*, as might occur during maintenance of the battery, the release would negate the *article* exemption. If the exemption is negated, the amount of lead and any other *toxic chemical* in these non-*article* batteries would be applied toward the *processing* threshold to determine if the *facility* must report.

Article Exemption, Sheet Metal

59. Does the article exemption apply to flat rolled sheet metals, if they are used in operations which typically produce scrap but no *release*?

Assuming the scrap metal pieces are recognizable as the original piece, the *article* exemption does apply to these metals if the forming process caused 0.5 pounds or less of *releases* of a listed *toxic chemical* from all like items or the items retain the thickness of sheet metal in whole or in part. Once an operation is performed on a metal that causes a *release* which is not recycled and which exceeds 0.5 pounds for the reporting year (for example, from

operations such as heating, grinding, or welding), the *article* exemption no longer applies and *releases* must be reported when listed chemicals in a sheet metal are *processed* in quantities greater than the *processing* threshold.

Article Exemption, End Use Function

60. A *facility* manufactures lead came (i.e., slender, grooved, lead rods). A lead billet is placed into a press and pushed through a die to produce a unique form. The *facility processes* 100,000 pounds of lead came. Is this *process* exempt from reporting under the *article* exemption?

The *article* exemption does not apply. The lead billet does not qualify as an *article* because it does not have an end use function other than to be of a size and shape convenient to further *processing*, and the end product is significantly different in shape and dimension from the starting material. Since the *facility processes* more than 100 pounds of lead, the *facility* must report for this *toxic chemical*.

Article Exemption, Recognizable as an Article, Disposal, Process, Lead

61. A covered manufacturing *facility* produces neon signs by bending leaded glass tubing. The *facility* uses enough tubing annually to *process* in excess of 100 pounds of lead, an EPCRA Section 313 *toxic chemical*. When signs are formed from glass tubing, the diameter of the tubes remains unchanged and lead is not *released* during the heating or bending *process*, qualifying the tubes for the *article* exemption. If a discrete number of glass tubes are broken and discarded during the year, under what circumstances would *disposal* of the broken tubes constitute a *release* that negates the *article* exemption, and how would the *facility* calculate the amount of lead used in their operation?

Disposal of the glass does not necessarily constitute a *release* which automatically negates the *article* exemption. For the tubing to meet the definition of an *article* when discarded, the diameter of the tubing must remain intact and unchanged. As a result, shards of glass no longer qualify as *articles*. If more than 0.5 pounds of lead is *released* and not recycled, then the *article* exemption would not apply to this glass tubing.

Article Exemption, PCB Transformers, Ancillary Use

62. A *covered facility* has a PCB transformer on-site which it uses for energy. The PCBs were removed from the transformer and *disposed*. Is the amount of PCB removed for *disposal* counted towards the *otherwise use* threshold? How is this activity covered under EPCRA Section 313?

If the *facility* removes the entire transformer including the PCB-laced oil as an *article*, the amount of PCB in the *article* would not be included in Section 313 threshold determinations and *release* and other *waste management* calculations. If a *toxic chemical* is present in an *article* at a *covered facility*, the owner/operator is not required to consider the quantity of the *toxic chemical* present in such *article* when determining whether an applicable threshold has been met or when determining the amount to be reported as a *release* or other *waste management*.

If the *facility* removes the PCB-laced oil from the *article*, this removal would negate the *article* exemption. To determine if the *facility* exceeds a threshold, the operator of the *facility* must count the amount of the chemical added to the recycle/reuse operation during the reporting year (40 CFR Section 372.25(e)).

If a *facility* has a transformer that leaks PCB-laced oil, this leaking would also negate the *article* exemption. To determine if the *facility* exceeds a threshold, again, the owner/operator of the *facility* must count the amount of the chemical added to the recycle/reuse operation during the reporting year.

The *facility* would be *otherwise using* the PCB added to the transformer (ancillary use). Only the amount of PCB added to the transformer needs to be aggregated for threshold determination, and the *facility* will most likely not be adding PCB-laced oil to the transformer. Therefore, it is unlikely that the *facility* will exceed the *otherwise use* threshold. The *facility*, therefore, would not be required to report *releases* and other *waste management* of the PCBs for Section 313.

If, however, the *facility* exceeds the 10 pound threshold and needs to report PCBs, the PCBs removed from the transformer and sent off-site for final *disposal* would be a reportable *release*.

Coincidental Manufacture, Combustion Byproducts, Hydrochloric Acid, Metal Compounds

63. A *covered facility* has a coal-fired *boiler*. The combustion of the coal generates aerosol forms of hydrochloric acid as a byproduct. Should the aerosol forms of the HCl emissions be reported under EPCRA Section 313?

Yes. In the combustion of coal, the *facility* will be coincidentally *manufacturing* aerosol forms of hydrochloric acid, as well as hydrofluoric acid and sulfuric acid. The combustion of coal will also result in the coincidental *manufacture* of new metal compounds. The *facility* must submit a Form R if it *manufactures* more than a threshold amount of any of these listed *toxic chemicals*.

Compounds, Metal Compounds, Release Reporting, Lead Compounds, Lead

64. A *covered facility processes* both elemental lead and lead compounds. The *facility* exceeds the 100 pounds per year *processing* threshold for lead compounds, but not for elemental lead, and must submit a report for lead compounds only. When calculating *releases* and other *waste management* activities from the lead compounds, the owner/operator is only required to account for the weight of the parent metal released (40 CFR Section 372.25(h)). Should the *facility* account for both *releases* of lead from activities involving lead compounds and *releases* of lead from activities involving elemental lead?

No. In the case when an activity threshold is exceeded only for lead compounds, the report is only required to be based on the *releases* and other

waste management estimates of lead, the parent metal, from lead compounds only. *Releases* and other *waste management* estimates of lead resulting from activities involving elemental lead need not be included in the *release* and other *waste management* calculations. Conversely, if the *facility* were to exceed an activity threshold for only elemental lead, the report would only have to be based on *releases* and other *waste management* estimates from activities involving elemental lead only.

Compounds, Chemical Qualifier, Fume or Dust

65. There are two chemicals on the list with the qualifier "fume or dust" (zinc and aluminum). What exactly is a "fume" or a "dust?"

EPA does not have a regulatory definition of a fume or a dust, but considers dusts, for purposes of reporting, to consist of solid particles generated by any mechanical processing of materials including crushing, grinding, rapid impact, handling, detonation, and decrepitation of organic and inorganic materials such as rock, ore, and metal. Dusts do not tend to flocculate except under electrostatic forces. A fume is an airborne dispersion consisting of small solid particles created by condensation from the gaseous state, in distinction to a gas or vapor. Fumes arise from the heating of solids such as lead. The condensation is often accompanied by a chemical reaction, such as oxidation. Fumes flocculate and sometimes coalesce.

Compounds, Coincidental Manufacture, Fume or Dust, Processing

66. A *covered facility processes* aluminum and zinc. These two *toxic chemicals* are listed under Section 313 with the qualifier "fume or dust." Is this *processing* operation subject to reporting?

If the *processing* of these substances generates (i.e., *manufactures*) any fume or dust or if the two substances were *processed* or *otherwise used*, at any time, as a fume or dust, the activities would be reportable under EPCRA Section 313. The *manufacturing*, *processing*, or *otherwise use* of these substances in fume or dust form would be subject to threshold determinations.

Chemical Category, Threshold Determination, Release Reporting, Delimited Category, PACs

67. The EPCRA Section 313 *toxic chemical* list contains three delimited chemical categories. A delimited category includes a finite number of chemicals specifically designated by EPA to be included as part of that category. Are threshold determinations and *release* and other *waste management* calculations for these three delimited chemical categories different than threshold determinations and *release* and other *waste management* calculations for other EPCRA Section 313 listed chemical categories?

Threshold determinations are made in the same manner for both delimited and nondelimited categories. If a *covered facility manufactures*, *processes*, or *otherwise uses* more than one member of a listed chemical category, the total volume of all the members of the category must be counted towards the applicable activity threshold (40 CFR Section 372.27(d)). If an activity

ADDENDUM

threshold is exceeded, the owner or operator of the *facility* is required to report under EPCRA Section 313. The report must cover all non-exempt activities at the *facility* involving members of the category.

The three delimited categories are diisocyanates, dioxin and dioxin-like compounds, and polycyclic aromatic compounds (PACs). The diisocyanates category consists of 20 specific members, the dioxin and dioxin-like compounds category consists of 17 specific members, and the PACs category consists of 21 specific members. For reporting on delimited categories, only the members that are specifically listed as part of the category are subject to EPCRA Section 313 reporting. When reporting other nondelimited chemical categories, any unique chemical substance that contains the named category compound as part of that chemical's structure, or any compound meeting the specified molecular formula, is subject to threshold determinations.

In 1999, (64 FR 58666, October 29, 1999), EPA classified the PACs category as a PBT chemical category and lowered the reporting threshold to 100 pounds. In addition, EPA added two members to this category: benzo(j,k)fluorine (fluoranthene) and 3-methylcholanthrene. EPA has developed guidance to facilitate accurate reporting for PACs entitled Guidance for Reporting Toxic Chemicals: Polycyclic Aromatic Compounds Category, accessible from the TRI web site (www.epa.gov/tri) under the heading "Guidance Documents." The guidance contains a list of Chemical Abstract Service (CAS) numbers for the individual chemicals within the PACs category and a CAS number list of some *mixtures* that might contain chemicals within the PACs category. The dioxin and dioxin-like compounds category was also classified as a PBT chemical category and a reporting threshold of 0.1 gram was established. EPA has also developed guidance to facilitate accurate reporting for dioxin and dioxin-like compounds; Guidance for Reporting Toxic Chemicals with the Dioxin and Dioxin-like Compounds Category is available from the TRI website (www.epa.gov/tri) under "Guidance Documents."

Mixture, Threshold Determination

68. A *covered facility* brings in natural and synthetic rubber in slab form. It then adds chemicals to the rubber to change it to what they are making (i.e., tennis balls). Does the *facility* need to consider the *toxic chemicals* in the rubber it receives?

Yes. Rubber is a *mixture* for reporting purposes. Further, note that the weights of the non-PBT chemicals must be added to the threshold determination if their concentrations are above the de minimis concentration limit (1 percent, or 0.1 percent for OSHA carcinogens) while the weight of any PBT chemical must be added irrespective of concentration. The weight added would be the weight percent of the *toxic chemical* multiplied by the weight of the rubber slab.

Releases, Release Reporting, Acid Neutralization, pH

69. How would a *facility* report under Section 313 on a wastestream which is neutralized to a pH above 6 before discharged to a POTW?

Covered facilities that use Section 313 chemicals for pH adjustments and neutralization must report if they meet the *otherwise use* threshold, even if these chemicals are consumed and no *releases* result. The listed *toxic chemical* is reported as zero pounds discharged to the POTW in Section 6.1 (Discharges to Publicly Owned Treatment Works) and the entire amount neutralized is reported in Section 8.6 (Treated On-Site). The neutralization process is reported under Section 7A of the Form R (On-Site Waste Treatment Methods and Efficiency).

Releases, Release Reporting, Stockpiles, Storage

70. A manufacturing *facility* that produces electricity by burning coal stores the coal in an on-site stockpile that is exposed to the outside atmosphere. The *facility* meets the threshold criteria (40 CFR Section 372.22) for filing a Form R for the *toxic chemical* benzene. Since the stockpiled coal contains benzene and is exposed to the outside atmosphere, would all the benzene in the coal need to be reported on the Form R as a *release* to land on-site?

No. A *facility* does not have to report *toxic chemicals* contained in an on-site stockpile of material that is intended for *otherwise use* on-site as a *release* to land on-site. However, any *toxic chemical* that escaped to air or remains in the soil from the stockpile material (e.g., evaporative losses to air, material leached to the ground, etc.) must be reported as *released* to the *environment* on-site. Once a *covered facility* meets the criteria for filing a Form R under EPCRA Section 313 for a *toxic chemical* (such as benzene), all *releases* of that chemical at the *facility* are to be reported. *Releases* of non-PBT chemicals from the stock pile will be eligible for the de minimis exemption.

Releases, Release Reporting, RCRA-empty, Off-site Transfer

71. A *covered facility* sends a 55-gallon drum containing less than one inch of a listed *toxic chemical* off site for *disposal*. For purposes of the RCRA hazardous waste regulations, the container is considered an empty container as defined in 40 CFR Section 261.7 (i.e., RCRA-empty). Must the *facility* report the listed *toxic chemical* contained in the RCRA-empty container as an off-site transfer for purposes of *disposal* on theForm R even though it is not considered to contain hazardous waste under RCRA?

Yes. The definition of an empty container pursuant to 40 CFR Section 261.7 does not apply to EPCRA Section 313. Even though the residue remaining in a container rendered RCRA-empty is no longer considered a hazardous waste under federal RCRA regulations, it is still considered a *toxic chemical* under EPCRA Section 313. The status of a listed *toxic chemical* as a nonhazardous waste under RCRA has no impact on the applicability of EPCRA regulations on that chemical.

Under EPCRA Section 329, the term *release* is defined as "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or *disposing* into the *environment* (including the abandonment or discarding of barrels, containers, and other closed receptacles) of any *toxic chemical*." In Part II, Section 8.1 of the Form R, EPA requires *facilities* to report all *releases* of listed *toxic chemicals*, except those quantities released to the *environment* as a result of remedial actions, catastrophic events, or one-time events not associated with production processes. *Disposal* of a RCRA-empty container which contains any amount of a listed *toxic chemical* is generally reportable in Section 8.1 when transferred from or *disposed* at an EPCRA Section 313 *covered facility*. If, however, the *facility* has total reportable amounts of a non-PBT chemical not exceeding 500 pounds, it may be eligible for the higher alternate reporting threshold in 40 CFR Section 327.27.

Waste Management Activities, NA vs. 0, Part II Section 8.8, Catastrophic One-Time Event

72. On the Form R, a *covered facility* owner/operator must provide information about routine and non-routine *releases* for each reported *toxic chemical*. Specifically, in Part II, Section 8.8, an owner/operator must report the quantity of any *release* of a *toxic chemical* into the *environment* or transferred off-site as a result of a remedial action, catastrophic event, or one-time event not associated with production processes. If the facility did not experience any such *release* or transfer, must the owner/operator report zero, or may the owner/operator report "NA" in Section 8.8?

While either notation, NA or zero, may be entered in Part II, Section 8.8 of the Form R, they are not synonymous. If a remedial action, catastrophic event, or one-time event not associated with production processes results in a *release* into the *environment* or an off-site transfer of the listed non-PBT chemical and the annual aggregate release was less than 0.5 pound, then a *facility* owner/operator should enter zero in Section 8.8. For PBT chemicals, *facilities* should report *releases* and other *waste management* amounts greater than 0.1 pound (and for dioxin and dioxin-like compounds 0.0001 gram), at a level of precision supported by the accuracy of the underlying data and the estimation techniques on which the estimate is based. (*see* (64 FR 58734, October 29, 1999) and Guidance for Reporting Toxic Chemicals with the Dioxin and Dioxin-like Compounds Category (EPA-745-B-00-021, December 2000)). An owner/operator should only report NA for Section 8.8 on the Form R if no *release* or transfer occurred as a result of these activities.

Form A Criteria

73. EPA published a final rule in the Federal Register on November 30, 1994 (59 FR 61488), which created an alternate threshold of one million pounds for certain *facilities*. How can a facility that exceeds one of the original thresholds qualify for the alternate threshold?

Facilities which have a *total annual reportable amount* of no greater than

500 pounds for a listed non-PBT chemical may qualify for the 1 million pound alternate threshold for that chemical, beginning with the 1995 reporting year. For purposes of the alternate threshold, the *total annual reportable amount* includes non-PBT chemicals listed at 40 CFR Section 372.65 which are *released* (including *disposed*), treated, recycled, and burned for energy recovery at the *facility* and amounts transferred from the *facility* to off-site locations for the purposes of recycling, energy recovery, treatment, and/or *disposal*. These amounts correspond to column B, Sections 8.1 through 8.7 of the reporting Form R. If a *facility's* combined *total annual reportable amount* does not exceed 500 pounds for a specific non-PBT chemical, the *facility* can qualify for reduced reporting requirements unless the amount of that non-PBT *chemical manufactured*, *processed*, or *otherwise used* within the reporting year exceeds one million pounds.

Covered facilities that qualify for the alternate threshold are not exempt from reporting, but must fulfill certain requirements. In lieu of submitting a Form R, the owner/operator of a *facility* must submit an annual certification statement (Form A) indicating that the *facility* met the requirements for use of the alternate threshold for a specific chemical. The *facility* must also maintain, and make available upon request, records substantiating the claim. The Form A includes basic information regarding the *facility's* identification, the chemical in question, and a statement of accuracy to be signed by a *senior management official* of the *facility*.

Form A

74. What is the Form A and who may submit this form?

The Form A provides certain *covered facilities* the option of submitting a substantially shorter form with a reduced reporting burden. *Facilities* which meet the SIC code, employee, and chemical activity thresholds but who do not exceed one million pounds *manufactured*, *processed*, or *otherwise used* and the *facility's total annual reportable amount* does not exceed 500 pounds for the non-PBT chemical, may submit an annual certification statement (Form A) instead of a Form R for the *toxic chemical*.

Form A Criteria

75. If I meet the criteria for filing a Form A for one non-PBT chemical, may I use it for all of the non-PBT chemicals covered at my *facility*?

No. Eligibility for use of Form A is *toxic chemical* specific. However, more than one *toxic chemical* can be reported on a single Form A. To be eligible for reporting a *toxic chemical* using Form A, a *facility* must not *manufacture*, *process*, or *otherwise use* more than one million pounds of the specific non-PBT chemical and the *total annual reportable amount* for the non-PBT chemical must be less than 500 pounds. In some instances, a *facility* may submit the Form A for some chemicals and the Form R for other chemicals. Although all non-PBT *toxic chemicals* that meet the eligibility criteria for use of Form A may now be reported together on a single Form A, each eligible *toxic chemical* must be individually listed on the Form.

Form R, Maximum Amount On-site, Fume or Dust, Part II Section 4, Threshold Determination

76. The list of *toxic chemicals* under EPCRA Section 313 contains two substances with a "fume or dust" qualifier (aluminum and zinc). For purposes of reporting the maximum amount on-site (Part II, Section 4 of the Form R), should *covered facilities* only report the maximum amount of fume or dust on-site or the maximum amount of all forms of the chemical on-site at any one time?

When determining the maximum amount on-site for Part II, Section 4 of the Form R, only the reportable form of a chemical (e.g., fume or dust) is to be considered.

Form R, Significant Figures

77. Please explain the "two significant figures" reporting guideline.

For non-PBT chemicals, estimates are not required to be reported to a greater accuracy than two significant figures (e.g., 4224 may be entered as 4200). The number of significant figures is the number of non-zero digits. One significant digit may be reported if the estimation techniques used do not support two digit accuracy. For PBT chemicals, if a *facility's release* or other management calculations support reporting an amount that is more precise than two significant digits, then the *facility* should report that more precise amount. (64 FR 58734, October 29, 1999)

Form R, Release Estimate, Significant Figures

78. When reporting *release* estimates for non-PBT chemicals on the Form R, EPA recommends *release* estimates be rounded to no more than two significant figures. Should *release* estimates always be reported in whole numbers, or should decimal places be reported in certain instances?

When reporting *release* and other *waste management* estimates on the Form R for non-PBT chemicals, always report using whole numbers (i.e., round to the nearest pound). For PBT chemicals, *facilities* should report *releases* and other *waste management* amounts greater than 0.1 pound (and for dioxin and dioxin-like compounds 0.0001 gram), at a level of precision supported by the accuracy of the underlying data and the estimation techniques on which the estimate is based. (*see* (64 FR 58734, October 29, 1999) and Guidance for Reporting Toxic Chemicals with the Dioxin and Dioxin-like Compounds Category (EPA-745-B-00-021, December 2000)).

DIRECTIVE #2 – DE MINIMIS EXEMPTION

The de minimis exemption allows *covered facilities* to disregard certain minimal concentrations of non-PBT chemicals in *mixtures* or *trade name products*. The de minimis exemption does not apply to the *manufacture* of a non-PBT chemical except if that *toxic chemical* is *manufactured* as an impurity and remains in the product distributed in commerce, or if the *toxic chemical* is *imported* below the appropriate de minimis level. The de minimis exemption does not apply to a byproduct *manufactured* coincidentally as a result of *manufacturing*, *processing*, *otherwise use*, or any *waste management* activities.

When determining whether the de minimis exemption applies to a listed non-PBT chemical, the owner/operator should consider only the concentration of the non-PBT chemical in *mixtures* and *trade name products*. If the non-PBT chemical is *manufactured* as an impurity, *imported*, *processed*, or *otherwise used* and is below the appropriate de minimis concentration level, then the quantity of the *toxic chemical* does not have to be applied to threshold determinations nor included in *release* or other *waste management* calculations. If a non-PBT chemical in a *mixture* or *trade name product* is below the appropriate de minimis level, all *releases* and other *waste management* activities associated with the *toxic chemical* in the *mixture* or *trade name product* are exempt from EPCRA Section 313 reporting. It is possible to meet an activity (e.g., *processing*) threshold for a *toxic chemical* on a *facility*-wide basis, but not be required to calculate *releases* or other *waste management* quantities associated with a particular process because that process involves only *mixtures* or *trade name products* containing the *toxic chemical* below the de minimis level.

Once a non-PBT chemical concentration is above the appropriate de minimis level in the *mixture* or *trade name product*, threshold determinations and *release* and other *waste management* calculations must be made, even if the chemical later falls below the de minimis level in the same *mixture* or *trade name product*. Thus, all *releases* and other quantities managed as waste that occur after the de minimis level has been exceeded are subject to reporting. If a non-PBT chemical in a *mixture* or *trade name product* above de minimis is brought on-site, the de minimis exemption never applies.

The 0.1 percent de minimis levels are dictated by determinations made by the National Toxicology Program (NTP), Annual Report on Carcinogens, the International Agency for Research and Cancer (IARC)

Monographs, or 29 CFR part 1910, subpart Z. Therefore, once a chemical's status under NTP, IARC, or 29 CFR part 1910, subpart Z indicates that the chemical is a carcinogen or potential carcinogen, the reporting facility may disregard levels of the chemical below the 0.1 percent de minimis concentration provided that the other criteria for the de minimis exemption is met. De minimis levels for chemical categories apply to the total concentration of all chemicals in the category within a *mixture*, not the concentration of each individual category member within the *mixture*. All other listed *toxic chemicals* have a one percent (1.0 percent) de minimis level.

1. De Minimis Application to the Processing or Otherwise Use of a Mixture

The de minimis exemption applies to the *processing* or *otherwise using*, of a listed non-PBT chemical in a mixture. Threshold determinations and *release* and other *waste management* calculations begin at the point where the chemical exceeds de minimis. If a listed non-PBT chemical is present in a *mixture* at a concentration below the de minimis level, this quantity of the substance does not have to be included for threshold determination, *release* and other *waste management* reporting. The exemption will apply as long as the *mixture* containing de minimis amounts of a non-PBT chemical never goes above the de minimis limit. Also, see the two examples below in which a *manufacturing* activity would qualify for the de minimis exemption.

Examples of Process and Otherwise Use Scenarios

There are many cases in which the de minimis limit is crossed or recrossed within a *process* or *otherwise use* scenario. The following examples are meant to illuminate these complex reporting scenarios. These applications are further described in the general section of the Toxic Chemical Release Inventory Reporting Forms and Instructions.

A. Example of Increasing Process Concentration to Above De Minimis Levels

A *manufacturing facility* receives toluene which contains less than the de minimis concentration of chlorobenzene. Through distillation, the chlorobenzene content in process streams is increased over the de minimis concentration of 1 percent. From the point at which the chlorobenzene concentration exceeds 1 percent in process streams, the amount present must be factored into threshold determinations and *release* and other *waste management* calculations. The facility does not need to consider the amount of chlorobenzene in the raw material, i.e., when below de minimis levels, when making threshold determinations. The *facility* does not have to report emissions of chlorobenzene from storage tanks or any other equipment where the chlorobenzene content is less than 1 percent.

B. Example of Fluctuating Process Concentration

A manufacturer produces an ink product which contains toluene, a listed *toxic chemical* below the de minimis level. The process used causes the percentage of toluene in the *mixture* to fluctuate: it rises above the de minimis level for a time but drops below the level as the process winds down. The *facility* must consider the chemical toward threshold determinations from the point at which it first exceeds the de minimis limit. Once the de minimis limit has been crossed the exemption cannot be taken.

C. Example of Concentration Levels that Straddle the De minimis Level

A *facility processes* 9,500,000 lbs. of *mixtures* containing 0.25–1.25 percent manganese. Manganese is subject to 1 percent de minimis concentration exemption. The amount of *mixture* subject to reporting is:

9,500,000 × (1.2 – 0.99)/(1.2 – 0.25) = 2,000,000 lbs. non-exempt *mixture*

The average concentration above de minimis is 1.1 percent.

2,900,000 × 0.011 manganese = 22,000 lbs manganese (below threshold)

In this example, because the *facility*'s information pertaining to the *toxic chemical* is available to two digits past the decimal point, the *facility* used 0.99 to determine the amount of the *toxic chemical* below the de minimis level. If the *facility* has information pertaining to the chemical that is available only to one digit past the decimal point, the *facility* should use 0.9.

2. De Minimis Application in the Manufacture of the Listed Chemical in a Mixture

The de minimis exemption generally does not apply to the *manufacture* of a non-PBT chemical. The de minimis exemption may apply to *mixture*s and *trade name products* containing non-PBT chemicals that are *imported* into the United States. Another exception applies to non-PBT chemicals that are coincidentally *manufactured* as impurities that remain in the product distributed in commerce at below the de minimis levels. In that case, the amount remaining in the product is exempt from threshold determinations. If the non-PBT chemical is separated from the final product, thereby classifying the chemical as a byproduct, it cannot qualify for the exemption. Any amount that is separated, or is separate from the product, is considered a byproduct and is subject to threshold determinations and *release* and other *waste management* calculations. Any amount of a *toxic chemical* that is *manufactured* in a wastestream must be accounted for on the Form R.

A. Example of Coincidental Manufacture as a Product Impurity

Toluene 2,4-diisocyanate reacts with water to form trace quantities of 2,4-diaminotoluene. The resulting product contains 99 percent toluene 2,4-diisocyanate and 0.05 percent 2,4-diaminotoluene. The 2,4-diaminotoluene would not be subject to Section 313 reporting nor would supplier notification be required because the concentration of 2,4-diaminotoluene is below its de minimis concentration of 0.1 percent in the product. Coincidental *manufacture*/production refers only to production of a chemical via a chemical reaction. It would not include separation of a byproduct from a purchased *mixture* during a processing operation.

B. Example of Coincidental *Manufacture* as a Commercial Byproduct and Impurity

Chloroform is a reaction byproduct in the production of carbon tetrachloride. It is removed by distillation to a concentration of less than 150 ppm (0.0150 percent) remaining in the carbon tetrachloride. The separated chloroform at 90 percent concentration is sold as a byproduct. Chloroform is subject to a 0.1 percent (1,000 ppm) de minimis level. Any amount of chloroform *manufactured* and separated as byproduct must be included in threshold determinations because the de minimis exemption does not apply to *manufacture* of a chemical byproduct. *Releases* of chloroform prior to and during purification of the carbon tetrachloride should be reported. The de minimis level can, however, be applied to the chloroform remaining in the carbon tetrachloride as an impurity. Because the concentration of chloroform remaining in the carbon tetrachloride is below the de minimis level, this quantity of chloroform is exempt from threshold determinations, *release* and other *waste management* reporting, and supplier notification.

C. Example of Coincidental Manufacture as a Waste Byproduct

A small amount of formaldehyde is *manufactured* as a reaction byproduct during the production of phthalic anhydride. The formaldehyde is separated from the phthalic anhydride as a waste gas and burned, leaving no formaldehyde in the phthalic anhydride. The amount of formaldehyde produced and removed as waste must be included in threshold determinations and *release* and other *waste management* calculations even if the formaldehyde is present below the de minimis level in the process stream where it was *manufactured* or in the wastestream which it was separated.

The de minimis exemption also does not apply to situations where the *manufactured* chemical is *released* or transferred to wastestreams and thereby diluted to below the de minimis level.

3. De Minimis Levels Impact Supplier Notification Requirements

If the *toxic chemical* in a *mixture* or *trade name product* is present below the de minimis level for that *toxic chemical*, supplier notification is not required for that chemical regardless of whether or not it is a PBT chemical.

DIRECTIVE #4 – COMPOUNDS AND MIXTURES

1. Definition of Compounds

A "compound" is a distinct chemical that results from the reaction of two or more other chemicals. In the formation of a compound, the reactant chemicals lose their individual chemical identities. Polymers formed as nonreversible reaction products are an example of compounds.

2. Definition of Mixtures

A *mixture* is any combination of two or more distinct chemicals if the combination is not the result of a chemical reaction. In a *mixture*, the individual components retain their identities. *Mixtures* include any combination of a chemical and associated impurities. Alloys are *mixtures* because the individual metals in the alloy retain their chemical identities. Wastes are not *mixtures.*

3. Mixtures Must be Considered for Section 313 Reporting

Threshold determinations and *release* and other *waste management* calculations for Section 313 reporting must include the amount of the listed non-PBT chemical present above the de minimis level in all *mixtures*. If a listed non-PBT chemical is present in a *mixture* at or above the de minimis level, or a PBT chemical is present at any concentration, only the amount of the *toxic chemical*, and not the *mixture* itself, is used for threshold determinations and *release* and other *waste management* calculations.

4. Supplier Notification and Concentration Ranges Provide Information for Reporting

The supplier notification requirements under 40 CFR Section 372.45 are designed to provide chemical users with information on the identity and concentrations of listed *toxic chemicals* present in the *mixtures* that they use. There can still be situations, however, when a *facility* may not have this information for a *mixture*. If the *facility* knows that a *mixture* contains a *toxic chemical* but no concentration information is provided by the supplier, then the *facility* does not have to consider the amount of the *toxic chemical* present in that *mixture* for purposes of threshold determinations and *release* and other *waste management* calculations. If only a range of concentrations is available for a *toxic chemical* present in a *mixture*, the owner/operator should use the midpoint of the "minimum" and "maximum" percentages in order to determine the amount to apply toward thresholds. If a *facility* owner/operator only knows the lower bound concentration of a *toxic chemical* present in a *mixture*, the owner/operator should assume the upper bound concentration is 100 percent, and compute an average based on these lower and upper bound concentration estimates to determine whether thresholds have been exceeded.

If there are other known components present in the *mixture*, the *facility* owner/operator should subtract out the percentage of these components to determine what a reasonable “maximum” percentage of the *toxic chemical* could be.

DIRECTIVE #5 – TOXIC CHEMICAL CATEGORIES

1. All Compounds in a Listed Chemical Category are Aggregated for Threshold Determinations

Toxic chemical categories listed under EPCRA Section 313 require a different approach when making threshold determinations and *release* and other *waste management* calculations. For a chemical that is included in a listed metal compound category, the total weight of that chemical compound, not just the parent metal, is used in making threshold determinations. A *facility* will need to calculate the total weight of all compounds that are in the category, sum the amounts involved throughout the *facility* in each threshold activity, and compare the totals to the applicable thresholds. A non-PBT compound in a listed chemical category that is present in a *mixture* below the de minimis concentration, based on the total weight of the compound, is exempt from threshold calculations under Section 1. Again, all individual members of a compound category must be totaled to determine if that compound category has exceeded the de minimis concentration in a *mixture*.

2. Make Threshold Determinations for Listed Toxic Chemicals Separately from the Listed Chemical Category

The Section 313 list contains some listed substances that are also members of a listed chemical category. Threshold determinations for a specifically listed *toxic chemical* are calculated separately from the threshold determinations for the chemical category. For example, 2-Methoxyethanol, which is specifically listed on the Section 313 list, is also a glycol ether compound but is not included in the glycol ether compound category for purposes of section 313 reporting. Because the chemical is specifically listed, a *facility* must make a threshold determination for 2-Methoxyethanol and a separate threshold determination for all other glycol ethers meeting the criteria for that chemical category that are not specifically listed under Section 313.

3. Calculate Releases and Other Waste Management Based on Parent Metal for Metal Compound Categories

Once a reporting threshold is met for a metal compound, *releases* and other *waste management* of compounds are calculated based on the pounds of the parent metal *released* or otherwise managed as waste rather than the total weight of the compound. EPA adopted this approach because of the difficulty in calculating *releases* of potentially numerous compounds within a metal compound category, recognizing that methods and data for monitoring the parent metal often exist while those for the compound(s) rarely will.

4. Optional Form R Submission for Parent Metal and Associated Metal Compound Category

If both the parent metal and associated metal compound category exceed their respective thresholds, one Form R, covering all *releases* and other *waste management* of the parent metal from activities involving both the chemical and the chemical category, may be filed. For example, if a *facility processes* 30,000 pounds of lead and *otherwise uses* 13,000 pounds of lead oxide, the facility could submit one Form R for lead and lead compounds. On this Form R, the *facility* would report all activities involving lead and lead compounds and all *releases* and other *waste management* of the parent metal lead. This option, preferred by EPA, is available to *facilities*, although separate reports may be filed if desired.

5. Calculate Releases and Other Waste Management Based on Nitrate Ion for Nitrate Compounds

Once a reporting threshold is met for the water dissociable nitrate compound category, *releases* and other *waste management* estimates are calculated based on the pounds of the nitrate ion in aqueous solution rather than the total weight of the compound. EPA adopted this approach because most monitoring data available only measure the dissociated nitrate ion *released* and not the amount of the total nitrate compounds from which the nitrate ion dissociated. Reporting the amount of total water dissociable nitrate compound in wastes would be complicated when more than one substance contributes to the nitrate ion content of the waste and when the nitrate compound is converted to a different substance due to waste treatment or other processes.

DIRECTIVE #6 – PCBs THRESHOLD DETERMINATION AND RELEASE AND OTHER WASTE MANAGEMENT REPORTING

Polychlorinated biphenyls (PCBs) are a listed chemical under Section 313.

1. PCBs in Articles are Exempt

EPA has stated that transformers are *articles* (and thus exempt from threshold determinations), but that the *release* or removal of fluid from the transformer negates the *article* status. The *article* status of only those transformers that have fluids removed (e.g., servicing or retrofilling), or have fluids escape are affected. However, the PCBs are still not considered if no new PCB-containing fluid is added, since the threshold determination is based on fluid added, not lost.

EPA has stated that *disposal* or removal of *articles* does not constitute a *release*. Therefore, *disposal* on-site, or off-site transfer of the whole transformer with fluid content undisturbed, does not negate the *article* status. The transformer is not included in threshold determinations and does not have to be reported as a *release* or an off-site transfer of PCBs for purposes of Section 313 reporting.

When calculating the threshold for *otherwise use*, a *facility* must consider only the amount of PCBs added to transformers during the reporting year (e.g., "topping off" a transformer), not the amount of working fluid contained in the transformer.

2. Coincidental Manufacture of PCBs is Subject to EPCRA Section 313

Facilities involved in coincidental *manufacture* of PCBs and further *processing* of *mixtures* containing PCBs must count the amount *manufactured* or *processed* toward these thresholds.

3. Treatment or Disposal of PCBs May Require EPCRA Section 313 Reporting

Facilities in the SIC codes 20 through 39, as well as the newly *covered SIC codes*, may be subject to Section 313 reporting if they treat or dispose of PCBs. Effective January 1, 1998, the interpretation of activities considered *otherwise used* includes *treatment for destruction*, *disposal*, and waste stabilization when the *covered facility* engaged in these activities receives materials containing any chemical (not limited to EPCRA Section 313 listed *toxic chemicals*) from off-site (regardless of whether the generating and receiving *facilities* have common ownership) for purposes of further *waste management*.

Processing represents a potentially covered activity. However, *facilities* are not likely to be incorporating PCBs into items distributed in commerce or to be using PCBs as starting or intermediate material for the production of other chemical substances that are distributed in commerce, or used on site.

DIRECTIVE #7 – DEFINITION OF OTHERWISE USE (Effective Reporting Year 1998)

On May 1, 1997, EPA published a final rule to expand the universe of industry groups subject to EPCRA Section 313 and PPA Section 6607 (62 FR 23834; May 1, 1997). In this rule, which became effective January 1, 1998 (for the 1998 reporting year, Form R reports due by July 1, 1999), EPA finalized a revised interpretation of the term *otherwise use.*

1. Current Interpretation of Otherwise Use

Until January 1, 1998, the definition of *otherwise use* means "any use of a *toxic chemical* that is not covered by the terms *manufacture* or *process* and includes use of a *toxic chemical* contained in a *mixture* or *trade name product*. Relabeling or redistributing a container of a *toxic chemical* where no repackaging occurs does not constitute *otherwise use* or *processing* of the *toxic chemical*." EPA has generally interpreted this term to include *toxic chemicals* that are not intentionally incorporated into a product distributed in commerce. This would include any activity involving a listed *toxic chemical* at a *facility* that does not fall under the definitions of *manufacture* or *process*. Some examples of *toxic chemicals otherwise used* include solvents, catalysts, coolants, lubricants and fuels. **Historically, EPA has instructed *facilities* that the *disposal* of a *toxic chemical*, in and of itself, does not constitute *manufacture, process,* or *otherwise use.***

2. Revised Interpretation of Otherwise Use

In the May 1, 1997 final rule, EPA modified its definition of activities considered *otherwise used* as it applies to EPCRA Section 313 activity thresholds to include on-site *treatment for destruction, disposal*, and stabilization when the *covered facility* engaged in these activities receives materials containing any chemical (not limited to EPCRA Section 313 listed *toxic chemicals*) from off-site (regardless of whether the generating and receiving *facilities* have common ownership) for the purposes of further *waste management* activities. Specifically, EPA has defined the term *otherwise use* to include "any use of a *toxic chemical"* contained in a *mixture* or other *trade name product* or waste, that is not covered by the terms *manufacture* or *process*. *Otherwise use* of a *toxic chemical* does not include disposal, stabilization (without subsequent distribution in commerce), or treatment for destruction, unless:

(1) The *toxic chemical* that was disposed, stabilized, or treated for destruction was received from off-site for the purposes of further *waste management*; or

ADDENDUM

(2) The *toxic chemical* that was disposed, stabilized, or treated for destruction was *manufactured* as a result of *waste management* activities on materials received from off-site for the purposes of further *waste management* activities. Relabeling or redistributing of the *toxic chemical* where no repackaging occurs does not constitute *otherwise use* or *processing* of the *toxic chemical*.

3. Examples of the Revised Interpretation of Otherwise Use

The following are examples of the revised interpretation of *otherwise use* as finalized in the May 1, 1997, final rule. These examples assume that the *facility* meets the EPCRA Section 313 employee and SIC code criteria.

Example 1: A *facility* receives a material containing 22,000 pounds of chemical A. Chemical A is an EPCRA Section 313 listed non-PBT chemical. The *facility* treats chemical A for destruction. Included among the various activities covered by EPA's revised interpretation of *otherwise use* is the *treatment for destruction* of a *toxic chemical* received by the *facility* from off-site. Because the *facility* received and treated chemical A for destruction, the treated amount of chemical A would be included in the calculation of the amount of chemical A *otherwise used* at the *facility*. In this case, 22,000 pounds of chemical A would be considered *otherwise used*. Thus, because the *facility otherwise used* chemical A above the 10,000 pound statutory threshold for *otherwise use*, the *facility* would be required to report all *releases* and other *waste management* activities involving chemical A.

Example 1A: A *facility* receives a material containing 22,000 pounds of chemical A, and chemical A is an EPCRA Section 313 listed non-PBT chemical. The *facility* stabilizes chemical A. Stabilization is included among the various activities covered by EPA's revised interpretation of *otherwise use* of a *toxic chemical* received by the *facility* from off-site. Because the facility received and stabilized chemical A, the amount of stabilized chemical A would be included in the calculation of the amount of chemical *otherwise used* at the *facility*. In this case, 22,000 pounds of chemical A would be considered *otherwise used*. Thus, because the *facility otherwise used* chemical A above the 10,000 pound statutory threshold for *otherwise use*, the *facility* would be required to report all *releases* and other *waste management* activities involving chemical A.

Example 1B: A *facility* receives a material containing 18,000 pounds of chemical A, and chemical A is an EPCRA Section 313 listed non-PBT chemical. The *facility* stabilizes 9,000 pounds of chemical A and disposes of the other 9,000 pounds of chemical A. Included among the various activities covered by EPA's revised interpretation of *otherwise use* are stabilization and disposal of a *toxic chemical* received by a *facility* from off-site. Because the

facility received the 18,000 pounds of chemical A from off-site, the amount of chemical A that is subsequently stabilized or *disposed* is considered *otherwise used*, and would be included in the calculation of the amount of chemical A *otherwise used* at the *facility* for the purpose of threshold determination. The *facility* would need to add the amount of chemical A that is involved in all *otherwise use* activities to determine whether the *otherwise use* threshold of 10,000 has been exceeded. In this case, 18,000 pounds of chemical A would be considered *otherwise used*. Thus, because the *facility otherwise used* chemical A above the 10,000 pound statutory threshold for *otherwise use*, the *facility* would be required to report all *releases* and other *waste management* activities involving chemical A.

Example 2: Assume now that the same *facility*, in treating chemical A for destruction, *manufactures* 11,000 pounds of chemical B. Chemical B is also an EPCRA Section 313 listed non-PBT chemical. This *manufacture* of chemical B is below the *manufacture* reporting threshold. However, the *facility* disposes of chemical B on-site. Included among the various activities covered by EPA's revised interpretation of *otherwise use* is the *disposal* of a *toxic chemical* that is produced from the management of a waste that is received by the *facility* from off-site. In this example, because the *facility* received an off-site material containing a chemical that is *treated for destruction* (i.e., chemical A), and during that treatment produced and subsequently disposed of chemical B, the disposal of chemical B under EPA's revised interpretation would be considered *otherwise used*. Because the *facility disposed* of, or *otherwise used*, 11,000 pounds of chemical B, the 10,000 pound statutory threshold for *otherwise use* is met. Thus, the *facility* would need to report all *releases* and other *waste management* activities involving chemical B.

Example 2A: Now assume that the situation in Example 2 is the same (and the *facility* is still below the *manufacturing* threshold for chemical B,) except the *facility* does not *dispose* of chemical B on-site, but incorporates the entire 11,000 pounds of chemical B into a product that is sold to another *facility*. The *facility* neither *treats for destruction*, stabilizes, nor *disposes* of chemical B and, therefore, does not *otherwise use* chemical B. However, in this example, chemical B is also considered *processed*. Therefore, the 11,000 pounds of chemical B are counted towards the 25,000 pound *process* threshold for that chemical at the *facility*.

Example 2B: As in the above two examples, 11,000 pounds of chemical B are *manufactured* from the treatment of chemical A (and chemical A was received from an off-site *facility*). The *facility* is still below the *manufacturing* threshold for chemical B. However, the *facility* disposes of 6,000 pounds of chemical B and uses 5,000 pounds of chemical B in a nonincorporative *manufacturing* activity at the *facility*. Both of these

activities are considered to be *otherwise use* activities. The disposal of chemical B is included among the various activities covered by EPA's revised interpretation of *otherwise use* described in the proposal to expand the types of *facilities* covered under EPCRA Section 313. Any non-incorporative use of a *toxic chemical* at a *covered facility* that is not otherwise exempt is an *otherwise use* activity under the current interpretation. The *facility* would add the amounts of chemical B involved in both *otherwise use* activities at the *facility* to determine whether it exceeds the 10,000 *otherwise use* threshold. Since the total amount of chemical B that is *otherwise used* is 11,000 pounds, the *facility* would need to report all *releases* and *waste management* activity involving chemical B.

Example 3: A *facility* produces on-site a material containing 22,000 pounds of chemical C. Chemical C is not an EPCRA Section 313 listed chemical. Also, chemical C was not *manufactured* as a result of managing a waste received from off-site. The *facility* treats chemical C for destruction and during treatment, *manufactures* 11,000 pounds of chemical D. Chemical D is an EPCRA Section 313 listed non-PBT chemical. The *facility* subsequently disposes of chemical D. In this example, although the *facility* disposes of chemical D, the 11,000 pounds of chemical D is not considered *otherwise used* under EPA's revised definition because the material from which chemical D was produced (i.e., the material containing the 22,000 pounds of chemical C) was not received by the *facility* from off-site. Thus, in disposing of chemical D, the *facility* does not exceed the 10,000 pound statutory threshold for *otherwise use*. The *facility*, however, must count the amount of chemical D *manufactured* toward the *manufacturing* threshold.

Example 3A: Assume instead that chemical C (which is not an EPCRA Section 313 listed *toxic chemical*) was received from off-site or was created in *waste management* activities conducted on materials received from off-site. In this situation, the disposal of chemical D would be considered an *otherwise use* activity involving chemical D. Therefore, the disposal of the 11,000 pounds of chemical D would exceed the 10,000 pound statutory threshold for *otherwise use*, and the *facility* would need to report all *releases* and *waste management* activities involving chemical D.

Example 3B: Chemical D is an EPCRA Section 313 chemical that is *manufactured* from chemical C during a *waste management* activity at the *facility*. (Chemical C is produced on-site and is not an EPCRA Section 313 listed *toxic chemical*.) In this example, the *facility* uses the entire 11,000 pounds of chemical D to neutralize a wastestream at the *facility*. Under the current definition of *otherwise use*, chemical D is considered *otherwise used*. Therefore, the *facility* exceeds the *otherwise use* threshold and the *facility* would report all *releases* and *waste management* activity involving chemical D.

Example 4: A *facility* receives 24,000 pounds of chemical E, which is not an EPCRA Section 313 *toxic chemical*. Chemical E undergoes a *processing* activity at the *facility*. This activity is not a *waste management* activity. During the *processing* of chemical E, 11,000 pounds of chemical F is *manufactured* as a byproduct. Chemical F is an EPCRA Section 313 listed non-PBT chemical. The 11,000 pounds of chemical F is then *disposed*. According to the current and the revised interpretation of the *otherwise use* definition, the *facility* has not *otherwise used* chemical F. Since chemical E was not received by the *facility* for the purpose of *waste management*, the subsequent *disposal* of chemical F is not an *otherwise use* activity under the revised interpretation of *otherwise use*. Under the current interpretation of *otherwise use*, the activity of disposal under these circumstances does not constitute a reportable activity for the purposes of threshold determinations. The *facility*, however, would have to count the amount of chemical F *manufactured* toward the *manufacturing* threshold.

Example 5: A *facility processes* 24,000 pounds of chemical E, an EPCRA Section 313 non-PBT chemical. This activity is not a *waste management* activity. During the *processing* of chemical E, 11,000 pounds of chemical E exits the *process* in the *facility*'s waste. Because chemical E has a high BTU/lb value, the *facility* combusts the wastestream containing chemical E in an energy recovery unit on-site. Under EPA's current and revised guidance on *otherwise use*, an EPCRA Section 313 *toxic chemical* that is a constituent of waste-derived fuel combusted in an energy recovery device is *otherwise used* by the *facility*, regardless of the origin of the waste-derived fuel. Therefore, when combusted for energy recovery on-site, chemical E, a constituent of the waste derived fuel, is considered *otherwise used* under the current definition of *otherwise use*. Because the *facility* combusts 11,000 pounds of the *toxic chemical*, the *facility* has exceeded the *otherwise use* activity threshold.

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Geographic Location
All of United States

Chemical Released
All chemicals

Industry
All Industries

Year of Data
2002

Data Set
The default is the current data update (as of August 2, 2004)

☐ *Select 2002 Public Data Release data set (frozen April 1, 2004 and released to the public June 25, 2004)*

Generate Report

Report columns to include

☑ **Total On-site Disposal or Other Releases**
Details
☑ On-Site Disposal to Class I Wells, RCRA Subtitle C Landfills, and Other On-Site Landfills
☑ Other On-Site Disposal or Other Releases

☑ **Total Off-site Disposal or Other Releases**
Details
☑ Off-Site Disposal to Underground Injection Wells, RCRA Subtitle C Landfills, and Other Landfills
☑ Other Off-Site Disposal or Other Releases

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What is the Toxics Release Inventory (TRI) Program

In 1984 a deadly cloud of methyl isocyanate killed thousands of people in Bhopal, India. Shortly thereafter, there was a serious chemical release at a sister plant in West Virginia. These incidents underscored demands by industrial workers and communities in several states for information on hazardous materials. Public interest and environmental organizations around the country accelerated demands for information on toxic chemicals being released "beyond the fence line" -- outside of the facility. Against this background, the Emergency Planning and Community Right-to-Know Act (EPCRA) was enacted in 1986.

EPCRA's primary purpose is to inform communities and citizens of chemical hazards in their areas. Sections 311 and 312 of EPCRA require businesses to report the locations and quantities of chemicals stored on-site to state and local governments in order to help communities prepare to respond to chemical spills and similar emergencies. EPCRA Section 313 requires EPA and the States to annually collect data on releases and transfers of certain toxic chemicals from industrial facilities, and make the data available to the public in the Toxics Release Inventory (TRI). In 1990 Congress passed the Pollution Prevention Act which required that additional data on waste management and source reduction activities be reported under TRI. The goal of TRI is to empower citizens, through information, to hold companies and local governments accountable in terms of how toxic chemicals are managed.

EPA compiles the TRI data each year and makes it available through several data access tools, including the TRI Explorer and Envirofacts. There are other organizations which also make the data available to the public through their own data access tools, including Unison Institute which puts out a tool called "RTKNet" and Environmental Defense which has developed a tool called "Scorecard."

The TRI program has expanded significantly since its inception in 1987. The Agency has issued rules to roughly double the number of chemicals included in the TRI to approximately 650. Seven new industry sectors have been added to expand coverage significantly beyond the original covered industries, i.e. manufacturing industries. Most recently, the Agency has reduced the reporting thresholds for certain persistent, bioaccumulative, and toxic (PBT) chemicals in order to be able to provide additional information to the public on these chemicals.

Armed with TRI data, communities have more power to hold companies accountable and make informed decisions about how toxic chemicals are to be managed. The data often spurs companies to focus on their chemical management practices since they are being measured and made public. In addition, the data serves as a rough indicator of environmental progress over time.

Source: http://www.epa.gov/tri/whatis.htm