

Do Releases From the TSCA Incinerator Affect the Health of People Living Nearby?

What is the TSCA Incinerator?

The TSCA Incinerator is an industrial operation that destroys organic chemicals in waste material and reduces the volume of waste materials that contain low-level radioactive contamination. The name of the incinerator comes from the Toxic Substances Control Act, or TSCA, an environmental regulation that governs how the incinerator operates and what the incinerator releases. Contractors to the Department of Energy (DOE) operate the TSCA Incinerator, which is located at the East Tennessee Technology Park (ETTP). Both the U.S. Environmental Protection Agency (EPA) and the Tennessee Department of Environment and Conservation (TDEC) have set strict rules limiting the amount of contaminants the incinerator can release. TDEC closely monitors the incinerator operations to ensure they comply with state and federal regulations.

The TSCA Incinerator began routine operations in 1991 and continues to operate today. Overall, it has treated more than 16,000 tons of hazardous and radioactive waste from the Oak Ridge Reservation and other Department of Energy facilities. Most of this waste is destroyed in the incinerator or is collected as ash, but a very small portion of the waste and some byproducts are vented into the air through the incinerator's main smoke stack.



TSCA Incinerator

Why is ATSDR evaluating the TSCA Incinerator?

The Agency for Toxic Substances and Disease Registry (ATSDR) is working with the Oak Ridge Reservation Health Effects Subcommittee (ORRHES) to help answer questions from local residents about environmental contamination. One specific issue of concern is airborne releases from the TSCA Incinerator. To address this issue, ATSDR has prepared a public health assessment that evaluates past, current, and potential future releases from the incinerator. The public health assessment has three objectives: (1) to assess whether residents have been harmed by contaminants released from the TSCA Incinerator; (2) to respond to specific community concerns about the incinerator; and (3) to make recommendations to help ensure that residents will not be exposed to harmful levels of contamination in the future.

What is ATSDR's main finding?

The TSCA Incinerator has a highly sophisticated design that currently surpasses the requirements of multiple state and federal regulations intended to protect human health and the environment. Like many industrial operations, the TSCA Incinerator does release trace levels of contamination into the environment. However, the amounts released are far below levels associated with health effects. Many safeguards are in place to ensure that the TSCA Incinerator continues to operate safely in the future. The remainder of this fact sheet describes how ATSDR reached this conclusion.

**The TSCA Incinerator
does not present a
public health hazard to
nearby residents.**

What information did ATSDR use to evaluate the TSCA Incinerator?

Since 1991, when it first began operating, the TSCA Incinerator has been studied extensively and continuously. Many investigators have identified and measured what the TSCA Incinerator releases into the air. They have modeled how contaminants move through the air, and measured what levels of air contamination are found beyond the ETTP facility property line. ATSDR has reviewed tens of thousands of relevant environmental measurements. ATSDR has also obtained documents and insights from numerous parties, including EPA, TDEC, the Tennessee Valley Authority, DOE and its contractors, a group of independent experts chartered by the Governor of Tennessee, members of the Public Health Assessment Work Group (now known as the Exposure Evaluation Work Group), ORRHES, the Oak Ridge Reservation (ORR) Local Oversight Committee, and local community members. ATSDR has considered information provided by each of these parties in its evaluation of the TSCA Incinerator.

The TSCA Incinerator does release trace levels of contaminants into the environment, but in amounts far below levels associated with health effects. Still, continued operation of the TSCA Incinerator is not expected to cause harmful exposures. Numerous safeguards, pollution controls, and strict permitting requirements are in place to prevent unsafe operating conditions.

Incinerator Design and Operation

The TSCA Incinerator is designed to meet the strict requirements of multiple environmental regulations intended to protect human health and the environment. The TSCA regulations, for instance, require the incinerator to destroy at least 99.9999% of polychlorinated biphenyls (PCBs). To reduce environmental impacts, a series of air pollution control devices minimizes releases from the incinerator into the atmosphere. Moreover, sophisticated controls automatically shut down the entire incineration process if operating conditions are not maintained within limits specified in health-protective environmental permits. Using these criteria and its own observations, ATSDR concludes that the TSCA Incinerator is designed and is operated in a manner consistent with current best practices for thermal treatment facilities.

Amounts and Types of Wastes Treated

Between 1991 and 2004, the TSCA Incinerator treated more than 16,000 tons of liquid and solid waste that contain various hazardous substances, including radioactive contaminants. All wastes must be thoroughly characterized before they arrive at the TSCA Incinerator, and their contamination levels must meet strict criteria before they can be treated. Health-protective environmental permits dictate the maximum amount of waste that the incinerator can process each year. In recent years, the amount of waste treated at the TSCA Incinerator has been only 5% of the permitted limits. In short, systems are in place to help ensure that the TSCA Incinerator does not process wastes that cannot be treated safely.

Fate of Chemicals

Residents have repeatedly asked ATSDR: "What happens to chemicals that are put into the TSCA Incinerator?" The answer to this question depends on the type of chemical treated. In general, the waste feed at the TSCA Incinerator contains two types of chemicals: organic chemicals and inorganic chemicals.

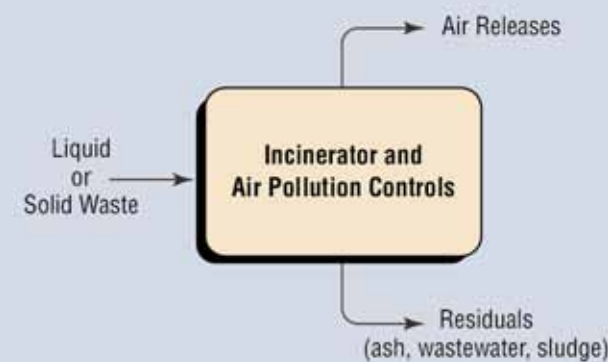
Organic chemicals. The high temperatures in the TSCA Incinerator destroy the overwhelming majority of organic chemicals in the waste feed. This process creates byproducts that are mostly harmless (e.g., water, carbon dioxide). However, very small amounts of toxic byproducts are also formed. Air pollution controls remove many of these toxic byproducts from the stack gases, and strict EPA and TDEC regulations limit the amounts of these chemicals that can be released.

Inorganic chemicals. The TSCA Incinerator does not destroy inorganic chemicals, which include metals and radionuclides. The metals and radionuclides in the waste feed are largely captured either in the incinerator ash or in the air pollution controls. These materials are then disposed of according to state and federal waste management regulations; they are not released to the environment. DOE continuously samples the gases in the TSCA Incinerator's main stack to ensure that releases of metals and radionuclides do not reach unsafe levels.



How the Incinerator Works

The incinerator destroys most chemicals in the liquid or solid waste feed. The gases seen in the stack exhaust are primarily harmless substances, such as water vapor and carbon dioxide. Some very small amounts of toxic byproducts are formed, but strict regulations limit what can be released. Some chemicals in the waste feed will be collected in the incinerator's ash, sludge, or wastewater. These process streams are handled according to applicable laws. Those interested in more detailed information about the TSCA Incinerator's design should refer to Section II.A of the public health assessment.



Air Emissions

Stack tests and trial burns have measured emission rates under various operating scenarios for the eight groups of contaminants that ATSDR evaluated: particulate matter, volatile organic compounds, PCBs, metals, acidic gases, dioxins and furans, polycyclic aromatic hydrocarbons, and radionuclides. With few exceptions, measured emission rates have been below health-protective limits established in the incinerator's environmental permits. In the isolated instances in which higher emission rates were observed, ambient air monitoring data collected at the time show that air contamination at off-site locations was not affected.

Dispersion Modeling Studies

Both the independent panel previously chartered by the Governor of Tennessee and DOE have conducted extensive air modeling studies to understand how emissions from the TSCA Incinerator move through the air to off-site locations. ATSDR has also conducted a modeling evaluation to account for limitations in the previous studies. While air quality models have inherent uncertainties and can only estimate a source's potential air quality impact, all three studies strongly suggest that the TSCA Incinerator's air quality impacts at off-site locations are minimal – a finding that has been supported by trends in the extensive air quality measurements at this site.

Relevant Air Quality Measurements

Since the TSCA Incinerator began treating wastes in 1991, many investigators have measured the site's potential air quality effects. Their studies have appropriately focused on contaminants that incinerators cannot destroy, such as metals, particulates, and radionuclides. Several thousand ambient air sampling results are available for numerous locations that surround the TSCA Incinerator, including locations where air models predict the greatest impacts. These measurements strongly suggest that air emissions from the incinerator do not cause exposure levels of public health concern at off-site locations.

What is being done to ensure that the TSCA Incinerator remains safe in the future?

Throughout the history of the TSCA Incinerator's operation, numerous safeguards have been in place to ensure that the facility operates safely. These safeguards include multiple design features that automatically shut the incinerator down before unsafe conditions occur, operation of air pollution controls to minimize air releases, and continuous sampling of stack emissions to monitor the incinerator's performance. Moreover, the TSCA Incinerator must operate within the limits of health-protective environmental permits established by EPA and TDEC.

Since the incinerator first came online, the existing safeguards and the EPA and TDEC permit conditions have successfully protected residents from unhealthy exposure. DOE, EPA, and TDEC have conducted extensive air sampling studies at off-site locations nearest the TSCA Incinerator, and these agencies plan to continue their sampling into the future. Their studies are important because they help monitor the incinerator's air quality impacts. ATSDR made recommendations in the public health assessment to be certain that these and other protective measures continue to be adequate.

Are there any general air quality concerns for the Knoxville metropolitan area? To what extent does the TSCA Incinerator contribute to these concerns?

When reviewing air sampling studies for the TSCA Incinerator, ATSDR learned that general air quality in the Knoxville metropolitan area (including Roane County) is sometimes poor. The poor air quality results from potentially unhealthful levels of two pollutants: ozone and fine particulate matter. These air quality problems are **regional in nature** and are not unique to Knoxville; they are also found in many urban and suburban settings in the United States.

The occasionally poor air quality does not result from the TSCA Incinerator. Rather, the poor air quality results from combined industrial and motor vehicle emissions over a broad area. People exposed to the infrequently elevated ozone and fine particulate matter levels could experience adverse health effects, such as lung irritation, aggravated asthma conditions, and difficulty breathing. Health effects are expected to be most likely among sensitive populations, which include children, the elderly, and people with respiratory conditions. Residents can avoid these health problems by following the advice given during air quality warnings issued by TDEC.

Where can I get copies of ATSDR's report on the TSCA Incinerator? And where can I find out about what else ATSDR is doing at the Oak Ridge Reservation (ORR)?

ATSDR is studying several environmental issues at ORR. We are looking into ways that residents might come into contact with contaminants that the ORR facilities are releasing or released in the past. For instance, ATSDR is examining releases from the Y-12 plant, the X-10 site, and the K-25 site. We are also preparing documents on specific chemicals, like mercury and polychlorinated biphenyls (PCBs).

You can get copies of the report on the TSCA Incinerator and find out more about ATSDR's ongoing work on these other environmental issues by:

Visiting one of our records repositories.



Copies of ATSDR's publications on the ORR, along with publications from other agencies, can be viewed in records repositories at the DOE Information Center, Harriman Public Library, Kingston Public Library, Oak

Ridge Public Library, Roane State Community College, and the Rockwood Public Library.

Visiting the ORRHES and ATSDR Web sites.

These Web sites have links to past publications, schedules of future events, and other information of interest. The ORRHES site is: <http://www.atsdr.cdc.gov/HAC/oakridge> and the ATSDR site is: <http://www.atsdr.cdc.gov>.



Contacting ATSDR directly.



Residents can contact ATSDR representatives directly by calling the agency's toll-free number, 1-888-42ATSDR (or 1-888-422-8737).