

POISON PLANTS II [19TH CENTURY CHLORINE FACTORIES STILL MAJOR MERCURY SOURCE]



Dawn Winalski January 2006

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POISON PLANTS II: 19TH CENTURY CHLORINE PLANTS STILL A MAJOR MERCURY SOURCE

WHO ARE THE NASTY NINE?

Chlorine is a chemical building block used in everything from swimming pools to plastic tents to paper towels. In 1894, a process was devised to produce chlorine by pumping a saltwater solution through a giant vat of mercury, or mercury cell, causing a chemical reaction in which chlorine is extracted from the salt.¹ Modern, mercury-free technologies have since been developed and are now being used by more than 90% of the U.S. chlorine industry.²

In January, 2005, Oceana published its first report on the industry entitled *Poison Plants*, which showed that nine chlorine facilities in eight U.S. states (Alabama, Delaware, Georgia, Louisiana, Ohio, Tennessee, West Virginia and Wisconsin) were using antiquated mercurybased technology, releasing tons of this toxic element into the environment in the process. Since that time, two of the nine plants have announced significant changes for the future.

In August 2005, the mercury-based chlorine facility operated by PPG Industries in Lake Charles, Louisiana, committed to take the most sensible action to reduce mercury pollution – shifting to readily available mercury-free technology. PPG expects to complete the conversion by 2007.³ In October 2005, Occidental Chemical announced its plans to shut down its mercury-based plant in Delaware.⁴ Each of these actions will result in significant mercury reductions. Once completed, seven mercury-based chlorine plants will remain in the United States.

MERCURY POLLUTION IN 2003

Despite repeated claims that they have reduced their pollution in recent years,⁵ mercury-based chlorine manufacturing plants continue to be a major source of completely unnecessary mercury contamination in the United States. According to the Environmental Protection Agency's (EPA) 2003 Toxic Release Inventory published in May 2005, mercury-based chlorine plants continue to be the largest source of mercury air pollution in seven out of the eight states in which they are located.⁶ Each plant continues to release approximately the same amount of mercury into the air as it has in the past three years. The only major decline in mercury air emissions between 2002 and 2003 came from a plant in Delaware that was partially idled in 2003.⁷ Prior to its closure, that plant released over 70% of the mercury emissions to air in Delaware.



Rank by total mercury releases	Facility	City	State	Emissions to Air			Emissions to Water	Total Emissions (air, water and off-site)
				FUGITIVE	STACK	TOTAL		
1	Occidental Chemicals	New Castle	DE	747	13	760	16	2862
2	PPG	New Martinsville	wv	1045	177	1222	16	2368
3	Pioneer	St. Gabriel	LA	857	48	905	16	1908
4	Occidental Chemicals	Muscle Shoals	AL	1067	1	1068	4	1757
5	Olin	Charleston	TN	1046	85	1131	18	1737
6	PPG	Lake Charles	LA	1045	175	1220	8	1601
7	ASHTA	Ashtabula	он	1046	337	1383	0	1511
8	Vulcan	Port Edwards	WI	1054	20	1074	2	1346
9	Olin	Augusta	GA	563	169	732	10	856
Total				8470	1025	9495	90	15946

TABLE 1: U.S. CHLORINE FACTORIES RELEASE TONS OF MERCURY (2003)

MERCURY MEASURED IN LBS.

Based on industry-submitted data, the nine operating plants continue to be a major source of mercury pollution in our environment. Consider these findings:⁸

- Mercury-based chlorine plants were the number one source of mercury air emissions in seven of the eight states where they operated, with Georgia as the exception, where the chlorine plant ranked second.
- Louisiana's two mercury-cell plants combined released nearly half (47%) of the state's mercury air emissions.
- ASHTA Chemical's Ohio chlorine facility was the nation's seventh highest overall mercury air polluter.
- Nationwide, six mercury-cell chlorine plants ranked among the top 25 mercury air polluters. All of the plants placed in the top 40.

THE ONLY WAY TO ELIMINATE MERCURY POLLUTION IS TO SHIFT TO MERCURY-FREE TECHNOLOGY

The only real solution to reduce and eliminate mercury emissions from this industry is to require a shift to mercury-free technology. Mercury releases by the nine plants in operation have shown little decline between 2002 and 2003. (Fig. 1)

Between 2002 and 2003, mercury emissions to air and water decreased by 395 lbs, or only 4%.⁹ The lion's share of this decrease came from Occidental Chemical's decision to idle its Delaware plant for part of the year.¹⁰ The idling of this one plant accounted for 80% of the year's reduced air and water mercury emissions.¹¹

The amount of total mercury released from the plants to the environment (through air, water, and disposal both on- and off-site) by the chlorine industry actually increased from 7.7 tons in 2002 to eight tons in 2003. Overall, this is an increase of 556 lbs due largely to an increase in off-site disposal of mercury of about 951 lbs.¹² The Occidental Chemical plant in Delaware was responsible for a large proportion of this increase,¹³ presumably because part of the plant was not operating. Ultimately, once all plants have converted to mercury-free technology, there will no longer be the need for mercury stored on-site, and there will be a finite need for disposal of these mercury wastes.

The Chlorine Institute has asserted that the industry is making significant progress in reducing mercury emissions by its chlorine facilities,¹⁴ and on the industry-level this may appear to be true. Overall emissions have declined, but according to the data, this has been largely the result of plant closures rather than an industry-wide clean-up of the mercury-cell process. In 2000, there were 11 operating mercury-cell chlorine plants in the United States. By 2003, after the conversion of Westlake Vinyls in Kentucky and the idling of Oxy Vinyl's Deer Park, Texas plant, only nine remained.¹⁵ In 2003, as previously mentioned, the Delaware Occidental Chemical plant operated at partial capacity.



TABLE 2: MERCURY EMISSIONS RELATIVELY CONSTA	NT OVER	TIME (200	0-2003)
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Facility	City	State	2000	2001	2002	2003	
ASHTA	Ashtabula	он	1390	1396	1395	1383	
Occidental	Muscle Shoals	AL	1075	1092	1087	1068	
Occidental	New Castle	DE	1076	1068	1074	760***	
Olin	Charleston	TN	1414	1130	1130	1131	
Olin	Augusta	GA		•	739	732	
Pioneer	St. Gabriel	LA	1204	1248	910	905	
PPG	Lake Charles	LA	1224	1222	1222	1220	
PPG	New Martinsville	wv	1227	1272	1233	1222	
Vulcan	Port Edwards	WI	1111	1111	1082	1074	
OxyVinyl Deer Park		тх	1106	1095	1046	**	
Westlake Vinyls	Calvert	KY	1100	1130	6	**	

Data unavailable

** Not in operation *** Plant operating at partial capacity MERCURY MEASURED IN LBS.

MERCURY-CELL PLANTS TRUMP POWER PLANTS¹⁶

According to EPA data based on the companies' own estimates, the average mercury-based chlorine plant released 1,055 lbs. (480 kg) of mercury into the air in 2003. Over the same period, the average U.S. power plant released 183 lbs. (83 kg). The average of the 100 power plants with the highest mercury emissions was 574 lbs. (261 kg).

In short, the average mercury-based chlorine plant released five times more mercury than the average mercury-emitting power plant in 2003. Mercury-based chlorine plants released nearly twice the amount of mercury as the 100 power plants with the highest emissions.¹⁷



The actual amount of mercury released by chlorine plants, however, is likely to be even higher. The chlorine industry's reported figures for mercury releases to air are based in part on monitored stack emissions, but they also include the industry's estimates of the amount of mercury that evaporates during routine operations and escapes through unmonitored ventilation systems and other leaks — so-called "fugitive emissions."¹⁸ According to the company reported data, a chlorine plant's fugitive emissions were eight times greater than its monitored mercury releases.¹⁹ Yet these fugitive emissions are only an estimate. There is good reason to suspect that the amount of fugitive mercury emissions is even greater than the industry suggests.

THE MERCURY 'ENIGMA' ENDURES

In 2003, the Nasty Nine mercury-cell chlorine plants collectively reported consuming 38 tons of mercury and releasing eight tons into the environment. They could not, however, account for the remaining 30 tons.²⁰ This disparity was first brought to the attention of the EPA in 2000, when the chlorine industry could not account for 65 tons of "lost" mercury. In 2003, the EPA famously described the fate of this lost mercury as "somewhat of an enigma."²¹ To put this figure in perspective, there are over 400 power plants in the U.S., which released a total of 45 tons of mercury into our air in 2003. Only nine chlorine plants combined to release and lose 38 tons.²² With both reported and 'lost' mercury taken into consideration, the nine mercury-based chlorine plants may rival the entire power industry as the nation's largest industrial mercury polluter.

CONVERSION IS BOTH POSSIBLE AND PRACTICAL

Reducing mercury emissions from chlorine plants is highly feasible. There are many examples of chlorine plants that have already made the transition from mercury-based to mercury-free technology, showing us that conversion is both possible and practical. In fact, evidence suggests that by converting from mercury-cell to membrane technology, chlorine plants can reduce operating expenses.²³

For example, Occidental Chemical's Mobile, Alabama plant converted from mercury-based chlorine production to mercury-free membrane technology in 1991. Besides eliminating mercury emissions, this conversion reduced the amount of hazardous wastes generated by 92%, falling from 38 tons per year to three tons per year.²⁴ The conversion project also saved the company approximately \$51,000 annually and reduced its consumption of natural gas.²⁵



According to Euro Chlor (a representative organization for the European chlorine industry), companies typically save 15% of their electrical energy costs and 10% of their total energy costs as a result of conversion.²⁶ By converting to mercury-free technology, the Borregaard plant in Norway reported an electrical energy savings of 30% per metric ton of caustic produced and a savings of 25% in labor costs.²⁷

Recently PPG Industries announced their plans to upgrade their plant in Lake Charles, LA to mercury-free technology by mid 2007, citing among other factors a 25% decrease in energy required to power the membrane cells.²⁸

Additional examples are provided in Table 3.

The cost of conversion for an individual plant will differ based on the plant's current infrastructure, size and location. For this reason, cost estimates vary widely. In 1995, the EPA estimated it would cost between \$100,000 and \$200,000 per ton of chlorine produced per day for a plant to convert to mercury-free technology. Thus, for a facility that produces about 65,000 tons per year, the cost would range from \$20 to \$40 million.²⁹ Similarly, in 2001, Euro Chlor predicted conversion would cost roughly 530 Euros per metric ton of annual chlorine capacity, though many plants already have converted for less. More recently, PPG said their conversion will cost an average of more than \$30 million per year for three years.³⁰

In Europe, the conversion of mercury-cell plants is an important step to reduce releases of mercury to the environment. In 1996, the European Commission agreed to take action to prevent releases of pollutants like mercury to the water, air or land from industrial activities. Through the Integrated Pollution Prevention and Control Directive (IPPC), this Commission required facilities to follow Best Available Technology (BAT), a concept and term similar to one used in the United States. Due to the availability of cleaner, more efficient technology, the mercury-emitting chlorine production process is not considered to be BAT in Europe. Therefore, this commission has required a phase-out of the use of mercury by October, 2007.³¹

Euro Chlor, however, is promoting an alternative timeframe that would result in 13 additional years of mercury releases to the environment. Some countries also have committed to phase-out mercury use, but according to a slower schedule than what is required by the Directive.³² In addition, members of the Paris Convention for the Prevention of Marine Pollution From Land-Based Sources (PARCOM) have also agreed that mercury-cell chlorine plants should be phased out completely but have set a target date of 2010.³³

Sweden, Belgium, Poland, the Netherlands and Finland all have timetables set to meet the 2010 deadline, while other countries have already met the deadline. For example, in Portugal, the only mercury-based plant had already converted to membrane cells in 2002.³⁴

Mercury-based chlorine production is a dangerous relic of the past. Newer, cleaner technology exists. Chemical companies and the public ultimately benefit from the conversion of mercury-based plants to membrane technology.

Table 3: PLANTS THAT HAVE CONVERTED SUCCESSFULLY TO ELIMINATE MERCURY RELEASES

Occidental Chemical Corporation: Mobile, Alabama: United States: 1991: Occidental Chemical's Mobile plant converted from mercury based chlor-alkali production to environmentally superior membrane technology in 1991, reducing the amount of hazardous wastes generated by 92%, from 38 tons per year to three tons per year.³⁰

Borregaard: Sarpsborg: Norway: 1997: In Norway, the last mercury-cell plant ceased its mercury-based operations in September of 1997, converting from mercury-cell to membrane technology.³⁶

Elektro Chemie: Bitterfield: Germany: Converted to membrane technology 47

Bayer: Dormagen: Germany: Converted to membrane technology 38

Donau Chemi, Brückl: Austria: 1999: During the conversion of this facility, the plant continued to run at 80% capacity, avoiding major losses in production.

BF Goodrich Corp. (Westlake Vinyls): Calvert City, KY: United States: 2003: Membrane technology went online in January, 2003. The plant's mercury cells were decommissioned by June, 2003 and are now inactive, 40

PPG Industries: Lake Charles, LA: United States: 2005: Conversion planned by mid-2007. 41



RECOMMENDATIONS

Oceana is seeking solutions to the global mercury problem. In the United States, our goal is to win a complete transition to mercury-free technology.

Phase out mercury-emitting chlorine production in the United States.

- EPA should require all operating facilities to convert to mercury-free technology.
- EPA should require any temporarily closed (idled) plants to shift to mercury-free technology before reopening.
- Facilities still using mercury-emitting technology should be required to monitor fugitive emissions, and conduct tests to identify the status of the lost mercury.
- In the absence of an EPA mandate, companies should stop releasing mercury unnecessarily, by converting to mercury-free technology.

Ensure the safe disposal of mercury when plants convert or shut down.

- Because mercury is a highly toxic substance, chemical companies and governments should be responsible for the cleanup of the site once a plant has been converted or closed. Surplus mercury and old equipment should be disposed of properly in a hazardous waste facility and not exported to other countries that are not currently subject to a phase-out.
- Companies should properly treat and clean up mercury-contaminated groundwater, surface water, soils and sediments on the site of the plant.

THE CHLORINE INDUSTRY CONTINUES TO BE A MAJOR MERCURY SOURCE

Pollution from the chlorine industry continues to be a major mercury source. The only way for these companies to eliminate their mercury pollution is to convert to mercury-free technology.

Europe is moving toward an industry-wide transition to mercury-free technology. In the U.S., one plant has recently committed to converting to mercury-free technology⁴² and another has announced its plans for closure.⁴³ The rest of the U.S. industry should follow suit. By bringing their production processes into the 21st century, chlorine manufacturers can greatly reduce the amount of mercury that is released and carried into our environment, our communities and our food.

[POISON PLANTS BY STATE]

STATE-BY-STATE ANALYSIS OF LOCAL MERCURY CONTAMINATION FROM MERCURY-CELL CHLORINE PLANTS

> In 2003, there were nine mercury-cell chlorine plants operating in eight states: Alabama, Delaware, Georgia, Louisiana, Ohio, Tennessee, West Virginia and Wisconsin. In seven of the eight states where mercury-cell chlorine plants are located, they were the number one source of mercury pollution in the state.⁴⁴ In 2005, Occidental Chemical announced the closure of its plant in Delaware, leaving eight operating mercury-cell plants in the United States.

> Forty-five states issued fish consumption advisories as a result of local mercury contamination in 2003.⁴⁵ This resulted in 2,300 advisories across the country due to mercury contamination in recreationally caught fish. Twenty-one states warned citizens against eating fish from any lakes and/or rivers in their state and eleven states have statewide advisories for mercury in all coastal waters.⁴⁶ In 2004, the number of advisories nationally continued to increase and West Virginia issued a statewide advisory as well.⁴⁷

MERCURY POLLUTION FROM CHLORINE PRODUCTION IN ALABAMA [2003]49

Alabama, once the site of five mercury-cell chlorine plants, today has just one — Occidental Chemical's Muscle Shoals facility in Northwest Alabama. Located near Pond Creek and the Tennessee River, this last plant is Alabama's largest single source of mercury pollution.⁴⁸

KEY STATISTICS FOR OXYCHEM'S MUSCLE SHOALS PLANT [2003]49

- #1 source of mercury released to the air in Alabama
- #2 source of total mercury pollution in Alabama, an increase in rank from #4 in 2002
- Responsible for 17 % of reported mercury releases to the air in Alabama
- #19 source of mercury released to the air in the United States
- RCRA Corrective Action Site⁵⁰

In 2003, the Muscle Shoals facility released 1068 lbs. (485 kg) of mercury into the air, 4.4 lbs. (2 kg) into water, and an additional 684 lbs. (311 kg) was disposed of off site, primarily in landfills. Of the air emissions, 1067 lbs. (485 kg) came from fugitive emissions, while only 1 lb. (0.5 kg) was measured and released as stack emissions.

Though the plant reported a 20 lb. decrease in air and water emissions from 2002 (the bulk of the decrease coming from stack emissions), it increased the amount of waste sent off-site by 10 lbs.



TOP TEN SOURCES OF MERCURY AIR EMISSIONS (ALABAMA 2003)



FORMER PLANTS LEAVE A LEGACY OF POLLUTION

Most of the chlorine plants that once operated within Alabama's borders are gone, but the mercury they generated is not. The Mobile area was once a chlorine industry hub, home to plants owned by the Olin Corporation, Stauffer Chemicals, and OxyChem, among others.⁵¹ The sites of these former plants are now Superfund and/or RCRA sites — areas identified by the government as contaminated with hazardous wastes that pose a threat to human life and the environment.⁵²

The Olin Chemical plant is a mercury-contaminated site in the Olin basin on the edge of the delta near the Mobile/Washington County line.⁵³ This plant used mercury-cell technology from 1952 to 1982, before finally shifting to diaphragm cell technology.⁵⁴ Tests show that past releases of mercury and organic chemicals have contaminated both the shallow groundwater beneath the site and nearby wetlands along the Tombigbee River.⁵⁵ As part of a 2003 fish monitoring survey, the Alabama Department of Environmental Management (ADEM) tested fish in the Olin Basin and found that mercury concentrations were above the Food and Drug Administration guidance level in bass, blue catfish and black crappie.⁵⁶

In summer 2005, the Mobile Register discovered that the contamination may extend well beyond the plant boundaries. Mercury contamination ranges far beyond the underground aquifer, and is not limited to the areas originally examined in the Superfund assessment conducted in 2001. Mercury contaminated waste was used in paving material, and can be found in parks, yards, driveways and roads around the town of McIntosh. Similar wastes — an aggregate of salt, calcium and mercury — are visible in 20-foot high heaps on several acres of the Olin property, which drains off the plant property into nearby streams, rivers and ultimately Mobile Bay when it rains.⁵⁷

MERCURY POLLUTION FROM CHLORINE PRODUCTION IN DELAWARE [2003]49

The only mercury-cell chlorine plant operating in Delaware in 2003 was the largest single source of mercury pollution in the state, releasing almost ten times more mercury than the number two source.⁵⁸ The Occidental Chemical Corporation (OxyChem) plant is located in Delaware City, near Red Lion Creek and the Delaware River.⁵⁹

KEY STATISTICS FOR OXYCHEM'S DELAWARE CITY PLANT [2003]⁶⁰

- #1 source of mercury released to the air in Delaware
- #1 source of total mercury pollution in Delaware
- Responsible for 70% of mercury air emissions in Delaware
- Responsible for 77% of total mercury releases in Delaware
- #37 source of mercury released to the air in the United States
- RCRA Corrective Action Site⁶¹

In 2003, this plant released 760 lbs. (345 kg) of mercury to the air and 16.2 lbs. (7.4 kg) into the water and disposed of 2087 lbs. (949 kg) off-site (primarily in landfills). Of the air emissions, 747 lbs. (340 kg) of the mercury came from fugitive emissions while 12.8 lbs. (5.8 kg) were measured and released as stack emissions.⁶²

This plant was partially idled in 2003 which caused the decrease in emissions to air and water that year. Mercury disposal off-site, however, increased substantially by 180%, compared to $2002.^{63}$



STOP SEAFOOD CONTAMINATION



TOP SEVEN SOURCES OF MERCURY AIR POLLUTION (DELAWARE 2003)

In October, 2005, Occidental Chemical announced its intention to shut down this plant, eliminating the use of mercury and only continuing limited production of potassium hydroxide. As a result, significant reductions of mercury releases will be realized in the future.⁶⁴ Again, these reductions occur only due to the plant closure as opposed to any pollution prevention techniques.

MERCURY POLLUTION FROM CHLORINE PRODUCTION IN GEORGIA [2003]

The only mercury-cell chlorine plant still operating in Georgia is the second largest single source of mercury pollution in the state.⁶⁵ The Olin Chemical plant is located in Augusta, Georgia, near the Savannah River.⁶⁶ With the closure of one Occidental Chemical plant in Delaware, and the planned conversion of the PPG facility in Lake Charles, Louisiana, Olin will be the only company operating more than one mercury-based chlorine factory in the United States. Olin's other mercury-emitting facility is in Charleston, Tennessee.

KEY STATISTICS FOR OLIN'S AUGUSTA PLANT [2003]67

- #2 source of mercury released to the air in Georgia
- #3 source of total mercury pollution in Georgia
- Responsible for 19% of mercury released to air in Georgia
- #38 source of mercury released to the air in the United States
- RCRA Corrective Action Site⁶⁸

In 2003, this plant released 732 lbs. (333 kg) of mercury to the air, 10 lbs. (4.5 kg) into the water and disposed of 114 lbs. (52 kg) off-site (primarily to landfills). Of the air emissions, 563 lbs. (256 kg) of the mercury came from fugitive emissions while 169 lbs. (77 kg) were measured and released as stack emissions.

Between 2002 and 2003, this plant decreased its overall releases by 172 lbs., primarily the result of a decrease in off-site disposal.



Facility

TOP TEN SOURCES OF MERCURY AIR EMISSIONS (GEORGIA 2003)



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MERCURY POLLUTION FROM CHLORINE PRODUCTION IN LOUISIANA [2003]

The two mercury-cell chlorine plants still operating in Louisiana are the number one and number three sources of mercury air emissions in the state.⁶⁹

Owned by PPG and Pioneer, the plants are located in Lake Charles and St. Gabriel, respectively. Together, they produce more than 40% of Louisiana's air mercury pollution.⁷⁰ Two additional plants, now shuttered, once operated in the towns of Geismar and Plaquemine.

PPG, LAKE CHARLES

Lake Charles is in Calcasieu Parish, nestled on the Calcasieu River some 30 miles upstream from the Gulf of Mexico. The lake itself is connected to the Gulf via a deep-water ship channel and is the seat and port of entry of Calcasieu Parish. The PPG plant is located near Bayou d'Inde and the Calcasieu River Estuary.⁷¹

KEY STATISTICS FOR PPG'S LAKE CHARLES PLANT [2003]⁷²

- #1 source of mercury air pollution in Louisiana
- #5 source of total mercury pollution in Louisiana
- Responsible for 27% of the mercury released to the air in Louisiana
- Responsible for 27% of the total mercury released in Louisiana
- #12 source of mercury released to the air in the United States
- RCRA Corrective Action Site⁷³



TOP TEN SOURCES OF MERCURY AIR EMISSIONS (LOUISIANA 2003)





In 2003, this plant released 1220 lbs. (555 kg) of mercury to the air, 8 lbs. (4 kg) into water, and disposed of 374 lbs. (170 kg) off-site (primarily in landfills). Of the air emissions, 1045 lbs. (475 kg) of the mercury came from fugitive emissions while only 175 (80 kg) were measured and released as stack emissions.⁷⁴ The air and water emissions from this site remained about the same as in 2002, however, there was an increase of about 60% in waste disposed of off-site.

PPG has announced that this plant will undergo a conversion to membrane technology which is scheduled to be completed by 2007. This conversion alone, following the necessary cleanup process, would result in a 27% reduction in mercury releases in the state. Conversion of the Pioneer plant in St. Gabriel is still a necessary step to rid Louisiana of its chlorine-related mercury pollution.

PIONEER, ST. GABRIEL

Pioneer's St. Gabriel facility is located on a 300-acre site near Baton Rouge, in Iberville Parish. The plant sits on the Mississippi River. This facility was the last mercury-cell plant built in the U.S.⁷⁵

KEY STATISTICS FOR PIONEER'S ST. GABRIEL PLANT [2003]⁷⁶

- #3 source of mercury air pollution in Louisiana
- #4 source of total mercury pollution in Louisiana, an increase from #6
- Responsible for 20 percent of mercury released to the air in Louisiana
- Responsible for 20 percent of the total mercury released in Louisiana
- #28 source of mercury released to the air in the United States
- Proposed RCRA Corrective Action Site⁷⁷

In 2003, this plant released 905 lbs. (412 kg) of mercury to the air, 16 lbs. (7 kg) into water, and disposed of 987 lbs. (449 kg) off site (primarily in landfills). Of the air emissions, 857 lbs. (390 kg) of the mercury came from fugitive emissions while only 48 (22 kg) were measured and released as stack emissions.⁷⁸ The levels of emissions to air and water are about the same from 2002, however, there was almost a three-fold increase in the amount of waste shipped off-site to landfills or other disposal.

MERCURY POLLUTION FROM CHLORINE PRODUCTION IN OHIO [2003]

The only mercury-cell chlorine plant still operating in Ohio is the largest source of mercury air pollution in the state and the seventh largest source of mercury air pollution in the nation. Only two power plants in the United States release more mercury to the air than ASHTA's Ohio chlorine plant.⁷⁹

The ASHTA Chemicals facility is located in Ashtabula, near Lake Erie and the Ashtabula River, which is an EPA Area of Concern. 80

KEY STATISTICS FOR ASHTA'S ASHTABULA PLANT [2003]81

- #1 source of mercury air pollution in Ohio
- #4 source of total mercury pollution in Ohio
- Responsible for 13% of the mercury air pollution in Ohio
- #7 source of mercury air pollution in the United States

In 2003, the ASHTA plant released 1383 lbs. (689 kg) of mercury to air and disposed of 128 lbs. (58 kg) off-site (primarily in landfills). Of the air emissions, 1046 lbs. (475 kg) of the mercury came from fugitive emissions while 337 lbs. (153 kg) were measured and released as stack emissions.



TOP TEN SOURCES OF MERCURY AIR EMISSIONS (OHIO 2003)

MERCURY POLLUTION FROM CHLORINE PRODUCTION IN TENNESSEE [2003]

The only mercury-cell chlorine plant operating in Tennessee is the largest source of mercury air pollution the state. $^{\rm 82}$

The Olin plant is located in Charleston, in the foothills of the Smoky Mountains, near the Hiwassee River.⁸³ With the closure of one Occidental Chemical plant in Delaware, and the planned conversion of the PPG facility in Lake Charles, Louisiana, Olin will be the only company operating more than one mercury-based chlorine factory in the United States. Olin's other mercury-emitting facility is in Augusta, Georgia.

KEY STATISTICS FOR OLIN'S CHARLESTON PLANT [2003]⁸⁴

- #1 source of mercury air pollution in Tennessee
- #2 source of total mercury pollution in Tennessee
- Responsible for 31% of the mercury air pollution in Tennessee
- #15 source of mercury air pollution in the United States

In 2003, the Olin plant released 1131 lbs. (514 kg) of mercury to air and 18 lbs. (8 kg) to water. The plant disposed of 562 lbs. (255 kg) to on-site landfills and 26 lbs. (12 kg) off-site (primarily in landfills). Of the air emissions, 1046 lbs. (475 kg) of the mercury came from fugitive emissions while 85 lbs. (39 kg) were measured and released as stack emissions.



TOP TEN SOURCES OF MERCURY AIR EMISSIONS (TENNESSEE 2003)

MERCURY POLLUTION FROM CHLORINE PRODUCTION IN WEST VIRGINIA [2003]

The only mercury-cell chlorine plant still operating in West Virginia is the largest source of mercury pollution in the state.⁸⁵ The PPG plant is located in Natrium, near New Martinsville, on the Ohio River.⁸⁶

One other plant operated in West Virginia and closed in 1991. It was operated by LCP, Division of Hanlin Group (Allied Chemical) in Moundsville, WV and is now a Superfund site.⁸⁷

KEY STATISTICS FOR PPG'S NATRIUM PLANT [2003]⁸⁸

- #1 source of mercury air pollution in West Virginia
- #1 source of total mercury pollution in West Virginia
- Responsible for 22% of the mercury air pollution in West Virginia
- #11 source of mercury air pollution in the United States

In 2003, the PPG plant released 1222 lbs. (555 kg) of mercury to air and 16 lbs. (7 kg) to water. The plant disposed of 1130 lbs. (514 kg) off-site (primarily in landfills). Of the air emissions, 1045 lbs. (475 kg) of the mercury came from fugitive emissions while 177 lbs. (80 kg) were measured and released as stack emissions.



TOP TEN SOURCES OF MERCURY AIR EMISSIONS (WEST VIRGINIA 2003)

MERCURY POLLUTION FROM CHLORINE PRODUCTION IN WISCONSIN [2003]

The only mercury-cell chlorine plant still operating in Wisconsin is the largest source of mercury pollution in the state.⁸⁹ In 2003, the plant was operated by Vulcan Chemicals. Since then, the plant has been sold to Erco Worldwide,⁹⁰ yet mercury-cell operations continue. The plant is located in Port Edwards, in Wood County near the Wisconsin River.⁹¹

KEY STATISTICS FOR VULCAN'S PORT EDWARDS PLANT [2003]⁹²

- #1 source of mercury air pollution in Wisconsin
- #1 source of total mercury pollution in Wisconsin
- Responsible for 28% of the mercury air pollution in Wisconsin
- #18 source of mercury air pollution in the United States

In 2003, the Vulcan plant released 1074 lbs. (488 kg) of mercury to air and 2 lbs. (1 kg) to water. The plant disposed of 271 lbs. (123 kg) off-site (primarily in landfills). Of the air emissions, 1054 lbs. (479 kg) of the mercury came from fugitive emissions while 20 lbs. (9 kg) were measured and released as stack emissions.



TOP TEN SOURCES OF MERCURY AIR EMISSIONS (WISCONSIN 2003)

END NOTES

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