= Chemetco =

Chemetco was formerly one of the largest United States refiners of copper from recycled or residual sources .
Its maximum output of 120 @,@ 000 tons per year was approximately half of the entire U.S. copper output from so @-@ called " secondary copper refining . " The company website described Chemetco as one of the world 's largest copper refiners and reported an estimated revenue in 1999 of $ 500 m . It was listed in 2000 as the 23rd @-@ largest privately held company in the United States .
The company had a history of environmental problems over its entire career , along with problems managing its wastes and by @-@ products . Eventually , it was convicted of water pollution offences spanning a decade , which contravened US federal law . The company 's former site is now a Superfund site on the National Priorities List .

= = History = =

The company originated on June 9 , 1969 as an Illinois corporation , Chemico Metals Corporation . On 23 March 1970 , it became a Delaware corporation . In 1973 , the company changed its name to Chemetco . By 1980 , it employed around 200 staff . By 2000 , Chemetco was a member of the St Louis Minority Business Council .
On November 13 , 2001 , the company filed for Chapter 7 bankruptcy (liquidation) following conviction in a U.S. federal court and a fine of $ 3 @.@ 86 million . Chemetco and former CEO , Denis L. Feron were charged on four felony counts : Conspiracy to violate the Clean Water Act , violation of the Clean Water Act , and two counts of making false statements . The plant , which closed on Nov 1 , 2001 , was promptly sealed by the Environmental Protection Agency (EPA) and tagged for an assessment of public health hazards .

= = Location = =

The Chemetco site is in a flood plain near the Mississippi River in Madison County , Illinois . The village of Hartford , Illinois (population approximately 1 @,@ 545) is approximately 1 mile (1 @.@ 6 km) north of the site . The nearest residential area is Mitchell , a small community approximately ½ mile to the southeast . The Lewis and Clark State Memorial Park is within sight of Chemetco 's former premises .
The Chemetco site is above an aquifer used for domestic , agricultural and industrial water consumers in several nearby communities , including Edwardsville , Hartford , Roxana and Wood River . Parts of the wider area enclosing the Chemetco site to the south are also known as Chouteau Island .
Main site operations were conducted within a 41 @-@ acre (17 ha) area , but Chemetco also owned hundreds of acres of farm land . The ATSDR has described how " ? Over the 30 years of plant operations , some of this was acquired to settle disputes with nearby farmers . "
The Mississippi River and two tributaries , the Cahokia Canal and Long Lake , are within 1 mile (1 @.@ 6 km) of the site . Some local properties are served by wells . The wetlands area to the south of the site is popular with recreational fishermen .

= = Operation = =

= = = Production = = =

Under Denis L. Feron , Chemetco had been a major producer of high @-@ purity copper derived from secondary sources ? recycled and residual materials .
These were received at the plant in large quantities from wholesalers , and in smaller quantities

from the corporation 's own network of warehouses that spanned the United States and Canada . These enabled material to be graded and pre @-@ sorted locally before refining at the plant .

Copper anodes (98 % Cu purity) emerged from the furnace as an intermediate product . For a number of years , these were electrolyzed by Chemetco to produce a higher @-@ purity copper cathode (99 @.@ 98 % Cu purity .) However , the company later discontinued electrolysis of its own copper and sold copper anodes , each weighing 740 lb (340 kg) to Asarco .

= = = Refining process = = =

Copper @-@ bearing material was smelted to produce black copper , containing impurities such as lead , tin and zinc . Black copper was refined using oxygen , producing 98 % copper , along with a zinc oxide residue and a slag containing lead , tin , nickel and a number of heavy metals .

What Chemetco described as " zinc oxide " was extracted from furnace flue gases using a scrubber system . The zinc oxide , along with the slag , became a waste product . The term " zinc oxide " was something of a misnomer , as lead , cadmium and other elements were also present .

The Agency for Toxic Substances and Disease Registry (ATSDR) has noted how the generation and management of waste by @-@ products was a long @-@ term issue for Chemetco , but also that Chemetco seemed to be unwilling to recognize its wastes as a problem :

" Chemetco company literature and statements have often emphasized that the facility recycled most materials and that waste streams were not generated . But the end result of this recycling activity was piled feedstock residues , smelting and solid residues , and accumulated liquids . Much of the material was stored directly on the ground , with little attempt to provide barriers or work practices to limit exposures . "

= = Prosecution and conviction = =

On 18 September 1996 , an enforcement officer for the Illinois Environmental Protection Agency (IEPA) discovered a hidden pipe , discharging toxic waste from the refinery into Long Lake , a tributary of the Mississippi River .

Investigations showed that the secret pipe had been active for ten years . A large area of wetland was contaminated with zinc oxide , lead , cadmium and other pollutants at several times the threshold for a public health hazard . Visible evidence of contamination extended five feet down into the bed of Long Lake on property owned by Chemetco .

During Grand Jury testimony , one witness estimated that the plant discharged waste through the pipe for 330 days out of 365 . Thirteen employees testified to using the pipe to discharge contaminated water .

Additionally , Chemetco discharged contaminated storm water every time it rained on the plant . A pump was automatically triggered , discharging pollutant @-@ laden storm water through the secret pipe . The prosecution calculated that this automatic process had occurred 948 times over a ten @-@ year period . It was also calculated that even if only 0 @.@ 01 inches (0 @.@ 25 mm) of rain fell , 1620 gallons of water would gather into a collection basin . From there , this large volume of contaminated water would be pumped into Long Lake .

Chemetco hampered the investigation of its illegal activity by making materially false statements . Before sentencing , the court described Chemetco 's conduct as " willful and egregious " .

On 12 December 2008 , Denis L. Feron , the former president of Chemetco , was placed on the federal EPA 's ' most wanted ' list . He had fled the USA before trial . Eventually , he paid a half @-@ million dollars in restitution and all charges were dropped against him .

= = Air @-@ borne dioxin production = =

A scientific study by the Centre for the Biology of Natural Systems (CBNS) Queens College of the City of New York , individually names Chemetco as one of the top ten individual contributors of dioxins deposition at eight Nunavut land receptors , from a total of 44 @,@ 000 potential sources in

the United States . As the report puts it :

" ? the effort detailed in this report is a response to the evidence that Nunavut is especially vulnerable to the long @-@ range air transport of dioxin . Although there are no significant sources of dioxin in Nunavut or within 500 kilometers of its boundaries , dioxin concentrations in Inuit mothers ? milk are twice the levels observed in southern Quebec . This is due to the elevated dioxin content of the indigenous diet ? traditional foods such as caribou , fish and marine mammals . "

The source of the air @-@ borne dioxin produced by Chemetco 's refining process was coated wire , including PVC @-@ covered wire , plastics and computer parts . These were routinely used as part of the mix of grades of scrap copper used to charge the furnaces . Citing Buekens et al . 1997 , an EPA report notes : " The presence of chlorinated plastics in copper scraps as a feed to smelters is believed to increase the CDD / CDF formation . " (CDD 's are dioxins and CDFs are polychlorinated dibenzofurans) .

The ATSDR describes how " Because Chemetco had accepted material from a firm known to have dioxin contamination , USEPA investigated dioxin . On April 12 , 1987 , USEPA sampled an area of the Chemetco plant which was used to manage zinc oxide collected from the venturi scrubber system . "

EPA testers found a dioxin concentration of 3 @.@ 4 parts per billion . As a result , their toxological assessment unit ? raised concerns about dioxins and furans in Long Lake sediments and the fish population . ? However , the ATSDR reports that these initial fears proved unfounded :

" In the summer of 1999 , staff from the Illinois Department of Natural Resources and Illinois EPA collected fish samples from two sections of Long Lake . Buffalo and carp were collected closest to ? the northern part of the lake where the illegal pipe discharged . Buffalo and crappie were collected from the southern section through Pontoon Beach . Fillet portions were analyzed for pesticides , polychlorinated biphenyls (PCBs) , dioxins , and furans . No elevated levels of these chemicals were found . "

This finding , in conjunction with those of Commoner et al. shows that Chemetco 's dioxins were almost entirely released as smokestack emissions (also called flue gas stack) emissions .

= = Other known environmental problems = =

Chemetco had a long history of violations . For example , in August and September 1992 , while taking air emission readings , Chemetco was caught using semi @-@ articulated trucks and water sprinklers as a buffer in front of the air emission monitors . This was in contravention of the Clean Air Act , 42 .

For a period , Chemetco was the single biggest producer of atmospheric lead in the United States .

In 1999 , the United States made a civil claim against Chemetco under the Clean Air Act , 42 . : " ? Chemetco will pay a civil penalty of $ 305 @,@ 267 ? " Chemetco was also required to provide injunctive relief " ? including installation of a Continuous Particulate Mass Monitor System .

Chemetco produced high @-@ purity cathodes using electrolysis . This electrolytic process used large amounts of sulfuric acid and according to the Agency for Toxic Substances and Disease Registry (ATSDR) would at times " ? reportedly release a visible " acid mist " drifting onto nearby farm fields . "

The ATSDR also notes how the electrolytic refining process also required the management of large amounts of acidic waste capable of dissolving heavy metals :

" ? According to a 1983 Illinois EPA memo , the strong @-@ acid electrolytic bath was believed to have been releasing material . Through the years , during many of the sampling events liquids were measured with low pH values (acidic) or very high pH values (caustic) . The high pH levels may have resulted from the company using caustic materials to attempt to neutralize standing acidic surface water . Acidic conditions typically increase the solubility of metals , and allow more mobility of the metal contaminants " .

Other hazardous liquids used at the site included halogenated solvents that may have been used for cleaning machine parts .

= = Postscript = =

= = = Remediation = = =

Three and a half years after the discovery of the secret pipe , Chemetco had failed to present an approvable plan for remediating the contaminated area .
When Chemetco shut down , the site was sealed and remediation began . However , the process was to prove protracted and several years later , it had not been possible to fully complete the process .
When interviewed in early 2005 , the Illinois EPA inspector who discovered the secret pipe in 1996 was pessimistic about the chances of rapid remediation of the site . He suggested that the clear @-@ up could take twenty years or so .
In 2006 , it was reported that a Canadian firm wanted to tackle the challenge of safely extracting metallic content from the wastes on site . Under a proposed plan needing feasibility study approval , the contractor outlined a deal under which it could extract valuable metals such as copper , zinc , tin , lead and aluminium from the site . One report describes how the bidder for this work would " ? design , provide and install equipment at the site for about $ 10 million and provide another $ 3 million for other cleanup while Chemetco [Estate] would operate the plant and pay royalties and lease payments ? "
The IEPA spoke approvingly of this proposed scheme under which non @-@ recyclables would remain on site . If given a green light to go ahead , the work was estimated to take around ten years to complete .

= = = Superfund Site = = =

On March 4 , 2010 , the Chemetco site was added to the Superfund National Priorities List because of the lead , cadmium and zinc contamination at the site and of nearby wetlands and Long Lake . The lack of available resources at the bankrupt Chemetco or at the State of Illinois necessitated proposal of this site to the National Priorities List (NPL) . This will enable the use of Federal funds to build a CERCLA enforcement case and ensure clean up the site . The U.S. Environmental Protection Agency will oversee the clean up of the site and affected areas . After the site was listed on the NPL , U.S. EPA , with the support of Illinois EPA , began the search for potentially responsible parties (PRPs) who may be liable for the clean up . In November 2011 , U.S. EPA issued a General Notice of potential liability to a group of PRPs , and is currently working with a subgroup of them . U.S. EPA plans to negotiate a settlement with PRPs for performance of the Remedial Investigation and Feasibility Study (RI / FS) for the site , which will define the nature and extent of contamination associated with the site and present options for the long @-@ term remediation of affected areas . Upon completion of the RI / FS Report , U.S. EPA will select a remedy for the site , with input from the community and stakeholders .

= = = Copper industry = = =

A trade magazine covering metals industry news has noted that " The closing of the Chemetco Inc. secondary smelter in Hartford , Ill . , in 2001 marked the end of large @-@ scale secondary copper smelting in the United States . "
Brian Taylor , writing for Recycling Today in 2007 , goes on to observe how
" .. in its 2006 report on National Emission Standards for Hazardous Air Pollutants (NESHAP) to the Federal Register , the U.S. EPA notes , ' The secondary copper smelting plants that served as the basis for emissions estimates have all shut down , and no similar secondary copper smelters have been constructed . ' "
Taylor notes that Chemetco was one of five smelters used by the EPA to establish its standards . The others were : Cerro Copper Products in Sauget , Ill . ; Franklin Smelting in Philadelphia ; Gaston

Recycling Industries in Gaston , S.C. ; and the Southwire Co. plant in Carrollton , Ca .