



CHINA'S LARGEST LEAD-ACID BATTERY EXPORTER ILLEGALLY DUMPS WASTEWATER

Investigative Report on Leoch Battery (Jiangsu) Corp.

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In early November 2017, Lvse Jiangnan received reports from a number of residents living in Jinhu County of Huai'an City that Leoch Battery (Jiangsu) Corp. (hereafter referred to as "Leoch Battery") was using hidden pipes to secretly discharge highly acidic wastewater from its factory site.

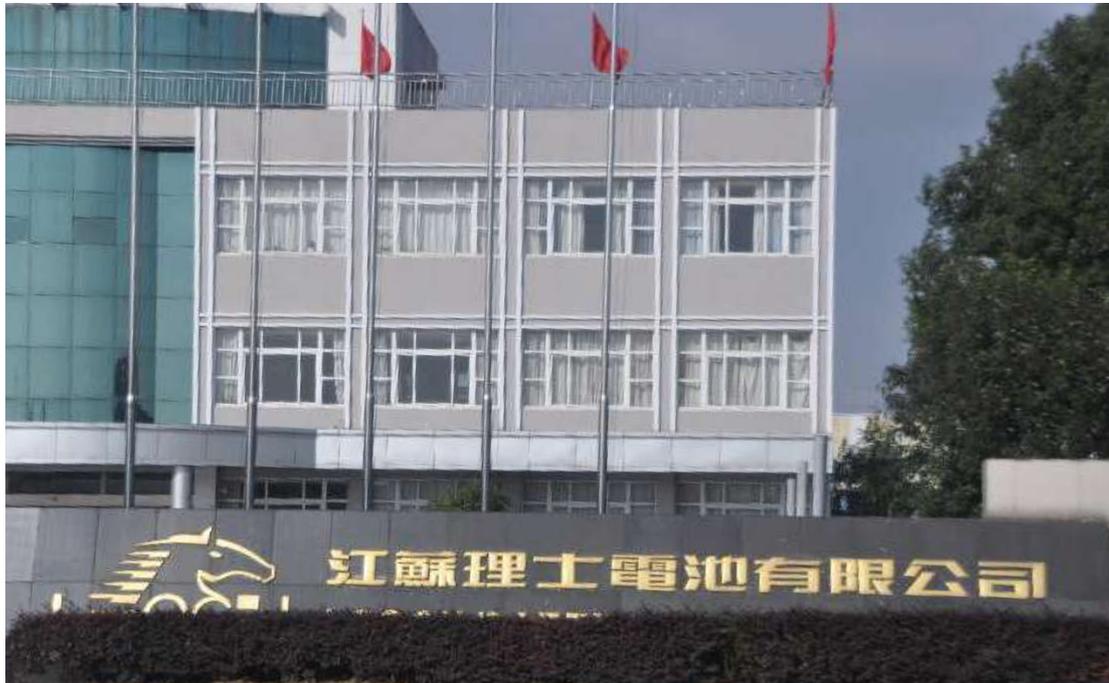


Figure 1. Leoch Battery (Jiangsu) Corp.

Lvse Jiangnan thereafter worked together with the Institute of Public & Environmental Affairs (IPE) to conduct desktop research. The organizations found that the official website of Leoch Battery's parent company states, "Leoch International Technology Limited ('Leoch'), an international new high-tech enterprise listed on the Main Board of the Hong Kong Stock Exchange (stock code: 842), was founded in 1999. We specialize in research and development, manufacturing, sales and marketing of full categories of lead-acid battery. After years of growth, Leoch became one of the leading and is the top exporter of lead-acid battery manufacturer in the People's Republic of China (the 'PRC')"¹ (see figures 2.1 & 2.2).

¹ <http://www.leoch.com/en/about.aspx>

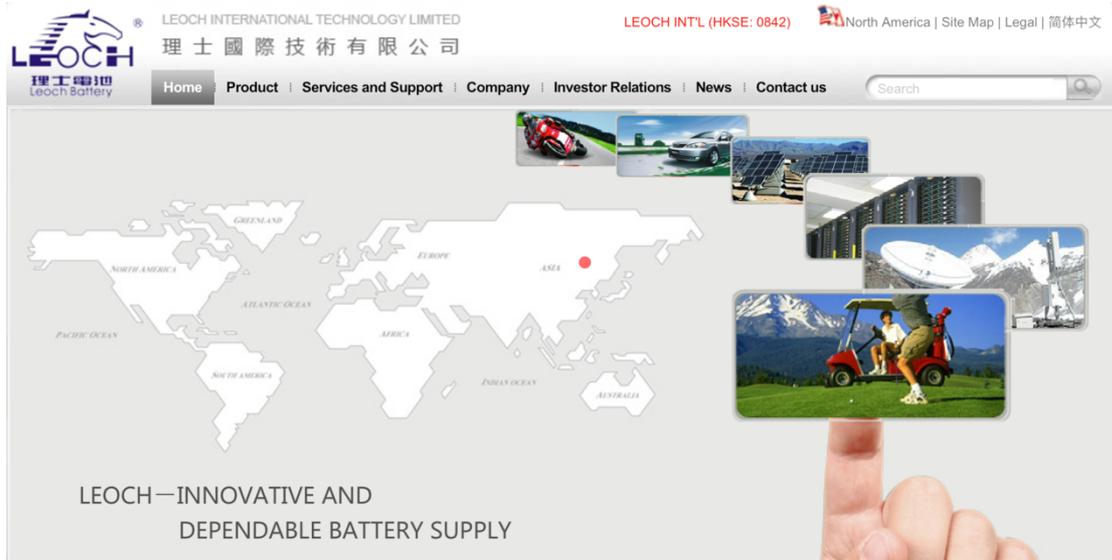


Figure 2.1. Leoch Battery's official website²

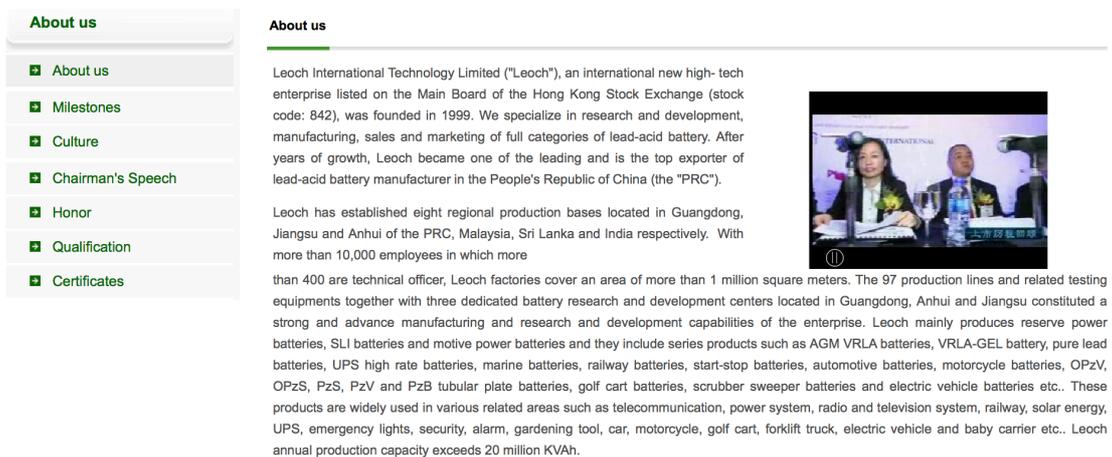


Figure 2.2. Company profile from Leoch Battery's official website³

Searches on the Jiangsu provincial platform of state-monitored pollution sources located the enterprise's self-monitoring plan, which was updated in January 2017. The plan reveals that Leoch Battery primarily works on lead-acid battery manufacturing and used battery recycling, and is a state-monitored enterprise for heavy metals. In addition to conventional pollutants, wastewater discharged by Leoch Battery also contains lead. Pollutants monitored manually and automatically at the discharge outlet including COD, pH and lead.

On March 23, 2016, the Huai'an municipal government released the *2015 Huai'an Key State-Monitored Pollution Sources Monitoring and Supervision Annual Report*. According to the

² <http://www.leoch.com/en/index.aspx>

³ <http://www.leoch.com/en/about.aspx>

report, in July 2015, the lead concentration in fugitive waste gas discharged by Jiangsu Leoch Science Technology Co., Ltd.⁴ exceeded legal standard by two times⁵ (see figure 3).

Chart 6. 2015 List of Key State-Monitored Pollution Sources for Heavy Metals that Exceeded Discharge Standards

No.	Enterprise Name	Category	Pollutant and Multiple of Exceedance	Month
1	Jiangsu Leoch Science Technology Co., Ltd.	Exhaust Gas	Fugitive exhaust gas: lead and its compound (2.0)	July

Figure 3. 2015 Huai'an Key State-Monitored Pollution Sources Monitoring and Supervision Annual Report

On-site investigation found illegal dumping of highly acidic wastewater containing lead

Based on the findings from desktop research, Lvse Jiangnan carried out several on-site investigations. On November 20, 2017, investigators arrived at the northeast corner of the wall near the wastewater treatment area, led by local residents who had reported the company. They discovered a pipe sticking out from the factory into the outer green belt. Substantial amounts of water with unknown content flowed from the pipe onto the ground, with some water sinking into the soil (figures 4 & 5).



Figure 4. Suspected dumping area of Leoch Battery

⁴ According to the National Enterprise Credit Information Publicity System (<http://www.gsxt.gov.cn/index.html>), Leoch Battery was formerly called Jiangsu Leoch Science Technology Co., Ltd.

⁵ <http://www.huaian.gov.cn/xxgk/hjbh/gkzd/content/5e38cfb9538919480153ab88de1816c8.html>

Since the suspected wastewater dumping area was located at Jinshi Road, which was under construction, maintenance workers told investigators that they found the pipe dumping sewage into green belt multiple times, but have no clue what was in the sewage or what harmful impacts it may pose.



Figure 5. Suspected dumping site of Leoch Battery

The wastewater alleged to have been dumped shows a pH level between 2-3 when tested on-site by investigators (figure 6).



Figure 6. Test results of pH level from wastewater allegedly dumped by Leoch Battery

Lvse Jiangnan collected a sample of wastewater suspected to have been dumped and commissioned a qualified third-party testing lab – Bureau Veritas Consumer Products Services (BV) – to examine and analyze the sample.

Test results by BV show that the pH level of the water alleged to have been dumped by Leoch Battery is 2.23 (highly acidic), while lead content of the water measured 8159 µg/L (figures 7.1 & 7.2).



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SUMMARY OF TEST RESULTS 测试结果的汇总

Test Items 测试项目	Test Requirement 测试依据	Test Result 结论	Remark 备注
pH	Water quality-Determination of pH value-Glass electrode method 水质 pH 值的测定 玻璃电极法 GB/T 6920-1986	Data 数据	See Result 见测试结果
Total Lead 总铅	Water quality—Determination of 65 elements—Inductively coupled plasma-mass spectrometry 水质 65 种元素的测定电感耦合等离子体质谱法 HJ700-2014	Data 数据	See Result 见测试结果

Photo of the Sample 样品照片



Figure 7.1. Water sample sent to BV by Lvse Jiangnan



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TEST RESULT 测试结果

Sub-Matrix 基质: Waste water 废水		Client Sample ID 样品标识	绿色江南
		Sample Description 样品描述	微黄液体
		BV Sample ID 实验室样品编号	66173820532-01
Items 项目	UNIT 单位	MDL 方法检出限	
pH	---	0.01	2.23
Total Lead 总铅	µg/L	0.09	8.15 × 10 ³

Figure 7.2. Test results of water sample sent to BV by Lvse Jiangnan

Leoch Battery's self-monitoring plan published on the Jiangsu provincial platform of state-monitored pollution sources shows that Leoch Battery implements the discharge limits of water pollutants for newly constructed enterprises in the *Emission Standard of Pollutants for Battery Industry*, which stipulates 0.5 mg/L (equivalent to 500 µg/L) as the maximum discharge limit for lead in wastewater, and 6-9 (figure 8) as the maximum discharge limit for pH.

Category	Pollutant monitored	Standard followed	Max. discharge limits	Monitoring methods	Methods sources	Equipment
Wastewater	COD	1	150	Fast digestion spectrophotometric method	HJ/T 399	COD digital reactor block/ COD on-line analyzer
	Pb	1	0.5	Flame atomic absorption spectrometry	GB 7475	Atomic absorption spectrophotometer/Pb on-line analyzer
	pH	1	6-9	Glass electrode method	GB 6920	pH meter
	SS	1	140	Gravimetric method	GB 11901	Electronic balance
	Ammonia-nitrogen	1	30	Gas-phase molecular absorption spectrometry	HJ/T 195	Spectrometer
	Total phosphorous	1	2.0	Ammonium molybdate spectrophotometric method	GB 11893	spectrophotometer

Figure 8. Leoch Battery's self-monitoring plan, in which "1" represents the *Emission Standard of Pollutants for Battery Industry*

After analyzing the test results of the wastewater alleged to have been dumped, Lvse Jiangnan decided to conduct another on-site investigation. This investigation focused on collecting samples from contaminated soil in order to further understand the impacts of Leoch Battery's illegal dumping behavior on the local ecology and environment.

On November 30, 2017, Lvse Jiangnan commissioned Bureau Veritas staff to collect soil sample 1 from the location where the highly acidic wastewater containing lead was alleged to have been dumped (figure 9).



Figure 9. BV staff locating sampling site

Then Lvse Jiangnan investigator found a concealed hole under the wall a few meters away. Although no water was being discharged through the hole at that time, the soil around the hole had been eroded into a muddy pit. The muddy side of the pit had been washed away to reveal sand. Investigators commissioned BV staff to collect sand sample No. 2 near the pit (see figures 10.1, 10.2, and 11).



Figure 10.1. The hole in the wall



Figure 10.2. The hole in the wall



Figure 11. BV staff locating sampling site

Test results provided by BV (see figure 12) revealed the following:

Soil sample No.1: pH=3.66 (highly acidic); lead concentration= 4610 mg/kg

Sand sample No. 2: pH=3.91 (highly acidic); lead concentration= 1990 mg/kg



**BUREAU
VERITAS**

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TEST RESULT 测试结果

Sub-Matrix 基质 : Soil 土壤			Monitoring Points 监测点位	
			1号点	2号点
Sampling Time 采样时间			2017年11月30日 12: 50	2017年11月30日 15: 30
Sampling Coordinate 采样坐标			N 33°00' 99.36" E 118°97' 99.51"	N 33°01' 02.78" E 118°98'
Sample Description 样品描述			Dark brown sand loam 暗棕砂壤土	ark chestnut sand loam 暗栗砂壤土
BV Sample ID 实验室样品编号			66173330194-01	66173330194-02
Items 项目	Unit 单位	MDL 方法检出限		
pH	---	0.01	3.66	3.91
Lead 铅(Pb)	mg/kg	0.30	4.61×10^3	1.99×10^3

Figure 12. Test results of soil sample No. 1 and sand sample No. 2 sent to BV by Lvse Jiangnan

According to the Environmental Quality Standards for Soil published by China’s Ministry of Environmental Protection (MEP), the pH and lead content of soil samples collected near the Leoch Battery factory all exceed standard levels (table 1).

Soil Environmental Quality	Standard Classification	pH	Pb≤ (mg/kg)
Level I	To protect the natural ecology and background of the region.	Natural background	35
Level II	To ensure agricultural production and protect human health.	<6.5	250
		6.5-7.5	300
		>7.5	350
Level III	To ensure the production of agroforestry and the normal growth of plants.	>6.5	500

Table 1. Environmental Quality Standards for Soil

Enterprise with alleged dumping behavior supplies to numerous well-known global brands

According to the National Enterprise Credit Information Publicity System,⁶ Leoch Battery was formerly called Jiangsu Leoch Science Technology Co., Ltd. (figure 13). It belongs to Leoch International Technology Limited (hereinafter referred to as Leoch International) and is listed on the Main Board of the Hong Kong Stock Exchange (stock code: 842). Leoch International has grown to become one of the leading lead-acid battery manufacturers in China and is China’s top exporter of lead-acid batteries.⁷



Figure 13. Former name of Leoch Battery

According to Leoch’s 2016 annual report, its major customers are telecom operators and equipment manufacturers. It was also reported by Economic Daily – China Economic Net on November 23, 2017 that Leoch Battery had built the first in Asia and the world’s third automatic production line of pure lead batteries, and had become a major supplier to Huawei, ZTE, China Tower, BMW, Jaguar Landrover, BOSCH and other well-known global brands.⁸

⁶ <http://www.gsxt.gov.cn/index.html>

⁷ <http://www.leochir.com/Company.aspx?id=1> (Date of access: 2017/11/27)

⁸ http://www.ce.cn/cysc/zljid/gd/201711/23/t20171123_26972473.shtml (Date of access: 2017/11/27)

The screenshot shows a news article on the China Economic Net website. The main headline is "理士电池出口与退运 检验检疫提供技术支持助力出口增长22%" (Lishu Battery Export and Return Inspection and Quarantine Provide Technical Support to Help Export Growth Increase 22%). The article is dated 2017年11月23日 09:03 and sourced from 经济日报-中国经济网. The text states that Lishu Battery's 1-billion yuan production line has become a core supplier for major brands like Huawei, ZTE, China Tower, BMW, Jaguar Land Rover, and Bosch. It also mentions a partnership with a German consulting firm and a 3000-million yuan investment in supply chain integration and digital transformation. The article notes that Lishu Battery's exports have grown by over 20% annually since 2004, with 2016 exports reaching 1.78 billion USD.

Figure 14. Report by Economic Daily – China Economic Net on November 23, 2017

Investigative report submitted to local environmental protection bureaus

Based on the above research, Lvse Jiangnan and IPE co-authored the “Pollution Investigation Report on Jiangsu Leoch Battery” and submitted it by EMS courier on December 11, 2017 to MEP’s East China Environmental Protection Inspection Center, the environmental protection bureau (EPB) of Jiangsu province, the “263 special administrative office” in Jiangsu, as well as the environmental protection bureaus of Huai’an and Jinhu cities.

At 2 p.m. on December 15, Lvse Jiangnan received a telephone call from the environmental protection bureau of Jiangsu Province. The provincial department had transferred the research report to the environmental protection bureau of Huai’an, who would be responsible for follow-up.

In addition to sending the report to these environmental protection departments, IPE and Lvse Jiangnan also sent a letter about environmental pollution by EMS courier to Leoch to the mailbox disclosed in Leoch’s 2016 annual report, as well as the factory address. The EMS system showed that the letter has been signed by Leoch at 12:48 p.m. on December 15.

Lead is extremely harmful to human health. Once it enters the human body, lead and its compounds may cause damage to the nervous system, hematopoietic system, kidneys, cardiovascular system and endocrine system, and may even cause lead poisoning. We call on the local environmental protection bureau to undertake a follow-up investigation as soon as possible, and for Leoch Battery to issue a public explanation about its suspected illegal dumping of wastewater containing lead that was discovered by Lvse Jiangnan.