HUMAN RIGHTS WATCH

TOXIC WATER, TAINTED JUSTICE

Thailand's Delays in Cleaning Up Klity Creek

Klity Creek. Provincial public health authorities have directed local residents to stop consuming water, fish and aquatic animals from the creek, an advice that is difficult to follow when they are unable to access other water sources or afford other food.. Kanchanaburi, Thailand. December 8, 2014.

TOXIC LEGACY

THE VILLAGE

On January 10, 2013, Thailand's supreme administrative court handed down a judgment in a remarkable case. Prior to the ruling, the 22 plaintiffs travelled to Bangkok from a small village in the jungle near Thailand's border with Burma. They came hoping the judge would grant them some long-sought relief.

Their village of Lower Klity Creek is located in Thailand's province of Kanchanaburi, a region known for its national parks and scenic waterfalls. Lower Klity Creek is home to about 400 ethnic Karen people, most of whom are subsistence farmers of rice, cassava, and vegetables.

Klity Creek meanders from mountains in the jungle, through their village, and down to a large dam. Eleven kilometers upstream from Lower Klity Creek village is Upper Klity Creek village, the site of a former privately owned lead-processing factory. The factory, which began operations in the mid-1960s, was ordered to close in 1998. But its toxic legacy remains.

Many of the plaintiffs suffer the symptoms of chronic lead poisoning, such as abdominal pain, fatigue, headaches, and mood changes. Some of their children have severe intellectual and developmental disabilities. Villagers from Lower Klity Creek are exposed to lead from contaminated water and food, and Thai public health authorities have advised individuals in the village to stop consuming water, fish, and aquatic animals from the creek.

The judge ruled in their favor. He found Thailand's Pollution Control Department—the government body charged with preventing and resolving pollution problems—negligent for being too slow to clean up the creek.[1] The department had no emergency plan after it initially became aware of the pollution in 1998. The steps it took were beset by delays. The department's stated approach of "natural rehabilitation"—essentially, waiting for Klity Creek to clean itself—would leave people exposed to hazardous lead in their water for long into the future.[2]

The court ordered the department to pay a total of nearly four million baht, or US$125,000, in compensation distributed among the 22 plaintiffs. But the judge also issued a ground-breaking order. For the first time in Thailand's history, a superior court ordered the government to clean up a toxic site.

The court did not direct the department how to go about the clean-up, but it set strict conditions to make sure the department did a thorough job: the court ordered that test results from the water, soil, vegetables, and aquatic animals in and around the creek must fall below the permissible levels on all four occasions over a one-year period.

The Lower Klity Creek plaintiffs are not the only individuals affected by the old lead processing factory. Lower Klity Creek villagers are still fighting a civil case against the company that operated the factory (and a nearby lead mine), Lead Concentrate (Thailand) Co. Ltd. The case was initiated by 8 plaintiffs in 2003 and was later expanded to a total of 151 plaintiffs. In 2010 the Kanchanaburi provincial court ruled in favor of the villagers, although the defendants appealed to the supreme civil court. The case is currently awaiting a final judgment.[3]

While residents of Lower Klity Creek village have patiently fought these cases through Thailand's extremely slow justice system, people living upstream in Upper Klity Creek village also stand to benefit from a clean-up. Some Upper Klity Creek residents live beside the lead processing factory or the factory's tailings ponds (used for storing processed mine waste).

But since the supreme administrative court ruling in January 2013, the Pollution Control Department's response has been more of the same- limited remediation steps and delays. In March 2013, the department hired a contracting company to take away some lead-laden soil from around the factory in Upper Klity Creek. At the same time, the department's director general was quoted in Thai media, pledging a full rehabilitation plan by the end of 2013.[4]

But by the end of 2013, the department was far from having a plan, let alone executing it. According to the schedule drawn up by the department shortly after the decision, studies for the rehabilitation process should have been completed by March 2014 and actual clean-up activities begun on May 1, 2014.[5] However, more than six months past the May 2014 deadline for the commencement of clean-up activities, the Pollution Control Department is still studying how to clean up the creek.

Even while its remediation efforts stalled, the department's environmental tests found unacceptably high levels of lead in soil along the creek bank, as well as water, creek sediment, fish, shrimp, crabs and vegetables at various locations along the creek during 2013 (the last year with all data published).[6]

A woman harvests vegetables that have been irrigated using water piped from Klity Creek. Kanchanaburi, Thailand. December 8, 2014.

THE POISONING

Residents of Lower Klity Creek may be exposed to lead in their daily lives—such as by drinking water or eating fish and other aquatic animals from Klity Creek, by eating food grown in lead-contaminated plots or cooked in lead-contaminated water, by contact with polluted soil around their houses, or breathing air contaminated by lead dust.[7]

Lead is a poisonous metal that poses serious health hazards: the most sensitive targets for lead toxicity are children's developing nervous systems, the hematological and cardiovascular systems, and the kidneys.[8] Symptoms can include neurological and physical problems such as anxiety, insomnia, anemia, memory loss, sudden behavioral changes, concentration difficulties, headaches, abdominal pains, fatigue, depression, hearing impediments, muscle spasms, disorientation, convulsions, and high blood pressure.[9] The range of manifestations of lead poisoning means that it can go unrecognized or can be confused with other disorders.[10]

Public health authorities recognize that there is no safe level of lead exposure. The World Health Organization notes:

> At lower levels of exposure that cause no obvious symptoms, and that previously were considered safe, lead is now known to produce a spectrum of injury across multiple body systems. In particular, lead affects children's brain development resulting in reduced intelligence quotient (IQ), behavioral changes such as shortening of attention span and increased antisocial behavior, and reduced educational attainment. Lead exposure also causes anemia, hypertension, renal impairment, immunotoxicity and toxicity to the reproductive organs. The neurological and behavioral effects of lead are believed to be irreversible.[11]

Pregnant women and children are particularly vulnerable to lead poisoning. In pregnant women, it can cause premature birth, low birth weight, or damage the fetus' developing brain. No safe blood lead level in children has been identified.[12]

In the US, the Centers for Disease Control and Prevention (CDC) dropped the "level of concern" of 25 micrograms per deciliter of lead in blood in children to 10 micrograms in 1991.[13] In 2012 the US CDC adopted a new approach that recommended that health officials should respond to a child found with a test result greater than or equal to 5 micrograms per deciliter of lead in blood.[14]

Blood tests carried out from 1998 to 2008 revealed elevated levels of lead in the blood of people living around Klity Creek. While results vary based on who is studied and when the study was carried out, a number of studies show lead in individual's blood at between 10 micrograms and 50 micrograms, with averages of around 20 to 30 micrograms per deciliter of lead.[15] In 2002-2003, the Ministry of Public Health reported that 235 children had lead in their blood over 25 micrograms per deciliter (out of 1558 children tested), while 83 adults had lead in their blood above 40 micrograms per deciliter (of 947 adults tested).[16]

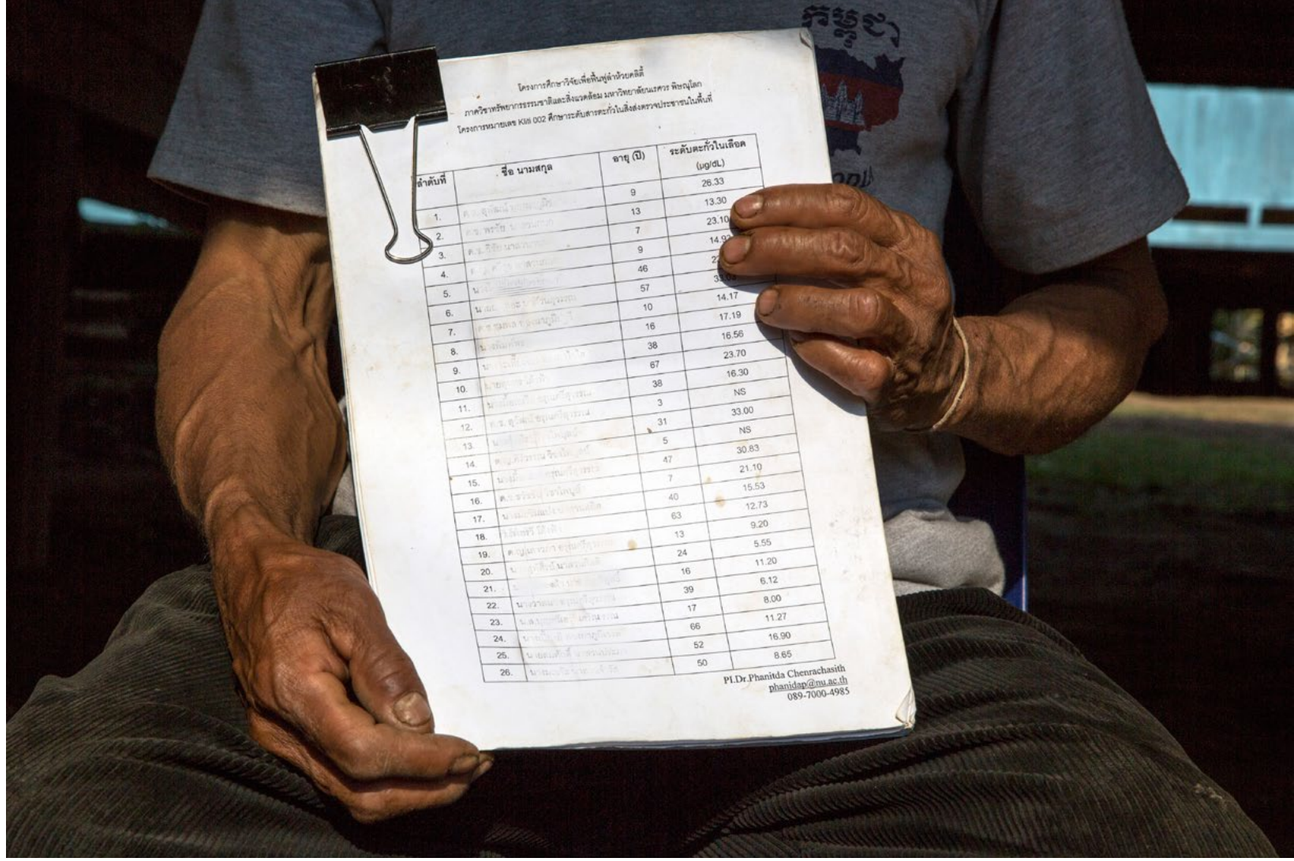
Research with residents of Upper and Lower Klity Creek villages, published in 2007, showed that when compared to villagers in nearby communities, individuals living near Klity Creek presented symptoms consistent with lead exposure. They tended to score lower in IQ tests and more frequently report illnesses such as nausea, vomiting, abdominal pain, constipation, concentration problems, muscle pains, headaches, insomnia, and memory loss.[17]

LACK OF MEDICAL ATTENTION

The government response to confirmed lead exposure has been inadequate. In 2000, a nongovernmental organization, the Karen Studies and Development Center, and later the Ministry of Public Health, arranged treatment for lead poisoning (i.e. chelation therapy) for some individuals with particularly elevated blood-lead levels. Experts recommend chelation therapy when a child is found with a test result of greater than or equal to 45 micrograms per deciliter of lead in blood, but not lower because at lower levels chelation is ineffective.[18]

Not all individuals tested by provincial and district public health authorities received the results of their blood tests, however, and there was no medical care following up from test results when they were communicated to individuals.[19] For these reasons, some villagers refused to participate in blood tests. Many villagers told Human Rights Watch that public health authorities stopped performing blood tests for lead in the village in 2007-2008.[20]

Among individuals who did receive their test results, some were told that they or their family members were safe if the results were less than 25 micrograms per deciliter of lead in blood for children, or 40 micrograms per deciliter of lead in blood for adults.[21] This standard appeared on some of the result forms handed out to Lower Klity Creek residents.[22]



Blood-level test results for Lower Klity Creek villagers compiled by an academic researcher in 2008. While results varied, a number of studies show lead in individual's blood at between 10 micrograms and 50 micrograms, with averages of around 20 to 30 micrograms per deciliter of lead. Many villagers told Human Rights Watch that public health authorities stopped performing local blood tests for lead by 2008. Kanchanaburi, Thailand. December 7, 2014.

ENDING THE EXPOSURE

As noted above, the US CDC recommends that health officials should respond to a child found with a test result greater than or equal to 5 micrograms per deciliter of lead in blood. At this level of exposure the US CDC recommends public health officials should: conduct investigations to determine the source of lead in their environments; take steps to control or eliminate the source, and repeat testing for a period of weeks to months (depending on how high the level is) to make sure that the level is not going up.[23]

These children should also be tested for iron deficiency and any nutritional deficiencies corrected, because adequate intake of iron, calcium and vitamin C can minimize absorption of ingested lead.[24]

Public health interventions for eliminating the source of exposure is challenging in settings like Lower Klity Creek village, where lead is found in the main source of drinking water and in important sources of protein and nutrition. Provincial public health authorities have exhorted local residents to stop consuming water and fish and aquatic animals from the creek.[25] However, for many Lower Klity Creek residents it is difficult to follow such advice when they are unable to access other water sources, or afford other food.

Much of the compensation money awarded after the supreme administrative court decision was donated by the plaintiffs to help fund the expansion of the existing system of pipes bringing clean water to houses in the village. But even now the piped water does not reach every house in the village. Older pipes or joints in the system frequently break, leaving individuals with no water and no choice other than to use and consume contaminated water from the creek. Farmers—both men and women—must drink water from the creek when they travel out to their fields.

In the case of Klity Creek, prevention of lead exposure requires a comprehensive clean-up—just as the supreme administrative court clearly ordered.

A farmer waters his chayote fields with irrigation water piped from Klity Creek. Kanchanaburi, Thailand. December 8, 2014.

Chanthira's 15-year-old son has an extra finger on each hand and an extra toe on each foot. Kanchanaburi, Thailand. December 7, 2014.
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HISTORY OF FAILED CLEAN-UP EFFORTS

What has happened to date by way of a clean-up has been piecemeal and ineffective. In 1999, the Pollution Control Department ordered the company that operated the lead processing factory, Lead Concentrate (Thailand) Co. Ltd., to dredge 2.5 kilometers of the creek to remove some of the lead-laden sediment. Afterwards, the department found that the company had dumped much of the sediment on the creek's edge, in improper landfills, where it risked being washed back into the creek.[26] In 2002, the department built two dams across the creek to try to stop the spread of lead sediment downstream; a subsequent academic study showed those dams to be ineffective.[27]

In January 2001, a department official was cited in Thai media as claiming that a master-plan for the cleanup of Klity Creek was imminent and that it would involve dredging the river over four to five years, then burying the sediment in a landfill site.[28]

However neither that master-plan nor any other eventuated. Instead, in 2005, the National Environment Board— the government committee overseeing the Pollution Control Department and formalizing environmental policies—officially adopted the policy of "natural remediation" of Klity Creek.[29] It was this policy that the supreme administrative court criticized for leaving the local residents with contaminated drinking water for an undeterminably long period of time.[30]

Consistent with its obligations under international human rights law, the Thai government is obligated to promptly implement the decision of the supreme administrative court to clean up Klity Creek. Thailand is party to the International Covenant on Economic, Social and Cultural Rights and to the Convention on the Rights of the Child. Both treaties place obligations on governments to protect the health of its citizens, with a special emphasis on children.[31] In international law, the right to health also entails the right to an effective remedy for violations of the right.[32]

Safe drinking water and sanitation are a human right and derive from the right to an adequate standard of living, found in (among other treaties) the International Covenant on Economic, Social and Cultural Rights.[33] In July 2010, Thailand voted in the UN General Assembly to "[recognize] the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights."[34]

There are existing academic studies addressing how to carry out the clean-up.[35] Regardless of how the department proceeds, the clean-up should be thorough in accordance with the supreme administrative court decision. The plan should be developed in close consultation with the local residents and involve ongoing negotiations based on open and transparent dialogue. Broad participation of the community is necessary and special effort should be made to ensure women and girls are engaged in consultations.

To avoid exacerbating residents' exposure to lead, the plan should anticipate disruptions to food and water sources—including the differential impact such disruptions might have on women, children, and persons with disabilities—during the actual clean-up and establish viable alternatives that mitigates negative impacts.

Klity Creek is an opportunity for Thailand's Pollution Control Department to establish a model that could be replicated elsewhere in the country. Rapid economic development in Thailand has led to widespread environmental pollution. At other locations where industrial pollution threatens the health and livelihood of local residents, the Pollution Control Department confronts similar or related challenges to those it faces at Klity Creek.

In 2011, the Ministry of Natural Resources and Environment's Department of Mineral Resources commissioned a strategic environmental assessment to guide it in its decision whether to reopen Kanchanaburi province for lead mining.[36] Human Rights Watch believes that a thorough clean-up of Klity Creek is required before Thailand can accurately assess the potential costs and benefits of reopening lead mining in Kanchanaburi province.

Individuals from Lower Klity Creek village continue to be exposed to toxic lead— as they have for decades. Many continue to suffer life-long, irreversible effects on their health and well-being, without being able to avoid the source of the poisoning. Many parents experience the mental anguish of knowing that they are raising their children in an environment that threatens their children's futures. It is time that Thailand's government took long-overdue steps to protect their health.

THE INDIVIDUALS

SOMCHAI

Somchai, a farmer in his 60's, was one of the 22 plaintiffs that won the court case against the government. He is married and has seven children. His sixth child, an adolescent boy, has an intellectual disability and attends a school for children with special learning needs in a nearby city.

> The supreme administrative court has given its verdict but what can we do if they won't follow the order? Before the court verdict and after the court verdict, the Pollution Control Department came to check the level of lead in soil sediment. Still they come every month but in all this time, they only conduct research. They should stop researching and start cleaning up.

CHANTHIRA

Chanthira, a mother of three children, suffers from frequent abdominal and muscular pains. She is particularly worried about the health of her 15-year-old son.

> The government doctor told me that my son's lead level wasn't above the unsafe level but I didn't understand what he meant and I'm still worried about him. My son has an extra finger on each hand and an extra toe on each foot. From about 5-months-old until he was 2-years-old, he had diarrhea all the time. He's a slow learner, slower than his friends in the same age group. My boy doesn't eat very much, he has a poor appetite. He can't run fast, he can't play sports. He is always weak and low on energy.

Somchai, a farmer in his 60's, harvesting corn near Klity Creek. Kanchanaburi, Thailand. December 8, 2014.

Chanthira (left), in her mid-30s, and her 15-year-old son live in Lower Klity Creek village. Kanchanaburi, Thailand. December 7, 2014.

Ma Ong Seang, in her early 50s, walks with a family friend who leads her down a path from her home in Lower Klity Creek village. Kanchanaburi, Thailand. December 7, 2014.

MA ONG SEANG

Ma Ong Seang, in her early 50s, lost her sight in the late 1990s. In 2002 she was diagnosed by a medical doctor in Bangkok as suffering illness because of elevated amounts of lead in her body. She is cared for by her mother and her two teenage sons.

> I eat fish when we don't have money and have little else to eat- maybe a few times each month. It doesn't matter whether I feel afraid [of lead poisoning], it's a question of having something to eat or not. When the tap water fails because of the condition of the pipe joints, water from the creek is our only source of water. Last month there was no tap water at all so everyone had to use creek water for drinking and cooking.

MINH

Minh, in her late 20's, came to Lower Klity Creek when she married a villager. They have a 7-year-old boy and a 9-month-old baby girl. Like other households in her part of the village, her house is not connected to the village's system of piped water.

> I worry about the possible harm to my children from the creek water. I am particularly worried about my son because he's too small for his age and falls ill often. He's skinny and pale. He learns very slowly: sometimes he doesn't understand what I say or the teacher says. I worry that these problems are caused by lead and I would like the government departments in charge to come and clean up the creek.
>
> When my son was much younger he had a blood test. I asked about the results when they came back about a year later but they said the results weren't ready. Other villagers didn't get results either. After the first test of my son's blood, I didn't allow them to take any more blood from him because I never saw the results from the first test.

Minh’s 7-year-old son brushes his teeth in the creek. Minh’s house, like many households in Lower Klity Creek village, is not connected to the village’s piped water system. Young children risk exposure if they ingest water while bathing. Kanchanaburi, Thailand. December 8, 2014.

Minh with her 7-year-old son and 1-year-old daughter in Lower Klity Creek village. Kanchanaburi, Thailand. December 8, 2014.

Kamthorn, who farms rice and corn near Klity Creek, suffers from headaches and pains in his shoulders and back. Kanchanaburi, Thailand. December 7, 2014.

KAMTHORN

Kamthorn, who farms rice and corn, suffers from headaches and joint pains in his shoulders and back. He is also one of 22 plaintiffs who won the court case against the Pollution Control Department in 2013. He hasn't received a blood test for lead since 2008; he says he never got the result.

> In 2005, the minister of environment came here, along with many other government officials, and asked us to withdraw our lawsuit. The minister said, "Let nature rehabilitate itself!" I asked him how long natural rehabilitation would take. The minister turned to the director general of the Pollution Control Department for an answer, but the director general couldn't answer. The villagers were happy when the supreme administrative court handed down its decision, but the government fights us with time, delaying any action time and again. When will the government do its job?

YASOER

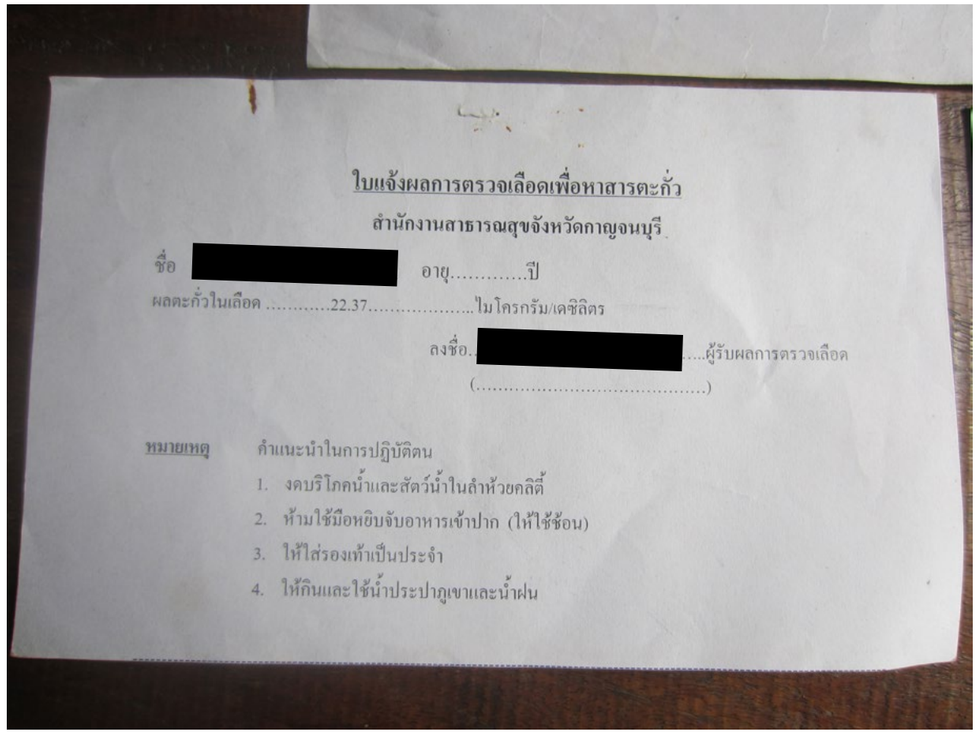
Yasoer, a farmer in his mid-60s, moved to Lower Klity Creek village when he was about 20-years-old after marrying a local villager. He's suffered from frequent headaches, feeling faint, and having pain in his legs, back and arms for over 30 years.

> The doctor told me to avoid water from the creek but of course we can't do this. I stay up to three weeks a month out in my fields when we are planting or harvesting. I have a small hut out there and I use creek water, all the time, for cooking, drinking, and washing. I also catch and eat fish. At other times of the year I take day trips out to my fields and, when the water I bring with me runs out, I drink from the creek.
>
> I joined the court case against the government because the Pollution Control Department wants nature to "rehabilitate itself." But if we wait for nature to rehabilitate itself, it might take 100 years or more and even then still not be clean.

Yasoer, 64, is a farmer from Lower Klity Creek village who has suffered from frequent headaches, feeling faint, and having pain in his legs, back and arms for over 30 years. Kanchanaburi, Thailand. December 7, 2014.

SAMPLE BLOOD TEST RESULTS

FORM 1:



ใบแจ้งผลการตรวจเลือดเพื่อหาสารตะกั่ว

สำนักงานสาธารณสุขจังหวัดกาญจนบุรี

ชื่อ [redacted] อายุ.....ปี

ผลตะกั่วในเลือด .....22.37.....ไมโครกรัม/เดซิลิตร

ลงชื่อ.[redacted].....ผู้รับผลการตรวจเลือด

(.....)

หมายเหตุ คำแนะนำในการปฏิบัติตน

1. งดบริโภคน้ำและสัตว์น้ำในลำห้วยคลิตี้
2. ห้ามใช้มือหยิบจับอาหารเข้าปาก (ให้ใช้ช้อน)
3. ให้ใส่รองเท้าเป็นประจำ
4. ให้กินและใช้น้ำประปาภูเขาและน้ำฝน

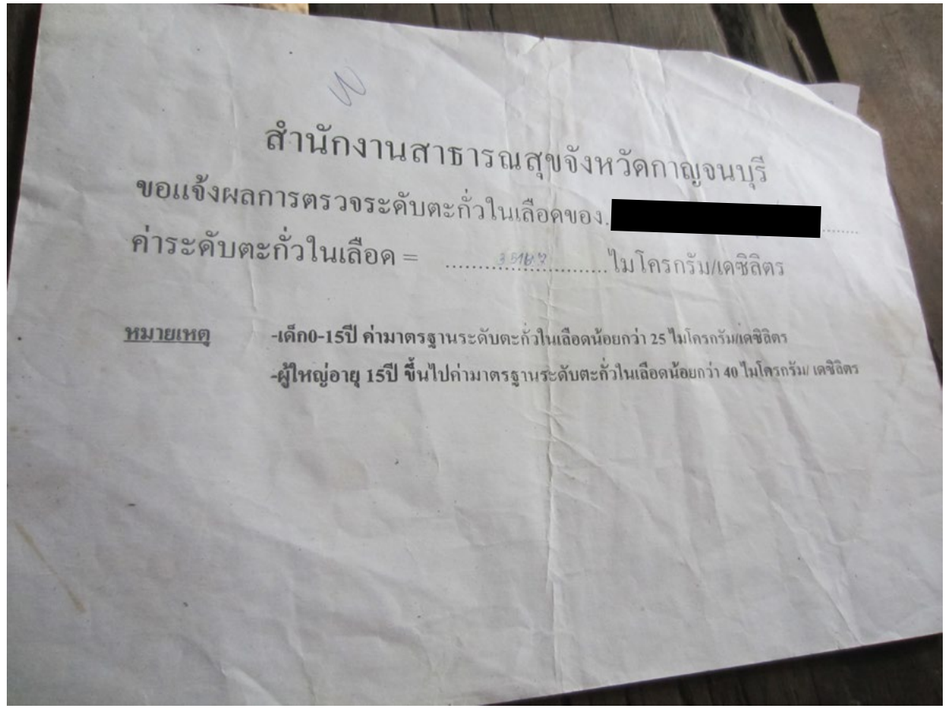
Result of Blood Examination for Lead Contaminant
Kanchanaburi Public Health Office

Name __[Name]_____Age _____ Year
Lead Contamination ___22.37_____ Micrograms / Deciliter
Signature_____ Blood Examinee
(_____)

Note: Advice for physical health care

1. Stop consuming Klity Creek's water and aquatic animals.
2. No hand-eating (using spoon)
3. Always wear shoes
4. Only consume mountain-pipe and rain water.

FORM 2:



สำนักงานสาธารณสุขจังหวัดกาญจนบุรี

ขอแจ้งผลการตรวจระดับตะกั่วในเลือดของ [redacted]

ค่าระดับตะกั่วในเลือด = ...ไมโครกรัม/เดซิลิตร

หมายเหตุ -เด็ก0-15ปี ค่ามาตรฐานระดับตะกั่วในเลือดน้อยกว่า 25 ไมโครกรัม/เดซิลิตร

-ผู้ใหญ่อายุ 15ปี ขึ้นไปค่ามาตรฐานระดับตะกั่วในเลือดน้อยกว่า 40 ไมโครกรัม/ เดซิลิตร

Kanchanaburi Public Health Office

Result of blood examination for lead contamination for [Name]
Level of lead contamination 18.7 micrograms / deciliter

Note: For children from 0-15 years old, level of lead contamination in blood must be less than 25 micrograms / deciliter.
For adults of 15 years old and over, level of lead contamination in blood must be less than 40 micrograms / deciliter.

RECOMMENDATIONS

To the Ministry of Public Health and the Ministry of Natural Resources and Environment

- Implement the supreme administrative court's judgment by jointly developing and making publicly available an itemized budget to prevent further exposure to lead by cleaning up Klity Creek.

To the National Environment Board

- Reverse the policy of "natural remediation" of Klity Creek and adopt the policy of a comprehensive, time-bound environmental clean-up strategy for Klity Creek.

To the Ministry of Natural Resources and Environment

- Implement a comprehensive, time-bound environmental clean-up strategy for Klity Creek.
- Ensure regular, broad and meaningful public consultation and participation in the development, implementation and monitoring of the clean-up strategy. Include dedicated measures that facilitate the participation of groups that may face specific impacts or that are marginalized, such as women, children, the elderly, and people with disabilities.
- To avoid exacerbating exposure to lead, the strategy should anticipate disruptions to food and water sources—including the differential impact such disruptions might have on women, children, the elderly, and people with disabilities—during the clean-up and establish viable alternatives that mitigate negative impacts.
- Devise a comprehensive environmental clean-up program to address other industrially polluted sites, abandoned or still occupied, that threaten human health in other parts of Thailand.

To the Ministry of Public Health

- Revise the current standards for lead in blood to reflect that lead, at levels lower than these standards, is harmful.
- Recommence testing of individuals living around Klity Creek. Put in place quality control measures and oversight to ensure that each individual who is tested receives their test results in a timely manner and understands the results.
- Ensure that prenatal services for women and girls living around Klity Creek include voluntary lead monitoring.
- Ensure all those in need in and around Klity Creek have access to evidence-based medical treatment and case management for lead poisoning. Undertake ongoing monitoring, including of blood lead levels, iron deficiency, neurodevelopmental development, and nutrition.

To the Ministry of Social Development and Human Security

- When blood tests of individuals in and around Klity Creek shows elevated levels of lead, provide social services to ensure that children and adults who have, or may develop, physical and cognitive disabilities as a result of lead poisoning receive disability-related services, including educational, employment, and financial assistance, as provided under the Persons with Disabilities Quality of Life Promotion Act (2007).

Klity Creek. Kanchanaburi, Thailand. December 8, 2014.
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1. The Pollution Control Department is a department of Thailand's Ministry of Natural Resources and Environment. It reports annually on the quality of the environment to the National Environment Board, the committee responsible for overseeing national environmental policy.
2. Mr. Yaseuh Nasuansuwan and 21 others v. Pollution Control Department, Supreme Administrative Court, Case No. Q597/2551, Judgment, November 16, 2012. Copy on file with Human Rights Watch.
3. See, for example, Yossaran Suphan and Supoj Kaewkasi,"Lead Mine Operator Ordered to Compensate Villagers, Clean Klity Creek," The Nation, December 21, 2010, http://www.nationmultimedia.com/2010/12/21/national/Lead-mine-operator-ordered-to-compensate-villagers-30144835.html (accessed October 22, 2014).
4. See, for example, the director-general of the Pollution Control Department, Wichian Jungrungreon, quoted in Pongphon Sarnsamak and Tanpisit Lerdbamrungchai, "Klity Villagers Want Creek Cleaned Quickly," The Nation, March 30, 2013, http://www.nationmultimedia.com/national/Klity-villagers-want-creek-cleaned-quickly-30203018.html (accessed October 22, 2014).
5. Pollution Control Department, "Action Plan to Solve Lead Contamination Issues at Klity Creek for 2013 – 2016," undated [Human Rights Watch translation]. Copy on file with Human Rights Watch.
6. Pollution Control Department, "Environmental Measurement Outcomes at Klity Creek, Chalae Sub-district, Thong Pha Phum District, Kanchanaburi Province, March 11-17, 2013," "Environmental Measurement Outcomes at Klity Creek... June 3-8, 2013," "Environmental Measurement Outcomes at Klity Creek... September 9-14, 2013," "Environmental Measurement Outcomes at Klity Creek... November 25-30, 2013," http://www.pcd.go.th/Download/pollution_kity.cfm (accessed October 22, 2014).
7. To gather material for this document, a Human Rights Watch senior researcher traveled to Klity Creek in July and August 2014 where he interviewed 14 residents of Lower Klity Creek village. He also spoke with 12 individuals from civil society groups, law firms, and universities with knowledge and experience regarding Klity Creek. Human Rights Watch conducted in-person interviews with all of the people included in this report, often with the assistance of Thai-language interpreters. All interviewees gave permission for us to use their statements and images. Where requested or deemed necessary for security reasons, we have changed names and omitted identifying details of interviewees. In all other cases, those profiled have given consent to use their names and all information included herein.
8. [US] Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, "Toxicological Profile for Lead," August 2007, http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=96&tid=22 (accessed October 23, 2014), p. 21.
9. [US] Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, "Case Studies in Environmental Medicine (CSEM): Lead Toxicity," undated, http://www.atsdr.cdc.gov/csem/csem.asp?csem=7 (accessed October 22, 2014).
10. World Health Organization, "Childhood Lead Poisoning," 2010, http://www.who.int/ceh/publications/childhoodpoisoning/en/ (accessed October 22, 2014), p. 53.
11. World Health Organization, "Fact Sheet: Lead Poisoning and Health," 2014, http://www.who.int/mediacentre/factsheets/fs379/en/# (accessed October 23, 2014).
12. [US] Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, "Toxicological Profile for Lead," August 2007, http://www.atsdr.cdc.gov/toxprofiles/tp13.pdf (accessed October 23, 2014), p. 10.
13. Helen Binns et al., "Interpreting and Managing Blood Lead Levels of Less Than 10 µg/dL in Children and Reducing Childhood Exposure to Lead: Recommendations of the Centers for Disease Control and Prevention Advisory Committee on Childhood Lead Poisoning Prevention," Pediatrics, 120(2007): 1285-1298 accessed October 22, 2014, doi: 10.1542/peds.2005-1770.
14. Advisory Committee for Childhood Lead Poisoning Prevention of the [US] Centers for Disease Control and Prevention, "Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention," January 4, 2012, p. x, http://www.cdc.gov/nceh/lead/acclpp/final_document_010412.pdf (accessed October 10, 2014).
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18. [US] Centers for Disease Control and Prevention, "Blood Lead Levels in Children Fact Sheet," 2014, www.cdc.gov/nceh/lead/acclpp/lead_levels_in_children_fact_sheet.pdf (accessed October 21, 2014).
19. Individuals told Human Rights Watch that they or their family members were tested for lead but did not receive those test results: Human Rights Watch interviews with Ma Ong Seng, "Wan Ni," "Phrun Ni," Kamthorn, Tongcho, Yasoer, and Minh, Klity Creek, July and August 2014. Individuals told Human Rights Watch there was no treatment or follow-up medical attention after test results: Human Rights Watch interviews with Sampong, "Wan Ni," Somchai, Yasoer, and Minh, Klity Creek, July and August 2014.
20. Individuals told Human Rights Watch blood tests for lead among local residents stopped in 2007-2008: Human Rights Watch interviews with Ma Ong Seng, Sampong, "Sap Da," "Wan Ni," Somchai, and Kamthorn, Klity Creek, July and August 2014.
21. Human Rights Watch interviews with Sompong and Chanthira, Klity Creek, July and August 2014.
22. Test result form, undated, seen by Human Rights Watch, July 2014.
23. Advisory Committee for Childhood Lead Poisoning Prevention of the [US] Centers for Disease Control and Prevention, "Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention," January 4, 2012, pp. x-xi.
24. Advisory Committee for Childhood Lead Poisoning Prevention of the [US] Centers for Disease Control and Prevention, "Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention," January 4, 2012, p. x.
25. For example, some test result forms handed to individuals contain the suggestion that the person "stop consuming water and aquatic animals from Klity Creek": Kanchanaburi public health office, test result form, undated, seen by Human Rights Watch, August 2014.
26. Ministry of Natural Resources and Environment, "Thailand State of Pollution Report," 2009, p. 7.
27. Paweena Panichayapichet et al.,"Evaluation of Ability of Rock Check Dam to Prevent the Transportation of Pb-Contaminated Sediment in Khli Ti Creek, Thailand," Chinese Journal of Geochemistry, 25(2006): 119-120, accessed October 23, 2014,doi: 10.1007/BF02839968.
28. Sopon Tatichotiphan, director of the pollution inspection division of the Pollution Control Department, quoted in Atiya Achakulwisut, "Deadly River," Bangkok Post, January 30, 2001, http://www.bangkokpost.com/outlookwecare/300101_Outlook01.html (accessed October 23, 2014).
29. Ministry of Natural Resources and Environment, "Thailand State of Pollution Report," 2005, p. 110. Natural remediation, also known as natural attenuation or monitored natural attenuation, is an accepted method of cleaning up contaminated sites, whereby natural processes decrease concentrations of contaminants in soil and groundwater. According to the [US] Environmental Protection Authority, "[natural remediation] is selected when any contaminant source has been removed and only low concentrations of contaminants remain in soil or groundwater. The anticipated cleanup time for monitored natural attenuation must be reasonable compared to that of other more active cleanup methods." [US] Environmental Protection Agency, "A Citizen's Guide to Monitored Natural Attenuation," 2012, http://www.clu-in.org/techfocus/default.focus/sec/Natural_Attenuation/cat/Overview/ (accessed November 13, 2014).
30. Mr. Yaseuh Nasuansuwan and 21 others v. Pollution Control Department, Supreme Administrative Court, Case No. Q597/2551, Judgment, November 16, 2012. Copy on file with Human Rights Watch.
31. International Covenant on Economic, Social and Cultural Rights (ICESCR), adopted December 16, 1966, G.A. Res. 2200A (XXI), 21 U.N. GAOR Supp. (No. 16) at 49, U.N. Doc. A/6316 (1966), 993 U.N.T.S. 3, entered into force January 3, 1976, acceded to by Thailand on September 5, 1999, art 12; Convention on the Rights of the Child (CRC), adopted November 20, 1989, G.A. Res. 44/25, annex, 44 U.N. GAOR Supp. (No 49) at 167, U.N. Doc. A/44/49 (1989), entered into force September 2, 1990, ratified by Thailand on March 27, 1992, art. 24.
32. The Committee on Economic, Social and Cultural Rights is the UN body responsible for monitoring compliance with the ICESCR. UN Committee on Economic, Social and Cultural Rights, General Comment No. 14: The right to the highest attainable standard of health, UN Doc. E/C.12/2000/4, adopted August 11, 2000, para. 59.
33. ICESCR, art. 11.
34. UN General Assembly Resolution, The human right to water and sanitation, UN Doc. A/RES/64/292, July 29, 2010.
35. A. Wangkiat, "Preliminary Study on the Revival of Klity Creek, Kanchanaburi Province," unpublished document, June 2006. Copy on file with Human Rights Watch; T. Phenrat, "Resuspension of Lead Caused by Dredging Klity Creek: Theory of Basic Assessment and Limitation," unpublished document, January 17, 2013. Copy on file with Human Rights Watch.
36. The Strategic Environmental Assessment, completed in 2013, does not make a clear recommendation to re-open lead mines in Kanchanaburi province, but presents various policy options (reservation, conservation and development) available to the Thai government. The overall tone is pro-development, suggesting at many points that leaving lead in the ground will prevent the country from economic benefits and development opportunities, especially for the battery industry. See Chula Unisearch of Chulalongkorn University, "Preliminary strategic environmental assessment for the management of geological resources (lead, zinc)," unpublished document, 2013. Copy on file with Human Rights Watch. See also Piyaporn Wongruang, "Lead Poisoning a Gamble for Country's Billion Baht Reserve," Bangkok Post, September 15, 2013, http://www.bangkokpost.com/lite/topstories/369771/favicon.ico (accessed October 23, 2014).

TOXIC WATER, TAINTED JUSTICE

Thailand's Delays in Cleaning Up Klity Creek

A 7-year-old boy swims in Klity Creek in Kanchanaburi, Thailand. The Pollution Control Department's environmental tests for 2013 (the last year with all data published) regularly found unacceptably high levels of lead in soil along the creek bank, as well as water, creek sediment, fish, shrimp, crabs and vegetables at various locations along the creek. December 8, 2014.

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