

Left in the dust

AREVA's radioactive legacy in the
desert towns of Niger



GREENPEACE

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In one of the poorest countries in the world, ranking last in the Human Development Index of the United Nations Development Programme (UNDP), where more than 40% of children are underweight for their age, water and access to improved water sources is scarce and almost three quarters of the population are illiterate¹, the French nuclear giant AREVA extracts precious—and deadly—natural resources, earning billions for its Fortune 500² corporation, and leaving little behind but centuries of environmental pollution and health risks for the citizens of Niger.

¹ United Nations Development Programme (UNDP), 2009. Human Development Index Niger 2007 http://hdrstats.undp.org/en/countries/country_fact_sheets/cty_fs_NER.html (accessed March, 2009)

² <http://money.cnn.com/magazines/fortune/global500/2009/snapshots/11244.html> (accessed March, 2009)



Somair open pit uranium mine, Niger.

For more information contact
enquiries@greenpeace.org

Writer: Andrea A. Dixon
 Contributors: Romain Chabrol,
 Bruno Chareyron, Alexandra Dawe,
 Nina Schulz, Rianne Teule, Aslihan Tumer
 Photography: © Philip Reynaers

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 Greenpeace International
 Ottho Heldringstraat 5
 1066 AZ
 Amsterdam
 The Netherlands

www.greenpeace.org

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Daily life, in and around Arlit and Akokan.



Executive summary

Nuclear energy giant AREVA is attempting a new nuclear revolution. The company has activities in over 100 countries throughout the world and aggressively pushes nuclear energy in new markets. Its public relations teams have been working overtime to convince governments, investors and the general public - hungry for clean energy - that nuclear energy is now a safe, clean, and 'green' technology. The devastating effects caused by this alarming misconception are already being felt.

Generating nuclear energy requires fuel that is acquired through the destructive and deadly activity of uranium mining. Uranium mining can have catastrophic effects on nearby communities and the environment for thousands of years to come. There are few places where these harmful effects are felt more distinctly than Niger, Africa.

A landlocked-Saharan country in West Africa, Niger has the lowest human development index on the planet. Arid desert, scarce arable land and intense poverty are hugely problematic - unemployment, minimal education, illiteracy, poor infrastructure and political instability are rife. However, Niger is rich in mineral resources - like uranium.

AREVA established its mining efforts in northern Niger 40 years ago, creating what should have been an economic rescue for a depressed nation. Yet, AREVA's operations have been largely destructive. There are great clouds of dust, caused by detonations and drilling in the mines; mountains of industrial waste and sludge sit in huge piles, exposed to the open air;

and the shifting of millions of tonnes of earth and rock could corrupt the groundwater source, which is quickly disappearing due to industrial overuse.

AREVA's negligent mismanagement of the extraction process can cause radioactive substances to be released into the air, seep into the groundwater and contaminate the soil around the mining towns of Arlit and Akokan, all of which permanently damages the environmental ecosystem and can create a multitude of health problems for the local population.

Exposure to radioactivity can cause respiratory problems, birth defects, leukaemia and cancer, to name just a few health impacts. Disease and poor health abound in this region, and death rates linked to respiratory problems are twice that of the rest of the country³. Yet AREVA has failed to take responsibility for any impacts. In fact, its company-controlled hospitals have been accused of misdiagnosing cases of cancer as HIV⁴. It claims there has never been a case of cancer attributable to mining in 40 years⁵—what it doesn't say is that the local hospitals do not staff any occupational doctors, making it impossible for someone to be diagnosed with a work-related illness.

The governmental agency in place to monitor or control AREVA's actions is understaffed and underfunded⁶. For years, NGOs and international agencies have attempted to test and assess the dangerous levels of radiation that Niger is being exposed to. A comprehensive, independent assessment of the uranium mining impacts has never taken place.

3 Chareyron B, 30 January 2008. Note CRIIRAD N°08-02 AREVA : Du discours à la réalité. L'exemple des mines d'uranium au Niger.

4 Sherpa, 25 April 2005. LA COGEMA AU NIGER - Rapport d'enquête sur la situation des travailleurs de la SOMAIR et COMINAK, filiales nigériennes du groupe AREVA-COGEMA, pg. 18.

5 AREVA, January 2009. AREVA in Niger, pg. 17.

6 Interview with Hamadou Kando, inspector and chief of technical services at CNRP, Niamey, Niger, November 2009

However, in November 2009, Greenpeace - in collaboration with the French independent laboratory CRIIRAD and the Nigerien NGO network ROTAB - was able to do a brief scientific study of the area, measuring the radioactivity of the water, air and earth around the AREVA mining towns. While not exhaustive, the results were disturbing:

- In 40 years of operation, a total of 270 billion litres of water have been used, contaminating the water and draining the aquifer, which will take millions of years to be replaced.
- In four of the five water samples that Greenpeace collected in the Arlit region, the uranium concentration was above the WHO recommended limit for drinking water. Historical data indicate a gradual increase in uranium concentration over the last 20 years, which can point at the influence of the mining operation. Some of the water samples even contained dissolved radioactive gas radon.
- A radon measurement performed at the police station in Akokan showed a radon concentration in the air three to seven times higher than normal levels in the area.
- Fine (dust) fractions showed an increased radioactivity concentration reaching two or three times higher than the coarse fraction. Increased levels of uranium and decay products in small particles that easily spread as dust would point at increased risks of inhalation or ingestion.
- The concentration of uranium and other radioactive materials in a soil sample collected near the underground mine was found to be about 100 times higher than normal levels in the region, and higher than the international exemption limits.
- On the streets of Akokan, radiation dose rate levels were found to be up to almost 500 times higher than normal background levels. A person spending less than one hour a day at that location would be exposed to more than the maximum allowable annual dose.
- Although AREVA claims no contaminated material gets out of the mines anymore, Greenpeace found several pieces of radioactive scrap metal on the local market in Arlit, with radiation dose rate reaching up to 50 times more than the normal background levels. Locals use these materials to build their homes.

After Greenpeace published some initial findings at the end of November 2009, AREVA had to take action. Some radioactive spots indicated by Greenpeace in one of the mining villages were cleaned up. However, this limited clean-up does not diminish the need for a comprehensive study so that all areas can be made safe for the community.

Greenpeace is calling for an independent study around the mines and towns of Arlit and Akokan, followed by a thorough clean up and decontamination. Controls must be put in place to ensure that AREVA follows international safety norms in its operations, taking into account the well-being of its workers, the surrounding populations and environment. AREVA must start to act like the responsible company that it claims to be. It must inform its workers and the local community about the risks of uranium mining; many of people in Niger have never heard of radioactivity and do not understand that uranium mining is dangerous.

The people of Arlit and Akokan continue to be surrounded by poisoned air, contaminated soil and polluted water. With each day that passes, Nigeriens are exposed to radiation, illness and poverty - while AREVA makes billions from their natural resources. The Nigerien people deserve to live in a safe, clean and healthy environment, and to share in the profits from the exploitation of their land.

AREVA, with its attempt to create a nuclear renaissance, brings to these communities the threat of losing the most basic elements necessary for life - poisoning their air, water and earth.

This report shows that nuclear power gambles with our lives, health and environment from the very beginning of the nuclear chain - mining for uranium. Dangerous and dirty nuclear power has no role in our sustainable energy future. Greenpeace calls for an energy revolution based on sustainable, cheap and safe renewable energies and energy efficiency.





Daily life, in and around Arlit and Akokan.



Daily life, with SOMAIR uranium mine in the background.

Introduction

The recent global surge of interest in nuclear power indicates an alarming misconception that nuclear energy is a clean and safe technology. This fallacy has been fuelled by the nuclear industry's aggressive promotion that it is a 'low-carbon' energy source. This report aims to dispel that myth by revealing the multitude of dangers and problems that AREVA's uranium mining has caused in and around the mining towns of Arlit and Akokan, Niger. AREVA has exploited the population and impacted upon the earth, the water and even the air around the mines. Greenpeace demands drastic action on the part of AREVA to literally clean up its act in Niger.

A Greenpeace team visited the uranium mining region in Niger between 1 and 9 November, 2009. The team's aim was to document the environmental impacts and associated human health risks caused by AREVA's uranium mines. The visit was prepared in collaboration with the French scientific laboratory CRIIRAD⁷ and ROTAB⁸, a network of NGOs in Niger.

Earlier work by CRIIRAD (since 2003) in collaboration with local NGO Aghir In'Man had identified a range of problems related to radioactive contamination. This included the contamination of drinking water from uranium and the presence of radioactive scrap metal in the mining towns.

When AREVA learned about the Greenpeace mission, it invited the team to document the mining sites. However, due to restrictions by local authorities it was not possible to move freely in the area around the mines and take all of the planned samples to carry out a full study. The team did, however, conduct a limited survey and was able to meet with local civil society and former mine workers.

Over the past years CRIIRAD and, later, Greenpeace have made numerous requests to AREVA for specific

information about the mining impacts in Niger. Despite AREVA's claims that it is a transparent and open company, prior to the Greenpeace expedition, AREVA had still not supplied the requested necessary data. During the 2009 visit, part of the information was finally provided⁹. However, crucial data concerning radon emissions and diffusion into the environment, closed water wells, and the mapping of gamma radiation levels in Arlit and Akokan were not provided. Given these technical limitations, and security restrictions in the area, the Greenpeace team has been unable to carry out a full study. In fact, a complete independent radiological and environmental survey has never been conducted in the area.

This report covers the wide range of problems around the mines, based on Greenpeace's findings, scientific analyses, documentation and witness statements. The report is not intended to be an exhaustive study on the negative effects of nuclear energy, uranium mining, or the global activities of the AREVA corporation. The findings by Greenpeace are intended to point out existing health and environmental risks posed by the Niger uranium mines that were recordable at the time of the research. The scientific analyses done by CRIIRAD are described in CRIIRAD report N°10-09¹⁰.

Despite the limitations of the survey, Greenpeace's findings, like the previous findings by CRIIRAD, are alarming. They confirm the need for complete and independent radiological and epidemiological studies to be carried out in the region. An exhaustive, independent study is essential to identify all risks, followed by a complete and thorough remedy to safeguard the people and environment in the mining region.

7 CRIIRAD = Commission de Recherche et d'Information Indépendantes sur la Radioactivité (Commission for Independent Research and Information on Radioactivity), www.criirad.org

8 ROTAB = Réseau des Organisations pour la Transparence et l'Analyse Budgétaire (Network of Organizations for Transparency and Budget Analysis), www.rotabniger.org

9 In order to obtain information from AREVA essential to evaluate environmental impacts from the uranium mining operations, Greenpeace signed a non-disclosure agreement when it received the information from AREVA. When publishing the first Greenpeace findings on 26 November 2009, some of the AREVA data was made public after Greenpeace notified AREVA that such data would be disclosed in the urgent interest of public health and safety. AREVA did not object to such disclosure. When necessary to substantiate the information in this report, references are made to some of the documentation provided by AREVA in November 2009.

10 CRIIRAD, February 2010. Report CRIIRAD N°10-09, 'Remarques sur la situation radiologique dans l'environnement des sites miniers uranifères exploités par SOMAÏR et COMINAK (filiales d'AREVA) au Nord du NIGER'

AREVA in Niger

Nuclear energy giant AREVA - whose majority shareholder is the French government - and its local subsidiaries have been mining uranium in Niger for over 40 years. In 1968, a holding company and the first mine, SOMAIR, were created¹¹. Excavation began at SOMAIR in 1971. The open-pit mine, which varies from 50 to 70 metres deep, is located seven kilometres northwest of the mining town of Arlit.

A second AREVA holding company and mine, COMINAK, were created in 1974. Production at COMINAK, located a few kilometres from the town of Akokan, commenced in 1978. Unlike SOMAIR, COMINAK is an underground mine. With a depth of 250 metres and over 250 kilometres of galleries, COMINAK is the largest underground mine in the world.

Since the beginning of production, SOMAIR and COMINAK have excavated over 52 million tonnes of ore, from which over 100,000 tonnes of uranium have been extracted¹². On average, the mines produce over 3,000 tonnes of uranium and net €200 million in sales each year.¹³ A third mine, Imouraren, is planned to start production in 2013 and is projected to be the largest uranium mine in Africa and the second largest in the world, with an annual production capacity of 5,000 tonnes of uranium¹⁴.

AREVA's revenues for 2008 (most recently published) were €13.1 billion, with a profit of €589 million.¹⁵ SOMAIR generated €161.7 million of that revenue by producing 1,743 metric tonnes of uranium. COMINAK earned sales of €100.6 million for its supply of 1,289 metric tonnes of uranium concentrate.¹⁶



11 AREVA, January 2009. AREVA in Niger.

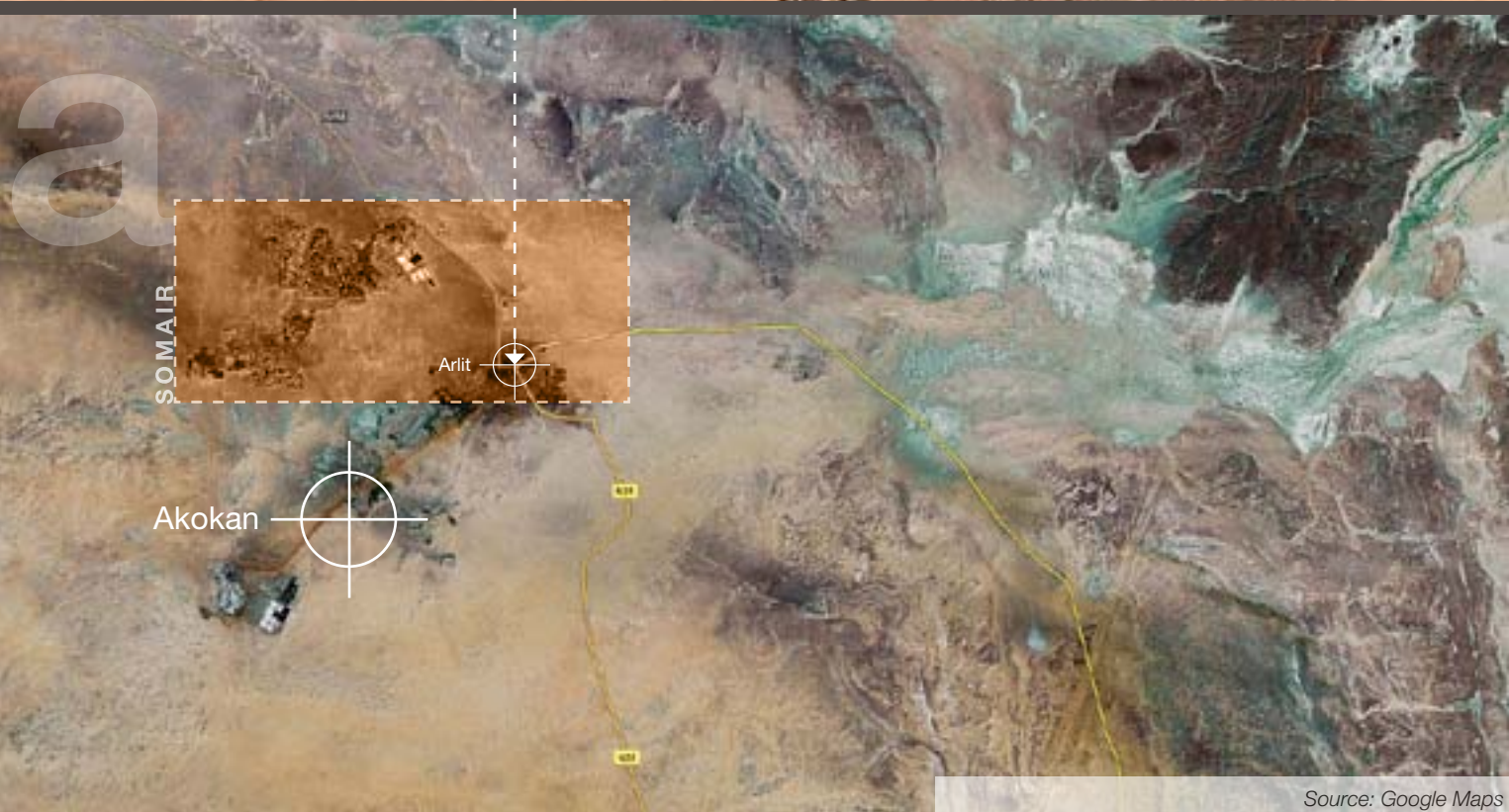
12 An ore is a type of rock that contains minerals with various valuable elements including metals. During the mining process, the ore is separated from unusable (waste) rock; it is then processed to extract the valuable element(s).

13 AREVA, January 2009. 2007 figures reported in 'AREVA in Niger'.

14 AREVA Press Release, 4 February 2009. AREVA, KEPCO sign partnership to develop Imouraren mine, plan to extend cooperation. <http://www.aveva.com/EN/news-8192/aveva-kepco-sign-partnership-to-develop-imouraren-mine-plan-to-extend-cooperation.html>

15 AREVA, 2009. Group performance for 2008. <http://www.aveva.com/EN/group-706/a-group-in-sustained-growth.html>

16 AREVA, 2009. Cominak: Operation of an unparalleled mine. <http://www.aveva.com/EN/operations-602/cominak-operating-the-largest-underground-mine-in-the-world.html>



Source: Google Maps

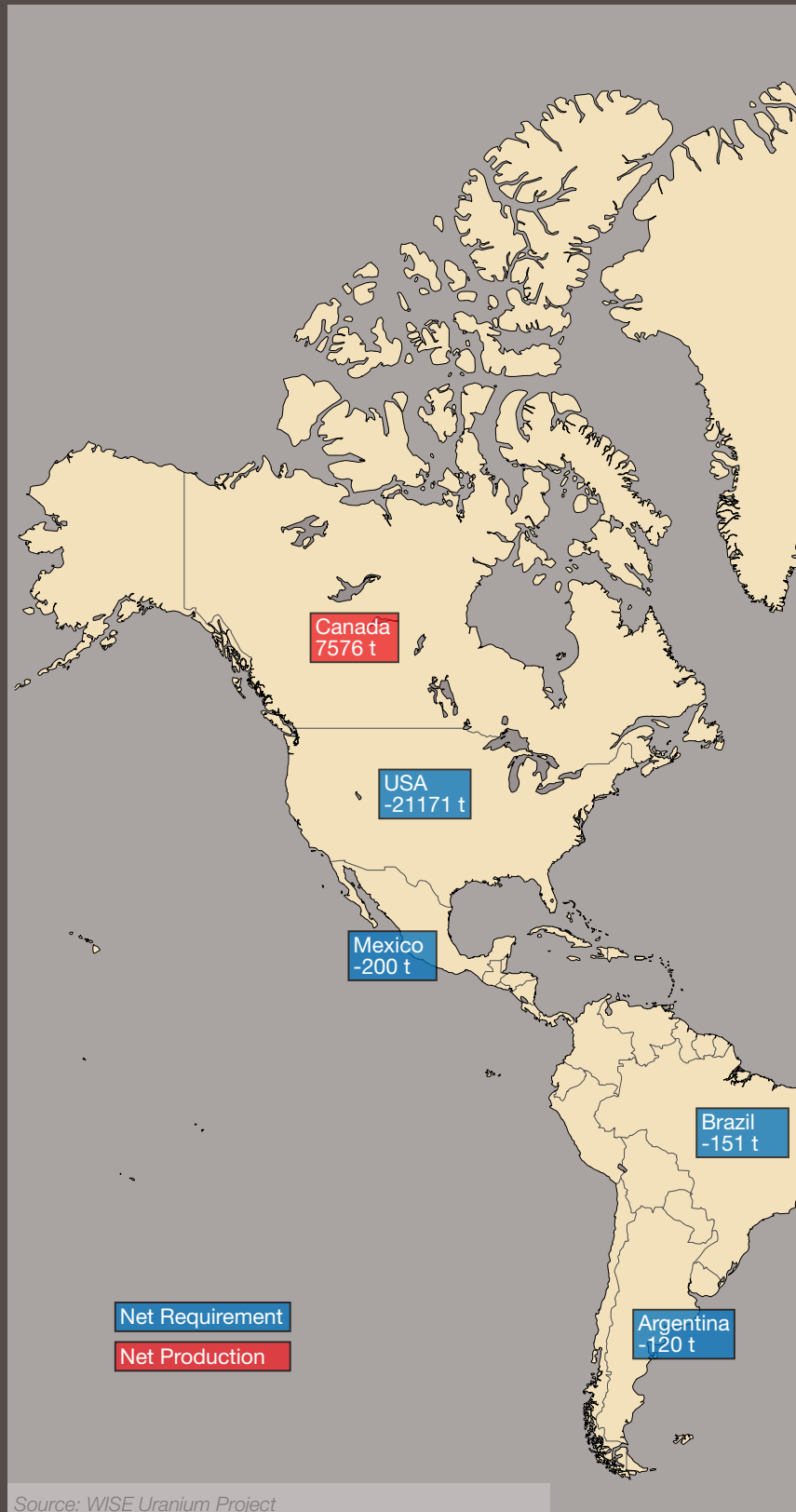
AREVA's international operations

AREVA is one of the world's largest nuclear energy companies. Headquartered in Paris, it is the only company in the world involved in all parts of the nuclear energy chain: uranium mining, chemistry, enrichment, fuel production, engineering, nuclear propulsion, reactors, reprocessing and decommissioning, as well as several other sub-sectors. AREVA has a presence in over 100 countries worldwide, and is looking to further expand its business in Asia, Africa and the Americas.

This expansion outside of Europe is caused in part by disappointments in its desired nuclear revival in western countries, such as delays and cost overruns in the construction of new reactors in Finland and France¹⁷; AREVA is now focussing its energies on selling reactors and services in other parts of the world. The company even considers selling older and cheaper reactors to countries that are new to nuclear power, even though safety standards in western countries would not allow these old designs to be built¹⁸. Furthermore, AREVA is aggressively exploring uranium mining possibilities in a range of other African and Asian countries¹⁹.

In recent years, exploration for uranium has significantly increased all over the world²⁰. The rising interest is caused by renewed talks about nuclear power, while at the same time part of the current uranium supply - from decommissioning of nuclear weapons materials - is running out. This uranium rush has resulted in a new phase of colonialism, with Africa opening up to mainly Chinese, French and Canadian companies interested in exploiting this valuable resource.

AREVA is one of the most active uranium mining companies in Africa, being present in 10 African countries. In addition to the mines in operation in Niger, AREVA plans to open a uranium mine in Namibia and is exploring in the Central African Republic (CAR), Gabon, Senegal, South Africa, the DRC, Morocco, Mauritania and Guinea²¹. AREVA's more than 40-year monopoly in Niger was broken in 2007 when the Nigerien government allowed several other countries permits for future prospection and excavation.



¹⁷ Deckstein D, Dohmen F, Meyer C, 15 October 2009. Der Spiegel: Nuclear Renaissance Stalls; Problems Plague Launch of 'Safer' Next-Generation Reactors.

¹⁸ Hollinger P, 14 January 2010. Financial Times: AREVA looks at bringing out older reactors.

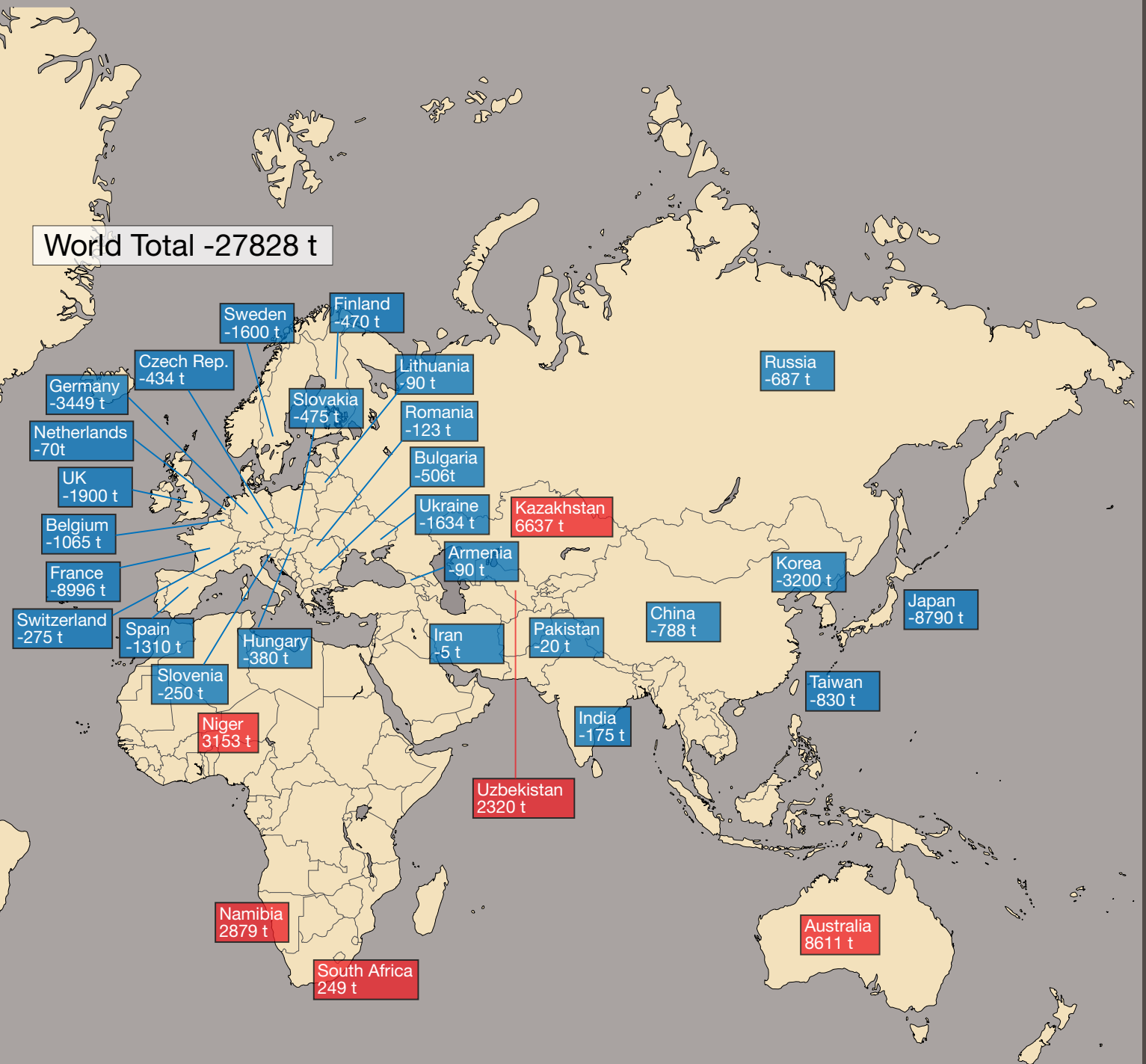
¹⁹ Uranium Mining Issues: 2009 Review, <http://www.wise-uranium.org/uissr09.html>

²⁰ Uranium Mining Issues: 2009 Review, <http://www.wise-uranium.org/uissr09.html>

²¹ World Information Service on Energy, <http://www.wise-uranium.org>

2007 Uranium Production vs. Requirements Balance

[Metric tonnes of uranium] (OECD 2008, WNA 2008)



Uranium mining in Niger

France's uranium mining activities started during the race for uranium shortly after World War II. Domestic uranium resources were already being mined, but in the 1960s new public awareness of the dangers of nuclear power and the harmful effects of uranium mining, in combination with rising costs and decreasing resources, forced France to further explore its colonies. A devastating activity like uranium mining is much easier and cheaper in poor, underdeveloped countries: no bureaucratic red tape (thanks to the political connections of colonial times); hardly any interference by health and environment watchdogs; and remote locations where activities happen 'under the radar'. As one commentator stated about the nuclear boom, "Getting a mine going in Texas takes two bookshelves full of authorisations... In Niger you give a shovel to a guy on \$2 a day and you're mining uranium."²²

Before AREVA began prospecting for uranium in Niger, this area of West Africa, known as the Agadez region, was home to many nomadic tribes and cultures, predominately the Tuareg and Peulh. The Tuareg, estimated at 1.5 million,²³ are a tribe without a country: they have wandered the deserts of the Sahara since the 7th century, across the borders of present-day nation states. Both the French colonists and the modern-day governments that have followed have continued to marginalise the Tuareg and dismiss their claims to land rights and autonomy. The Tuareg repeatedly lose the land and resources they need to survive. A lack of clean water and fertile soil, in particular, threatens to destroy these nomadic herders.²⁴ Angry and desperate, a Tuareg rebellion arose two decades ago, causing instability and security problems in the region, which have continued on and off for many years despite negotiations. Due to these security issues, NGOs and journalists have been forced out of northern Niger by the government²⁵.



²² *The Times Online*, "The Great Uranium Stampede," http://business.timesonline.co.uk/tol/business/industry_sectors/natural_resources/article7009629.ece

²³ *Media Monitors Network*, "Blumen and Yellowcake: The struggle of the Tuareg in West Africa" (March 2009), <http://usa.mediamonitors.net/content/view/full/60963>

²⁴ *Al Jazeera*, 31 August 2008. 'Foreigners Vie for Niger's Riches'

²⁵ International Relations and Security Network (ISN), 28 August 2009. 'Niger: Democracy Under Threat', <http://www.isn.ethz.ch/isn/Current-Affairs/Security-Watch/Detail/?lng=en&id=105265>



AREVA-operated COMINAK underground uranium mine, Akokan.



Akokan and Arlit

In order to facilitate the creation of a workforce in northern Niger's uranium belt, AREVA created the towns of Arlit and Akokan²⁶ *ex nihilo* to house its 2,000 plus employees in the middle of the barren Sahara. A two-day journey through the desert from the capitol Niamey (800 kilometres), this region of northern Niger is extremely desolate and remote. After 40 years of existence, the two towns, which are only a few kilometres apart, make up an urban area with a population of approximately 80,000 inhabitants²⁷.

According to AREVA, nearly all the inhabitants are in some way connected to the AREVA mines: workers, their families (the average household has eight children), as well as the social systems and businesses that support local life.

Town officials and a majority of the 2,400 miners and their families have company-maintained family homes with nice roads, running water, electricity, schools, AREVA-run hospitals, and a sports complex. However, there is also 'another' district - a shanty town of dusty dirt roads littered with garbage around a collection of haphazard huts built out of mud, corrugated iron, scrap metal and plastic sheets. According to one account,²⁸ "Entering the town is a little like becoming an extra in a 1950s B-movie about the end of the world. Unlike the majority of workers in the mines, who have been brought in from southern Niger, most of the 60,000 odd residents who live in Arlit's shanty towns are from the north."



Surveying in Akokan.

²⁶ Latin: out of nothing

²⁷ AREVA, January 2009. 'AREVA in Niger'.

²⁸ *Guardian*, "Niger and the Real Cost of Nuclear," <http://www.guardian.co.uk/commentisfree/2009/feb/01/nuclear-power-africa-niger>



Akokan, Niger.



Early studies commence, but with difficulty

In response to a call from local resident Almostapha Alhacen, president of local NGO Aghir in'Man²⁹, CRIIRAD and French human rights organisation Sherpa travelled to Arlit in December 2003 to evaluate the health and safety conditions and conduct a first review of the radiological environment. They planned to interview former workers and local doctors, and take radiological readings of the environment. However, when they arrived in the capitol Niamey, CRIIRAD's equipment was seized at customs. It was later discovered that the director of operations of COMINAK had tried to persuade Alhacen to convince the NGOs to cancel the research study, which Alhacen refused to do³⁰.

Since the first trip in 2003, CRIIRAD has carried out multiple studies and issued several reports³¹ documenting its alarming findings. In samples taken of the air, water, soil and scrap metal in the region, readings identified dangerous radiation in the towns, sometimes far exceeding international safety standards. In partnership with CRIIRAD, the French association Sherpa³² visited the mining region in 2003 and interviewed local doctors, citizens and workers to investigate the origins of health problems being encountered by the local population³³. Its work reinforced the need for independent studies on the situation around the Niger uranium mines.

29 Aghir in'Man, which means 'the shield of the soul' in the Tuareg language, is an environmental and workers'/human rights organisation

30 Chareyron B, 30 January 2008. Note CRIIRAD N°08-02 'AREVA : Du discours à la réalité / L'exemple des mines d'uranium au Niger'.

31 Chareyron B, "Compte rendu de mission à ARLIT du 3 au 11 décembre 2003. Mission exploratoire en vue de la réalisation d'une expertise indépendante de l'impact radiologique des mines d'uranium SOMAIR et COMINAK", Rapport CRIIRAD N°03-40, 19 December 2003 ; Chareyron B. 2008 op. cit.

32 Sherpa is an association of lawyers specialised in corporate social responsibility and international law. www.asso-sherpa.org

33 Sherpa, "La Cogema au Niger. Rapport d'enquête sur la situation des travailleurs de la SOMAIR et COMINAK, filiales nigériennes du groupe AREVA-COGEMA", 25 April 2005.

Nuclear in brief

In order to better understand the radiological findings, it is helpful to have a brief overview of nuclear energy and uranium mining.

Nuclear energy is the energy that is released when atoms are split. This process produces dangerously radioactive materials. These materials emit radiation that can be very harmful to people and animals, and damages the environment for hundreds of thousands of years to come.

Nuclear power plants use uranium as fuel. Before it is ready to be used as fuel, a series of processing steps create large volumes of waste and serious environmental contamination: uranium mining, leaching³⁴ of the uranium from the ore, chemical conversion, uranium enrichment and production of nuclear fuel. After the uranium is used in the nuclear reactor, the waste created remains radioactive for hundreds of thousands of years.

How is uranium mined?

Uranium is most often mined through open-pit mining and closed (tunnel) galleries. First, waste rock³⁵ is excavated in order to reach the mineral-rich ore. While waste rock does not contain valuable amounts of uranium, it does (unlike normal rock) contain higher concentrations of radioactive elements, like uranium and its decay products³⁶. It is often left exposed in mountain-like heaps until a mining site is exhausted and then refilled. Similarly, ore that contains too-low uranium concentrations to be worth processing is also discarded like waste rock. These piles of industrial waste can emit dangerous amounts of radioactivity into the environment.

After usable ore is excavated, it is crushed and leached with chemicals and water in a uranium mill. These chemical plants are often located in close proximity to the mines to limit the transportation of crude ore—SOMAIR and COMINAK each have their own dedicated uranium mill, using sulphuric acid as a leaching agent. During the process of leaching, several other minerals (heavy metals and radioactive elements) are also extracted with uranium, and must later be separated out.

Following the separation, the final product, commonly referred to as 'yellow cake' (with impurities), is packed and shipped for further processing. The leftover sludge of separated elements, known as tailings, is dumped in piles or special ponds. Apart from the portion of uranium removed, all radioactive decay products remain in this sludge. This includes long-lived decay products such as thorium-230 and radium-226 and some remaining uranium. Hence, the tailings sludge contains **85% of the initial radioactivity** of the ore. The chemical agents used in the leaching process, as well as heavy metals and other contaminants like arsenic, are also left behind in the tailings.³⁷ Non-radioactive contaminants released in the mining process, such as copper, manganese, arsenic and cadmium can also have serious health effects.

How is uranium dangerous?

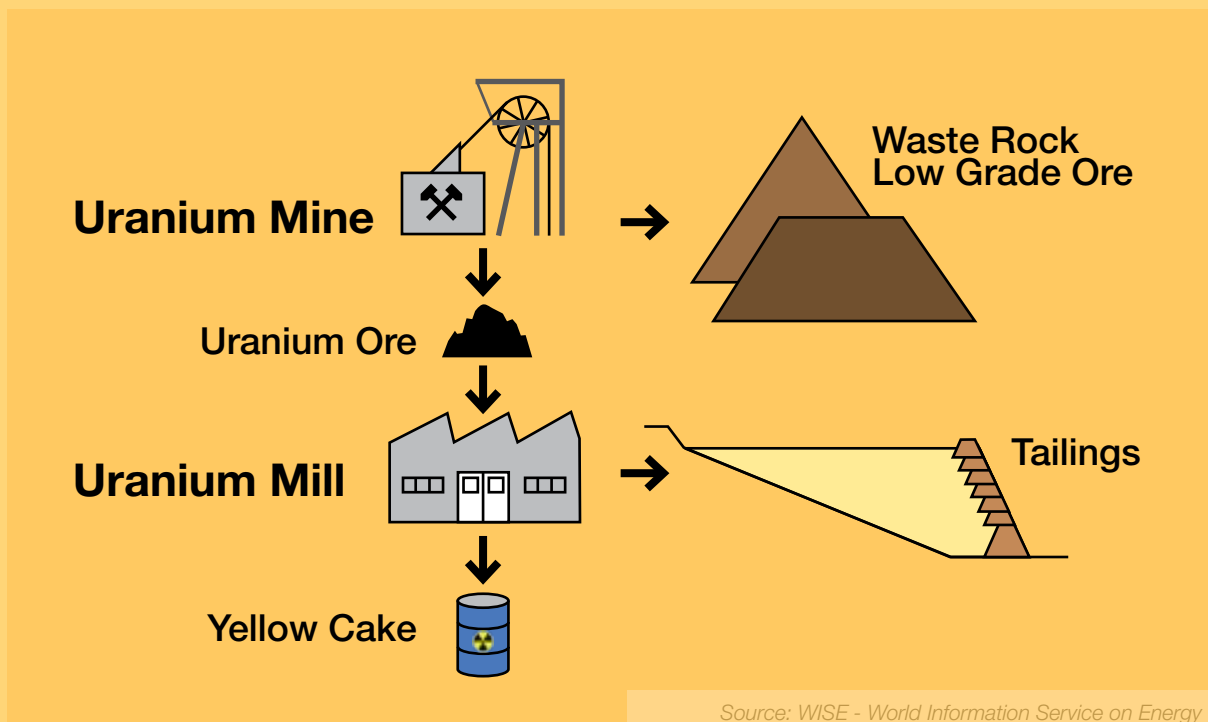
Uranium is a naturally occurring resource. Uranium and its natural decay products are both radioactive and toxic. While uranium is buried underground, the Earth's layers protect populations and the environment from its dangerous radiation. However, when the earth around uranium ore is disturbed, as is the case during mining excavation, the waste rock and tailings emit high concentrations of radon into the air, particularly when left exposed in the open air. The wind can cause radioactive dust from the mine to travel great distances around the radius of the disturbance.

³⁴ Extraction, using a chemical agent; often acid is used to extract the mineral from the ore.

³⁵ Waste rock is 'useless' rock that is removed during the mining process in order to reach the mineral-containing ore.

³⁶ Radioactive decay, or loss of energy, is the process in which an unstable atom spontaneously emits ionising radiation. This decay results in a transformation to another atom, named the daughter product or decay product.

³⁷ World Information Service on Energy, <http://www.wise-uranium.org>



The mining disturbance, which happens deep within the Earth's layers, can also affect the groundwater, as radioactive material can contaminate drinking water supplies. Because of the long lifetime of these contaminants, hazardous impacts from uranium mining can be expected to last tens of thousands of years after mining operation has stopped.

Exposure to radioactivity has been linked to genetic mutations, birth defects, cancer, leukaemia and disorders of the reproductive, immune, cardiovascular and endocrine systems³⁸. Internal contamination³⁹ with radioactive materials often results in significant radiation exposure because the substances can stay trapped in the body for long periods of time and continue to emit radiation.

Inhalation and ingestion of alpha-emitting⁴⁰ particles is especially dangerous. The toxic effects of contaminants (including non-radioactive) also have serious health impacts, such as kidney and liver diseases, hypotension, etc.⁴¹

The dose from external exposure to radiation for local population around uranium mines is limited when mine materials do not spread. The typical dose rate close to uranium ore containing 0.1% uranium is about 5 microSieverts⁴² an hour, between 25 and 50 times more than normal background radiation. The dose rate is further elevated close to waste rocks and tailings. This mainly poses a risk to miners, who possibly spend a lot of time close to the ore, waste rocks and tailings. Note that this risk is in addition to the dose from exposure caused by internal contamination.


38 See for example US Environmental Protection Agency. http://www.epa.gov/rpdweb00/understand/health_effects.html

39 The risk of radiation exposure can be divided into two categories: (1) external radiation from radioactive elements outside of the body; (2) internal contamination of the body with radioactive elements that enter the body.

40 There are three types of ionising radiation: alpha, beta and gamma. Gamma radiation is electromagnetic radiation, like X-rays. Alpha and beta radiation are small particles, i.e. helium atoms and electrons respectively.

41 See for example: *Guidelines for drinking water quality*, first addendum to third edition. Vol 1: Recommendations. WHO, 2006. This version of the guidelines integrates the third edition, which was published in 2004.

42 MicroSievert: a unit which measures radiation dose levels



“Our city is covered in dust. We have taps in our homes but at times, we can spend two weeks without water, only dust. And you have to pay for that.”⁴³

Salifou Adinfo, former driller for 33 years with AREVA

43 Interview with Salifou Adinfo, November 2009. Former driller for AREVA, Arlit, Niger

Water



A disappearing water supply

In 40 years of operation, a total of 270 billion litres of water have been used, contaminating the water and draining the aquifer which will take millions of years to be replaced.

One of the harmful effects of uranium mining in Niger is its impact on water resources. Millions of litres of water are used daily in the mining operations, particularly in the leaching process to separate the uranium from the ore. The water is pumped from a groundwater table - the Tarat aquifer - which is 150 metres deep. This is a fossil aquifer, meaning the water is not easily renewed: it will take millions of years for it to fill up again. Consequently, the water use in the mines and the mining towns causes a long-term depletion of the region's water resources.

In 40 years of operation, a total of 270 billion litres of water have been used in Arlit and Akokan⁴⁴. Based on an old preliminary study from 1968, AREVA claims that this represents about 20% of the Tarat aquifer⁴⁵. About 35% of the water is said to be used for industrial use, while the other 65% is for drinking water production. Though AREVA claims the use of water has declined in the last decade, there was an increase in water use in the SOMAIR mine in the past years⁴⁶. When asked for an explanation, AREVA said that more water is used in the new ore leaching process. Also, the water use is proportional to the increase in production: the more uranium produced, the more water used.

⁴⁴ AREVA, "AREVA in Niger, January 2009", pg.9.http://niger.areva.com/niger_home/liblocal/docs/AREVA%20au%20Niger%20janvier%202009%20version%20anglaise.pdf

⁴⁵ Cogema Niger, "Synthese Hydrogeologique. La nappe du Tarat dans la region d'Arlet-Akokan", May 2004.

⁴⁶ Mahamadou I., SOMAIR Site Manager, Presentation to Greenpeace, 2 November 2009.

A hydrogeological study from 2004 establishes the significance of the water use in the mines. “In the section of the CK [COMINAK] mine, the water has been completely drained and its level has dropped to the wall of Tarat [aquifer] (decrease of 150 metres); this has sometimes led to an inability to operate the water wells dug near the mine, namely Comi_10, Comi_11 and Arli_987.”⁴⁷

When asked about the legacy AREVA leaves to the area, Almoustapha Alhacen, president of local NGO Aghir in’Man, said, “Enduring pollution! Lack of water, because the ground water table is already at 70%. As they fill every 100 million years, one can say they are not filling. The fauna has also disappeared. The flora has disappeared. It is a desert country, but there are trees...their roots cannot grow deeper than 60 metres! However, the water tables are now at 300 metres: the trees cannot reach them. The heritage for us is enduring pollution.”⁴⁸

The SOMAIR open pit mine and the COMINAK underground mine cut through the Tarat aquifer. Radioactive materials previously caught and immobilised in the ore are disturbed by the mining operations. The aquifer is opened up to the contaminants, which can spread throughout the water table. At those places the groundwater is removed from the mines in order to mine the ore. The removed ‘industrial’ water becomes contaminated by the uranium and other radionuclides and can no longer be used as drinking water⁴⁹, which decreases the supply of clean, potable water.

The decreasing water supply also has huge social and economic impacts, and particularly threatens nomadic herders. In a country where fertile land for agriculture is scarce, communities compete for farming resources. In Niger, only 11.5% of land area is arable.⁵⁰

“The health of the animals is also in peril. Livestock as well as domesticated animals [pets]...The noise pollution will force many animals to leave the area, which is their natural life... The exploitation of this whole area, as 159 permits [for uranium mining] were distributed, condemns the pasture. This will force these animals to the south... and all this will aggravate and reinforce desertification,” said Marou Amadou, president of human rights organisation FUSAD.⁵¹

The emptying of aquifers increases the rate of desertification, the drastic decline of land into an arid and dry state. Desertification is caused by overgrazing, over-drafting of groundwater and diversion of water from rivers for human consumption and industrial use. The Sahara currently expands its sands at a rate of 5 kilometres every year.⁵²

According to Issouf Baco, Nigerien Minister for the Environment and the Combat against Desertification, “The first problem in the case of exploitation is the large craters, the enormous quarries which are open and which then affect the groundwater table... The water problem arises everywhere. The water situated at the level of the Air [Mountains] is a fossil aquifer—not renewable... The damage is significant. Anything removed from the bowels of the earth is creating damage. There may be diseases that we cannot suspect at this time. And it is a worry for future generations.”⁵³

47 Cogema Niger, “Synthese Hydrogeologique. La nappe du Tarat dans la region d’Arlit-Akokan”, May 2004, pg 58.

48 Interview with Almoustapha Alhacen, President of Aghir in’Man, in Arlit, Niger, November 2009.

49 AREVA, January 2009. ‘AREVA in Niger’, pg.9. http://niger.aveva.com/niger_home/liblocal/docs/AREVA%20au%20Niger%20janvier%202009%20version%20anglaise.pdf

50 International Fund for Agricultural Development, 2005. Country Statistics Niger <http://www.ruralpovertyportal.org/web/guest/country/statistics/tags/niger>

51 Interview with Marou Amadou, President of Le Front Uni pour la Sauvergarde des Acquies Democratiques (FUSAD), in Niamey, Niger, November 2009.

52 FAO Corporate document repository: Land and environmental degradation and desertification in Africa, 1995. <http://www.fao.org/docrep/x5318e/x5318e02.htm>

53 Interview with Issouf Baco, Minister for the Environment and Combat against Desertification, in Niamey, Niger, 2009





Dangerous water

“The people [here] don’t know about radioactivity, but there are [still] many people who do not drink the water in Arlit...They say they are sick when they drink it.”⁵⁴

Almoustapha Alhacen

In four of the five water samples from the Arlit region, the uranium concentration was above the WHO recommended limit for drinking water. Historical data indicate a gradual increase in uranium concentration over the last 20 years, which can point at the influence of the mining operation. Some of the water samples even contained dissolved radioactive gas, radon-222.



Collecting water samples

As already mentioned, the Earth’s layers protect people and the environment from naturally occurring radiation buried deep underground. However, mining operations cause radioactive materials and chemicals in the ore to be more readily mobilised, which increases the risk of groundwater contamination. When the earth, rocks and groundwater are exposed to air, chemical and physical processes can change, which can result in an increased transfer of certain chemicals.

Water contamination was discovered by CRIIRAD in 2003 and *L’Institut de Radioprotection et de Sûreté Nucléaire* (IRSN)⁵⁵ in 2004 in local wells around the Niger uranium mines. According to CRIIRAD, analyses of water distributed by AREVA in Arlit in the period from 2003 to 2005 showed total alpha activity of between 10 and 100 times above the WHO guidance value.⁵⁶ CRIIRAD has shown that the strong alpha activity was due to high concentrations of uranium⁵⁷.

Following these reports, AREVA closed several of the identified wells, but has never admitted this was due to uranium in the water. However, internal AREVA documents make clear that SOMAIR had known for several years about the uranium levels in the drinking water they supply⁵⁸. CRIIRAD also has a copy of a letter dated 12 February 2004 in which the laboratory responsible for radiological testing of the water for SOMAIR told them that the ‘water would not meet the criteria for potability’.⁵⁹

According to former AREVA miner Alka Hamidou, “...The pump 150 metres to the west was closed, supposedly because it is not fit to drink. It is the company that has closed it! ...According to the analysis results, they told they would close it...They said only that it is not good.”⁶⁰



⁵⁵ Institute for Radioprotection and Nuclear Safety

⁵⁶ Former WHO guidance value 0.1 Bq/l; anything above this value demands further investigation. As given in Drinking water quality directives, second edition. WHO, 1994. (Guidance value changed to 0.5 Bq/l in 2006).

⁵⁷ Report CRIIRAD 05-17, 20 April 2005. Impact de l’exploitation de l’uranium par les filiales de COGEMA-AREVA au Niger.

⁵⁸ Simplified annual report SOMAIR, 2002. Table « Contrôle de la qualité de l’eau des nappes souterraines », pg 9)

⁵⁹ Report CRIIRAD 05-17, 20 April 2005. Impact de l’exploitation de l’uranium par les filiales de COGEMA-AREVA au Niger.

⁶⁰ Interview with Alka Hamidou, Former AREVA miner, in Arlit, Niger, November 2009

⁵⁴ Interview with Almoustapha Alhacen, President of Aghir in’Man, in Arlit, Niger, November 2009



Nevertheless, the 'AREVA in Niger' press pack of February 2005 stated (page 10): "Bacteriological (monthly), radiological (half-yearly) and chemical (yearly) analyses show the absence of contamination."⁶¹

In 2008, the Nigerien *Centre National de RadioProtection* (CNRP)⁶² confirmed the water contamination. According to Dr. Aïssata Niandou, director of the CNRP, "...For two years we have been able to do analysis [of water]. We have taken water samples, made analyses and released results at the request of mining companies or on our own visits, since the people asked if the water from these wells was contaminated or not. We found that some wells were contaminated. We have requested the closure of these wells and then we returned to the sites to check they had been closed."⁶³

Greenpeace findings

In November 2009, Greenpeace collected samples from six wells that are used by the local population for consumption. One sample was taken near Imouraren, the new mine not yet in operation; this sample acts as a control. The other five samples were collected in and around the mining towns Arlit and Akokan. An extract of the measurements conducted by the CRIIRAD laboratory on the water samples is presented in Table 1; the full results can be found in CRIIRAD report N°10-09.⁶⁴

Table 1

Sample no.	Date	Name location	Description location	U 238 (µg/l)	Alpha total (Bq/l)
N041109.01	4 November 2009	Tchit in Taghat, Imouraren	Village well, 60 metres deep, at north side of village. Water is kept in storage tank at ~8m height. Used for drinking water and animals.	4.0	0.10 +/- 0.03
N051109.02	5 November 2009	Well COMI24	Well in desert, south of Akokan, east of COMINAK mine. Sample taken from tap outside of monitoring station. Tap is used as drinking water by nomads, people passing by. Connected to water system Akokan.	25.0	0.87 +/- 0.17
N051109.04	5 November 2009	Well Akokan	Village well, south side of Akokan, at small community next to gardens. Tap located near garbage belt.	33.1	0.54 +/- 0.10
N061109.02	6 November 2009	Tap Arlit	Village well, at the corner of street. Used by all families in neighbourhood.	23.2	1.25 +/- 0.24
N061109.03	6 November 2009	Tap Arlit North	Village well connected to Arli252 well, which is about 200 metres NNW. Used by Mr. Alka and surrounding community and nomads. Next well to E was recently closed.	63.8	3.32 +/- 0.49
N061109.05	6 November 2009	House Akokan	House of Mr. Tanko, Akokan. Water is from general water supply in Akokan	10.1	0.30 +/- 0.07

61 AREVA, February 2005. 'AREVA in Niger'

62 National Centre for Radiological Protection

63 Interview with Dr. Aïssata Niandou, Director of Centre National de RadioProtection, in Niamey, Niger, November 2009

64 Report CRIIRAD N°10-09, February 2010. 'Remarques sur la situation radiologique dans l'environnement des sites miniers uranifères exploités par SOMAÏR et COMINAK (filiales d'AREVA) au Nord du NIGER'.

The uranium concentration in the sample from the Imouraren area was 4 µg/l (micrograms per litre) and the total alpha concentration was 0.1 Bq/l (Becquerel per litre).⁶⁵ Both values are within World Health Organisation (WHO) recommended limits.

In contrast, the total alpha activity concentration in four of the five samples from the Arlit region was up to six times higher than the WHO recommendation for further checks of 0.5 Bq/litre⁶⁶. In four of the five water samples from the Arlit region, the uranium concentration was above the WHO recommended limit for drinking water of 15 µg/litre.

The high uranium and total alpha concentration is also observed in documents that were provided to Greenpeace by AREVA in November 2009. The documents contain data on the uranium concentration and total alpha activity measured in water between 2006 and 2008⁶⁷. High uranium and total alpha concentrations have been measured by AREVA in some of the wells for drinking water over the past years.

In January 2010, a few water wells near a uranium mine in Brazil were closed because of raised levels of alpha activity⁶⁸, even though the levels of total alpha activity

were lower than in the Niger water samples. AREVA has so far not closed the contaminated wells in Arlit. The historical data from the wells in the Arlit region that were closed in 2005 indicate a gradual increase in uranium concentration over the last 20 years,⁶⁹ which point to the influence of the mining operation.

The CRIIRAD analyses reveal that some of the water samples contain dissolved radioactive gas, radon-222 (20 Bq/l to 30 Bq/l). The potential radiation dose from radon dissolved in the water for people who could drink it can be very significant. Therefore, these preliminary measurements indicate that it is vital that the presence of radon-222 in water is monitored. This is currently not done by AREVA.

A broad chemical analysis was performed on the water samples, showing significantly increased levels of metals and chemicals like sulphates, nitrates, etc. For a number of chemicals, the concentrations exceed the values recommended by the WHO.⁷⁰ This is the case, for example, for nitrates (50 mg/l), molybdenum (70 µg/l), and selenium (10 µg/l). Many of the chemicals found, such as nitrites, molybdenum and tungsten, are not monitored by AREVA, even though the industrial activities of SOMAIR and COMINAK utilise large quantities of

65 Bq = Becquerel, a unit for radioactivity.

66 *Guidelines for drinking water quality*, first addendum to third edition. Vol 1: Recommendations. WHO, 2006. This version of the guidelines integrates the third edition, which was published in 2004.

67 "Analyses chimiques et radiologiques des ouvrages hydrauliques eau potable de SOMAIR" and "Analyses chimiques et radiologiques des ouvrages hydrauliques eau potable de COMINAK". Provided by AREVA in November 2009.

68 INGA (Institute of Water and Climate Management), Nova coleta do Ingá detecta

radioatividade em três pontos de Caetité. 22 January 2010. <http://www.icaetite.com.br/?lk=4&id=7850>

69 Cogema Niger, "Synthese Hydrogeologique. La nappe du Tarat dans la region d'Arli-Akokan", May 2004; Pg 157, well no. ARLI_837 and ARLI_214.

70 *Guidelines for drinking water quality*, first addendum to third edition. Vol 1: Recommendations. WHO, 2006. This version of the guidelines integrates the third edition, which was published in 2004.



chemical products.⁷¹ Whether the increased presence of these substances in the drinking water at Arlit and Akokan is caused by industrial pollution, domestic pollution or natural causes, needs further study.

According to Alka Hamidou, “This water is given to us for free by the company, but we drink it as it is, in spite of ourselves. We are obliged to drink it because there is no other source. Since it is 4 km from their stock of waste rocks, we think there is seepage that pollutes the water of this well.”⁷²

AREVA still will not admit there are increased levels of uranium and other contaminants in the water. The AREVA document *AREVA in Niger* published in January 2009 says about the water supplied to the mining towns, “Monthly bacteriological, twice-yearly radiological, and annual chemical analyses show no signs of contamination”⁷³. When questioned in June 2009 by a journalist about the reasons why some wells had been closed, AREVA Niger’s Director of Sustainable Development, Moussa Souley, declared⁷⁴ that these wells were “apparently affected by nitrates” and that this was “natural pollution.”

71 For example, according to CRIIRAD 2008, in 2002 COMINAK used the following consumables: sulphur (11,768 tonnes), cement (5,160 tonnes), sodium chloride (3,799 tonnes), sodium carbonate (2,955 tonnes), ammonium nitrate (1,487 tonnes), oils (893 m³), magnesium (637 tonnes), solvents (364 m³), explosives (325 tonnes), caustic soda (211 tonnes), sodium chlorate (79 tonnes), conveyor belts (3 kilometres), tyres, metal, batteries etc.

72 Interview with Alka Hamidou, Former AREVA miner, in Arlit, Niger, November 2009

73 AREVA, January 2009. ‘AREVA in Niger’

74 Quoted from the film “Uranium, poisoned legacy” by Dominique Hennequin, broadcast on the French channel Public Sénat in December 2009.

There is no public data on nitrate concentrations in the closed wells. However, AREVA data from other wells has shown increased nitrate levels (up to twice the limit of 50 mg/l)⁷⁵ but these wells have not been closed. AREVA has been supplying water to the towns of Arlit and Akokan for over 30 years. The people of Arlit and Akokan presume the water is clean. Still they are exposed to health risks by drinking water containing high levels of uranium and other contaminants.

Hamidou, 56, was an operator in a sulphuric acid workshop for 20 years (6 years with SOMAIR and 14 years with COMINAK). His wife, Fatima Daoui, 45, has had three miscarriages. She has lived in Arlit since the age of 10. “We have problems. We are worried indeed and have fears for our health. Now, if I travel to another area, I feel better. [When I go] back to Arlit, I have problems. My legs are bad, my eyes burn.”

Daoui, who is the president of *l’Association des Femmes des Quartiers Périphériques d’Arlit*,⁷⁶ continues, “There are diseases which never existed in the past. It’s been 35 years that I’ve resided in this city. There are diseases that have come in recent years... Typhoid, cancer, cough, weakness of the joints, kidney diseases, foot pains, sexual impotence...”⁷⁷

75 “Analyses chimiques et radiologiques des ouvrages hydrauliques eau potable de SOMAIR” and “Analyses chimiques et radiologiques des ouvrages hydrauliques eau potable de COMINAK”.

76 Women’s Association of Outlying Arlit.

77 Interview with Fatima Daoui, President of *l’Association des Femmes des Quartiers Périphériques d’Arlit*, Arlit, Niger, November 2009

At a water pump.





““There are some truths that we should not say but it’s like this: we are living dead! We can spend days without approaching our families: we repel them [because of the danger]! We are all radiated.”⁷⁸

Salifou Adinfo, former AREVA miner

78 Interview with Salifou Adinfo, November 2009. Former driller for AREVA, Arlit, Niger

Air

Radioactivity in the air

Death rates due to respiratory infection in the town of Arlit (16.19%) are twice that of the national average (8.54%).

Radon monitoring in an Akokan garden.



“I know radiation comes to town... Of course, I’m sure of that.”⁷⁹ - Gigo Zaki

While the ingestion of contaminated water can cause numerous health problems, it is not the only way to be exposed to mining impacts. The activities of uranium mining cause the spread of radioactive materials in the air, both by the diffusion of radioactive dust and the release of radon gas.

In cases where the local population does not drink local water or eat local food, radon (Rn-222) gas is the leading cause of exposure to radiation from mining operations. Inhalation is the dominant route of exposure. The total exposure depends on the amount of radon that is released from the mining operations and the distance from the mine.

Even though the physical half-life⁸⁰ of radon is relatively short (3.8 days), this radioactive gas can cover dozens or even hundreds of kilometres before it totally decays. Radon is an emitter of alpha particles, and its decay results in the creation of short half-life heavy metals (polonium-214 and polonium-218) which also emit alpha particles. Although the radioactivity of radon lasts only 38 days, the half-life of some of its decay products is longer: 138.5 days for polonium-210 and 22.3 years for lead-210. These elements will pose a radioactive risk for many years to come. Inhalation of radon gas and its decay products leads to irradiation of the respiratory passages.

⁷⁹ Interview with Gigo Zaki, former laundry worker in SOMAIR, Arlit, Niger, November 2009

⁸⁰ The physical half-life is the time after which half the radioactive atoms have disintegrated (radioactive decay); it takes 10 half-lives for the initial radioactivity to fall to one-thousandth.

In the vicinity of the uranium extraction zones, significant quantities of radon are emitted into the atmosphere. This can lead to an accumulation of lead-210 and polonium-210 on soil and vegetation surfaces. This increases the risk of internal contamination of the local population via ingestion of contaminated foodstuffs. Indeed, polonium-210 and lead-210 are among the most radiotoxic of these radionuclides by ingestion. It is clear that the dispersion of radon around uranium mines leaves the inhabitants of the region exposed to serious and potentially fatal health risks.

Gigo Zaki (he estimates he is between 65 and 70 years old) was a laundry worker at SOMAIR for 30 years before he was forced to retire from illness. AREVA never informed him of the risk of breathing in the dust from the mines, nor gave him any protective equipment from the fumes and dust. “We were not given anything to protect our nose and mouth,” he said. “We were treated as animals.”⁸¹

The increased incidence of lung cancer among uranium miners has been known for decades. Recent epidemiological studies have moreover confirmed that inhalation of radon, even in very low doses, increases the risk of lung cancer⁸². Lung cancer, respiratory system illnesses, pulmonary

hypertension, and a variety of non-malignant respiratory diseases—such as pneumonia—are the most common health risks linked to radon exposure. After inhalation, other radioactive isotopes can also enter the bloodstream and other organs and put them at risk for more diseases.

According to an environmental impact study done in 2000 by COMINAK, the death rates due to respiratory infection in the town of Arlit (16.19%) are twice that of the national average (8.54%).⁸³

However, in public documents AREVA continues to minimise and ignore the risks. “Allergies (pulmonary, ophthalmologic), are some of the most common illnesses. They are found everywhere in the Sahara region and have long been recorded by the WHO as typical of desert areas. They are caused by sand irritating eyes and lungs and are unrelated to mining activities,” its report of 2009 states.⁸⁴ While it is true that respiratory ailments are common in desert regions, the COMINAK figures could indicate a pattern heightened by some other cause.

“Most of these people [villagers] died because of radiation,” former worker Tanko Anafi declared. “I left the mine, but I did not leave the village. I continue to consume the same radon!”⁸⁵

81 Interview with Gigo Zaki, former laundry worker in SOMAIR, Arlit, Niger, November 2009

82 WHO 2009; http://www.who.int/phe/radiation/background_radon/en/index.html

83 Chareyron B, 30 January 2008. Note CRIIRAD N°08-02 ‘AREVA : Du discours à la réalité. L'exemple des mines d'uranium au Niger’.

84 AREVA, January 2009. ‘AREVA in Niger’, pg. 17.

85 Interview with Tanko Anafi, former mine worker, Arlit, Niger, November 2009



Poisonous air vented from the mines

“Sometimes, one or two months after the end of his work, the person dies. It’s an open secret: it’s due to the radiation!”⁸⁶

Salifou Adinfo, Driller for 33 years with AREVA

Radon measurement done at the gendarmerie (police station) in Akokan showed a radon-222 concentration in the air three to seven times higher than normal levels in the area. The National Centre for Radioprotection is not able to measure radon and relies on information supplied by AREVA.

During the November visit, the Greenpeace team planned to install radon detectors primarily near the main sources of radon dispersion (the 37 outtake air vents of COMINAK’s mine tunnels and SOMAIR’s and COMINAK’s radioactive waste piles), to study the transfer of radon into the environment and evaluate the danger to the population. Another aim was to identify contamination of vegetation and milk from animals that graze in the area, to allow for an estimation of exposure and subsequent health risks for local population.

However, due to the ‘security’ restrictions placed on the Greenpeace team, the radon measurements were ultimately taken mainly within the urban zone, several kilometres from the sources. Still, one of the radon measurements showed a significantly raised level of radon in the air⁸⁷. The measurement done at the police station in Akokan shows a radon-222 concentration in the air of 131 Bq/m³,⁸⁸ three to seven times higher than normal levels in the area. The gendarmerie is less than 2.5 km from the entrance of the COMINAK mine. The raised levels of radon-222 in the air can be caused by open air storage of mining waste (including tailings) or the atmospheric emissions from the underground mine.

⁸⁶ Interview with Salifou Adinfo, Former driller for AREVA, Arlit, Niger, November 2009

⁸⁷ Report CRIIRAD N°10-09, 'Remarques sur la situation radiologique dans l'environnement des sites miniers uranifères exploités par SOMAIR et COMINAK (filiales d'AREVA) au Nord du NIGER' (February 2010)

⁸⁸ Bq/m³ is the unit of measure for radioactivity per volume (cubic metre).



Uranium ore lixiviation plant and tailings mountain, SOMAIR.

AREVA has been aware of raised levels of radon-222 at the gendarmerie, as can be found in AREVA's figures from the COMINAK 2008 environmental report⁸⁹, but has not acted on it. This report acknowledges that the added annual dose received by the population at the gendarmerie of Akokan is 1.36 mSv,⁹⁰ higher than the annual allowable dose for members of the public (1mSv)⁹¹. About 90% of this dose is due to radon emissions.

A network of air-monitoring equipment was installed in the region in the past for measurement of radiation, radioactive dust and radon gas. However, when it showed Greenpeace this equipment, AREVA could not explain what would be done in case the monitored data indicated dangerous levels. When asked what would be done if increased levels of radiation were measured, AREVA's Sustainable Development Director Moussa Souley seemed to think that high readings would indicate a problem with the machinery, and not a true risk. He stated, "Either this machine is wrong... How come that suddenly things go wrong for everything? Frankly, it is not a scientific way to see things. But if that happens, ok, it may be the case, very low radiation in the Arlit area. There is nothing to do! ...We'll call experts to help us analyse...and bring out the solution...but it is something improbable."⁹²

AREVA's 2009 report claims that "Inspections are carried out by agents of the Mining Department and the National Centre for Radiological Protection. The CNRP conducts periodic on-site inspections and issues inspection reports."

However, Greenpeace interviews at the CNRP revealed that the centre is grossly understaffed and underfunded. When asked about CNRP inspection of radon impacts, Hamadou Kando, inspector and chief of technical services at CNRP answered:

"For the time being, we, competent authority, are not able to measure [it]. We do not have the equipment to measure radon. But, as I've said, we plan to acquire two detectors for reading potential alpha energy in the budget for 2010."⁹³

By 2011, Kando hopes they will have all the equipment, as well as a staff of three physicists that he can train to conduct the necessary tests. Despite the best efforts by the CNRP, however, they are currently unable to monitor all safety risks to the public around the mines.

When the CNRP was asked if it was felt that AREVA was hiding things, Kando responded, "We have virtually no such impression. We work with many technicians for radiation protection. They know what radiation protection is. We have confidence. It is true that we make great efforts to have independent means of control. But for now, we really trust... I do not see why a scientist will begin to turn facts. True, it could happen."⁹⁴

More detailed information on radon emission data from the mines, which has not been provided so far by AREVA despite repetitive requests, is essential in order to be able to estimate the radiation impact on the population.

"We had access to certain documents," Alka Hamidou confided about his time working at the mines, "[Within] an 80 km radius, everyone is affected by radiation."⁹⁵

89 COMINAK, Radioprotection, Surveillance radiologique de l'environnement bilan de l'annee 2008, 27 April 2009.

90 mSv: millisievert, the unit which measures radiation dose levels

91 recommended by the International Commission on Radiological Protection (ICRP) and enforced by legislation in most countries.

92 Interview with Moussa Souley, Director of Sustainable Development AREVA Niger, Arlit, Niger, November 2009

93 Interview with Hamadou Kando, inspector and chief of technical services at CNRP, Niamey, Niger, November 2009

94 Ibid.

95 Interview with Alka Hamidou, Former AREVA miner, Arlit, Niger, November 2009





Air vent from COMINAK underground mine.



Radioactive dust in the wind

“The city of Arlit does not have a paved road...Only nests of dust; torrents of dust everywhere. This dust is contaminated! At 5 pm to the east of the city, you cannot see anything at all.”⁹⁶

Salifou Adinfo.

Fine (dust) fractions showed an increased radioactivity concentration reaching two or three times higher than the coarse fraction. Increased levels of uranium and decay products in small particles that easily spread as dust would point at increased risks of inhalation or ingestion. The CNRP warns that radioactive materials in water used to wet the roads can accumulate on the road surface reaching unacceptable levels in the long term.

⁹⁶ Interview with Salifou Adinfo, November 2009. Former driller for AREVA, Arlit, Niger



Uranium mining activities are a source of radioactive dust⁹⁷. Freed by mining explosions and released from the storage of ore and mining wastes (waste rocks, tailings), the wind can cause radioactive dust to travel great distances.

Some of the mining activities create additional dust, according to Alhacen. “They [SOMAIR] make large holes to enable big open sky detonations. For economic reasons they make large explosions... but they could make small holes. There are many problems: the dust is greater with big detonations. These explosions were felt 80 kilometres away! There are many houses in the city that have cracks because of these explosions. In the beginning, you could hear it 200 kilometres from here... We have asked them to make smaller holes.”⁹⁸

The Greenpeace team took a range of samples of soil in the mining towns⁹⁹. Generally, the fine (dust) fraction¹⁰⁰ of those samples shows an increased radioactivity concentration compared to the gross, coarse fraction (see Table 2 on page 38). Sometimes the activity concentration was two or three times higher in the fine fraction.

Fellow ex-worker Tanko Anafi, adds “We are in this dust since 1968. We live in the same plight from the dust. There was a slight improvement in 2009. An NGO called out for the watering streets of certain streets... The trees are becoming all red. It is the same for us!”¹⁰¹

Increased levels of uranium and decay products in small particles that easily spread as dust would point at increased risks of inhalation or ingestion, given the amount of dust that is created in the mining process, and that deserts are obviously dusty by nature (aggravated by intense seasonal dust storms).

97 US Environmental Protection Agency, RadTown USA; Uranium Mines, April 2006. <http://www.epa.gov/radtown/docs/uranium-mines.pdf>

98 Interview with Almoustapha Alhacen, President of Aghir in' Man, Arlit, Niger, November 2009

99 CRIIRAD report no. 10-05, Analyses radiologiques de sol prélevé par GREENPEACE au NIGER (secteur ARLIT et AKOKAN), 28 January 2010

100 Fine fraction = the fraction with particles smaller than 63 microns (dust)

101 Interview with Tanko Anafi, former mine worker, Arlit, Niger, November 2009

One soil sample was taken on the road near Akokan, which is watered by AREVA to reduce the dust formation. The fine fraction of that sample showed there was more uranium-238 (thorium-234) in comparison to radium-226 (uranium/radium ratio of 1.87), whereas in the other three samples this ratio is normal (close to 1). This increased uranium concentration can be caused by deposit of uranium-bearing dust, or by uranium present in the water used to wet the roads.

According to AREVA's 2009 report, "The blasting and operation of heavy vehicles involved in open-pit mining creates dust. Mining companies use a variety of methods to deal with this problem, like dampening the roads and monitoring the radioactivity of dust in the air using dust samplers and dosimeters."

One of the ways in which AREVA tries to combat the dangerous dust is by dampening the roads - however, water containing uranium is used. "The groundwater removed from these mines by a process called dewatering is not fit for human consumption, since it is contaminated by the uranium deposits it flows through. It is used in the mining operations, in particular for ore processing and dampening the roads to keep down the dust."¹⁰²

By using water with significant uranium contamination on the roads, uranium is liable to accumulate on the ground where sprayed (uranium 238 has a half-life of 4.5 billion years). In its inspection report from June 2009, the CNRP warns that the radioactive materials in the water can accumulate on the road surface reaching unacceptable levels in the long term¹⁰³.

“Our children are already in contact with uranium: they have it in their bones, in their blood—and their children will also have it !”¹⁰⁴

**Kalla Abdou,
former driver at COMINAK**

¹⁰² AREVA, January 2009. "AREVA in Niger"

¹⁰³ CNRP, Rapport de Mission, D'inspection de Radioprotection dans la Compagnie Minière d'uranium d'Akokan (COMINAK), June 2009.

¹⁰⁴ Interview with Kalla Abdou, driver at COMINAK from 1990 until 1991, Arit, Niger, November 2009

Earth

In contrast to water pollution and spreading of radon gas in the air, some radioactive risks of uranium mining are caused by external exposure to radiation¹⁰⁵. Radioactive materials, such as waste rocks and traces of uranium ore, can escape from the mine and end up among people who are unaware of the risks. Greenpeace used radiation monitors to check for the presence of radioactive materials at some places in and around the mining towns. The radiation monitoring instruments used by Greenpeace were an ICX Identifinder gammaspectrometer, a contamination monitor Mini-Monitor Series 900 (probe type SL) and a gamma dosimeter Graetz X5DE. Using these instruments, radioactive materials were discovered on the streets, in the market and in open space close to the underground mine.



Spreading of radioactive soil

The concentration of uranium and other radioactive materials in a soil sample collected near the underground mine was found to be about 100 times higher than natural levels in the region, and higher than the international exemption limits.

At various locations around the mine, five soil samples were taken, mainly in the villages. One sample was taken in a zone a few metres from an air vent from the underground mine. Another sample, collected in a garden in Akokan where materials had been stored on the ground for years (collecting dust), showed a radiation level around 50% above the background level when measuring close to the surface. The other three soil samples were taken in order to establish a baseline characterisation: soil close to the gendarmerie at Akokan, garden soil from Akokan, and soil from the road from Akokan to Arlit. The samples were analysed by CRIIRAD using gamma spectrometry. Results are presented in report CRIIRAD N°10-05¹⁰⁶ and summarised in Table 2 on the following page.

¹⁰⁵ The risk of working of radiation exposure can be divided into two categories: (1) external radiation from radioactive elements outside of the body; (2) internal contamination of the body with radioactive elements that enter the body.

¹⁰⁶ Rapport CRIIRAD N°10-05, Analyses radiologiques de sol prélevé par GREENPEACE au NIGER (secteur ARLIT et AKOKAN), 28 January 2010.

Table 2

Sample no.	Name location	Description location	U-238 (Th-234) (Bq/kg)		Ra-226 (Bq/kg)		Pb-210 (Bq/kg)	
			<2mm	<63 µm	<2mm	<63 µm	<2mm	<63 µm
N051109.01	Vent A	10 meter north of vent GT238 for COMINAK mine. Around the vent radiation levels generally 250-300 nSv/hr. At this spot 1440 nSv/hr, mainly in top layer. After taking sample still high readings at remaining soil.	6,200	22,600	6,700	26,500	6,900	28,400
N061109.01	Gendarmerie Akokan	Gendarmerie, located outside village on main road to COMINAK mine. Soil sample taken approx 1 m from monitoring station.	61	88	44	89	44	111
N061109.04	House Akokan	House of Mr. Tanko, Akokan. In corner where some scrap is stored (10 yrs?). Sample is top 1cm of dusty sand collected in that corner.	65	106	46	114	66	174
N071109.01	Garden Akokan	Garden located at south side of Akokan, NE of COMINAK mines. Owner Algamousa Amouman. Sample taken 2m. from location monitor.	50	88	40	95	58	150
N071109.02	Road Akokan - Arlit	Road from Akokan to Arlit, which is regularly watered with industrial water from COMINAK. Sample taken about 80 meter from sign of entrance Akokan.	38	127	25	68	24	95

The sample from close to a COMINAK outtake vent was taken at a location where the radiation levels were about seven times higher than normal background levels (1.44 microSv/hr). Gammaspectrometric analysis showed that the levels of uranium-238 and its decay products (thorium-234, radium-226, lead-210), were about 100 times higher than normal levels in the region (activity concentrations 6,000-7,000 Bq/kg¹⁰⁷). This is higher than the international exemption limits¹⁰⁸. It is important to note that the fraction of small particles (dust, smaller than 63 micrometres) contains even higher concentrations of uranium and decay products, up to 26,500 Bq/kg. This radioactive dust can pose serious risks in case of inhalation or ingestion.

In view of the location where the sample was collected, it can be assumed the radioactive material was brought up from the subsoil when the air vent was excavated. This confirms that with their activities the mining companies leave behind solid radioactive matter in the environment, within reach of the local population.

Two samples of undisturbed soil indicate an excess of lead-210 in comparison to radium-226, especially in the fine (dust) fraction. This is typical of the top layer of soils, as a result of the deposition of lead-210, a decay product from radon-222 present in the atmosphere. Radon emitted from the mining operations can bring about an abnormal accumulation of lead-210 and polonium-210 on the surface of soil and vegetation¹⁰⁹. This signals the need to check vegetation for contamination.

The results of these samples demonstrate that radioactive materials with sometimes levels of radionuclides above international exemption limits, are found in publicly accessible areas and pose a direct risk to the local population, especially through inhalation or ingestion.

¹⁰⁷ Becquerel per kilogram

¹⁰⁸ According to the directive Euratom 96/29, these materials require measures to be put in place to protect the local population from radiation. Exemption limit for uranium-238 is 1,000 Bq/kg.

¹⁰⁹ Report CRIRAD N°10-09 (February 2010) « Remarques sur la situation radiologique dans l'environnement des sites miniers uranifères exploités par SOMAIR et COMINAK (filiales d'AREVA) au Nord du NIGER »



Dumping of radioactive sludge

“The stored tailings are exposed! AREVA must do something. The outdoor storage is not sufficient!”¹¹⁰

Almoustapha Alhacen

Thirty-five million tonnes of tailings, accumulated over the past forty years of operation, is stored in open air. These tailings, containing 85% of the original radioactivity of the ore, will remain radioactive for hundreds of thousands of year. AREVA representatives try to justify the ongoing bad practice by referring to low standards at the start of the operation 40 years ago.

In the process of separating uranium from the ore, large volumes of radioactive sludge are left over – the tailings (see ‘How is uranium mined?’ on page 18). Due to the vast quantities of rock that are manipulated, there are literally mountains of industrial waste, containing 85% of the original radioactivity of the ore. Due to the long half-lives of some of the radioactive elements, tailings remain radioactive for hundreds of thousands of years. Worldwide, the uranium mining industry has not found a solution for long term storage of these wastes.

The release of toxic elements and the amount of radiation exposure around uranium mines largely depends on the waste management practises. In the short term, the storage of tailings pose a significant health risk to the workers and local population, because of the dispersion of radon gas and radioactive dust. This risk is multiplied when the tailings are stored in the open air without any protective layers. Radon and dust can be carried by the wind and affect the population in a wide area around the mine.

¹¹⁰ Interview with Almoustapha Alhacen, president of Aghir in'Man, Arlit, Niger, November 2009



In the AREVA mines in Niger, the tailings have been and are still dumped in the open air, forming a mountain of radioactive elements and chemicals. A total of 35 million tonnes of tailings has been accumulating over the past 40 years in the mines of SOMAIR and COMINAK¹¹¹. Note that the production of uranium in the same period was 104,000 tonnes¹¹² – for each kilogramme of uranium produced, 335 kilogrammes of tailings were left behind.

AREVA knows that the current tailings storage is far below international best practice standards¹¹³. The company representatives justify the bad practice by referring to different standards at the start of operation 40 years ago, while simultaneously playing down the risk of the used methods. AREVA claims the crust that forms on top of the tailings after the sludge has dried prevents radioactive materials from escaping¹¹⁴, but it offers no supporting data to confirm this.

111 Report CRIIRAD N°10-09 (February 2010) « Remarques sur la situation radiologique dans l'environnement des sites miniers uranifères exploités par SOMAIR et COMINAK (filiales d'AREVA) au Nord du NIGER »

112 AREVA, January 2009. 'AREVA in Niger'

113 Note that best practice standards currently do not prevent the spreading of radionuclides in the environment on the long-term.

114 Personal communication, AREVA representative, 2009.



SOMAIR site manager Issiyakou Mahamadou admits to problems with tailings storage. “We have to deal with the legacy that started forty years ago. We are making financial provisions... We will not leave tailings the way they are now... The way tailings are today, it’s not best practice. Currently there is high level of radioactivity.”¹¹⁵

It has been known for many years that long-term coverage of waste rock and tailings can reduce the spread of radon¹¹⁶, one of the main routes of radiation

exposure for people living around a mine. The radon dispersion from tailings stored in the open air is higher than dispersion from tailings that were covered with a protective layer.

AREVA has ignored these risks and so far continues to dump the tailings in large piles in the open air. There is insufficient control of radon dispersion around the tailings. As illustrated previously, the CNRP in Niamey, the national regulator, is unable to carry out radon measurements, meaning there is no independent control.

¹¹⁵ Interview with Issiyakou Mahamadou, site manager of SOMAIR, Arlit, Niger, November 2009

¹¹⁶ Thomas K.T., Management of wastes from uranium mines and mills. IAEA Bulletin, VOL. 23, No.2, 1981. <http://www.iaea.org/Publications/Magazines/Bulletin/Bull232/23204683335.pdf>

Akokan - waste rock in the streets

“The pot holes in the roads have been refilled with the debris from the mine! Then, they use water from the mine, the exhaust water, with that they wash down the road!”¹¹⁷

Tanko Anafi, former AREVA employee.

On the streets of Akokan, radiation dose rate levels were found to be up to almost 500 times higher than normal background levels. A person spending less than one hour a day at that location would be exposed to more than the maximum allowable annual dose.

In addition to the storage issues of tailings and waste rock, which can cause dispersion of pollutants via air or water, waste rocks or low grade ore¹¹⁸ are often used for landfills, road construction or even building construction in the mining area¹¹⁹. These contain often large amounts of radioactive elements and heavy metals. CRIIRAD and Greenpeace discovered this hazard is still present in the town of Akokan.

In 2007, CRIIRAD and Aghir in'Man carried out radiological surveys in the town of Akokan. Directly in front of the Akokan hospital, they discovered shockingly high levels of radiation up to 100 times higher than normal background levels¹²⁰. This radiation was caused by radioactive waste rock that had been paved into the road during its construction. CRIIRAD reported their findings to AREVA and local authorities and requested a thorough survey and clean-up.

AREVA confirmed the presence of radioactive materials in the streets of Akokan¹²¹. In October 2008, local subsidiary COMINAK reported that all contamination problems had been addressed, and in September 2009 AREVA confirmed to CRIIRAD that the clean-up was complete¹²².

However, the Greenpeace survey in November 2009 has proven that AREVA failed to sufficiently check and clean up the village of Akokan. In a brief inspection, Greenpeace identified seven locations in Akokan with unacceptably high levels of radiation (see Table 3). At three locations, the Greenpeace measurements directly contradict AREVA data. At three spots, radiation levels are higher than 10 microSv/hr at 5 cm. In one area the levels were as high as 63 microSv/hr at 5 cm and up to 3 microSv/hr at 1 metre. Dose rate at ground level is almost 500 times higher than normal background levels. A person spending less than one hour per day at that location would be exposed to more than the maximum allowable annual dose for the public of 1 mSv. This poses a serious risk of direct exposure to radiation for anyone spending time in the streets of Akokan. In addition there is the potential for radioactive dust to be released from these places if there is no protective layer of clean sand on top of the waste rocks.

¹²⁰ CRIIRAD: *Presence de matériaux radioactifs dans le domaine public à ARLIT et AKOKAN (Niger), à proximité des mines SOMAIR et COMINAK (AREVA)*, (14 May 2007)

¹²¹ Plan de Masse, COMINAK Environnement Naturel, 2 October 2008 (on file at Greenpeace International)

¹²² Letter from Sébastien de Montessus, Director Mining Business Unit, AREVA to Bruno Chareyron, CRIIRAD, Reference: BUM/DCRE CE 09/004 – YDR/SCT, 8 September 2009.

¹¹⁷ Interview with Tanko Anafi, former mine worker, Arlit, Niger, November 2009

¹¹⁸ Ore with uranium content too low to be processed.

¹¹⁹ Chareyron B., Radiological hazards from uranium mining, CRIIRAD 2005.





Radiation measurements in Akokan.

Table 3

Coordinates location	Description location	Maximum dose rate at 5 cm	Dose rate at 1 m	Dose rate according to COMINAK
		(microSv/hr) background 0.13	(microSv/hr) background 0.13	(microSv/hr)
N18°42'52.14" E7°20'46.74"	On the road, close to the garden of house 95 (NE hospital COMINAK), opposite 08C waterhydrant, over an area of approx 2 m ²	0.50		0.1
N18°42'48.18" E7°20'26.34"	In the middle of the road in front of block 82 (houses 8211 and 8212), spread over an area of approx. 25 m ²	10.00		0.3 (nearby)
N18°42'45.30" E7°20'34.74"	In between two drainage covers, between block 45 and 53 (in front of house 5312), spread over an area of approx. 10 m ²	2.50		0.2
N18°42'57.18" E7°20'39.96"	Behind the COMINAK hospital, next to garden of block 115, over an area of roughly 2 m ²	63.00	2.7-3.0	0.7
N18°42'57.90" E7°20'38.28"	On small square between blocks 181-184, about 2 m ²	49.00	>2.0	-
N18°42'58.80" E7°20'34.86"	On the street between blocks 188 and 189, about 3 m ²	5.00	1.0	-
N18°42'40.38" E7°20'40.86"	On the middle of the street between block 13 and Pepiniere, area of approx 18x2 m ² (highest levels opposite door next to 1306).	4.75	1.0	

Clearly this problem is not merely isolated to those seven places in Akokan, and both towns should be checked thoroughly.

After Greenpeace published these findings at the end of November 2009, AREVA had to take action. AREVA has informed Greenpeace that the seven spots indicated by Greenpeace have been cleaned up, and AREVA drew up an action plan to check the villages. Greenpeace welcomes this partial clean-up of the village of Akokan by AREVA, but emphasises the need for a comprehensive study so that all areas can be made safe for the community.





Taking radiation measurements on an ore loader.

For sale: radioactive scrap metal

“It’s everywhere. Beams have been sold across the country...They are found in houses. We buy them in the market. There is no way of knowing [where all the scrap is].”¹²³

Tanko Anafi, former AREVA employee.

Although AREVA claims no contaminated material gets out of the mines anymore, Greenpeace found several pieces of radioactive scrap metal on the local market in Arlit, with some radiation dose rates reaching up to 50 times more than the normal background levels. Locals use these materials to build their homes.

In the uranium mines, equipment and materials used to process the uranium are likely to become radioactively contaminated. This includes the mining equipment used to excavate the uranium ore, but also machines, barrels, transport systems, and all sorts of tools that are used in the mines and mills. The radioactive contamination of the equipment is dangerous for anyone who comes in contact with them.

The problem of contaminated scrap metal poses a serious health risk, because every piece of metal and textile – contaminated or not – is used for construction of houses, tools, kitchen utensils, etc. According to ex-workers from the mine, textiles that were previously used at the bottom of settling ponds of radioactive liquids in the uranium leaching process, have been widely distributed to the mine workers. People used them in their houses, unaware of their radioactive risks.

¹²³ Interview with Tanko Anafi, former mine worker, Arlit, Niger, November 2009

During the investigations conducted by CRIIRAD in December 2003, the problem of dispersion of contaminated scrap metal was first identified. A metal pipe was found on the market in Arlit, contaminated by a radioactive deposit containing radium-226 in high concentration (235,000 Bq/kg). CRIIRAD immediately notified AREVA of the problem, who more than a year later announced a “systematic campaign of identification and detection of radioactive scrap metal offered for sale on the market.” However, in the following years contaminated metal was still identified on the market on a several occasions¹²⁴.

¹²⁴ Chareyron B., “AREVA : Du discours à la réalité / L'exemple des mines d'uranium au Niger”, Note CRIIRAD N°08-02, 30 January 2008

Greenpeace findings.

During a limited survey at the Arlit market on 7 and 8 November 2009, Greenpeace found various pieces of contaminated materials, see Table 4. A massive ore loader which had been purchased less than a year before, was covered with radioactive deposits with dose rate levels up to 3.3 microSv/hr at 5 cm, i.e. more than 25 times normal background levels. The owner was told that the machine had been cleaned and there was no risk of contamination. He plans to cut the ore loader into pieces to sell the metal, which would expose him and his workers to serious risks of ingestion or inhalation of the radioactive deposits.

Everything from the mines turns up in the towns



Table 4

Description object	Maximum dose rate at 5cm (microSv/hr)	Detector used
Beams of wood, transported in the same truck that is used for sulphur transport. Truck goes into mine to unload the sulphur, after which the wood ends up at the market.	0.65	ICX (bkg 0.14)
Metal beam (girder), 6 m long.	7.80	ICX (bkg 0.14)
Nordest crane, used in mine, covered with a lot of mud (seems no attempt to clean)	0.55	ICX (bkg 0.14)
White piece of metal, according to Mr. Alga the edge of a lid from a soda barrel that was used in the mine.	0.92	Graetz (bkg 0.06)
Ore loader from COMINAK, covered with a lot of mud. Bought a year ago. Owner was told it had been cleaned. Will be cut to pieces to sell metal.	max. 3.30	Graetz (bkg 0.06) & ICX (bkg 0.14)
Truck used in the mine, covered with contaminated mud. Will be sold and re-used.	max 3.00	



Taking radiation measurements on the streets of Arlit and Akokan.

The same market salesman explained that he had bought a large truck from the mining company. Also this truck was covered with radioactive remains from the mine (dose rate levels up to 3 microSv/hr). This truck will be sold and re-used, potentially causing further spread of the contamination to a wide area.

A 6-metre long metal beam was radioactive with levels up to 7.8 microSv/hr, more than 50 times normal background levels. These kinds of beams are often used for the construction of houses, where direct exposure to the radiation can easily exceed the maximum allowable annual dose for the public of 1 mSv.

When Greenpeace returned to the market the next day, they were told that AREVA had 'reclaimed' the contaminated beam. The owner had not been compensated.

The owner of the metal beam said, "They are aware of your [Greenpeace's] arrival, just as with CRIIRAD. Once they know there are visitors, they go around... They make an inspection and they clear things out, and without paying! This metal, I paid a coupon, I have paid for it. Now, they come and take it off me... This is not normal!"¹²⁵ "

"They were here reclaiming things yesterday after you [left]. They came twice last week ...They took a cowry last week too. With pipes! They have not paid. They say they will exchange it for other metals. They [villagers] have no possibility to claim the material back."

There is no doubt that objects with these levels of radiation should be treated as radioactive waste. They pose not only risk from external exposure, but also risk from internal contamination by ingestion and inhalation of the radioactive materials deposited on the pieces.

Alka Hamidou gave Greenpeace a tour of the local market to illustrate some of the problems with contaminated scrap metal. "People buy scrap metal here to cover the houses and certain materials are used domestically: they sell carts, ploughs... All this is done with the scrap from the mine! Axes, knives... A lot of things are made right here!" he said.

"This is the cover of a soda barrel that comes from the sulphuric acid workshop at SOMAIR. Here, in town, people use it to collect water. They bring this downtown and sell it to women then boil the water for washing."

¹²⁵ Interview with local resident, owner of the metal beam, Arlit, Niger, November 2009

Indicating a local trader, Hamidou said, "This is a guy who pays the coupons for used materials that come from the factory... He then sells it to Burkina Faso or Nigeria. Last year, he reconditioned a bulldozer, and then he sold it to Burkina." When asked if the heavy machinery was cleaned and checked for contamination before being sold, his response was: "Scarcely. A cleaning without checking, that is nothing at all! And who will check? Who will check?"

"They took this [scrap metal] back without paying anything. It's not normal! He [market salesman] paid for this. Paid, with a coupon! It is the workers who resell it...If the company wants to retrieve it, they must pay! They took it back last week... They took it for free!" ¹²⁶ said Hamidou.

AREVA has acknowledged the problem of the spreading of contaminated scrap metal¹²⁷. They claim that for a few years the mining companies have put a system of control in place to prevent any further contaminated materials leaving the mine. Anne Fauconnier, vice-president of communications for AREVA Mining said, "We had this kind of trouble a long time ago. As soon as we heard about this kind of scrap we had to contact the authorities to make a common response to that."¹²⁸

According to AREVA, any material found in the market was sold a long time ago, before the control system was in place. The market salesmen deny this. Most pieces found by Greenpeace had been bought from the mines less than a year ago.

Almoustapha Alhacen from Aghir in'Man says the problem runs so deep that it is a difficult issue to solve. "The problem is truly profound. These materials, they were given for 40 years to the workers. A lot of houses have been built with [it], so it will take serious effort to retrieve it." He thinks AREVA has long been hiding from the accusations for financial reasons. "If you just ask someone who has built his house [with contaminated scrap] to dismantle it, you'll have to pay..."¹²⁹

¹²⁶ Interview with Alka Hamidou, Former AREVA miner, Arlit, Niger, November 2009

¹²⁷ Letter from Sébastien de Montessus, Director Mining Business Unit, AREVA to Bruno Chareyron, CRIIRAD, Reference: BUM/DCRE CE 09/004 – YDR/SCT, 8 September 2009.

¹²⁸ Interview with Anne Fauconnier, vice-president of communications for AREVA Mining, Arlit, Niger, November 2009

¹²⁹ Interview with Almoustapha Alhacen, President of Aghir in'Man, Arlit, Niger, November 2009







Former mine worker Dan Bancufa Moumgo, who has now fallen sick.

**“We worked with our bare hands!
...The mining company never informed us
about the risks... we relied on what
God decided.”¹³⁰**

Salifou Adinfo

130 Interview with Salifou Adinfo, Former driller for AREVA, Arlit, Niger, November 2009

Disregard for the local population

A lack of education and information regarding the risks

While the enumerated health and environmental impacts are staggering, perhaps even more shocking in the case of Niger is how AREVA had a complete disregard about informing the citizens of the risks of its mining operations. AREVA argues that during the time of the opening of the mines in the late 1960s some of the health risks were unknown¹³¹. However, one of the original incentives for AREVA to prospect abroad was the growing concerns over health in France. National (French) and international standards for nuclear activity were already being put in place¹³².

“The white men, when they were here, they knew. The white men openly talk about the diseases caused by the mine,” Fatima Daoui stated, referring to the 500 French expatriates who used to run the mines. It wasn’t the same for her people, though; an air of secrecy stifled the Nigerien workers, who weren’t free to speak about health problems without fear of repercussion. “The workers could not speak and are suffering from diseases. They can see their wives suffering from cancer, from malaria, but could not say anything. They [the mining companies] were aware.”¹³³

According to Salifou Adinfo, 67, who was a driller in the mines from 1966-2000, there was no protective equipment for workers. “In that time, there was complete ignorance! No mask, no protection. Then [later] we received protection. Before, we worked with our bare hands! ...The mining company never informed

us about the risks...we relied on what God decided.”¹³⁴

“We were not informed,” concurs ex-colleague Tanko Anafi. “About the health risks, I was not informed... they didn’t say anything. We ourselves are not told anything. We only work..A medical visit at our hiring and that’s all...”¹³⁵ Daoui’s, Hamidou’s, Adinfo’s and Anafi’s testimonies mirror many other accounts that Greenpeace heard in their time in Niger: in the beginning, and for many decades, no workers were informed of the risks and many had little or no protection. Also the population was kept in the dark.

Alhacen declares, “AREVA says nothing to the people of Arlit. AREVA doesn’t have a structure to inform people. AREVA says nothing, not an ounce, to inform them about the dangers of radioactivity. That’s the struggle that we are having with them! For them, we should say nothing! They think that we [they believe] scare people,”¹³⁶ he says, when the NGO tries to inform people of the dangers.

Even when workers were provided dosimeters, they were not informed of the dose they received. Further, sub-contractors, which are used frequently, do not wear dosimeters.

According to a 2008 report by the NGO Tchinquagen Association, “The first individual safety outfits such [as] masks were placed at the workers’ disposal in the middle of the eighties—nearly 15 years after the beginning of the mining. During the first years, the miners used to work with their plain clothes. So they used to come back home with the clothes they had worn to work, which were covered with ore dust.”¹³⁷

¹³¹ Personal communication, AREVA representative, 8 November 2009.

¹³² IAEA 2006. Country Nuclear Power Profiles. Paragraph 3.1 <http://www-pub.iaea.org/MTCD/publications/PDF/cnpp2009/countryprofiles/France/France2006.htm>

¹³³ Interview with Fatima Daoui, President of l’Association des Femmes des Quartiers Périphériques d’Arlit, Arlit, Niger, November 2009

¹³⁴ Interview with Salifou Adinfo, Former driller for AREVA, Arlit, Niger, November 2009

¹³⁵ Interview with Tanko Anafi, former mine worker, Arlit, Niger, November 2009

¹³⁶ Interview with Almoustapha Alhacen, President of Aghir in Man, Arlit, Niger, November 2009

¹³⁷ Tchinquagen Association: “La malédiction de l’uranium, le Nord-Niger victime de ses richesses” (August 2008)

“At first, everyone was leaving with his work suit to go home! Even today, we still see, some guys who come from the area with their work clothes,”¹³⁸ said Hamza Lawali. Work clothes covered with dust from the mines pose a risk of exposure to the workers’ families.

Corroborated by the SOMAIR workers’ trade-union representatives, the Tchínagen report goes on to say that even when protection was provided to the employees, the sub-contractors were excluded. According to a letter been sent to COMINAK by a factory inspector in 2003: “I’ll ask you to watch and see to it that the sub-contractors’ employees working down below the mine get the same safety conditions than your own employees. I’m caring about the principle of equality in protecting indiscriminately all the workers from the same risk in common surroundings.” As of the writing of the report in 2008, this situation had still not been improved for sub-contractors.

Ibrahim Ekawel, an electrician at SOMAIR for 30 years, stated, “We were never informed about the risks. It was only lately...around 1990. They said, ‘One should care about safety.’ We were told to protect ourselves, but [even then] we were not given the proper equipment!” He continued, “As for ourselves, we can say our life is almost over. I pray [to] God that the miners today have safer working conditions.”¹³⁹

Massive developments have been made in the health and science sectors in the last decades. Still AREVA only began to take action on some of these matters in the late ‘90s and 2000s, sparked by local pressure, namely the work of Aghir in’Man and other NGOs.

“Since 2003, the most important thing that has changed is ourselves [the Nigerien people]! Our mentality over the issue has changed... This awareness has led to the historic march of 6 May, 2006, the first demonstration against the actions of AREVA in Arlit. 5,000 people. Thanks to this mobilisation, AREVA has improved a lot of things,”¹⁴⁰ Alhacen said.

Salifou Adinfo also spoke of some changes at the mines: “At the beginning, they did not tell us about the risks, but lately they started to give masks, gloves, protective shoes and helmet...” However, a new

feeling of fear and anxiety is sweeping the community. “When we did not know, we weren’t scared, but now, we are...concerned because we are not healthy.”¹⁴¹

While the awareness amongst workers has grown over the years, many people in the community still seem unaware of the risks. AREVA has begun to inform their current employees to take precautions, but has done nothing to inform the local population of the dangers of mining and exposure. While informing employees is a step in the right direction, these slight improvements are clearly not enough.

Accidents and the lack of urgency following contamination has also been a serious problem for AREVA. On 23 January 2004, uranium was being transported on trucks to Cotonou harbour in Benin for transportation to France. In southern Niger, one of the trucks flipped over, causing 17 barrels of uranium to be spilled. A month later, samples were taken and analysed by the CRIIRAD, showing figures 2000 times higher than normal.¹⁴² Despite demands from the National Centre for Radioprotection (CNRP), it took AREVA one month to address the spill.¹⁴³

Due to the efforts of Aghir in’Man, the CNRP and CRIIRAD, some improvements have been made. “The drivers who transport the uranate to Cotonou or Lomé are aware of the risks. This was not the case before 2003. The convoys are [now] escorted,” said Alhacen. “The uranate is today wrapped three times: the drums are wrapped in plastic and put in a container...before, the drums were loaded in a truck—that’s all! A big change...”¹⁴⁴

“One of recommendations [AREVA has followed] concerns the protection of vehicles. The cabins were not closed [in the mines]. Now, vehicles that are collecting ore have enclosed cabs and air conditioning,”¹⁴⁵ said Hamdou Kando of CNRP. Also, according to Alhacen, a sprinkler is now in place to water down the dust in the mines when grinding rocks.¹⁴⁶

141 Interview with Salifou Adinfo, Former driller for AREVA, Arlit, Niger, November 2009

142 Chareyron B., Impact de l’exploitation de l’uranium par les filiales de COGEMA-AREVA au Niger. Bilan des analyses effectuées par le laboratoire de la CRIIRAD en 2004 et début 2005. Rapport CRIIRAD N°05-17, April 2005.

143 Ibid

144 Interview with Salifou Adinfo, Former driller for AREVA, Arlit, Niger, November 2009

145 Interview with Hamadou Kando, inspector and chief of technical services at CNRP, Niamey, Niger, November 2009

146 Interview with Almoustapha Alhacen, President of Aghir in’Man, Arlit, Niger, November 2009

138 Interview with Hamza Lawali, ex-worker mines, Arlit, Niger, November 2009

139 Interview with Ibrahim Ekawel, former electrician, Arlit, Niger, November 2009

140 Interview with Almoustapha Alhacen, President of Aghir in’Man, Arlit, Niger, November 2009





Almoustapha Alhacen, President of Aghir in'Man

Health problems and illnesses

“The health of the general population is zero!”¹⁴⁷

Ibrahim Ekawel

While safety improvements and radiation monitoring of the current employees is crucial and necessary, it does nothing to make up for the risks former workers were exposed to.

Approximately 10 years ago SOMAIR laundry worker Gigo Zaki collapsed while working, and was taken to the hospital. “I washed the clothes for the miners and [their] clothes for the city as well...dress for mining and for normal life...I was the only one in charge of that since 1968.” Completely unprotected during his time of employment, he recounts his episode: “...I couldn’t remember what happened...I was told that I did not recognize anybody [for] one week.” Since the collapse he was forced to retire and has been ill ever since: his hands and legs are now paralysed. “We are already radiated. We are no more useful. We can only watch.”¹⁴⁸

Only in recent years has AREVA followed the CNRP’s recommendations on laundry work. “We also asked that the washing of work uniforms will not be sent in town for cleaning, but done there [at the facility]; and they have taken steps in this direction,”¹⁴⁹ CNRP’s Kando said. This action illustrates AREVA’s awareness of the health risks.

Zaki is one of many ex-workers and local people who have illnesses they cannot account for - and which often have not been properly diagnosed and treated¹⁵⁰. Many suffer from the uncertainty, not knowing what risks they have been exposed to and how that will affect the lives of themselves and their families.

¹⁴⁷ Interview with Ibrahim Ekawel, former electrician, Arlit, Niger, November 2009

¹⁴⁸ Interview with Gigo Zaki, former laundry worker in SOMAIR, Arlit, Niger, November 2009

¹⁴⁹ Interview with Hamadou Kando, inspector and chief of technical services at CNRP, Niamey, Niger, November 2009

¹⁵⁰ Interviews by Greenpeace with ex-workers during visit Arlit, Niger, November 2009.

Tanko Anafi declares, “I know I am affected like nearly everyone who worked and those currently in the villages... We are more than 1,200 people that have left all across the country. Some have died elsewhere. Some of these deaths are linked to uranium.”¹⁵¹

One ex-worker, Kiro Marafa, 58, was dying, according to his family. His wife, Saoudé Idi, was extremely distraught and tried to explain his situation. “There is no point asking the doctors [what’s wrong]... They would not tell us. They only say he is suffering from blood pressure.” We are waiting from the mine company to take action, she said, because we have no power. “We know there are indeed many, many diseases and risks linked with this work. But at least we have food on the table; we have something to eat.”¹⁵²

‘Company provided’ healthcare

AREVA has built two hospitals in the mining towns, one in Arlit and the other in Akokan. AREVA’s press pack states that “These facilities are open to everyone in the region, meaning that the population benefits from the best healthcare in Niger¹⁵³.” However, it goes on to say that mine employees and their families account for two-thirds of the patients treated, and the rest treated are from the general population. Statistically, in an urban area of 80,000, where the company only employs 2,400 people (plus families), the equal acceptance of all patients - given these figures - seems quite improbable.

When questioned on health coverage, AREVA representatives said that a worker is covered for three years following the end of his employment¹⁵⁴. The existence of coverage term limits also appears to conflict with the promise of access to free care for the entire population.



Alka Hamidou, former AREVA miner.

¹⁵¹ Interview with Tanko Anafi, former mine worker, Arlit, Niger, November 2009

¹⁵² Interview with Saoudé Idi, local resident, Arlit, Niger, November 2009

¹⁵³ AREVA, January 2009. “AREVA in Niger”

¹⁵⁴ AREVA representative, COMINAK hospital, 2 November 2009. Personal Communication.



Ex-worker Hamza Lawali complains that former workers were not admitted at the hospitals, especially when their pain may be due to their work in the mines. He tells of one colleague who was rejected from treatment. “One time he went to the hospital, and they said to him, ‘You are no longer part of this company so you must go to the clinic to be treated!’ It’s abusive.”¹⁵⁵

When asked by Greenpeace, Anne Fauconnier, vice-president of communications for AREVA Mines admitted “We are responsible for the health of our workers and also the retired workers. We pay a lot of attention to survey them in order to help them, even if they are no longer working in the mines. We set up an observatory in order to monitor them in their working life and future life.”¹⁵⁶ She goes on to say that there is dust around the mines, so they built a hospital, so workers can receive all that they need, and their families and the people in the community as well.

While Fauconnier’s remarks seem appropriate, AREVA’s public stance on health issues caused by the mines, stated in its 2009 report,¹⁵⁷ implies there is no problem at all. “Cancers are extremely rare. During 40 years of mining, not one case has been detected that was thought to have been caused by exposure to ionising radiation. Cancer is an illness found mainly in Western countries with elevated pollution levels and high consumption of rich food, tobacco and alcohol.”

As the AREVA-run hospitals do not staff any occupational doctors, it is impossible for someone to be diagnosed with a work-related illness. Nigerien Environmental Minister Issouf Baco says “To this day we have no proper occupational medicine in Niger. The doctors who are there and who are hired by the company cannot do what the company does not ask. There must be an independent substitute from the state... There has been no independent study. Even less independent health care! It is always the companies who treat the health of the people. The studies are those of the government. That’s what saves face.”¹⁵⁸

Alhacen agrees. “In these hospitals, there are no occupational doctors. There are surgeons, general practitioners and midwives. They are very good at their jobs! But there is not a doctor working to declare occupational diseases, as required by Nigerien law. AREVA has done everything to avoid that, which explains the absence of occupational illnesses for 40 years. It’s very shocking.”¹⁵⁹

“The problem we have with radioactivity here, these are low doses. Long term, low doses lead to cancer. Cancers that attack the kidneys...silicosis. There are many cases like this. That is why we require an independent radiological and epidemiological study to verify if these diseases are associated with radioactivity. We were confronted by AREVA, which does not agree to this study.”

In 2005 shocking allegations were made against one of the hospitals that it was misclassifying cases of cancer as HIV¹⁶⁰. According to the Sherpa 2005 report, a patient who suffers from lung cancer is never informed of that diagnosis. A former employee of one of the hospitals said that “the only confirmed cases of cancer involve people from outside the mining companies” and goes on in a very serious charge, “when these symptoms affect agents of corporations, one talks about malaria, AIDS...”

Alka Hamidou expressed, “It is not possible to have access to medical records. Who is going to give them to you? We don’t have the right. It is the company. We do not touch! [From] bad to worse, it is not supported by those currently working. Yet they too [the workers] are affected! Those in the company, they are afraid of being fired! If you [workers] write something, they dismiss you without cause!”¹⁶¹

“As citizens of the region, what we want is health! If there is an illness, people will be monitored and treated... We need the former workers to have access to healthcare,”¹⁶² Lawali stated.

155 Interview with Hamza Lawali, local resident, Arlit, Niger, November 2009

156 Interview with Anne Fauconnier, vice-president of communications for AREVA Mining, Arlit, Niger, November 2009

157 AREVA, January 2009. ‘AREVA in Niger’, pg. 17

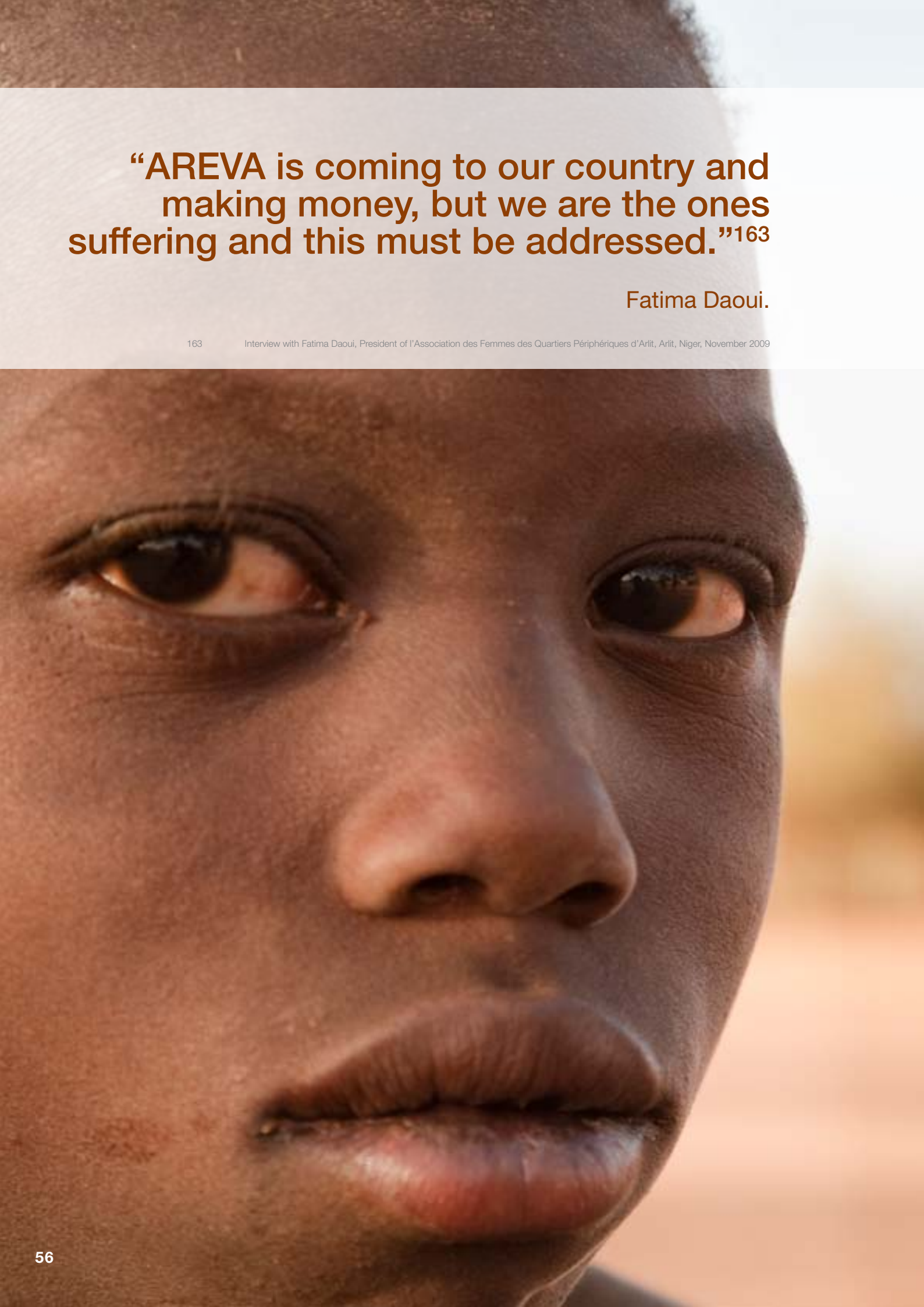
158 Interview with Issouf Baco, Minister for the Environment and Combat against Desertification, Niamey, Niger, 2009

159 Interview with Almoustapha Alhacen, President of Aghir in’Man, Arlit, Niger, November 2009

160 Sherpa, « LA COGEMA AU NIGER - Rapport d’enquête sur la situation des travailleurs de la SOMAIR et COMINAK, filiales nigériennes du groupe AREVA-COGEMA », pg. 18. 25 avril 2005

161 Interview with Alka Hamidou, Former AREVA miner, Arlit, Niger, November 2009

162 Interview with Hamza Lawali, local resident, Arlit, Niger, November 2009

A close-up, high-resolution portrait of a woman with dark skin and eyes. She is looking slightly to the right of the camera with a serious, contemplative expression. The lighting is soft and natural, highlighting the texture of her skin and the intensity of her gaze. The background is blurred, suggesting an outdoor setting with warm, golden light.

“AREVA is coming to our country and making money, but we are the ones suffering and this must be addressed.”¹⁶³

Fatima Daoui.

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Interview with Fatima Daoui, President of l'Association des Femmes des Quartiers Périphériques d'Arlit, Arlit, Niger, November 2009

Nuclear inequality

Poverty and enduring pollution

“People are not afraid. They do not know what radioactivity is ... The priority of people is poverty. But we must not lose sight of this problem. The radioactivity increases poverty and creates victims.”¹⁶⁴

Almoustapha Alhacen

Local leaders like Alhacen feel that the problems caused by AREVA only compound the existing ills in Niger. “We ask the production of uranium to fight against the curse of poverty. What we are seeing for 40 years is that this problem has only increased! In the belt around Arlit, people are very poor: neither water nor electricity... The risk is that the same could happen at Imouraren. It is therefore necessary that the public be more vigilant so that there is less pollution and are more benefits from the uranium.”¹⁶⁵ One of the ironies of AREVA’s rush for uranium in order to provide electricity to the world is that many Nigeriens don’t even have electricity.

He makes the argument that instead of driving out poverty, they have inherited enduring pollution. “The Nigeriens, 3,000 of whom live from the mine, believe that there is nothing better in life.” He continues, “I must tell you that in Arlit, they use oil lamps in the suburbs! In Arlit, some have no water...The little Nigerien lights a kerosene lamp to read his lessons... Many homes are without electricity. We regret it! We are neither pro-nuclear or anti-nuclear. 90% of Nigeriens do not even know that we produce uranium today in Niger.

100% of Nigeriens do not know what radioactivity is! 100% of Nigeriens do not know that uranium is used to make electricity! The problem of Niger is the following: uranium must contribute in the reduction of poverty. It is evident that if it does not contribute, it is not worth it.¹⁶⁶”

Fears about AREVA expansion and the creation of the third mine, Imouraren, are many. Alhacen says the effects from the mining will affect the ecosystem, as well as the Tuareg and other nomadic populations. “They will first run out of places for pasture, which will be altered. AREVA needs 40 km of radius for operation. Then come all the impacts that we know: the detonations and the light will disturb the entire ecosystem. Animals do not like the light at night. The noise of the engines... They will also burn a lot of wood. All this of course before the radioactivity and the draining of the groundwater.”¹⁶⁷

Daoui worries that the local populations around Imouraren there will feel the same effects that Arlit and Akokan do, “The rural people there don’t understand that: uranium could kill.”¹⁶⁸

According to Marou Amadou, of FUSAD, “After 40 years of operation and AREVA’s presence in Niger, us Nigeriens, we feel we have not had our fair share. We evaluate this in terms of what benefits the state of Niger has received—a little less than 10%—since more than 2500 billion CFA francs, of which an estimated 292 billion have returned to the state of Niger.”

He continues, “We can no longer explain this inequitable distribution which contributes to keeping us in a situation of extreme poverty, misery, streams of illiteracy, ‘benign’ diseases that continue to kill people, including the people living in the uranium exploitation zones.”

“The UNDP has published its Index of Global Development: Niger holds the tail in 182nd place... AREVA will want to be relieved of any responsibility for it.

¹⁶⁶ Ibid.

¹⁶⁷ Ibid.

¹⁶⁴ Interview with Alhacen, President of Aghir in Man, Arlit, Niger, November 2009

¹⁶⁵ Ibid.

¹⁶⁸ Interview with Fatima Daoui, President of l’Association des Femmes des Quartiers Périphériques d’Arlit, Arlit, Niger, November 2009

We say that for many of the facilities and households in Europe, and particularly, more than two bulbs in three in France are lit by uranium from Niger, which is provided primarily by, Electricité de France (EDF).. We believe it is urgent that we consider a win/win cooperation. For the rest, it belongs to the government of this country—specialist in bad management and corruption—to better manage the resources managed by the exploitation of uranium.”¹⁶⁹

The uranium mines will close in the next five to ten years, when the uranium runs out. Closure of the mines not only means the loss of jobs for the people working in the mine, but it will also destroy the economy in the mining towns. Roughly 80,000 people are currently dependent on the mines and associated businesses. So far, AREVA has no social plan providing for the future of the citizens of Arlit and Akokan¹⁷⁰.

AREVA representatives acknowledged on several occasions during the Greenpeace visit in November 2009 that a lot of mistakes have been made in the Arlit region around the mining operations. They stated that in setting up the new uranium mine in Imouraren AREVA aims to prevent the social-economic legacy of a city. “Fifty years later we will not make the same mistake as in Arlit. We will not build another city [in Imouraren].”¹⁷¹

Anafi declared, “AREVA has to comply with its commitments to the health of the public and the workers. It must not repeat COMINAK and SOMAÏR [in Imouraren]. They must not let one worker affected by radon rot in the hospital...”¹⁷²

¹⁶⁹ Interview with Marou Amadou, November 2009, President of Le Front Uni pour la Sauvergarde des Acquis Democratiques (FUSAD), Niamey, Niger

¹⁷⁰ Personal communication, AREVA representative, 3 November 2009.

¹⁷¹ Ibid.

¹⁷² Interview with Tanko Anafi, former mine worker, Arlit, Niger, November 2009









A call to action

“It is my children who are going to work there! ...I do not want them subjected to the same fate as me! ...AREVA must improve their procedures so that everything works well... In both cases may it be on our side or their side. I believe that is the best solution.”¹⁷³

Alka Hamidou

For many years, AREVA and its partners have exploited the population, the earth, water and air in the mining region. Their activities continue to threaten the health, safety and welfare of the citizens in the area, as well as damage the surrounding environment for literally hundreds of thousands of years to come. AREVA is not only physically and socially exploiting the Nigerien people, it is also robbing them of their greatest known economic resource by not sharing the wealth of the uranium excavation.

The studies done by Sherpa, CRIIRAD and Greenpeace, and the accounts from the local population and community leaders illustrate the decades of negligence and disregard that AREVA and its partners have shown to their own employees and the people of Niger. In the majority of instances, AREVA was aware or should have known of the danger and damage that its activities were causing to the environment and the population; yet it failed to act responsibly and take precautions to limit harm to the people and environment.

A comprehensive study never seems to have been undertaken in any African country where COGEMA / AREVA operates, even though international experts and public health officials have, for a number of years already, been concerned about the development of lung cancer due to the presence of radon in homes,

according to the 2007 Sherpa report¹⁷⁴. “A scientific study can usually establish, with good statistical certainty, the relationship between the number and the nature of the diseases detected, especially so for cancers, and the doses of radiation received.”

Greenpeace is calling for an independent and thorough evaluation of the mining activities, environment and health impacts of the population in the mining region, and an immediate redress of problems. The air, water and soil, along with all buildings, roads and surfaces must be decontaminated. Radioactive scrap metal must be retrieved, and replaced with clean and safe alternatives. Actions must be taken to address the loss of land and resources for the nomadic populations, and ensure their way of life is not further threatened. An independent health care and monitoring system must be available for all, free of charge, and no one should be turned away. Screenings for cancer and other occupational diseases must be set up; any discoveries must be honestly diagnosed and swiftly treated.

Further, in view of the anticipated expansion of the uranium mining sector in Niger, the government and the leaders of Niger must step in and ensure the environmental and health agencies that are in place are properly funded, educated, and equipped so that they can fairly - and independently - assess the local situation. The government must also ensure that the people of Niger, and not the politicians, are adequately compensated for the exploitation of their land's resources.

The people of this region need to be treated with the dignity and the humanity that they deserve. The workers, their families, and the community as a whole have paid too high a price to supply France and the world uranium for nuclear energy. AREVA must change its behaviours and practices in Niger and in other mining endeavours so that populations will be safeguarded from these problems.

¹⁷³ Interview with Alka Hamidou, Former AREVA miner, Arlit, Niger, November 2009

¹⁷⁴ Sherpa. Synthèse des rapports. AREVA au Gabon et au Niger, pg. 3. 4 April 2007



Greenpeace recommendations

AREVA must publicly recognise the problems caused by its uranium mining activities. AREVA owes it to the citizens of Niger and future communities in new mining areas to publish the truth about the impacts and the risks to people and environment.

AREVA must take immediate action to solve the problem of radioactive materials in the mining towns. A comprehensive radiological survey needs to be done to identify the presence of radioactivity outside the mines, such as contaminated scrap metal, plastic and geotextiles. The inspection methodology must be appropriate and comprehensive, i.e. sensitive equipment should be used, and objects should be checked on contact. Any contaminated material found in the community should be bought back and removed immediately, in order to limit the exposure to radiation of the population.

Radioactive scrap metal should be prevented from leaving the mine. Maximum allowed contamination thresholds should be made public.

AREVA must acknowledge the problem of uranium and other contamination in the water wells. Immediate measures need to be taken to prevent the public being exposed by drinking contaminated water. Clean, safe drinking water needs to be provided for all citizens while the decontamination is taking place to prevent further illnesses.

AREVA must support the realisation of an independent, comprehensive and fair assessment of the impacts of the uranium mining activities in Niger. Representatives from civil society should be included in this process and should be given access to all relevant data.

AREVA should continuously monitor all identified routes of radiation exposure, including water contamination, deposits of radionuclides, radioactive dust. Those should be incorporated in the dose estimates for workers and the population. All this information should be made publicly available in environmental impact reports.

AREVA should propose solutions for the short-term and long-term storage of waste rock and tailings from the mines in Arlit, the exhaustion of water resources, as well as for long-term health monitoring of the population. A programme should be set up to support the population of Arlit and Akokan also after closure of the uranium mines.

AREVA should be honest and transparent in its public documents. While AREVA press statements declare that the annual limit of 1 mSv for exposure of members of the public dose is respected, the environment impact assessment report of COMINAK proves otherwise.

AREVA should take responsibility for its actions not only in Niger, but worldwide. It should prevent all environmental, health and social problems caused by uranium mining in its existing and future uranium mining activities.

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Greenpeace International
Ottho Heldringstraat 5,
1066 AZ Amsterdam,
The Netherlands
t +31 20 718 2000
f +31 20 718 2002
www.greenpeace.org