DON'T wear shoes inside. Wash outdoor toys often. Don't hang washing out if there's a northwesterly blowing. In fact, try not to be outside at all if there's a northwesterly. Don't vacuum while your children are in the room. Don't drink rainwater. Or cook with it. Especially don't use it to make baby's formula. Don't let toddlers put their hands in their mouths or play on the grass.

The list of dos and don'ts for parents in South Australia's Port Pirie seems endless. Alarming to the uninitiated, these health guidelines are a way of life in this seaport town, and they are paying dividends, though not quickly enough for some.

Every year, more than 44 tonnes of fine lead dust is emitted from the heavy metal smelter that towers over the historic township. The dust settles on the city's wide streets and big back gardens, on its cars and letterboxes; it drifts on the breeze into homes, clinging to curtains, bedding, carpet, clothing.

A 200m chimney stack visible from all Pirie's vantage points has become a symbol of all that is right and wrong in the town that, along with Whyalla and Port Augusta, forms South Australia's "Iron Triangle".

The stack represents employment in a place where jobs are scarce; the smelter employs 14 per cent of the town's workforce. But it also represents a sickness -- dangerously high lead levels among the 14,000-strong population. This is a problem in particular for the 840 children in the town under the age of five, the group most vulnerable to the effects of lead poisoning.

One in four of Pirie's under-fives has lead levels above National Health and Medical Research Council guidelines, which is 10 micrograms of lead per decilitre of blood.

Aarron Fuller knows firsthand the effects of lead poisoning on children, having grown up in Pirie. He and his 21-year-old partner, Jess Reed, are used to the health guidelines that dictate the life of their 18-month son, Benjamin -- or BJ, as they call him.
"We don't really let BJ play in the dirt," Fuller says. "I'm pretty strict with him. I don't want him to have any problems like I did."

When Fuller was BJ's age, he had a blood lead level above 40mcg a decilitre.

As a youngster, he spent much of his life visiting doctors. He suffered from asthma, attention deficit disorder, hyperactivity, behavioural problems and learning difficulties. In 2000, his mother, Cindy Fuller, joined a class action against the then smelter operator, Pasminco.

She wanted Pasminco to pay for a home tutor to help her son with his studies, as well as compensation.

"He had major problems at school. He couldn't concentrate," Fuller tells The Australian. "We wanted the smelter to take responsibility, but they brushed it off and said it wasn't their fault."

The class action ultimately failed, and Aarron Fuller, now 24 and unemployed, is still on medication for the behavioural problems that plagued his early years.

He bears no bitterness toward the smelter but is angry the community is not doing more to protect children such as BJ from the lead.

"It is just the Pirie community; it's just how we are. Pirie is just screwed," he says. "It's just hear no evil, see no evil."

While there have been improvements in lead emissions and blood lead levels in the past decade (in 2005, 60 per cent of children had blood lead levels over 10mcg, now it is 25 per cent), it is still the case that almost everything BJ touches is coated in the fine lead powder that comes from the smelter and is invisible to the naked eye.

In high doses, lead can cause cancer, kidney failure and a brain disease, encephalopathy. In low doses, it is a neurotoxin, which means it causes brain damage, particularly in children, whose brains are rapidly developing.

The Port Pirie smelter, built in 1889, is the largest of its type in the world and processes 195,000 tonnes of lead a year for Zurich-based metals company Nyrstar. Lead smelting is the economic backbone of the town, and managing the toxic dust has become an accepted part of life for residents.

The town's picturesque setting -- between the Southern Flinders Ranges and the sea, 200km north of Adelaide -- belies the contamination. In fact, 3000 children have tested positive for lead poisoning in the past decade.

Just more than 700 people are directly employed by Nyrstar, but not everyone is concerned about the lead.

At one of the town's playgrounds, Emma Scarman confides that her seven-year-old son, Hayden, has a blood lead concentration of 17mcg per decilitre. But this pales in comparison, she says, with the 56mcg she recorded as a toddler in the 1980s.

"I haven't been worried," says Scarman. "He is fine. He has no development problems and I never had any problems."

"Pirie is a great place to live, but if the smelter closes, then Pirie would just be a ghost town because the majority of people work there."

Bruce Lanphear, an international expert on lead toxicology and public health and a professor of children's environmental health at Simon Fraser University in Vancouver, says the evidence is almost definitive that lead levels as high as experienced by Aarron Fuller and Hayden cause ill health.

He says lead poisoning occurs to varying degrees at levels above 5mcg, despite health authorities preferring to use the term "elevated lead levels".

A review of academic research by the US National Toxicology Program this year concludes that a range of adverse health effects in humans are caused by low-level lead exposure.

In children, the NTP finds "sufficient evidence" that low-level lead exposure can cause delayed puberty, reduced postnatal growth and adverse neurological outcomes such as decreased IQ and hearing. Even at levels of less than 5mcg, the NTP finds evidence of brain injury and increased incidence of attention deficit hyperactivity disorder.

"The only evidence that would be stronger than what we know now would be if we took 1000 children and tested half of them by dosing them with lead and compared the effects with the other half," Lanphear says. "We don't
need more evidence. To say the jury is out is completely false."

Following the NTP's review, the US Centres for Disease Control dropped its "level of concern" from 10mcg per decilitre to 5mcg.

Australia's recommended levels are still under review. The NHMRC's lead working committee is expected to report to the council later this year.

If it follows the US position, hundreds more children in Port Pirie will come in above the recommended levels.

Data from the Public Health Information Development Unit at the University of Adelaide reveals Port Pirie has asthma levels 11 per cent above the national average and lung disease 24 per cent higher. The rate of males with mental health and behavioural problems is 26 per cent higher than average and high or very high psychological stress levels affect 14 per cent of the population.

Lanphear says the changed position of the Centres for Disease Control sends a clear message to Australian regulators to revise their recommended standards.

"In the aftermath of that," he asks, "are we going to say we should err on the side of protecting the industry and the economy, or are we going to err on the side of protecting our children?"

The state Environment Protection Authority has given approval for Nyrstar to continue its emissions of 44 tonnes annually until 2017. Nyrstar has said it is investigating a redevelopment of the smelter to meet new environmental standards, but that significant government or third-party assistance will be needed. The estimated cost of transforming the smelter into a modern "metals recovery facility" is estimated at $350 million.

SA Health records the blood lead levels of children up to the age of five in Pirie four times a year. Improvements in recent years have been achieved largely through environmental efforts.

The aforementioned tips for living in the shadow of the smelter come from a slick website for the "Ten for Them" community action group, a Nyrstar-backed organisation that aims to decrease blood lead levels of children.

It was formerly called Tenby10, but was renamed after the program failed to meet its target of having 10 per cent of the town's children with blood lead under 10mcg by 2010.

According to SA Health data, 25 per cent of children under five had blood lead levels above 10mcg last year and 8 per cent recorded more than 15mcg. SA Health says it does not collate data on how many children record levels between 5mcg and 10mcg.

Despite the community's best efforts, contamination in Pirie is almost impossible to avoid. Children under two are the most vulnerable. Babies who put their hands in their mouths will ingest lead. Young children who dig in the dirt or roll on the grass are exposed to lead.

A study last year by Sydney's Macquarie University found that playground equipment in the town has surface lead of more than 3000mcg a square metre -- almost 10 times the level set by WA Health in its Esperance lead clean-up program.

"Trying to reduce lead exposure by cleaning the house, or vacuuming, or even sending in cleaning crews without reducing the source will not protect children," says Lanphear.

Warnings of the potentially damaging health effects of lead in Port Pirie are not new.

Countless committees and taskforces have been established by government to examine lead poisoning in Pirie, starting with a royal commission in 1925. The most recent taskforce was set up by the Weatherill government earlier this year.

A 1983 report prepared by Philip Landrigan for the South Australian Health Commission said the risks associated with low lead exposure were significant enough to justify moving the population of the town.

"Reduction of children's exposure to lead in Port Pirie and prevention of any further lead-induced neuropsychological impairment there requires urgent interventive action," the report said. "Serious consideration should be given to the possibility of evacuating population from the most heavily contaminated areas."

The mass evacuation of the town never occurred, and emissions from the smelter are similar to when the report was published, down from 50 tonnes of lead in 1982 to 44 tonnes last year.
Mark Taylor, a professor in environment science at Macquarie University who has reported on Port Pirie lead emissions for the state government, says the government, the company and residents are largely captured by vested interests, which has prevented action.

"One has to conclude that the government has ignored advice from their own experts, their own government officers," Taylor says.

"The reason action should be taken is to protect those children who cannot protect themselves."

South Australian director of public health Kevin Buckett says the health department is concerned that improvements in blood lead results are levelling out.

Nyrstar says it wants a "long-term future" for the smelter in Port Pirie and is in talks with the state and federal governments about redeveloping. "While Nyrstar and the (government) taskforce is strongly committed to reaching an agreement, there are still quite a number of complex legal, financial and technical issues that need to be resolved," a company spokeswoman tells The Australian.

As negotiations between the company and government continue, talk of another class action is brewing. The Fullers are again considering suing for damages.

Damian Scattini, principal for Maurice Blackburn, admits resistance from the town to taking on Nyrstar is inevitable, as many are residents captive to their employer. Unemployment sits at 11 per cent.

"You can't see lead, but you can see unemployment," he says. "And children have no voice."