
LEAD Action NEWS

LEAD Action News vol 9 no 2, April 2009 ISSN 1324-6011

Incorporating Lead Aware Times (ISSN 1440-4966) & Lead Advisory Service News (ISSN 1440-0561)

The journal of The LEAD (Lead Education and Abatement Design) Group Inc.

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Contamination of La Oroya - Peru

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[All photos of La Oroya in this newsletter courtesy of Dr Godofredo Arauzo]



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Case File: Helping a Doctor help 35,000 Lead-Poisoned people around the Lead smelter at La Oroya in Peru - How GLASS works

by Elizabeth O'Brien, Manager, Global Lead Advice and Support Service (GLASS) 24/3/06

On Jan 11th 2006, a doctor working for the Health Ministry in Peru, Dr. Godofredo Arauzo, contacted us through the form on our website describing La Oroya Community's situation and looking for support. Our first contact with Dr Arauzo and the following events were documented in our Fact Sheet published on March 24th, 2006:

[Case file: Helping a Dr help 35,000 lead poisoned people around Lead-Smelter of La Oroya - Peru](#)

More recently, Dr Arauzo provided GLASS with the following factsheet about La Oroya:

CONTAMINATION OF 'LA OROYA', PERU

Written in Spanish by Dr Godofredo Arauzo [E-mail: godo_ara@hotmail.com]

Translated into English by Orlando Aguirre-Lopez, Volunteer, The LEAD Group

The Blacksmith Institute has conducted research, in 2006 and 2007, about the most polluted cities in the world, and it has concluded that La Oroya is among the 10 most polluted cities in the world. The 'Graffiti' (2007) considers it as one of the 5 deadliest cities in the world.

Actually, they have been quite benevolent. According to my several years' research, La Oroya is the most polluted city of Peru, Latin America and the world as well; and it is getting more polluted all the time.



Lead in the children's blood of 'La Oroya Antigua' is 53.7 micrograms per decilitre ($\mu\text{g}/\text{dL}$) (DIGESA, 1999); in pregnant women: 39.49 $\mu\text{g}/\text{dL}$ (UNES, 2000); in new born babies: 19.06 $\mu\text{g}/\text{dL}$; in mothers at the time of giving birth: 319 $\mu\text{g}/100$ grams of placenta (Castro, 2003), and 39 $\mu\text{g}/\text{dL}$ for labourers, (Doe Run, 2003). The maximum accepted amount of lead in the blood is 10 $\mu\text{g}/\text{dL}$; at present, the American Academy of Pediatrics (AAP) considers that the maximum allowed level is 0 $\mu\text{g}/\text{dL}$.

When 'La Oroya' was in the hands of Centromin, it used to get rid of residuals only through the 167.5 meter chimney, with the following averages, in tons per day: sulfur dioxide, 1,000; lead, 2,500; arsenic, 2,500; cadmium, 80; particulate material, 50 and so on; plus 24,000 tons of toxic gases produced by the incomplete combustion of coal, not mentioning those residuals expelled through the industrial incinerator and through the 94 small chimneys, approximately 15,000 tons. A total of 45,000 tons per day, (PAMA, La Oroya Metallurgic Complex, 1996). Another research affirms that only through the highest chimney, 119°, 917.440 tons were expelled at the speed of 8.7 per second (Chuquimantari Meza, 1992).

Every three months, the figures of the heavy metal concentrations are sent by Doe Run to the Energy and Mining Ministry. With this information, Cederstav has shown that the pollution has increased; for example, the sulfur dioxide has climbed to near a 300% due to production increment (Cederstav and Barandiarán, 2002).

The Inter American Association for the Environment says that the environment quality of La Oroya has seriously been damaged since Doe Run took over, and the company itself states that the heavy metal gas concentrations have increased in the air: Lead, 1,160%, Cadmium, 1,990%, and Arsenic, 606% (Portugal C y Cols [Portugal C and Cols], 2003)

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After writing the factsheet, Dr Arauzo agreed to join The LEAD Group's Technical Advisory Board, (thus becoming our first Board member in South America).

In order to publish the factsheet, we needed to complete the references with titles and publication details, in order to do so, we contacted Doe Run, which was the author of one of the references cited by Dr Arauzo. Mr. Victor Belaunde, Doe Run Corporate Affairs Manager replied to us sending the following comments about Dr Arauzo's article:

COMMENTS ON PIECE WRITTEN BY MR. ARAUZO

By Victor Belaunde, Doe Run Peru, sent by email to The LEAD Group, 31/10/08

"The Blacksmith Institute has conducted research, in 2006 and 2007, about the most polluted cities in the world, and it has concluded that La Oroya is among the 10 most polluted cities in the world. The 'Graffiti' (2007) considers it as one of the 5 deadliest cities in the world. Actually, they have been quite benevolent (...)"

- In 2006 and 2007, the Blacksmith Institute published lists of what they considered to be the world's most polluted places. These lists included unranked "Top Ten" cities. The city of La Oroya was included in the Top Ten.
- In May 2008, a team of experts from the Technical Advisory Board of the Blacksmith Institute accepted our invitation and visited La Oroya and our installations. Reports on their visit, including conclusions, recommendations and findings may be found at: <http://www.blacksmithinstitute.org/projects/display/36>.
- In general, the Blacksmith Institute summarized their conclusions as follows:

"In May 2008, a team of experts from Blacksmith Institute's Technical Advisory Board visited the site and reviewed these plans and activities. Their report is attached here. In general, the team found that the programs and plans of the company and government were effective. While pollution levels still remain high, it is expected that the current programs and investments will be effective in controlling exposures to lead in the near future."

" (...) According to my several years research, La Oroya is the most polluted city of Peru, Latin America and the world as well; and it is getting more polluted all the time."

- It would be interesting to learn the basis for this conclusion. In any event, this remark implies that environmental and pollution problems are getting worse every day, and that is an objectively false remark.

" Lead in the children's blood of 'La Oroya Antigua' is 53.7 micrograms per decilitre ($\mu\text{g}/\text{dL}$) (DIGESA, 1999); in pregnant women, 39.49 $\mu\text{g}/\text{dL}$ (UNES, 2000); in new born babies, 19.06 $\mu\text{g}/\text{dL}$; in mothers at the time of giving birth, 319 μg per 100 grams of placenta (Castro, 2003), and 39 $\mu\text{g}/\text{dL}$ for labourers, (Doe Run, 2003). The maximum accepted amount of lead in the blood is 10 $\mu\text{g}/\text{dL}$; at present, the American Academy of Pediatrics (AAP) considers that the maximum allowed level is 0 $\mu\text{g}/\text{dL}$."

- According to the Peruvian Ministry of Health, the blood lead levels of children under 6 declined by almost 50% (year end 2007 versus 2004). This improvement is attributable in part to a 68% reduction of air borne lead since 1997, made possible by the improvements Doe Run Peru implemented to its facilities.

"Every three months, the figures of the heavy metal concentrations are sent by Doe Run to the Energy and Mining Ministry. With this information, Cederstav has shown that the pollution has increased; for example, the sulfur dioxide has climbed to near a 300% due to production increment (Cederstav and Barandiarán, 2002)."

- Pollution levels have demonstrably decreased since 1997. In most cases the reduction is dramatic. In addition, production has not increased, quite contrary, Zinc production decreased more than 40% and Copper production dropped 11%. Up to date environmental indicators may be found at www.doerun.com.pe.
- Some examples of the across the board improvements in the environmental indicators of the Metallurgical Complex of La Oroya (all of them independently verified by the authorities):
 1. [88% reduction in the volume of effluents discharged into the Mantaro river](#)
 2. [99.9% drop in lead content in effluents discharged to the Mantaro river](#)
 3. [99% drop in arsenic content in effluents discharged to the Mantaro river](#)
 4. [70% reduction in overall dust emissions through the stack](#)
 5. [74% and 89% reduction in lead and arsenic emissions through the stack](#)
 6. [77% reduction in air borne lead in La Oroya](#)
- With respect to sulfur dioxide, with the new sulfuric acid plant of the Lead Circuit, inaugurated September 30, SO₂ emissions are expected to drop by 50% versus 1997. Further reductions will be accomplished by October 2009, when the new copper technology is implemented and the sulfuric acid plant of the Copper Circuit goes on-line.
- In this sense, since 1997, all environmental indicators have improved, including emissions, discharges and air quality. All this may be demonstrated and information to the contrary is demonstrably and objectively false. Furthermore, production has decreased, and this may also be demonstrated.

“The Inter American Association for the Environment says that the environment quality of ‘La Oroya’ has seriously been damaged since Doe Run took over, and the company itself states that the heavy metal gas concentrations have increased in the air: Lead, 1160%, Cadmium, 1990%, and Arsenic, 606% (Portugal C y Cols [Portugal C et al], 2003).”

This statement is demonstrably wrong. The figures are above.

FINAL COMMENTS / BACKGROUND:

1. The Metallurgical Complex of La Oroya has been in operation since 1922. Its original owner was The Cerro de Pasco Corporation. In 1974, the Cerro de Pasco Corporation was expropriated by the Peruvian Government and its assets assigned to a state owned enterprise called Centromin Peru.
2. In 1997 the Doe Run Peru bought the Metallurgical Complex of La Oroya in a public bidding process conducted as part of a privatization program of the Peruvian government. Doe Run Peru committed to invest US\$ 107.5 million and execute the environmental upgrade program previously developed by Centromin and approved by the Peruvian government. In turn, the Peruvian State committed to conducted remediation of the soils and land affected historical and legacy contamination.
3. The environmental upgrade program developed by Centromin and approved by the Peruvian government turned out to be insufficient and inadequate, both in terms of the investments required and the scope of the projects needs.
4. Doe Run Peru has substantially expanded its financial commitment and the scope of the environmental projects. This came attached with a term extension, taking the term to complete the program from 10 years to 13 years and 9 months. Doe Run Peru estimates that its total environmental investments when the upgrade program is completed will exceed US\$ 400 million, quadrupling the original commitment. To this end, Doe Run Peru is re-investing the entirety of its profits and has deferred any dividends or like payments until after the environmental projects are satisfactorily completed.

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Due to the fact that this letter was a direct response to the article by Dr. Arauzo, we forwarded this information to him. In turn, he replied to us by sending additional information about the article he originally wrote:

Reply to the commentary of Mr. Victor Belaunde about Contamination of La Oroya, Perú.

The original of this document is in Castilian Spanish; written by Dr. Godofredo Arauzo, member of the Technical Advisory Board of The LEAD Group.

Translated into English by Orlando Aguirre-Lopez, Volunteer, The LEAD Group

The Blacksmith Institute visited La Oroya in May, 2008. The observations about the achievements in contamination by this metallurgic complex, according to statements of The Inter American Association for the Defence of the Environment (AIDA, by its name in Spanish), are DECEIVING, because such statements have no basis; they are a summary presented by Doe Run. AIDA holds that the environmental quality, and the accomplishing or the degree of protection for human health of La Oroya can't be evaluated based on the degree

of investment made by the Company, but it should be done based on the current data about the quality of air, lead levels in the blood, and other environmental and health indicators, data that the report doesn't take into account.

They comment that Blacksmith is based on limited observations in order to evaluate, let's say for example, the sulphur level in the zone. The Blacksmith Institute affirms that the SO₂ concentration in La Oroya has a day time average of 5.0 µg/m³ (maximum allowed is 13 µg/m³); but during the day this institution was in La Oroya, the SO₂ concentration was zero.

Finally, AIDA concludes that the Blacksmith report undermines the efforts to really reach the remediation and clean-up of La Oroya⁽¹⁾.

AIDA states that the quality of air in La Oroya has deteriorated seriously after the metallurgic complex came into Doe Run's hands. Doe Run itself said that the lead concentration rose 1,163%, the arsenic, 606%, and the cadmium 1,990%⁽²⁾. The concentrations of lead, cadmium, arsenic, sulphur dioxide and others have substantially increased since 1997, mainly due to the increasing of production; for example, the lead production rose 25%⁽²⁾. The inhabitants of La Oroya are contaminated by a toxic cocktail⁽⁴⁾.

The cadmium concentration (Cd) rose dramatically since the acquisition of the Complex by Doe Run. The Cd concentration was 0.22 µg/m³ in the union in 1999. (The level allowed was 0.0055 µg/m³); it surpassed by more than 40 times the limit and didn't inform the Ministry for Mines and Energy (MEM) since the year 2000; in the same way, the arsenic concentration soared since 1997. There is no monitoring of particulate material smaller than 2.5 microns (PM 2.5), that are the most dangerous to human health, and move easily. Cederstav says that the parameters of air quality have been deteriorated dramatically after Doe Run got in charge of the Complex⁽⁵⁾.

The Environment Protection Agency of USA (EPA), has 1467 chemical compounds registered as the most harmful, and sulphur dioxide (SO₂) is ranking number 16 in dangerousness⁽⁶⁾. Cederstav showed, based on the same figures that Doe Run sends to MEM every 3 months, that SO₂ emission had increased by more than 200% since Doe Run got in charge of the Complex⁽⁵⁾.

The Blacksmith Institute affirms that the SO₂ concentration in La Oroya is, on average, 5,000 µg/m³⁽¹⁾; another author reports that this average is 934 µg/m³⁽²⁾; the level allowed is 13 µg/m³ CDC 2006⁽⁷⁾. The day time concentration is higher between 8 am and 5 pm, and it reaches a peak of 2,100 ppb (the allowed value is 280 ppb)⁽⁵⁾. On August 13th, 2008, the SO₂ concentration arrived at an historic and horrifying limit: 27,000 µg/m³ (8-9-10) (the allowed figure is 13 µg/m³, CDC, 2006⁽⁷⁾).

Other heavy metals and highly toxic compounds are not analysed in La Oroya: vanadium, uranium, mercury, antimony, barium, selenium, sulphur dioxide, chromium, cobalt, molybdenum, nickel, and aluminium⁽²⁾. The inhabitants of La Oroya are contaminated, not only with lead, but with cadmium, arsenic, sulphur dioxide, and antimony, as well; the antimony concentration is 30 times higher than in USA⁽¹¹⁾. La Oroya is daily life laboratory.

There hasn't been any decrease in the air concentration of lead in La Oroya; in Huanchan such concentration is above 15 times the level permitted; in the months of January and February, 2007, it was an excess of 245% above the allowed level in Huanchan station; in 2006 the cadmium concentration exceeded 48 times the levels allowed by the WHO⁽¹²⁾; lead production increased by 25%⁽²⁾.

Doe Run monitors only specific sources; it does not monitor the toxic agents that are emitted through the 95 small stacks, neither it monitors the extract deposits and arsenic of Vados and Malpaso, as it does not monitor either the elimination coming from the industrial incinerator and the coke plant that was emitting 23,800 cubic meters per day of toxic gases (PAMA).

Doe Run explained that the pollution of La Oroya had diminished; one attendant person blurted out: the pollution has increased; the lecturer answered: show me a document about your statement, and the person replied: 'the best document I count on is my contaminated body'⁽⁴⁾.

The SO₂ emissions from the Peruvian copper foundries are among the production sources of the highest sulphur dioxide concentration in the world, and they are also among the most contaminated production sources in the world⁽¹³⁾.

There is no concrete information about the quality control systems for the sampling and for the analysis of the monitoring procedure used by the company; we are not certain about the accuracy, confidentiality, and fitness of the information reported to MEM; the figures reported to MEM could be considered as an approximation and are under-evaluated, they are not in electronic neither in graphic form ⁽⁵⁾.

The contamination generated in La Oroya is not only limited to this city, but it also pollutes distant areas like Concepción, 100 km far away of La Oroya: The University of Missouri found lead in the blood of children with ages 0 to 6 years: 20 to 44 µg/dL in 72.22% of them; 10 to 19 µg/dL in 16.67%; 45 to 69 µg/dL in 8.33% and less than 10 µg/dL in 2.78% of them; it means that 97.22% of the children of the city of Concepción are contaminated with more than 10 µg/dL of lead in their blood; the amount permitted was 10 µg/dL ; but, at present, the Academy of Paediatrics of USA says that the maximum allowed is 0 µg/dL of lead in the blood ⁽¹⁴⁾. In the rural zone near La Oroya, Cuchimachay, there is an amount of 59.26 ppm (the allowed level being 3 ppm) of cadmium in the soil; there is no vegetal cap in this place ⁽¹⁵⁾.

The metallurgic complex of La Oroya has 37 liquid flows that go to the Mantaro River; Doe Run monitors only 12. The rules of the Peruvian state about monitoring of the quality of water in the mining works state that all the liquid discharges that go to surface waters must be constantly monitored ⁽⁵⁻¹⁶⁾.

On 26, July, 2006, Doe Run obtained the ISO 14001:2004 certificate ⁽¹⁷⁾, and on 11, March, 2008, it was gone because the company did not comply with Peruvian environmental laws, and did not have appropriate measures for preventing contamination ⁽¹⁸⁾.

In Huancayo, 120 km far away from La Oroya there is jurisprudence. In 1942 the Judiciary Power orders the Cerro de Pasco Copper Corporation, owner of La Oroya at that time, to pay a compensation of \$200,000 to Bazo Velarde, because of the harm caused to the Jatunhuasi Livestock, by the smokes of La Oroya ⁽¹⁹⁾.

The Judiciary Power ⁽²⁰⁾, the Constitutional Court ⁽²¹⁾ and the Inter American Commission for Human Rights (CIDH, for its name in Spanish) ⁽²²⁾, demanded that the Peruvian state be aware about the health of the inhabitants of La Oroya.

La Oroya pollutes the surface and deep waters, the soil, the air, and generates acid rain ⁽²³⁾, factors that cause damage to human and animal health, the ecosystems and biodiversity, in a way greatly irreversible. The smokes of La Oroya have affected 700,000 hectares around La Oroya ⁽²⁻²⁴⁾.

Doe Run will reduce its contamination in two circumstances: when it uses up to date technology, as that it puts in practice in Herculeanum, or when it reduces the refining tons. The Trial plant, in Canada, decreased by 25% the lead concentration in the children's blood, and reduced the concentration of heavy metals in the air by more than 75%, by the use of clean technology; in El Paso, when the foundry was closed down, the lead concentration in the air decreased immediately, and the lead concentration in the children's blood plummeted by more than 75%; in Torreón, Mexico, the government ordered to refine only 50%, and similar effects were obtained ⁽⁵⁾. The damages must be paid by Doe Run according to the world consensus 'he/she that pollutes pays', set in practice in Europe since 1972 ⁽²⁵⁾, and, the way as it does in Herculeanum, can apply these actions in La Oroya ⁽²⁻²⁷⁾.

"On August 13, 2008, La Oroya has been confirmed as the most contaminated city in the world. That day, the SO₂ concentration in La Oroya reached an historical and horrifying level: as journal El Comercio says ⁽⁸⁾; it got to 27,000 µg/m³; while the allowed level was 13 µg/m³ ⁽⁷⁾, and the device that measured the concentration got to its maximum limit; probably, if the device had had more space in its scale, that figure would have been higher ⁽⁸⁻⁹⁻¹⁰⁾, but when Blacksmith was visiting La Oroya the SO₂ concentration arrived to 0 (zero) ⁽¹⁾. Some other figures confirm that La Oroya is the most polluted city on earth: according to the report 'Mantaro Revive 2007' (Mantaro comes back to life): the arsenic (As) in La Oroya Antigua (The Old Oroya) has a soil concentration of 4713 ppm, while the allowed amount is 12 ppm, and the cadmium (Cd) has 193.87, while the permitted amount is 14 ppm, according to the Canadian Environmental Quality Guidelines ⁽²⁸⁾ "

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