

GOLD'S AFFLICTION

Soros Gold Bubble at \$1,384 as Miners Push Buttons

By Cam Simpson

Dec. 20 (Bloomberg) - James Burton didn't have a penny invested in gold of the \$142.8 billion he managed as chief executive officer of the California Public Employees' Retirement System in 2002. Why would he? The metal had been in a bear market for two decades.

Yet shortly after announcing his retirement from the largest public pension fund in the U.S., Burton agreed to fly to London to entertain a job offer from a mining companies trade group he had never heard of. Squishing across a rain-soaked British golf course in rented shoes in early June 2002, he listened to what sounded like a far-fetched idea: Selling gold as an investment to the masses.

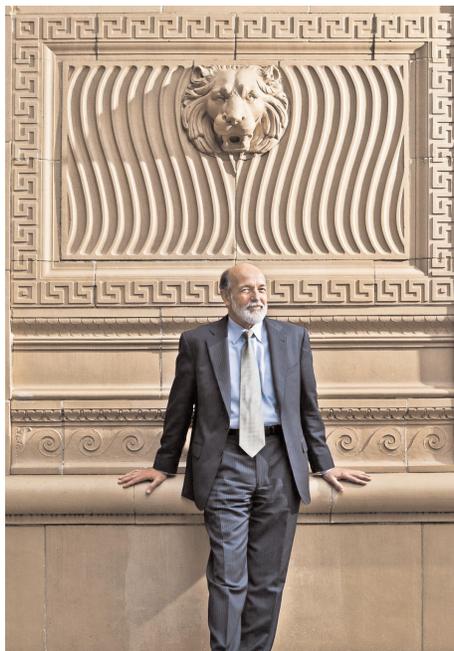
It was time to get investors to buy a precious metal they'd shunned for a generation, Christopher Thompson, the World Gold Council's new chairman, told him that day. The key was dividing bars of gold into securities tradable on the New York Stock Exchange. He wanted Burton to lead the effort, in no small part because of his connections with institutional investors. Gold was then trading at about \$328 an ounce in London.

"I was convinced that there was a market for the man on the street who would buy a lot of gold if he could find an easy way," says Thompson, 62, who at the time was also chairman of Johannesburg-based Gold Fields Ltd.

\$1,431.25 an Ounce

Thompson bested Burton in match play on the 17th hole, convincing him to take the job as the World Gold Council's CEO. What the two did next shows the role mining companies played in gold's longest bull run in at least 90 years, reaching a record \$1,431.25 an ounce as of 10:30 a.m. Hong Kong time today.

Under the men's leadership, a trust set up by the World Gold Council, which includes producers such as Barrick Gold Corp. and Newmont Mining Corp., won approval from



James Burton, former chief executive officer of the World Gold Council. Photographer: Eric Millette/Bloomberg Markets via Bloomberg

the U.S. Securities and Exchange Commission for an exchange-traded product backed by bullion. It gave investors access to gold without the cost and hassle of taking physical delivery.

The fund, SPDR Gold Trust (pronounced Spider), now holds 1,299 metric tons of gold valued at about \$57 billion, more than the Swiss central bank. Investors include the University of Notre Dame, the Texas teachers' pension fund and a who's who of hedge fund titans and money managers such as John Paulson's Paulson & Co., Laurence Fink's BlackRock Inc. and George Soros's Soros Fund Management LLC.

Biggest Funds

Globally, the 10 biggest such funds now hold a combined 2,113 metric tons of gold, more than the official reserves accumulated by every country in the world save four: the U.S., Germany, Italy and France.

Their popularity has helped drive

unprecedented gains for the precious metal, and some people, including analysts at Goldman Sachs Group Inc., say gold can go higher.

Soros, who made \$1 billion betting against the British pound in 1992, called gold the "ultimate asset bubble" at the World Economic Forum's January meeting in Davos, Switzerland, when the price of gold was at \$1,087.10 an ounce. His fund held \$664.8 million in gold-backed exchange-traded funds as of Sept. 30.

Gold's rise resembles moves reached before the three big crashes of the last decade: the Nasdaq tech-stock bubble of 2000, the U.S. housing market bubble of 2005-2006, and the crude oil-price spike of 2008, according to data compiled by Bloomberg.

In a Dec. 14 interview, Jason Toussaint, the World Gold Council's managing director for the U.S. and investment, pointed to a September report by the group arguing that the pace and increase of gold's price isn't comparable to the characteristics of recent bubbles. The metal's rise is consistent with its long-run average when compared with other assets, including equity indexes and oil, the report said.

Parabolic Rise

History shows that when the price of an asset takes a parabolic climb like gold's has, it's eventually bound to crash, according to Mark Williams, an executive-in-residence and master lecturer at Boston University's finance and economics department. And when it does it's almost always the smaller, individual investors that get out too late, he said.

As much as half of the gold in exchange-traded funds may be held by individual investors, according to BlackRock, the world's largest money manager.

"Your little guy is going to get hit by the doorknob on the way out," Williams said.

Driving Social Change

Already gold's record prices are driving wide-ranging social change around the world.



An employee holds a one hundred gram gold bar at Goldcore Ltd. in London. Photographer: Chris Ratchliffe/Bloomberg

In the remotest parts of Africa, villagers scrambling for ever more valuable flecks of gold risk death at the hands of mine security and parents squeezing gold wealth from ore have inadvertently poisoned their own children in the process. In India, where gold has cultural significance, parents are crushed they can't buy their daughters as much gold jewelry as they wanted for their weddings.

The council declined to comment on the painful dividends.

When it worked to create the fund, one concern was that the exchange-traded product might contribute to a bubble. Burton and his investment team worried that too much success would shoot gold prices up too fast, resulting in a crash like the one that occurred in January 1980, he said. Back then the bubble burst in one day and took two decades to recover.

Pushing Every Button

Ultimately those engineering what would become SPDR Gold decided it wasn't their job to worry about it.

"Our primary mission was to find every button we could push to stimulate demand," Burton, 59, said in an interview in London. "We also knew that we had launched something that we could not control."

Their timing was impeccable. They opened investment in a reputed safe asset to potentially millions of new investors just before the financial crisis of 2007 and 2008 and the ensuing global economic slowdown. Until then, bullion was viewed by many as a fringe holding for the rich with Swiss bank vaults or gold bugs who hoarded the metal beside canned food to hedge against Apocalypse.

"They were very patient and they tapped a real deep need in the ordinary investor to be able to buy and sell gold like a stock," says Jeremy Siegel, a finance professor at the University of Pennsylvania's Wharton School in Philadelphia.

'Pivotal Moment'

The creation of the fund was a "pivotal moment," said Scott Malpass, chief investment officer for Notre Dame in South Bend, Indiana. It provided a vehicle for investors that made gold readily available and cheap and easy to trade, he said.

He managed about \$5.5 billion, as of the end of fiscal year 2009, in endowments and other funds for the school.

A gold skeptic, he began buying into SPDR Gold after Lehman Brothers Holdings Inc.'s collapse in 2008, acquiring about \$111 million by July 1, 2009. The school held about \$65.8 million in the fund as of Sept. 30, according to SEC records.

While the World Gold Council was not first in the world to develop an exchange-traded product backed by gold, bringing it to the U.S. market was crucial, Burton and Thompson say.

The fund, now called SPDR Gold, started trading in 2004 and led the way for exchange-traded products backed by commodities in the U.S. Of the \$1.4 trillion in exchange-traded products worldwide at the end of November, \$171.7 billion were backed by or linked to commodities, according to BlackRock.

Atomic number 79 on the periodic table, gold has captivated humans for at least 6,000 years, since goldsmiths fashioned it into decorative objects and jewelry on the coast of the Black Sea in what is today Bulgaria.

Malleable Metal

A malleable metal, gold isn't really consumed. Virtually every ounce of gold that's ever been mined is still around: an estimated

165,000 metric tons. Peter Bernstein, the late economic historian, cited a calculation that all of the world's gold could be melted to fit into a single oil tanker in his 2000 best-selling history of the precious metal, "The Power of Gold."

King Croesus first minted gold coins as money in the 6th century B.C. in what is now Turkey. By the 20th century, the U.S. and most nations had formally adopted a gold standard.

The price was effectively set at \$35 an ounce until U.S. President Richard Nixon dropped the gold standard in August 1971, paving the way for a price explosion. Investors flocked to gold in the ensuing decade of financial and political turmoil. By January 21, 1980, they drove the price to a then-record \$850 per ounce, equal to an inflation-adjusted \$2,266 today. Gold crashed the next day.

By 2000, the mining industry faced the prospect of entering a third straight decade of a bear market for gold. SPDR Gold was born of that crisis.

Turkish Game Show

From its inception in 1987, the World Gold Council had concentrated on promoting gold jewelry, the industry's traditional anchor. Very little was done to push gold as an investment, according to Kelvin Williams, executive director of marketing for AngloGold Ashanti Ltd. until 2006.

One of the council's highest-profile investment campaigns involved a Turkish television game show aired in 2000. Contestants competed to win their weight in gold as two women paraded in skirts and bikini tops covered in coins.

Other promotions encouraged Muslims to use gold as a way to save for their once-in-a-lifetime pilgrimage to Mecca. The council also lobbied India and Italy to sell gold over the counter at post offices and banks.

The World Gold Council hired consulting firm Bain & Co. to review its operations. The mission grew by early 2002 to include a plan that would be dubbed "Project Sun" to study how to create an ETF, according to Thompson.

Wildest Dreams

The council would achieve its wildest dreams if a tradable security created demand for 900 tons of gold or \$20 billion, Burton and Thompson say Bain told them. Bain declined to comment for this article.

Separately, Jeffrey M. Christian, the managing director of New York-based researcher CPM Group and adviser to several gold producers, wrote an open letter in January 2001 to the industry's executives urging them to realize that "increases in investment demand for physical gold can have immediate and dramatic effects on gold prices."

His research showed gold prices rose significantly only when investors purchased more than 529 metric tons in a year. He says mining executives were frustrated that their companies were wasting time and money on promoting jewelry sales.

"Mining companies were starving," Christian says now. The major gold mining indexes, FTSE Gold Mines Index in London and the Philadelphia Gold & Silver Index, reached all-time lows in late 2000 and early 2001.

Fortune Cookie

Christopher Thompson was already a believer in the need to open up gold to investors when he joined the World Gold Council.

Unlike most of his mining counterparts, Thompson, who was born in Johannesburg, had a background in finance: in the U.S. he managed three closely-held funds that invested in gold-mining ventures.

In 1998 during dinner with his wife and children at a Chinese restaurant in Denver he cracked open a fortune cookie. The small slip of paper inside read: "You'll go to Africa and take over the greatest gold mine there."

A few months later he accepted a job as chairman and CEO of the newly created Gold Fields mining company, gaining a seat on the World Gold Council's executive committee. Thompson framed the fortune and propped it on his desk in Johannesburg. He arrived with firm ideas about how to jump-start gold prices.

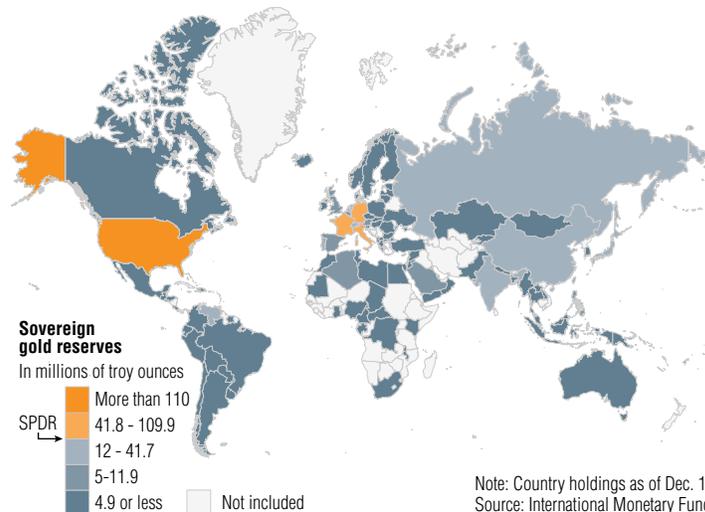
Bars and Coins

For starters, he says he understood that markets are made in the margin and the marginal players in the gold market were always investors. Getting them to buy gold was the challenge.

Two ways U.S. investors bought gold were inconvenient, Thompson says. Buying bullion bars meant paying commissions, storage costs and insurance, as well as exit fees to sell. Although less expensive, gold coins had

Fund Amasses Gold

SPDR Gold Trust holds 41.8 million troy ounces (1,299 metric tons) of gold, far more than most countries have in reserves.



Bloomberg

higher fees for buying and selling, Thompson says.

Thompson says he resolved to get the World Gold Council to find a way to make buying gold easy.

Yet the council still clapsed to gold jewelry after more than a decade of marketing campaigns inspired by the ubiquitous "A Diamond is Forever" advertisements from De Beers, the world's biggest producer of the gems. In May 2001, the World Gold Council embarked on a new, \$55 million effort called "Glow with Gold." The council aimed to boost jewelry sales and rebrand the precious metal through advertisements, arguing gold's brand had been muddied by the likes of golden credit cards and breakfast cereals.

It didn't break the slump. The expense pushed the council into a deficit, according to Thompson and Burton. It also fueled debate about the group's very existence.

'Jeopardy'

"The future of the council was very much in jeopardy," said Katherine Pulvermacher, who joined the council's investment team in 2001.

The following April, the World Gold Council had a turbulent annual meeting in Melbourne, Australia, according to Thompson

and Kelvin Williams.

Neither man will detail what happened, but it ended with Bobby Godsell, then chairman and CEO of what was then called AngloGold Ltd., stepping down as chairman of the World Gold Council and Thompson taking his place. Godsell, 58, did not return calls seeking comment.

Thompson wasted little time moving forward. He didn't renew the contract of the then World Gold Council CEO with whom Godsell had led the "Glow with Gold" campaign.

401ks

During his rainy day golf match with Burton, he laid out his idea: Create a trust that would offer gold through shares sold on the New York Stock Exchange. The trust would divide ownership of a single, 400-ounce bar of gold into about 4,000 shares, which would rise or fall with gold's spot price.

At the time, when millions of Americans had become comfortable investing through their 401ks, gold could be elevated to the same status as other assets, Thompson argued.

Nothing like it had been approved by the SEC.

"If you can't get that done, you'll be

fired,” Burton recalls Thompson saying. He accepted the challenge.

With the World Gold Council staff, Burton tracked and tested similar products in other markets first. The group offered its backing and some marketing support to Graham Tuckwell, an Australian natural resources consultant who on his own created the world’s first bullion-backed, exchange-traded fund and got it listed on the Australian Stock Exchange in 2003.

Tuckwell

Tuckwell, founder of London-based ETF Securities Ltd., struck on the idea after an acquaintance mentioned an oddball product in 2002: wine securities. They were “funny little things” that allowed shares of a particular vintage to be traded on a stock exchange, he says.

The World Gold Council and Tuckwell then got a similar product listed on the London Stock Exchange. And the World Gold Council supported a parallel South African project with Vladimir Nedeljkovic at Absa Capital.

Each success brought momentum and confidence, says Burton. The NYSE was the Holy Grail. It was the only market big enough to have a real impact, Thompson and Burton say.

It took two years and as much as \$15 million on preparations and lawyers for Burton and his team to win approval, according to Burton, who is now a partner at California Strategies LLC, a public affairs consulting firm.

As they worked in 2003 and 2004 to shape an NYSE product that could pass muster with the SEC, Burton and the investment staff started gaming out what he called “threat scenarios.”

‘Perfect Storm Scenario’

What if the funds were so successful that gold went into a bubble?

“There was a potential perfect storm scenario where suddenly gold would fall into the clutches of hedge funds and momentum traders in very, very aggressive, leveraged plays, which could spike the price and then drop the floor out from underneath it,” Burton recalls of the talks.

“Our biggest concern was it would burn another generation of investors and you’d start the whole goddamned tale of



George Soros, chairman of Soros Management Fund LLC.

Photographer: Joshua Roberts/Bloomberg.

tears over again,” he says.

At the SEC in Washington, the core concern was trying to understand an unregulated asset they knew very little about, says Robert Colby, then the agency’s deputy director of the Division of Trading and Markets.

They were conscious that approving the first commodities-based exchange-traded fund would open the floodgates to a wide range of similar investment vehicles, Colby says.

Chocolate Bars

The SEC would not approve new forms of securities until it was convinced they were not readily subject to manipulation, Colby says. Even though no one regulated trading in gold, the fact that many nations still held a significant portion of their reserves in gold helped the council win this point, he says.

On Nov. 18, 2004, Burton strode across the NYSE floor and tossed brokers chocolate bars wrapped in gold foil to resemble bullion. He and Thompson rang the opening bell together as the World Gold Council launched its exchange-traded fund under the name StreetTracks Gold Trust and the ticker symbol GLD. Bank of New York Co. acted as the trustee, while a unit of State Street Corp. marketed the fund.

When the trading stopped, the champagne flowed. The frenzy for gold among

investors was instant.

In the eight days it traded that November, the new ETF attracted more investment for the month than all but two other funds offered on the NYSE, including mutual funds, according to data compiled at the time by the Financial Research Corp.

Fastest-Growing ETF

By the 30-day mark, the fund’s \$1.29 billion made it the fastest growing exchange-traded fund in history, according to data published at the time by TrimTabs Investment Research of Santa Rosa, California, an independent research firm.

That was more than double the \$610 million raised by the previous record holder, iShares Lehman bond fund, TrimTabs said.

“We were jubilant,” Pulvermacher says.

Thompson retired the next year. His successor, Pierre Lassonde, then president of Greenwood Village, Colorado-based Newmont, declared ETFs “our biggest success in 25 years, the biggest since the South African Krugerrand in the 1970s.”

The coins containing one troy ounce of gold gave millions of individual investors access to the gold market during its last significant run. The world anti-apartheid movement and the global gold slump combined to quash their sales in the 1980s.

Speaking at a private investment conference Sept. 27, 2005, at the Westin Hotel in Denver, Lassonde linked the rising investment demand from the fund to the rising price of gold and looked to a future in which his group used such funds to spur demand all over the world.

‘Enormous’ Impact

SPDR Gold is now listed in Japan, Hong Kong, Singapore and Mexico City. Gold prices took off, especially as more funds joined in the fray. Gold rose more than 58 percent in the 18 months after SPDR Gold started trading to more than \$700 in May 2006, reaching a 25-year high, without adjusting for inflation.

“Big, enormous, large and ongoing” is how Dennis Gartman, an economist and editor of the Gartman Letter in Suffolk, Virginia, characterized the exchange-traded products’ impact on gold prices. Widespread concerns about the dollar, other currencies and monetary policy will continue channeling

investor demand to gold for the foreseeable future, Gartman said.

Gold's popularity shows how investors are snapping up hard assets as governments and central banks led by the Federal Reserve pump more than \$2 trillion into the world financial system.

Goldman Forecast

Goldman Sachs analysts including Allison Nathan and Jeffrey Currie forecast in a Dec. 13 report that gold will rise to \$1,690 in 12 months. Last year, investment overtook jewelry as the biggest source of demand for the first time in three decades and will retain the top spot this year, according to GFMS Ltd., a London-based research firm.

To meet the demand, mining companies pushed global gold production to a seven-year high in the first half of the year, according to GFMS. The industry's total average cash cost to produce an ounce of gold rose 17 percent in that period as companies pushed to extract ore that would otherwise not make economic sense, GFMS said in a September report.

New York-based BlackRock runs one of the fastest growing bullion funds today. It carves roughly 100 shares from every ounce of gold, versus the 10 shares per ounce created by the World Gold Council ETF.

In so doing, iShares Gold Trust makes it possible for day traders or college students to play the gold market for about \$13.44. That's less than the cost of a 16-inch pepperoni pizza delivered to a dormitory in Chicago.

Day Trader

One such day trader is James "Pat" King, a 25-year-old Boston University finance graduate who started working out of the basement in his parents' home in Lincroft, New Jersey, after he lost his job on Wall Street in August 2009.

King had invested in the SPDR Gold fund in April of that year on the advice of his father who was "very leery of the federal government and their ability to make money appear out of thin air," he says. He's holding that investment while he trades shares in BlackRock's iShares Gold Trust more often, hoping to capitalize on the metal's news-driven price swings. He's unsure how he'll know when to sell his main gold holdings.

"There's so much uncertainty in the underlying state of the macro economy," he said. That translates into "a massive pouring into gold of money from the sidelines, even moms-and-pops and high net-worth individuals want a piece of it."

'Yellow Elephant'

World Bank President Robert Zoellick has suggested that Group of 20 nations should consider using gold as an international reference point of market expectations about inflation, deflation and future currency values as they reform the global monetary system.

"Gold is the yellow elephant in the room," Zoellick said on Nov. 10. "Markets are already using gold as an alternative monetary asset because confidence is low."

Byron Wien, vice chairman of Blackstone Advisory Partners LP, says he's recommending institutional portfolios put 5 percent of assets in gold. That's come as a shock to some clients. He says he's been run out of conference rooms.

"People think it's just another bubble or it isn't real," he said.

Wien says he sees gold reaching \$1,500 within two years, although any potential price gain is less important than having a safety net. "I'm recommending gold as a kind of insurance policy against calamity in financial assets," Wien, 77, said.

While Soros has called gold a bubble, he hasn't gotten out of the market.

SPDR Gold was the Soros Fund's largest

single holding as of Sept. 30, according to a filing with the SEC. The fund acquired 5 million shares in the iShares Gold Trust, the filing shows.

'Where Are You'

"It's all a question of where are you in that bubble," Soros, 80, said in a speech at a meeting organized by the Canadian International Council in Toronto on Nov. 15. "The current conditions of actual deflationary pressures and fear of inflation is pretty ideal for gold to rise."

"The big negative is that too many people know this and a lot of hedge funds are very heavily exposed," Soros continued. He declined an interview request for this article.

Siegel, the Wharton finance professor, says he's skeptical about the metal over the long term, especially for retail investors. He believes they will have a harder time judging when to buy and sell.

His research shows gold has underperformed stocks, bonds, bills and even real estate over the long run. It has total real returns of just 0.6 percent per year since 1802, compared with 6.6 percent for stocks, 3.6 percent for bonds and 2.8 percent for bills. One of the only things gold has beaten is the dollar, said Siegel.

Unlike assets such as oil or wheat that are consumed based on economic factors, gold's true value is difficult for ordinary investors to judge, Siegel said. Its worth is often determined by fears of inflation or financial collapse, he said.

"If you can judge how these investors will evaluate those fears, you will do well," he said.

– With assistance from Asjlynn Loder in New York and Nicholas Larkin in London.

– Editors: Marcia Myers, Melissa Pozsgay

GOLD'S AFFLICTION

African Gold Rush Kills Children as Miners Discover Lead Dust

By Alan Katz

Dec. 21 (Bloomberg) -- Gold brought death to Umoru Musa's nine-family compound in Sunke, a mud-brick village in northern Nigeria.

Five of the 25 children, including Musa's 1-year-old daughter Nafisa, lost their lives in May after villagers ground ore from nearby hills they didn't know were also loaded with lead. Rising prices for gold promised a windfall. Instead, they helped unleash the deadliest lead-poisoning crisis in modern medical history.

As the adults pulverized rocks with their grain grinder, they spewed lead dust across the ground where their children played and poultry grazed. They spread more of the material, lethal to children in high doses, around the communal well where they washed the ore to sift out the gold.

"This gold cost us a lot," Musa, 40, said in the open-air courtyard of his home last month as a clean-up team in white respirator masks cleared away lead-laden dirt. "There is nothing God can give that is better than a human being."

At least 284 children under the age of five have died from lead poisoning in eight villages in Nigeria's Zamfara state as a result of small-scale gold mining, according to government officials. An additional 742 are being treated for high levels of lead in their blood, a number which may rise to 3,000 by the end of next year, according to Medecins Sans Frontieres, also known as Doctors Without Borders.

Brain Damage

Health effects from lead poisoning, including brain damage and miscarriages, will plague the area for years, said Joseph Graziano, professor of environmental health sciences at Columbia University's Mailman School of Public Health in New York.

The deaths are an unintended consequence of a 21st century gold rush. Villagers turned en masse to mining over the past two years, spurred on by more frequent



In Daretta, villagers began gold mining in earnest after the arrival of a group of Chinese miners, according to the village chief Mohammed Bello. Photographer: Shawn Baldwin/Bloomberg

visits from gold-buying middlemen. During that time, investors drove bullion prices up 58 percent in London as they sought a haven from the aftermath of the financial crisis. Gold reached a record \$1,431.25 an ounce in London on Dec. 7.

In Nigeria, soil from 29 villages has shown unsafe lead levels for children, according to preliminary tests by the U.S. Centers for Disease Control and Prevention. The crisis is "unprecedented" for the number of deaths and the amount of lead found in the children, according to Atlanta-based CDC, which has helped set up testing and treatment in the area. Some cases were measured at about 15 times the level that calls for immediate treatment, said Medecins Sans Frontieres, an international humanitarian organization often referred to as MSF.

'Morbid Novelty'

"I'm stunned to learn of an epidemic of this severity and magnitude at a time when lead poisoning in the developed world is truly diminishing," said Graziano, who

with two colleagues discovered the lead-treatment drug now being used in Nigeria. "This has a morbid novelty of poor people trying to find a source of income only to encounter this massive exposure."

In June, Nigeria's federal government banned all mining in Zamfara state, which is in the country's northern Muslim area. Yet lead levels found in a few compounds in October show that some families were grinding the ore in their homes again, according to aid workers and local officials.

Blacksmith Institute, a New York-based charity working on the cleanup effort, has a total budget for the project of about \$950,000, most from the United Nations Children's Fund, known as Unicef, said John Keith, Blacksmith's head of operations in Nigeria.

Costly Cleanup

Blacksmith is seeking an additional \$2 million to extend the efforts to more contaminated villages and provide long-term training to help Nigerian agencies deal

with the problems.

“It would be a lovely and appropriate response to find that people who have profited very much so from this run-up looked to give back a little,” said Richard Fuller, Blacksmith’s president. Nigeria’s small-scale miners “are just trying to pull themselves from the very bottom of the poverty rung and artisanal mining is one of the best ways of increasing local economic development, all over the world,” he said.

In Sunke, the mud-brick village where the 1-year-old girl died, her father, Musa, says he got the idea of grinding ore for gold from the nearby village of Dareta. Residents there made enough income to roof 36 structures with corrugated metal, replacing the traditional thatch or earth and keeping the rainy season from eroding layers of their mud-brick walls each year.

\$100 a Day

Soon Musa was in business, buying 50-kilogram (110-pound) bags of ore to process in the compound. The family could earn the equivalent of \$100 on a good day by grinding and processing five bags.

Musa would make the three-hour trip by motorcycle to Zamfara’s capital, Gusau, to sell the gold mix to dealers. The compound earned enough to buy a metal

roof of its own, a motorbike and breeding cows.

A few months later, Musa said he realized that the chicks and ducklings that pecked about the grounds were disappearing. Then nine-month-old Nazifi became gravely ill, convulsing violently. He died a few days later. Four other children rapidly showed similar symptoms, and were dead within about a week, he said.

With the cause of the deaths a mystery, he said he kept processing gold though he was overcome by grief at times. “It was very silent, very emotional,” Musa said in his native Hausa. “When I was grinding the rock, sometimes my heart would begin to ache so much that my head would start to pound and I would have to stop.”

Shutting Down

Once doctors linked the deaths to the gold operation, Musa said he shut it down. The cleanup team found the ground around the compound’s well contained more than 100 times the lead limit in the U.S. for public areas such as playgrounds.

“We only grind grain now,” Musa said, pointing to the blue grinder hooked up to a generator just outside his compound door.

Small-scale gold mining creates work

for 10 million people worldwide, according to Kevin Telmer, an associate professor at the University of Victoria in Canada and executive director of the Artisanal Gold Council.

For most of them, “this is the best opportunity they have of escaping poverty,” he said.

Small-scale miners start by beating rocks into gravel with a mortar and pestle or an iron bar, then grinding it. The resulting sand is washed over a ridged board to remove the lighter particles. Villagers who do the processing themselves, such as Musa in Sunke, then use mercury to extract the gold.

‘Desperate Situations’

The health risks come more often from the mercury, which can damage the central nervous system, according to the findings of the United Nation’s Global Mercury Project.

Telmer described the Zamfara crisis as a “perfect storm”: poor miners working with toxic ore in the home, and using a dry grinding process that spreads the toxic dust.

When prices rise, no matter the commodity, people start pushing into places that otherwise wouldn’t be economical, said Ian von Lindern, the chief executive officer of TerraGraphics Environmental Engineering Inc., a Moscow, Idaho-based consulting company that is providing the technical direction for the cleanup.

“A lot of those are desperate situations,” he said.

The state government in Zamfara has called for the mining ban to be lifted. It’s impossible to stop people from mining who have gotten used to a new way of life, according to Alhaji Sadiq Abubakar, special assistant to Zamfara’s governor. It’s better to educate them on how to mine safely, he said.

Helping Miners

If the ban is lifted, the state plans to set up processing areas near mines and provide water to the miners in the area, said Zubairu Mohammed, the district head of Anka, the local government area that encompasses Sunke. Officials would also supply registered miners with tools, training and micro loans, he said.

Nigeria, Africa’s most populous country, is best known for its oil resources



In Dareta, the first village to be decontaminated, soil samples in three family compounds revealed high lead levels again in October indicating they’d gone back to grinding ore there. Photographer: Shawn Baldwin/Bloomberg

in the Niger Delta. The country exported tin, coal and gold in the 1930s and 1940s, when it was under British rule. It gradually turned away from mining, and in the late 1950s began to focus on oil, which accounted for 85 percent of exports in 2009.

In 2007, the western African nation passed a new mining law and encouraged foreign companies to invest there. Zamfara State invited teams of surveyors from China, the U.S., Australia and elsewhere in May and August 2009 to assess levels of gold, copper and other minerals, said Abubaker Maru, the state environment commissioner.

Mining in Earnest

In Daretu, villagers began gold mining in earnest after the arrival of a group of Chinese miners, according to village chief Mohammed Bello. They dug neat square holes in a dry riverbed two kilometers (1.2 miles) out of town. Neither Bello nor other local officials were able to say who employed the Chinese workers.

Mining picked up after the discovery last year of a rich vein of gold a few kilometers from Sunke in an area contaminated with lead, Maru said.

Many families established ore grinding operations in or near their homes for the first time. The lead spread far from its original sources as couriers on motorcycles took the rocks to villages across the region for processing.

Besides metal roofs, the gold profits afforded people motorcycles and other luxuries. In rural Zamfara, 85 percent of the population lives on less than \$1 a day, a higher proportion than for the country as a whole, according to the most recent survey funded by the World Bank. Nationally, 37 percent of Nigerians living in rural areas have access to safe water, according to Nigeria's National Bureau of Statistics' Social Statistics Report, 2009.

'A Good Thing'

Kabiru Sani, 25, a former cow-herder with no income, shifted to gold about two years ago when he saw people wearing new clothes paid for by mining proceeds.

"My instinct was that it was a good thing to try," says Sani, who wore green



*Umoru Musa, aged 40, who lost his 1-year-old daughter to lead poisoning, hold his sick son Ibrahim, aged 6 months, inside the family home in Sunke, northern Nigeria.
Photographer: Shawn Baldwin/Bloomberg*

khakis and a t-shirt with SKELETON written across the back. He dug ore from mines around Sunke and ferried bags of it to a nearby processing area on his Honda motorcycle that's adorned with a pink seat cover and a decal of crossed AK-47s on the headlight.

He says he was able to earn as much as 50,000 naira a week, or \$323, at the height of the gold rush this year.

The motorcycles villagers bought helped get the gold to traders in Gusau. From there, gold was further refined and driven to Benin, on Nigeria's western border, to be turned over to dealers working with wholesale buyers from Europe and Dubai, according to interviews with several traders.

"We have very big wholesalers coming here to buy gold and they always want more," Jibril, a dealer in Cotonou, the main port city of Benin, said by phone. He declined to provide his last name because he said he operates in the black market.

Kulu's Son

Kulu Rabiou watched as other women earned cash from crushing ore in her village of Tungan Daji before asking for her own bags in February. Pounding rocks into gravel with a mortar and pestle netted her

500 naira, or about \$3.23, for three days work --more money than she had ever had, she said.

Now her 2-year-old son Imrana shows signs of permanent brain damage: crying, biting his mother and hitting her, according to Medecins Sans Frontieres doctors treating him at a hospital in Anka.

He became sick in May, crying inconsolably at night. By July, when the symptoms worsened, the rainy season had filled local riverbeds cutting off the roads to the hospital.

Observing Symptoms

"He was a boy who moved so much, so active, now he just lies here," Rabiou, 30, said, her hand on Imrana's head as he slept next to her on a hospital mattress. "What will he do even if he lives? He can't walk or think right." Rabiou recently was released and is being treated at home, according to MSF.

Doctors from Medecins Sans Frontieres on a tour to encourage meningitis vaccines in the region were dismayed when they started seeing the heavy metal-poisoning symptoms in March. Nigeria has a high child mortality rate from illnesses such as malaria, meningitis and measles. About 186 children in 1,000 die in



Women and children from lead-contaminated villages rest on mattresses during testing and treatment for lead poisoning in a Medecins Sans Frontiers ward at Anka hospital, northern Nigeria. Photographer: Shawn Baldwin/Bloomberg.

Nigeria before the age of five, compared with 8 in the U.S., according to Unicef figures from 2008.

Dr. Anyaji Prince Chinedu said five families brought in small children who were convulsing and vomiting on his first day at the Yargalma town dispensary. He and the lone nurse could treat only one at a time. Some lost consciousness while waiting to be examined and one child died, he said.

Chinedu, just two years out of medical school, returned to the MSF base in Gusau that night feeling helpless and broke down crying to his coordinator, he said.

‘Scenario is Horrible’

“Please don’t send me there again,” he recalls saying. “The scenario is horrible. They were all little, little kids.”

He did go back and he’s now treating children in the lead work of a hospital in Anka.

Nearly half the children who visited clinics with symptoms of lead poisoning died in the first months until the lead-treatment drug succimer was approved by the Nigerian government and reached Zamfara in June, according to Antonio Neri, medical epidemiologist at the CDC.

Danish drugmaker H. Lundbeck A/S is providing succimer to MSF free through

its U.S. unit. A 19-day course for a young child normally costs \$308, the company said. Some children in Nigeria are on their sixth course of the drug.

Succimer, which binds to the lead and then is expelled from the body with urine, has lowered lead levels in the children who have taken it, said Ellen van der Velden, who served as MSF’s emergency coordinator for Nigeria from July through November. However, the level shoots higher when they stop taking the drug, indicating they either have large amounts of the metal stored in their bones or are being re-contaminated, she said.

“We have no idea how long it will take for these children to be cured,” she said.

Cleanup Progress

To eradicate the lead, cleanup teams scrape off about 5 centimeters of topsoil, bag it, and deposit it in landfills with a high proportion of clay. The scraped areas in the village are topped by new soil. The landfill is marked off so villagers won’t dig or plant crops there.

By the end of January, seven villages will have been completed, said Blacksmith’s Keith. The charity also has enough money to cover about a quarter of the cleanup required in Bagega village.

The mining ban has reduced the amount of gold coming from the region to traders in Gusau by about 80 percent, according to Abdul Wahid Halidi, a dealer who has been in the business for a quarter century.

At a lake by Bagega, as many as 200 people used to gather to wash their ground ore and separate gold.

Lead-Filled Bricks

It was mostly quiet on a Sunday in November. Four boys ran leftover ore across a washboard looking for specks of gold missed in prior washings. A dozen blue Viking-brand grinders sat unused on the land above the lake. One was being cleaned by Mohammed Sani, who said he planned to take it to Niger to process gold there. Ore deliveries had slumped to almost nothing from a peak of as much as 30 bags day, he said.

That doesn’t mean the crisis is over. In Bagega, hundreds of mud bricks made from the lead-tainted, red-brown sand left over from processing ore lay drying in the area between the grinders and the lake. Built into houses, they will poison residents for years, as pieces flake off to be inhaled or eaten by children, Keith said.

“Welcome to lead poisoning in action,” he said.

‘Hopeless Case’

In Dareta, the first village to be decontaminated, soil samples in three family compounds revealed high lead levels again in October, indicating they’d gone back to grinding ore there, Keith said.

With the price of gold being what it is, it seems inevitable that some mining will continue, said Columbia University’s Graziano.

“If they can’t stop the exposure, it’s a hopeless case,” he said.

Even if all lead could be removed, health problems will plague the communities for years to come, he said.

As girls now aged 6 to 15 marry and become pregnant, their bodies will release lead stored like calcium in their bones, causing miscarriages, and children exposed to such high lead levels will have reduced brain function of some form, Graziano said.

“We do know they will be left permanently impaired,” Graziano said.

Bitter Moments

Musa said that while he still has bitter moments, the pain is fading and the village has come to life again. Children are singing again and they dance around.

He sent one of his brothers to fetch Naziru Haruna, a 1- year-old who has been to Anka hospital three times for lead treatment. Sitting tall in his fathers’ arm, Naziru smiled, laughed and grabbed at a hand as it came up to pat him on the back.

“Now we have hope,” Musa said.

A week later, the lead poisoning had appeared again. Musa’s six-month-old son Ibrahim started vomiting and losing his hair. Musa took him to the lead ward at the Anka hospital where doctors asked that Ibrahim and his mother stay for treatment. MSF said Ibrahim’s condition improved, he recently was released, and is now under treatment at home.

--With assistance from Cam Simpson in London and Ardo Hazzad in Bauchi, Nigeria.
Editors: Marcia Myers, Melissa Pozsgay.

GOLD'S AFFLICTION

Shooting Gold Diggers at African Mine Seen Amid Record Prices

By Cam Simpson

Dec. 23 (Bloomberg) - Barrick Gold Corp.'s North Mara mine near the Tanzanian border with Kenya disgorges millions of pounds of waste rock each week, piled high around communities where almost half the people live on less than 33 cents a day.

Children in school uniforms scurry across the rubble to reach their classes. Women with water pails atop their heads skirt past the heaps. The piles grow as the longest bull market for gold in at least 90 years pushes Barrick, the world's largest miner of the precious metal, to increase production.

Villagers, too, are hunting the ore on the North Mara land that their ancestors worked for decades, sometimes paying with their lives.

Security guards and federal police allegedly have shot and killed people scavenging the gold-laced rocks to sell for small amounts of cash, according to interviews with 28 people, including victims' relatives, witnesses, local officials and human-rights workers.

"They are not arresting them or taking them to court," said Machage Bartholomew Machage, a member of the Tarime District Council, the highest local government body. "They are just shooting them."

At least seven people have been killed in clashes with security forces at the mine in the past two years, according to the 28 people interviewed. In at least four cases, police acknowledged the shootings in contemporaneous press accounts.

Killed and Wounded

The dead include Mwita Werema, a father of four who was killed one day after gold set another record price in October 2009; Chacha Nyamakono, who was one year from becoming the first in his family to complete a basic education; and Daudi Nyagabure, shot in February, who was eager to build a future for his pregnant wife.

Fifteen people were seriously wounded in the same period, according to



A villager searches for gold on the summit of discarded waste rock at the North Mara mine armed with nothing more than a bottle of water and a hammer in the district of Nyangoto, Tanzania. Photographer: Trevor Snapp/Bloomberg

the Legal and Human Rights Center, a human-rights group in the Tanzanian city of Dar es Salaam, and Machage, who was the district council vice chairman until August.

Toronto-based Barrick and African Barrick Gold Plc, which is 74 percent-owned by the Canadian miner, pay the Tanzanian government for federal police protection at the mine and employ private armed guards, according to company documents.

The violence at North Mara is a brutal dividend of gold prices that have risen almost threefold in the past five years to a record \$1,431.25 on Dec. 7.

In written responses to questions about the situation, African Barrick said it frequently faces groups of intruders, often armed, who illegally enter the North Mara mine with the intent of stealing valuable ore.

Mine Trespassers

It also said some thefts, vandalism and other incidents are the result of organized crime, in part stoked by transients in the border region with Kenya.

People killed or injured after crossing into the mine area shouldn't be considered small-scale miners because they were all trespassing and therefore acting illegally, said Andrew Wray, head of investor relations for African Barrick, in a Dec. 21 written response to questions.

"ABG categorically refutes any claim that any persons injured or killed were artisanal or small scale miners," he wrote.

He declined to comment on specific cases, citing active or potential police investigations, except for one. He said allegations that mine security inflicted lethal injuries in that instance are "fundamentally untrue." They were the result of a fight between intruders over stolen ore, he wrote.

Security Improves

Security incidents at the mine have "significantly declined" during the past two years despite record gold prices, Wray said. The company declined to comment on the number of people killed or injured by security forces in the past two years.



Rhoda Muhere, the widow of Muhere Biraro, looks through family photographs of her late husband at her home in the district of Kwanja, Tanzania. Photographer: Trevor Snapp/Bloomberg

Barrick didn't respond to written questions about North Mara, instead directing them to African Barrick. The Canadian company raised 581 million pounds, the equivalent of \$872 million at the time, from the March 19 initial public offering in London of African Barrick.

Aloyce Tesha, a spokesman for Tanzania's Ministry of Energy and Minerals, which oversees mining, declined to comment when presented with a list of the alleged killings at the mine. In an e-mail, he said the issues involved criminal investigations and referred questions to the police. Calls to the Inspector General of Police and the office of Tanzanian President Jakaya Kikwete were not returned.

Tensions Erupt

"The villagers are human beings and so they would like to get the minerals, and the policemen do not want them to get to the minerals," Constantine Massawe, the commander of federal police forces at the mine and throughout the region, said in Swahili in a Nov. 11 telephone interview. "It's not easy. If you tell them to leave, it's not easy to get them to leave." He declined to comment further.

During the reporting for this story, Tanzanian police arrested a photographer

working for Bloomberg News on suspicion of trespassing at the mine site. He was jailed for a night and had his passport held for six days before he was freed without charges.

Security at the mine, where there are four open pit deposits, escalated after a riot in December 2008, African Barrick has said. A group of people invaded one pit after it had been blasted for ore. They burned \$7 million of equipment and cost the mine several days of production. Police shot and killed one trespasser, Wray said.

Much about the killings since then is unknown, including their precise locations. In some areas popular with scavengers, few fences or signs mark where mine property ends and village life begins.

Firing Into Crowds

In several incidents, witnesses and contemporaneous press accounts quoting police indicated that officers fired into or over large crowds. In one killing, police told the government newspaper that shots were fired into the air after some miners tried to disarm officers.

According to Barrick, in some instances deaths and injuries were inflicted by other trespassers, not by the police or security. Barrick said some incursions go deep into its mining areas.

John McKay, a Canadian member of Parliament who sponsored legislation this year that sought to sanction mining companies for human-rights abuses abroad, said he wasn't familiar with the North Mara mine and he declined to single out specific operators. Still, he said the profits delivered by gold's high prices are causing a "moral blindness" at some companies.

Knocking Heads

"It seems like the attitude is, 'If we have to knock a few heads along the way, so be it,' because there is so much money to be made," he said. His proposal was defeated in Parliament on Oct. 27.

The government of Guatemala is considering a suspension of operations of Vancouver-based Goldcorp Inc.'s Marlin mine after the Inter-American Commission on Human Rights alleged that the facility was contaminating water supplies. Jeff Wilhoit, Goldcorp's vice president of investor relations, said the complaints underlying the ICHR's petition, including alleged human-rights violations, were without merit.

He also said the company was implementing recommendations from an independent human-rights assessment completed in June.

The World Gold Council, the London-based mining trade group, helped boost the surge in investor demand now bringing record results to Barrick and other members. It started SPDR Gold Trust, the first exchange-traded product backed by bullion approved in the U.S. The 10 largest such funds held more than 2,113 metric tons of gold valued at about \$94.2 billion as of Dec. 21, according to Bloomberg data. They allow investors from retirees to hedge funds to invest in gold.

Land Once Theirs

Mining firms are spending some of the money they're earning from record gold prices to boost production, exploration and development at North Mara and in other corners of the developing world. Those living near veins of gold are in turn trying to profit from ore in their communities.

"There is awareness amongst communities about the fact that the gold

price is so high, but that very little of the benefit from that seems to be coming back to them,” said Keith Slack, the Washington-based head of Oxfam America’s extractive industries program, which works on security and human-rights issues globally.

There are growing fears that the collision of these forces could yield a new wave of turmoil for years, Slack said.

Barefoot Geologists

At North Mara, local “barefoot geologists” were the first to mine this rock, working by hand decades ago on their ancestral lands. An estimated 40,000 people in the area depended on small-scale mining for their livelihoods, according to a history compiled by the mine’s first developer, Afrika Mashariki Gold Mine Ltd.

The mine’s development and growth displaced an estimated 10,000 households, including many who didn’t receive compensation under previous owners, according to the African Barrick prospectus.

Vancouver-based Placer Dome Inc. bought the mine in 2003. Barrick acquired Placer Dome in 2006 for \$10.4 billion, making the company, founded by Canadian billionaire Peter Munk, the world’s largest gold producer.

Total payments to the local community are unclear. African Barrick said in its written response that it supported thousands of school scholarships. It didn’t say how much it had spent on those efforts.

Security Incidents

Barrick acknowledged deaths at the North Mara mine in two sentences in its 486-page IPO prospectus, dated March 19. “In some cases, those involved in security incidents have been injured, sometimes fatally,” one of the passages read.

Two months after the December 2008 unrest, Barrick Chief Operating Officer Peter Kinver credited “a great deal of support” from the Tanzanian government for helping with what he called “sporadic incursions of people coming onto the mine.” That support helped the company meet its production goals at North Mara in January 2009, he said on a call with analysts on Feb. 20, 2009.

The company has reported no other



Villagers compete against a bulldozer as they search for gold contained in discarded waste rock from the North Mara mine in the district of Nyangoto, Tanzania. Photographer: Trevor Snapp/Bloomberg

major disruptions to production since.

Mwita Werema knew the risks of scavenging waste rock for gold, said his widow, Eunice Mwita. Her 35-year-old husband was a lifelong small-scale miner who lost his land to the mine in 2002, she said.

The Two-Six

“He used to tell me, ‘If they catch me one day, I’m sure they will kill me,’” she said, speaking in a whisper barely loud enough to be heard above the clucking of a single chicken just beyond her open doorway. Her four children played outside on a low, sallow mound of earth, their father’s grave. As she spoke in July, she was expecting a fifth child any day.

Werema was shot on Oct. 15, 2009. That morning he and his mining partner, Nchia Mwita, had worked their way deep into a vast area of waste rock that locals call the “Two-Six,” which abuts one of the pits. They carried water bottles, hammers and their rucksacks, his friend recalled.

People each day flood the Two-Six, named long ago when the mine designated it as rock pile No. 26, according to villagers. The daily activity supports a single-stool barber shop, operating from a shack erected on the stones. A handwritten sign identifies

it as the Two-Six Hair Salon.

Nchia Mwita’s and Werema’s story mirrors the daily cat-and-mouse routine described by other miners. Typically they may get 30 minutes to sift stones before security guards appear and force them to flee, they said. They’ll lie low for 10 or 15 minutes, then return.

Bribes for Access

Sometimes they can buy time by paying small bribes, which some police and security officers routinely demand, said miners and local officials. Mwita said those who are paid can easily betray villagers, turning on them if fellow officers arrive.

The day Werema was killed, he and his friend weren’t prospecting long when two large crowds of scavengers began moving in behind them, working their way up the rock piles as well, Mwita recalled. About eight armed security men appeared on higher ground roughly 500 feet away, Mwita said. One guard began firing randomly at the crowd, he alleged.

Suddenly, “I saw him go down,” Mwita said of his friend Werema. Blood spilled onto the stones. He was shot once in the back and died, Mwita said.

Police took responsibility for the shooting in statements to local newspapers,

though they said Werema was shot in the left leg. Mwita said he saw a private Barrick guard pull the trigger.

North Mara's Allure

There's no mystery to North Mara's allure for locals. While company data show that the rocks African Barrick processes there yield an average of about 3 grams of gold per metric ton, a bagful of the best waste rocks can be sold for the equivalent of a few dollars to buyers operating from the trunks of cars parked right on the rock fields.

The mine, sitting east of Lake Victoria, had 2.9 million ounces of proven and probable reserves at the start of 2010.

As much as 40 percent of the population in the surrounding Tarime district survives on less than 33 cents a day, the government estimated in 2005. Many live mostly off what they can grow.

Record gold prices have drawn more people to scavenge for gold-laced ore during the past two years, said Nyagabure Chacha, who lives in a hut that is an easy walk from the rock piles.

Miners track the price of gold using the internet connections on mobile phones they must take to a communal solar-powered charging shack because most have no electricity.

'People Have Nothing'

"These people have nothing," Chacha said. "They have no resources to survive."

On Feb. 2, Chacha's son, Daudi Nyagabure, allegedly was among the victims. Around 1 p.m. that day, security forces shot and killed the 21-year-old, his father said, based on accounts from others at the scene.

The son was starting his own family. He and his 19-year-old wife had one child, and she delivered another four months after becoming a widow.

Like several relatives of miners killed here, the old man expressed resignation, not bitterness. He quoted a popular Swahili proverb about the impossible task of gathering spilled water back into a cup.

Those who own the mine and the people who live around it "are moving in opposite directions," he said. The company is rising, he said, as the people fall.

Human-Rights Standards

On Nov. 19, Barrick announced it had joined an international group of extractive companies, governments and non-profits that promotes voluntary standards to foster human rights in security operations.

The non-binding guidelines, called the Voluntary Principles on Security and Human Rights, include one saying that companies should report credible allegations of human-rights abuses by public security forces to the appropriate authorities.

Wray, of African Barrick, said the company "will make a formal request" to the regional police commissioner's office for an investigation if it's made aware of allegations of abuse.

The company mentioned no violence at the mine in reports describing its social-responsibility record on community relations, health and safety for 2009 and 2010. Last year's report stated: "At Barrick, we are committed to making a positive difference in the communities in which we work."

Wray wrote in a Dec. 15 statement that the company is installing additional perimeter fencing, walls and security cameras "in certain sensitive areas" and is trying to educate local residents about the dangers of illegal mining.

Gold's Payoff

Rising gold prices pushed Barrick to record net income in the third quarter of \$837 million, or 84 cents a share. As of Dec. 22, its stock had gained 30 percent this year, matching the gain of the 16-company Philadelphia Stock Exchange Gold and Silver Index. Barrick produced 7.42 million ounces of gold in 2009, compared with 5.3 million for its nearest competitor, Greenwood Village, Colorado-based Newmont Mining Corp.

"We are a company that has been a major beneficiary of raising the gold price," Regent, Barrick's CEO, said Nov. 11 at a London gold conference sponsored by RBC Capital Markets.

In the first nine months of this year, Barrick's cash margins increased 52 percent to \$783 an ounce, compared with \$515 an ounce a year earlier, according to a financial statement released by the company Oct. 28.

African Barrick has been a laggard. On

Oct. 14, its share price dropped 9.5 percent in London after the company cut full-year output estimates at its new Buzwagi gold mine, which is about 300 miles south of North Mara. It said workers had stolen diesel fuel from the mine, causing production delays.

'Appalling Start'

"They're off to an appallingly bad start," said Peter Rose, an analyst at Fox-Davies Capital Ltd., in London, who recommends buying ABG stock and has a one-year price target of 674 pence. The March IPO wouldn't have been possible without high gold prices, he said.

African Barrick's share price began recovering after it announced positive exploration results at two separate sites Nov. 29 and Dec. 2, including North Mara. It closed at 591 pence yesterday.

Production stoppages are down at North Mara, Wray said, adding that the company budgeted a total of \$20.4 million for security at all four Tanzanian mines this year. The biggest share of those costs goes to North Mara, a 16-square-mile (42-square-kilometer) property just west of Tanzania's Serengeti National Park, one of the world's most renowned game preserves.

Of the 15 people listed as injured at the North Mara mine by the Legal and Human Rights Center of Dar es Salaam, Bloomberg News interviewed two. It also found a woman, Mwora Marwa, who was listed as dead by the human-rights group, after she was shot and hospitalized for almost a year. All three provided medical or other records documenting their injuries from gunfire.

Ruptured Eye

They included a 12-year-old boy whose right eyeball was ruptured by a bullet and a 28-year-old man, Joseph Ikaya Mgaya, who said police approached him and fired a single shot into his right leg without warning or provocation.

Mgaya carries two letters in his pocket. One is from the general secretary of his village. It says he was "shot by the patrolling police near the mining area" and asks police officers to stop harassing him. The second, stamped by police, obliges the request. "Please don't disturb him, he is sick



A gold buyer weighs gold pellets with metal hand scales at a store in the district of Nyangoto, Tanzania. Photographer: Trevor Snapp/Bloomberg.

and I have checked his documents and they are legal," it says.

Of the seven killed whose families were interviewed by Bloomberg News, at least five of the incidents were reported in Tanzanian newspapers. Police were quoted taking responsibility for four.

One report stated that on July 8, 2009, police confronted hundreds of villagers at the mine. Massawe, the police commander, was quoted saying villagers threw stones.

Rushing for Bullets

"Police fired so much tear gas and so many gunshots to prevent the villagers from invading the mine (they) ran out of ammunition stock and had to rush for more bullets," Massawe was quoted saying in the state-owned Daily News.

Two people were killed by the gunfire. One was Chacha Nyamakono, 17, who lived with his extended family in huts made of mud, stone and handmade bricks about a two-hour walk from North Mara.

He was the first in the family to attempt an education, loved science and always had his nose in his books, said his sister-in-law, Paulina Chacha, 36. The family burned his high school papers and notebooks after his death because they were too painful a

reminder, she said.

"He said, 'When I'm done with school, I'll provide a better life for you,'" recalled his 73-year-old grandmother, Marita Nyamakono, perched on a stool next to a scrawny, sleeping dog.

'Hard to Survive'

"It's very hard to survive here," she said. "We don't have sugar. We don't have medical care - nothing." The other miner killed that day was Mwita Machapele, 37, a father of three sons. He was shot in the back, according to both his wife and Massawe's comments in the government newspaper.

His widow, Mama Godfrey, said she collected her husband's bloodied corpse from police on a road next to the mine, where about 500 people had gathered.

"I didn't bother asking the police what happened," she said, "because it was the police who killed him. There was no point of asking. Even if I asked, what could I do?"

Bloomberg News did not include some cases tallied by local officials or human-rights investigators in its count, often where there wasn't a witness or a contemporaneous press account. One of those cases involved Christopher Jakuo, 42, who was shot and killed at the mine on June 3, 2009, according to his widow and Machage.

Earning Extras

What her husband earned scavenging ore paid for extras, like meat and milk, said Mama Christopher, who lives in a mud and thatch hut in a hamlet called Chuchuri. Since his death, the family survives on what it can grow: sweet potatoes, corn, cassava and millet.

"You can see the children are losing weight," she said. She dreams of her dead husband. "We speak together and I tell him about my problems raising the children. I can't do this alone."

One incident brought the community close to rioting, according to several accounts - the death of Muhere Biraro, a popular local leader.

Biraro, 40, lived with his wife and seven children in three stone and mud huts in a hamlet called Sekube. Starting in late 2008, Biraro worked for Barrick in one of the mine's pits, according to his wife, Rhoda. It was the first full-time employment in Biraro's life, bringing steady income and even health services, including medicine, from the mine dispensary.

Hardhat Memorial

The family began building a brick home so they could finally move from the huts, she said, sitting on a plastic chair just a few feet from where her husband's hardhat hangs. It's on a nail pounded into the mud wall above the bed they shared.

Their new life ended when Biraro was fired in early 2009 as part of 200 dismissals that a company press release called a cost-saving move.

Desperate, Biraro began small-scale mining in the Lake Victoria region, hours from the family's home, his wife said. This year he focused on the Barrick rock piles instead, because they were close, according to a friend he worked with at the mine.

On March 20, one day after Barrick completed the IPO of its African Barrick unit, Biraro went hunting for stones. The next morning, his wife learned her husband was at a small health clinic near the mine.

Drenched in Blood

A friend of her husband's, Charles Mbusiro, 39, arrived first at the hospital and

recalled seeing Biraro drenched in blood. “He had lots of injuries, in the head, in his back, all over,” Mbusiro said.

Biraro was weak, his friend said. He described being confronted at the mine by Barrick’s private security officers.

“They surrounded me and they attacked me and beat me and they stabbed me and took me and dumped me by the roadside. The police picked me up from there,” Mbusiro said Biraro told him before he died.

With villagers on the verge of rioting over the death, Tanzania Omtima, the village chairman, and Isaac Zablo, a local Christian minister, said they met with senior mine managers and demanded answers. Mine security officials said they had found Biraro disoriented, then handed him over to police, both men said in separate interviews.

Omtima and Zablo insisted on being taken to the scene to question security

guards and others, and to examine the surroundings. After gaining permission, both said they were stopped en route by mine security guards, who refused to let them pass. The family and Omtima said no one was arrested.

Killers Unclear

In a statement to the government newspaper that was published on its website that same day, Massawe, the police commander, alleged that Biraro had been killed by other small-scale miners after retrieving ore.

“He was an intruder and it seems he has been killed by colleagues,” Massawe was quoted saying.

In his statement, Wray said the allegations that mine security killed Biraro “are fundamentally untrue” and that “evidence instead strongly suggests that his injuries were the result of a conflict with

other intruders over gold-bearing material stolen from the mine.”

He also said that while the two community leaders, Omtima and Zablo, initially were granted access to the site of the killing, it was under the control of police and “this area was a crime scene.”

Biraro’s widow now spends her days walking from home to home with her children in tow, offering to do odd jobs so they can live off more than the crops they grow.

Her oldest boy is often absent. He feels responsible now for the family, she said, so he scrounges rocks at the same mine where his father was killed.

– With assistance from Sarah McGregor and Eric Ombok in Nairobi and Christopher Donville in Vancouver. Editors: Marcia Myers Flynn McRoberts, John Voskuhl