

# Pebble Project moves forward after election victory

In Alaska's southwest corner, in the Bristol Bay region, 476 holes have been drilled to help define the size of the Pebble Project. The results indicate that the deposit holds close to 32 Mt (72 billion lbs) of copper and 2.9 Gt (94 million oz) of gold.

The Pebble Partnership, an Alaskan limited partnership of Anglo American and Northern Dynasty Minerals, owns the project that consists of two world-class mineral deposits. Currently in the prefeasibility and prepermitting stage of development, the Pebble Project is one of the largest and highest profile exploration projects in North America.

## History

The Pebble West Project was originally discovered in 1988 by Cominco (now Teck Cominco). Drilling programs in 1997 defined a near-surface mineral deposit of 1 Gt (1.01 billion st). Minerals found included copper, gold and molybdenum.

Northern Dynasty Minerals acquired the property in 2001 and, by 2005, it had confirmed a measured and indicated resource of 4.1 Gt (4.5 billion st) containing 1.2 kt (42.1 million oz) of gold, 11.2 Mt (24.7 billion lbs) of copper and 612 kt (1.35 billion lbs) of molybdenum and additional silver.

By September 2005, Pebble East, a deeper, but richer deposit had been found.

Drill data by the end of 2005 confirmed a 3.4-Gt (3.7-billion st) inferred resource containing 19 Mt (42.6 billion lbs) of copper, 1.2 Mt (39.6 million oz) of gold and 1.2 Mt (2.7 billion lbs) of molybdenum.

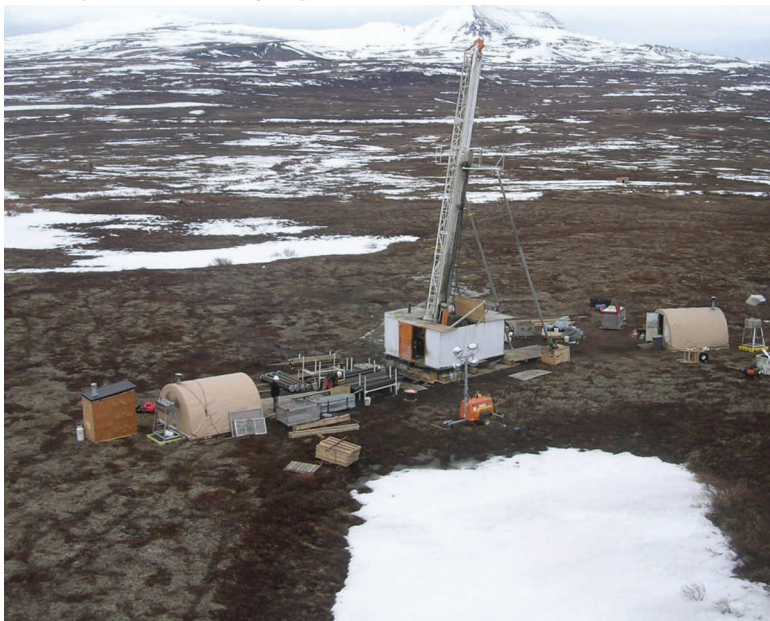
This find expanded the scope and potential of the project because of its higher grades and mineral content. Development and permitting timelines were deferred so more studies could be conducted to support the expanded project.

The Pebble Partnership said it would continue these studies throughout 2009 to support the preparation of a proposed development plan that will be submitted for government and public review in the next few years.

In 2007, \$90 million was invested on exploration, engineering, environmental and socioeconomic studies. These studies included 48,000 m (157,000 ft) of drilling at Pebble East. The 2007 drill program led to an increase in the inferred mineral resource at Pebble East of 3.9 Gt (4.3 billion st) containing 22 Mt (49 billion lbs) of copper, 1.4 Mt (45 million oz) of gold and 1.3 Mt (2.8 billion lbs) of molybdenum.

In July 2007, the Pebble Limited Partnership, was formed between a U.S. subsidiary of Anglo American and Northern Dynasty Minerals. Anglo American became a

**A drill rig, positioned on protective tundra pads, operates at the Pebble exploration site. A maximum of 10 drill rigs were permitted to carry out continuing exploration work in 2008.**



50-percent partner in Pebble with equal rights, in exchange for a staged cash investment of \$1.425 billion

## Opposition

Located 27 km (17 miles) northwest of the community of Iliamna, in the Bristol Bay region, the Pebble Project is at the headwaters of the Bristol Bay salmon fishery, a world-class fishery. Partly because of this location, the Pebble Project has faced opposition from the outset.

Opponents to the mining project were able to drum up enough support and signatures to place Ballot Measure 4, the Clean Water Initiative, on the state of Alaska's ballot for the 2008 elections. Ballot Measure 4 was aimed specifically at stopping development of the Pebble Project. It argued that the proposed Pebble Project would pose a high risk of polluting the watershed and could be dangerous to Alaska's wild salmon population.

Opposition to the project even appeared in *The New York Times*, which weighed in by urging Alaskans to vote for the measure in order "to save one of the last healthy wild salmon populations left." *The New York Times* wrote that "one of the greatest remaining runs is at risk from a giant gold and copper mine that would dominate the headwaters of Alaska's Bristol Bay, an extraordinarily rich fishery that produces about half of the wild salmon sold in North America."

William M. Gleason,  
Senior Editor

Alaskans Against the Mining Shutdown (AAMS) waged a counter effort to the ballot measure. They argued that, while the initiative was directed at the Pebble Project, it was so broadly written that its passage would effect all other metal mining operations in Alaska, future and present, including Teck Cominco's Red Dog Mine expansion and the Donlin Creek project.

AAMS stressed that the measure would ban Alaska from approving any large mining operation that releases any "measurable amount" of contaminants that would affect human health "or any stage of the life cycle of the salmon."

At the Northwest Mining Association's annual meeting in Reno, NV on Dec. 5, 2008, Lorna Shaw gave a presentation about AAMS's efforts to defeat Ballot Measure 4. She noted that supporters of Ballot Measure 4 had a lengthy head start but, thanks to a focused campaign, support from a number of organizations including the Native American organization NANA and a late, unofficial endorsement from Alaska Gov. Sarah Palin to vote no on Ballot Measure 4, the most expensive ballot initiative of its kind in Alaska history, was defeated by voters, 57.4 percent to 42.86 percent. This cleared the way for the Pebble Partnership to continue with its prefeasibility studies.

The Pebble Partnership has reportedly said it anticipates more legal challenges to arise, but will aim to begin the permitting process in 2009 or 2010.

By the end of 2007, The Pebble Partnership had invested \$220 million on a range of work programs and studies at the Pebble Project. Information generated from these studies will be used to prepare a proposed mine development plan to be submitted for government and public review.

**Since the discovery of the Pebble deposit in 1988, all exploration site work has been done with helicopters, ensuring no footprint has been left behind on the tundra.**



More environmental studies are planned to expand and strengthen the database generated during the past three years.

The Pebble Partnership has invested \$100 million on its environmental and socioeconomic study programs and has used more than 50 consulting firms and 500 environmental scientists and technicians, 75 percent of them are Alaskans.

"This year, a total of 26 separate study teams and hundreds of individual scientists and technicians undertook work programs in the Pebble Project area," said Pebble Partnership chief operating officer John Shively.

The Partnership is currently assembling an Environmental Baseline Document for Pebble, which will be submitted as part of the project's permit applications.

One of the key objectives is to ensure that the proposed project can operate safely while preserving fisheries and other valued natural resources in the Bristol Bay region.

The Pebble Partnership's proposed mine development plan will be subject to an exhaustive regulatory review involving 11 state and federal agencies and the citizens of Alaska. The Pebble Partnership must provide the required information for an environmental impact statement and be issued more than 60 types of permits. The combined review and permitting process could take three years or more to complete. This

**The Pebble Project sits 27 km (17 miles) northwest of Iliamna, in the Bristol Bay region.**



**A driller and drill helper operate a drill rig at the Pebble exploration site. More than 80 percent of the Pebble workforce is Alaskan, with local (in region) hire numbers expected to reach 150 plus for 2008.**



lengthy timeline ensures that local residents and other stakeholders will be able to play an active role in the planning and review process.

While drilling continued at Pebble until early December, the Partnership expected to release a revised mineral resource estimate for the Pebble deposit toward the end of the year. A significant proportion of the known mineralization at Pebble East is expected to move from inferred to indicated mineral resource categories.

## Project planning and concepts

As part of its overall plan, the Pebble Partnership said it is committed to developing the Pebble Project in a way that will optimize benefits for local communities while protecting important environmental values and traditional ways of life.

Technical and environmental studies will help determine the best mining, processing, tailings storage and infrastructure options.

The mining plan will likely involve conventional openpit mining at Pebble West and underground mining at Pebble East.

Preliminary evaluations suggest that block-cave mining may be selected as the best underground mining option at Pebble East.

## Location challenges

The Pebble Project's remote location is currently only accessible by helicopter and there is no current infrastructure on site. If the project is developed, some of the major components that are being considered include a 138-km (86-mile) single-lane, restricted access industrial road between the mine and the port site. The road will be used for freight and consumables used at the site.

A multi-model port on Iniskin Bay will be used for loading mineral-bearing concentrates onto ocean-going

vessels and receiving freight and consumables.

After mining, mineralized ore will be fed to a metallurgical processing plant to separate the copper, gold and molybdenum. The froth flotation process physically separates these minerals from waste rock using organic compounds and wetting agents. The Pebble Partnership is also evaluating alternative processing methods to maximize gold recoveries.

Copper concentrate at Pebble will be sent by a pipeline to a port site and dewatered before shipment. The water will be returned through a separate pipeline to the mine site for re-use. The nonmineralized portion of the processed material will be stored in a modern tailings facility designed and constructed to protect downstream water quality and withstand the most severe earthquake that could possibly occur in the region.

Power to the site is another issue that will have to be addressed. Mike Heatwole, vice president, public affairs said the Pebble Partnership is exploring all of its energy options.

According to reports posted at the Pebble Partnership Web site [www.pebblepartnership.com](http://www.pebblepartnership.com), studies to date envision routing power southward from the Railbelt grid near Nikiski by overhead transmission lines along the west side of the Kenai Peninsula, then across Cook Inlet by submarine cable to a proposed port site near Williamsport, then again by overhead transmission line along the road corridor to the mine site. Other

**A Pebble environmental consultant measures stream flow levels in order to document current existing conditions near the Pebble Project exploration site. Environmental baseline studies have been conducted by more than 50 consulting firms and 500 people.**



scenarios are being considered, including the use of alternative energy sources.

The proposed infrastructure for the Pebble Project could also provide low-cost power, improved road access and other benefits to communities in the Bristol Bay region.

Alternative sites for the port are being evaluated, along with various options for the supply and delivery of power to the project and to nearby communities.

In addition to the power benefit, development of the Pebble Project will generate capital investment of between \$3 and \$5 billion, 1,000 high-skill, high-wage

operations jobs for 50 to 80 years, 2,000 jobs during the project's two to three-year construction phase, tens of millions of dollars in annual tax payments to state and local governments, among other spinoff benefits and business opportunities.

"We believe Pebble has the potential to provide very significant economic benefits to the Bristol Bay region and Alaska as a whole in the years ahead, through employment, supply and service contracts, government revenues and spinoff economic activity," Shively said. "But we're also proud of the economic contributions we are making today as an exploration and development project." ■

## Exploration budgets peak in 2008, according to MEG

The Metals Economics Group (MEG) found that the planned 2008 nonferrous exploration budgets for companies that were included in its 19th edition of *Corporate Exploration Strategies* (CES) totaled \$12.6 billion.

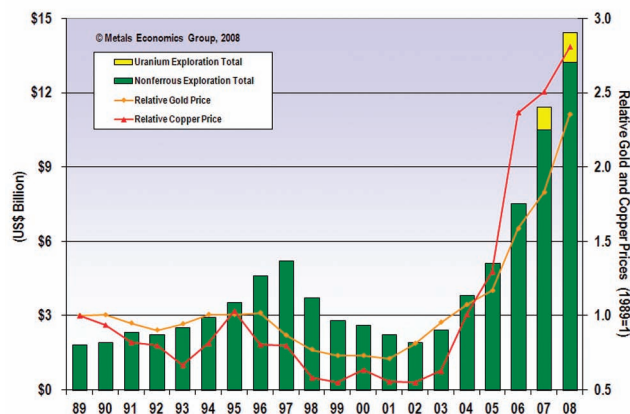
MEG estimates that the budgets of the 1,912 companies included cover 95 percent of worldwide commercially oriented nonferrous expenditures. When the remaining 5 percent is added, exploration expenditures reach \$13.2 billion — this is a 26 percent increase over 2007's estimated total and the sixth consecutive yearly increase since the bottom of the cycle in 2002.

In addition, the CES study began including uranium budgets in 2007. This year's study includes aggregate uranium budgets totaling \$1.15 billion. Including uranium budgets, the total number of companies covered rises to 2,085, and the aggregate exploration budget (including the \$12.6 billion nonferrous total above) increases to more than \$13.75 billion. Including estimates for budgets MEG could not obtain, worldwide nonferrous planned exploration expenditures, including uranium allocations, total more than \$14.4 billion.

However, companies seldom spend exactly the amount budgeted on exploration in a given year, tending to spend more than budgeted during the good times and less during the bad. The current global economic crisis will certainly suppress the actual aggregate exploration spending relative to the total amount budgeted, but the overall decrease will likely be tempered by the fact that many companies spent the bulk of their 2008 budget in the summer field season prior to the acceleration in market panic that began in late September. While cuts to residual exploration plans over the remainder of 2008 will likely be quite severe for many companies — particularly the junior explorers — MEG still expects the total amount actually spent on nonferrous exploration during the year to reach an all-time high, although it will be somewhat lower than the \$14.4 billion total planned budget (including uranium).

While major and intermediate producers with their deeper pockets have the option of continuing to fund

Exploration budgets in 2008.



exploration at close to previous levels, in the near term panicked equity markets and tumbling commodity prices will have severe effects on the junior explorers, since their dependence on equity financing for funding makes them the most vulnerable sector of the industry. The majority of the juniors—the drivers of the exploration upswing over the past few years—will cut exploration and development to conserve their cash in an effort to survive until conditions improve. As a result, 2008 will mark the end of the recent exploration boom, as contractions in both the number of active junior explorers and their individual budgets will take their toll on the industry's aggregate total, regardless of what the major and intermediate companies do in 2009.

Given the uncertain financial outlook for the mining industry, and the global economy in general, just how deeply explorers cut spending next year and how long the down cycle will last are impossible to predict at this point, MEG said. However, given the decline in metals prices and the continuing volatility and financial instability at the time of writing, an overall decrease in 2009 exploration spending similar in scale to the year-on-year declines during the first few years of the last downturn is certainly possible. ■