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The Baikalsk Pulp and Paper Mill, constructed directly on the shore of Lake Baikal. For the first time in over 40 years, its smokestacks are not emitting clouds of foul-smelling chemical compounds.

A Bitter-Sweet Victory:

One of the Main Sources of Pollution on Lake Baikal Comes to a Halt

By Elena Agarkova

BAIKALSK–The pulp mill that polluted Lake Baikal for 43 years has closed. Almost. Just like its murky past, the mill's future remains unclear. Its unpredictable history shows that we cannot be sure of the mill's demise until it officially shuts its doors and sells its antiquated equipment to pay off creditors. This letter looks at the Baikalsk Pulp and Paper Mill (BPPM) and environmental mismanagement of our most precious natural resources, a place of transcendent beauty that holds one fifth of the world's fresh water.

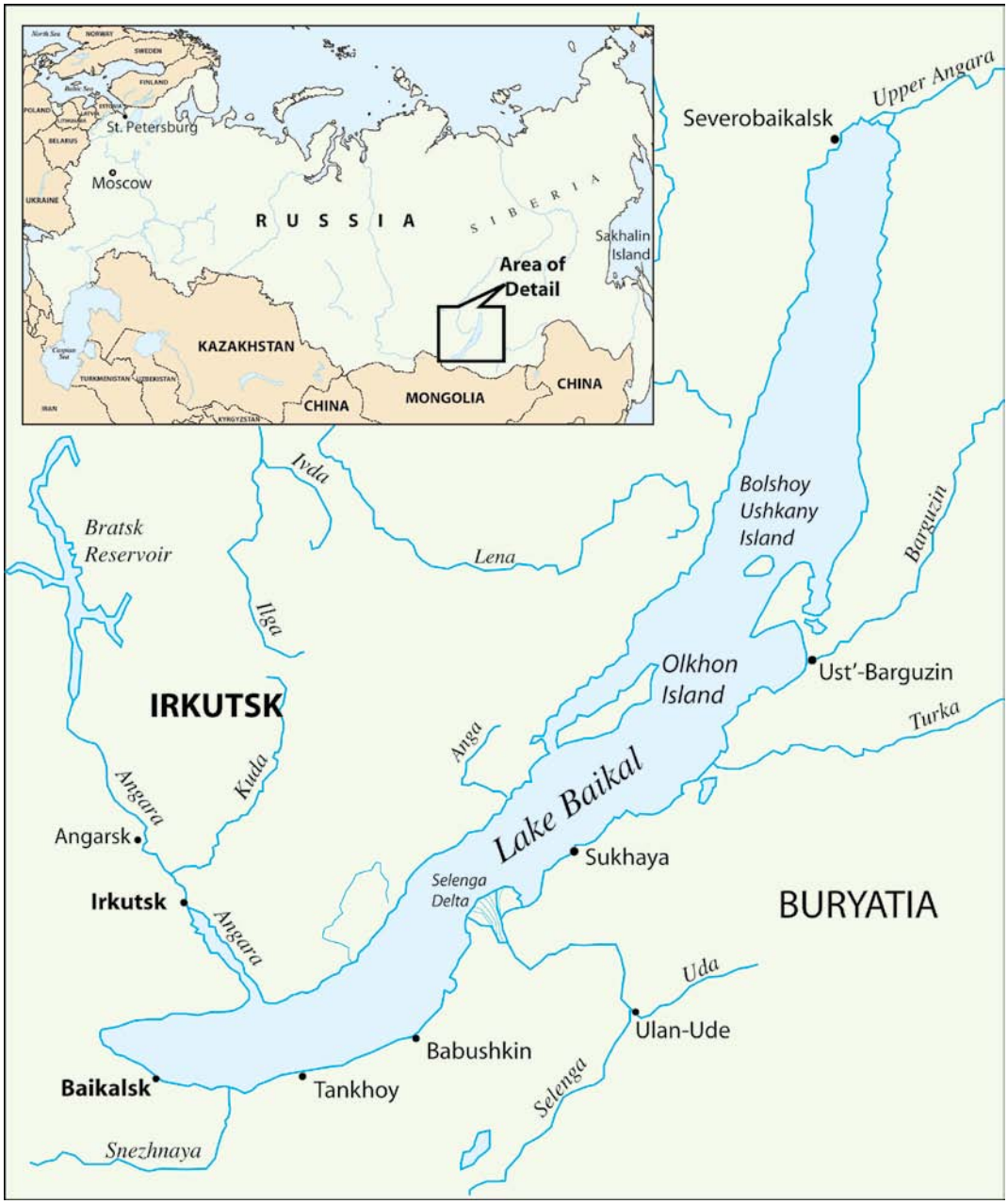
We know some of the reasons behind the initial decision to build a pulp mill on Baikal. However, it is not clear why the BPPM operated for so long despite numerous government decrees that called for closing or re-profiling the mill. Construction of an industrial facility directly on Baikal's shore became a catalyst for the environmental movement around the entire country. So many people consider this lake sacred that, despite the state's heavy suppression of civic dissent, people openly spoke out against the mill. Writers sent impassioned letters to newspapers and wrote books about the mill's dangers to Baikal; scientists refused to sign official construction documents; film direc-

tors made movies about existing pollution from the plant. But despite unprecedented public opposition to the mill, until October 2 of last year BPPM continued to discharge 120 thousand cubic meters of liquid wastes (more than 4 million cubic feet) into the world's cleanest lake, daily.

We can only make educated guesses about the real reasons behind the mill's abrupt stop. BPPM's history is full of guesses, questions, and rumors. After new owners acquired the mill in 2002, where did the profits disappear? If the mill became as unprofitable as the owners claim, why did they resist public and governmental pressure to close the plant? Why, after decades of empty decrees, in 2007 did a federal environmental watchdog agency finally step up to file lawsuits against the mill? And more importantly, why did the agency succeed?

Did the federal government decide to make serious its promise to protect Baikal from any threat of pollution? In 2007 then-president Putin in a dramatic gesture moved a planned oil pipeline away from Baikal's northern shore. At the televised conference, Putin declared: "If there is even the smallest, the tiniest chance of polluting Baikal, then we must think of future generations. We must do everything to make sure this danger is not just minimized, but eliminated." Perhaps federal agencies have taken that statement as an order to protect Baikal, which contains 80 percent of Russia's drinking water, in earnest. Companies already bottle clean Baikal water, taken from the depth of 400 meters, and sell it in Moscow supermarkets at a price higher than that of premium gasoline. But in a world where millions of people do not have access to clean water, Baikal's water means more than a business opportunity. The Lake is a strategic resource.

Other factors may be behind the mill's closure. In the past, the Russian government has used environmental violations by companies as means for non-environmental ends. For example, in 2006 the Kremlin threatened Shell with criminal prosecution for water pollution, illegal logging and other damage on Sakhalin Island. Shell led the consortium of companies developing the world's biggest liquefied natural gas project on Sakhalin. Soon after, Shell ceded majority control of the project to the Russian state-owned gas monopoly Gazprom. Rosprirodnadzor, a federal environmental watchdog agency, played a key role in threatening Shell with lawsuits. After the change in control, local administration and environmental groups continued to appeal to federal agencies because violations of Russian law did not stop.



Russian laws, including environmental regulations, are complicated and contradictory. Some argue that such legal "chaos" allows the government to have de facto control over most of its citizens and businesses. Anyone can be violating some law or other at a given time, so it is up to the government to decide whether a prosecution serves its needs in any

To this day, the mill continues to discharge wastewater into waste storage "tanks," man-made ponds 4 to 8 meters-deep, dug into the mountain slopes nearby.

particular instance. Was there a non-environmental reason behind the lawsuits that Rosprirodnadzor began to file against the mill in 2007? Perhaps. Or perhaps the agency played into the hands of the mill's latest owner, Oleg Deripaska. Deripaska, Russia's aluminum king, came out the winner of the aluminum wars that took place in Russia's aluminum industry in the 1990s, with dozens of businessmen and directors shot dead. He built a business empire that included airports, insurance companies, construction, car manufacturing, mining, timber, and the world's largest aluminum producer, RUSAL. Deripaska belongs to Russia's political elite, having married into President Yeltsin's family. But last autumn Deripaska went from being Russia's richest man to its most indebted. Forbes estimated that his fortune tumbled 88 percent to about $3.5 billion, as a result of the economic crisis. Deripaska borrowed heavily to expand his business, and RUSAL owes $14 billion in bank debt alone.

Ever since Deripaska's timber holding, Continental Management, bought the controlling stake in the BPPM, local media criticized the holding's management practices. The acquisition has been described as a hostile takeover and part of Deripaska's heavy investment into the forest industry. People at the BPPM suspected that the new owners wanted to bankrupt the plant. According to insiders, Continental Management instituted a 40 million-rubles-a-month savings program, which cut down expenditures on equipment replacement and repair. Russian internet sites published graphs detailing offshore transactions that allowed the BPPM's owners to claim financial losses and avoid payment of taxes.

The mill's bankruptcy may be around the corner. Since the mill halted its operations in October 2008, Continental Management has repeatedly stated that compliance with environmental regulations makes production economically unfeasible. If the mill goes bankrupt, millions of tons of toxic waste that accumulated under and around the plant may become the government's responsibility, not Deripaska's. This will be an expensive undertaking. But it is highly doubtful that the mill's current owners ever intended to comply with governmental decrees requiring reclamation and recultivation of polluted groundwater and land.

What will happen to the people of Baikalsk, a town that formed and lived to service the mill? Three out of 15 thousand of its inhabitants worked at the BPPM, but the majority of the rest depended on the mill for their incomes,

directly or indirectly. The mill's owners have already fallen behind on paying their workers' wages and unemployment benefits, creating an unstable situation in the town. The mill used to supply the town with cheap electricity and hot water. Baikalsk is just one of the many "mono-towns," completely dependent on one factory that the Soviet state ordered into existence. The economic crisis has hit these towns especially hard. For their inhabitants, demise of the town's main employer means soaring unemployment, a drastic drop in overall income, inability to make payments on bank loans, lack of work opportunities, and a sharp rise in crime. Who will bail out towns like Baikalsk?

The rise and fall of the Baikal Pulp and Paper Mill is an example of a spectacular failure of environmental and economic decision making. To understand how this failure came about, we need to take a look at a timeline that spans millions of years.

* * *

More than 25 million years ago. One of the greatest wonders of nature has been forming on the subtropical plains of Southern Siberia. The earth's crust fractures along parallel planes. Rift valleys form. Tectonic plates grind and pull apart. Lake basins appear.

One to three million years ago. A land connection still separates northern and southern Prabaikal. The average temperature drops to about +5 Celsius.

Ten thousand to 800,000 years ago. Baikal comes to exist in the form that we know it today. The mountains of Baikal's western shore rise rapidly. An ice shield grows over the Baikal mountain region. As icebergs and ice tongues slide into Baikal, glacial waters fill the widening rift. The northern and southern lakes become one whole.

Modern geological period. Baikal is the deepest, oldest lake in the world. More than 350 streams and rivers flow into it, and only one, the Angara, flows out. Baikal contains 5,500 cubic miles of water and is more than 5,370 feet deep. The rift itself goes much deeper. Below the water lie miles of ancient sediment. This mud contains an undisturbed record of millions of years, going back to when palm trees and magnolias grew in Baikal's basin, and cave tigers and lions roamed its valleys. More than 1,500 endemic species live in the lake.

More than 100 thousand years ago. Evidence of man's activity on Baikal exists.

6th-8th century. An ancient culture called Kurumchan flourishes on Baikal's shores.

Year 1227. According to some legends, Ghenghis Khan is buried on Baikal. One of his decrees declared the Baikal region to be a protected, sacred area.

15th-17th century. Buryats, descendants of Mongol tribes, form a separate ethnic group on Baikal.

Second half of 17th century. Cossacks, the first Russian explorers of Siberia, come to the Baikal region and establish first fortified fortresses. A tax collection outpost for local fur trappers, built in 1652, becomes an official town, called Irkutsk, in 1686. Locals begin to create songs and legends about the Lake, referring to it as the Glorious Sea, Sacred Baikal.

1918-1920. After Bolsheviks take power in the October Revolution of 1917, Russia goes through a bloody Civil War. By 1921 the Red Army succeeds in defeating the White Army and Bolsheviks gain control of European Russia, Siberia, and the Russian Far East.

1950-1958. The Soviets build the Irkutsk Hydropower Station. The dam on the Angara River raises Baikal's surface level by one meter and turns Baikal into an impounded body. Now Baikal is hostage of Irkutskenergo and its engineers, who want to raise the lake's fluctuation level to two meters (from the legally allowed one meter). In February of 2008 the Russian Ministry of Natural Resources began an inquiry into the precipitous drop in Baikal's surface. According to the Ministry, Baikal started sinking in October of 2007, going down with a speed of 12-15 centimeters per month, although there were no droughts or other unusual climatic events. The Ministry wondered whether someone decided to release more water to the Angara hydropower stations: "There is no other explanation for a 17 percent increase in electricity generation in the last three months." Temptation of a quick but huge profit may be to blame. Each centimeter of the Baikal water (a third of a cubic kilometer) produces 200 megawatts of electricity. The Irkutsk hydropower company exports a considerable amount of energy generated by the Angara hydropower stations, primarily to China.

1953. Stalin dies and Nikita Khrushchev becomes the next leader of the Communist Party.

1954-1956. The government makes the decision to build a pulp mill on the south eastern shore of Lake Baikal. Khrushchev's obsession with proving the USSR's superiority over America drives many absurd industrial and agricultural "innovations" (for example, forceful replacing of wheat with corn, which could not grow in the Russian climate). Baikal becomes one of the victims of the Cold War. To compete with the U.S. military, the Soviet Union needs "super cord," a special type of cord used in airplane tires. Only four lakes in the country, including Baikal, have water pure enough for super cord production, water that is sufficiently mineral-free. Several reasons, including the exceptional purity of Baikal waters, access to nearby sources of wood, and availability of transport, favor

Despite years of secrecy about the "super cord" that mill produced for the military, there is a monument to a rocket in the center Baikalsk. The habit of keeping the military connection secret persists to this day. When I was in town recently and asked the cab driver, who used to work at the mill, what the monument meant, he mumbled that it had "something to do with Gagarin," a Russian astronaut who became the first man in space.

building the mill on Baikal.

But political reasons may have played a more important role in the choice of the mill's exact location. One Russian source reports that the Irkutsk Communist Party leaders pushed for putting the mill directly on the shores of the lake. Back then the salaries of Party secretaries depended on the number of communists in their regional divisions. Huge industrial construction projects guaranteed an influx of young Komsomol, members of the Communist youth organization, a dependable source of future Communists. Putting the mill in a relatively remote and undeveloped location, such as Baikal's southeastern shore, would force the State to move thousands of people to the construction site, providing the region's Party with new blood. The governmental commission apparently preferred to put the pulp mill on the shores of the Angara, about 20 kilometers downstream from Irkutsk, where the city could supply the project with a qualified workforce and housing. The Irkutsk regional Party leaders disagreed and, in the end, won. However, the Buryatia Party leaders did not wish to be outperformed and lobbied for construction of a pulp mill on the territory of their region as well.

1958. The government makes its decision known to scientists. The Siberian Branch of the Academy of Sciences immediately expresses grave concern for the future of Baikal. Scientists recommend a number of alternative sites, to no avail.

1959. News of the proposed mill reaches the general public when the newspaper "Soviet Russia" publishes a statement of protest by a group of scientists against the construction of the pulp mill. In the coming years scientists and writers continue to speak out against the mill. The Soviet environmental movement is born.

1960-1961. The Central Committee of the Communist Party and the Ministers' Cabinet issue decrees ordering construction of *two* pulp mills on Baikal, one on the southeastern shore and another in the delta of the Selenga river, on the Buryatia side of Baikal. The Ministers' Cabinet issues an order that prohibits initiation of production and exploitation of the mills without proper systems of wastewater treatment.

The Komsomol mill construction team dismisses concerns over the inevitable pollution of Baikal. "The only question that remains now is about the most effective means in which the industrial waste waters will be treated... but if we unite and target our efforts on solving this problem, we will solve it, and the mill on the shores of Baikal will only enhance the lake's beauty." Opposition to production of "super pulp" means opposition to "the mighty plans of the Party for building Communism."

1964. Leonid Brezhnev strips Khrushchev of all his privileges, puts him under house arrest, and takes over the leadership of the Communist Party.

1966. The same year one Soviet academician warns Brezhnev in an open letter that the world is on the verge of a fresh-water crisis, the Baikal Pulp and Paper Mill begins its operations. The mill's emissions fail to meet standards set by the 1960 law for wastewater quality after treatment. Michael Gofman, the head state officer of health of the Ministry of Melioration and Water Resources (MMWR) and a member of the state inspection commission, refuses to sign the document certifying the mill's waste treatment systems as legally adequate. The head of another ministry replaces Gofman with a local representative of the MMWR, who signs the document. By the time the improper shuffle of commission members comes to light, the mill has began discharges into Baikal.

The town of Baikalsk grows up around the BPPM to service the mill. The mill uses chlorine to produce bleached cellulose. BPPM's designed annual output capacity includes 200,000 tons of pulp and 12,000 tons

Baikalsk streets and buildings, typical of the Soviet-era construction, have not changed much since 1960s.

of sack kraft and kraftliner paper. Over the next four decades, the mill will also produce millions of tons of toxic wastes, including sulphur oxides, chlorinated organic compounds, suspended particles, nitrates, phosphates, phenols, sulphates, derivative lignin, and heavy metals.

1966 to the present. Scientists repeatedly find that BPPM's discharges of pollutants exceed projections by 10 to 500 percent. The Soviet government issues numerous decrees calling for protection of Baikal from pulp mill pollution and conserving Baikal's natural resources; establishing that heads of ministries and agencies bear personal liability for timely enforcement of measures protecting Baikal; calling for an end to all wastewater discharges into Baikal by year 1985; ordering a stop to BPPM's pulp production and re-profiling of the mill into an environmentally-safe enterprise by 1993; ordering a stop to BPPM's pulp production and re-profiling of the mill into an environmentally-safe enterprise by 1995.

Some experts say that BPPM's "super cord" has become obsolete by 1971, because of the invention of higher quality synthetic cord. Other sources (including BPPM's official publications) state that "super cord," the initial reason for BPPM's existence, is superior to synthetic cord and remains necessary for production of rockets, high-quality medicine, explosives, and other strategically important products, well into 2000s.

1970-1980. The mill's production and associated emissions reach their peak. The mill stores accrued lignin wastes in huge dumps on mountain slopes nearby.

1987-1988. An outbreak of a viral infection results in mass mortality of *nerpa*, the endemic Baikal seal. Scientists suspect that the seals' chronic exposure to environmental contaminants caused suppression of their immune system.

1987 to 2004. During this period the mill lays off over 6,000 workers—or the majority of the workforce in Baikalsk—as part of streamlining its operations.

1990. The Selenga mill has been re-tooled to operate on a closed-cycle system, without dumping waste into the lake (however, some scientists and environmentalists question the program's success).

The Russian federal government issues another decree ordering the BPPM to end its current method of production by 1993.

1992. The Russian federal government issues an order to convert the BPPM to other uses, clean up storage tanks with accrued lignin wastes and contaminated groundwater underneath the plant, and construct a separate sewage treatment system for the town of Baikalsk, by 1996. The order allows production of up to 160 tons of cellulose annually until the retrofitting takes place.

1996. American scientists who attend conferences in Russia dedicated to strategies on how to reduce dioxin levels in the environment and human beings, report that knowledge of dioxins in Russian scientific, policy and environmental circles remains minimal. Dioxins are highly toxic by-products of the chemical and paper-bleaching industries that can cause cancer, immune system suppression and damage to the nervous and reproductive systems. Until 1989, Russian dictionaries did not have entries on dioxins because the word related to military production. The topic has been declassified, but there has been no funding from the

federal government to set up dioxin research laboratories, which cost several million dollars each. Because of closed communication channels and economic obstacles, Russian scientists have not been able to attend international conferences or even read Western scientific journals. Reports include Irkutsk and the Baikal region on the list of dioxin hot spots in Russia.

1996. UNESCO declares Baikal to be a World Heritage Site. In its nomination summary UNESCO describes Baikal as a lake "so distinctive that it merits a separate Biogeographic Province.[1] [S]o much about Lake Baikal is different from anywhere else on earth that it has attracted widespread scientific attention as well as calls for its preservation. It has been referred to as the "Galapagos of Russia" as its age and isolation have produced one of the world's richest and most unusual freshwater faunas. Along with the equally interesting features of Lake Tanganyika, Lake Baikal would be the single-most remarkable freshwater lake on the planet."

The UNESCO nomination summary refers to the BPPM as the greatest pollution source for Baikal, and notes that the Russian government has agreed to convert the mill to other uses. "This activity will cost more than US$100 million and will cause local economic disruption in the short term. The closure of the existing inefficient mill and the cessation of the cellulose bleaching that has had such severe effects on the south end of Lake Baikal is, however, essential."

A draft of a Federal Law on Protection of Lake Baikal passes the first reading in the Russian State Duma. The law distinguishes three zones for regulation purposes: 1) the central lake zone, adjacent lands and protected territories; 2) the buffer zone including practically the entire watershed basin; 3) the zone of atmospheric influence.

A supplement to the draft gives a detailed description of the central zone. Its border includes the Baikal cavity, goes over the tops of the coastal mountains and makes up a strip of land adjoining the lake 20 kilometers wide in average, changing from 10 kilometers (in

Some of the mill's storage ponds lie only 500 meters away from Baikal.

1 Animal ecologists coined the term "biogeographic province" to describe subdivisions of biomes, based on animal or plant distribution. But whereas biomes are characterized by one prevailing dominant form of "climax" vegetation, meaning that which will develop if nature is allowed to take her course over a few centuries, without human interference (the desert, grassland, coniferous forest, tropical rain forest – generic subdivisions of the world's biota), biogeographic provinces are areas that differ considerably, either in their animal or plant species, or in the character of their vegetation, from one another.

the southern part of the lake and near the Selenga delta) to 80 kilometers (at the northern end of the lake).

Per discussions with the Russian authorities, UNESCO approves the borders of the UNESCO "Lake Baikal" World Heritage Site. The borders correspond to the central zone (including Lake Baikal) with the adjacent protected territories and other lands within the water protection zone. The only difference from the central zone is that the World Heritage Site excludes four urban areas on the shore of the lake (including the town of Baikalsk).

1997. Russian scientists from the Irkutsk Institute of Geochemistry of the Siberian Branch of the Russian Academy of Sciences report high concentrations of polychlorinated dioxins in the blubber tissue of the Baikal seal. The report states that nerpa's dioxin levels are comparable with those reported for ringed seals living in the Baltic Sea, a body of water exposed to heavy industrial pollution.

1999. President Yeltsin signs the "Law on Protection of Lake Baikal," a unique document that grants a special protection status to a natural object. Critics of the law point out that it is a "framing" document which needs detailed bylaws for successful implementation. One of the missing pieces is the detailed description of the central zone that was part of the draft of the law in 1996. The question of central zone borders remains open.

2000. In January the government includes BPPM on the list of corporations that are "strategically valuable for the economy." Pursuant to an order of the Ministers' Cabinet of Ministers, 49 percent of BPPM's shares should remain in state hands (non-privatized).

In March Putin orders the Russian government to urgently develop a Comprehensive Program for Conversion of the BPPM, "to end discharge of toxic wastes into Baikal at the earliest possible date."

2001. Of the three phases of the proposed Comprehensive Program for Conversion of the BPPM, only one passes environmental review required by federal law. In the summer the experts approve the first phase, which calls for an end to direct discharge of the mill's wastewater into Baikal, via conversion of production to a closed water cycle system.

In August Russian Prime Minister Kasyanov signs "The List of Activities Banned in the Central Ecological Zone of the Baikal Nature Territory." The law specifically prohibits production of pulp and paper on Baikal without a closed water cycle.

The World Bank takes under consideration the BPPM's

As I roamed around the plant's storage tanks last November, I saw rusty pipes and leaks everywhere.

request for a loan to retrofit the mill. The mill asks for $22 million out of the $33 million needed to modernize the production process and switch to closed-loop technology.

2002. Japanese marine researchers publish findings of high accumulation of dioxins and polychlorinated biphenyls in Baikal seals' blubber and livers.

In March President Putin comes to Baikalsk to ski at the Sobolinaya ("Sable") mountain ski resort, property of the BPPM. He meets with the mill's director and vows to personally lobby the World Bank for the $22 million loan.

In the spring a World Bank mission visits the BPPM. After a detailed examination of the proposed investment project and the financial situation of the mill, the mission experts conclude that the project is technically feasible, is financially strong and ecologically reasonable. The mission recommends the Bank to finance the BPPM investment project.

In July Continental Management, a timber holding owned by Deripaska's Basic Element, buys 51 percent of BPPM shares. A federal agency, Rosimuszhestvo ("Russian State Property Committee"), owns the remainder. Local media report that the purchase was a hostile takeover, part of the "timber wars" waged by Continental Management and its competitors in the industry.

BPPM's equipment looks and sounds ancient. Some workers have said to me that if the World Bank loan had gone through, they would have made the plant "look like candy."

2003. The World Bank provides the BPPM with a $22.4 million credit, earmarked for financing the first stage of the mill conversion, and specifically for purchasing the necessary equipment. The Russian government guarantees the loan. The mill's owners agree to provide an additional $11.1 million for the conversion project.

Per loan terms, the mill does not get any moneys directly. BPPM will only receive equipment. Suppliers will be selected on a competitive basis, and the World Bank funds will pay for equipment after delivery. The mill's director states in an interview that, to their regret, "organization of the [World Bank loan] took a lot of time. The World Bank is very scrupulous from the viewpoints of control, responsibility and evidentiary."

According to the Program for Conversion of the BPPM, the closed water cycle system must begin operating in 2006, and the entire first phase of the Program has be completed by January 2007.

2004. The World Bank experts visit the BPPM in December to check on the progress of the closed water cycle construction.

2005. In the beginning of the year the World Bank states that unless the mill's owners present a viable schedule for completing the conversion program on time, the Bank will withdraw from the conversion project. According to the Bank, Continental Management failed to invest its share of the funds and attempted to modify the list of agreed-upon equipment.

Continental Management declares the current conversion project unfeasible and states that the total cost will be over $50 million. Several days later the World Bank withdraws from the project. Continental Management fails to come up with a new conversion project, but, under pressure from the federal Ministry of Natural Resources, agrees to finish the closed water cycle system.

2006. On April 27, following mass protests across the country, President Putin declares Baikal to be a na-

tional treasure and tells the state-owned oil company Transneft to move its East Siberia-Pacific Ocean pipeline beyond the Baikal watershed territory.

In July the UNESCO World Heritage Committee advises the Russian Federation Government to approve the proposed central ecological zone of Lake Baikal urgently and asks the country to provide the World Heritage Centre with a detailed report about the Lake's protection by February 1, 2007.

In November 2006 Russia finally establishes the borders of the "Lake Baikal" World Nature Heritage site at the national level, along with the three ecological zones envisioned by the Law on Protection of Lake Baikal. The central ecological zone of the Baikal natural territory includes the whole territory of the UNESCO World Heritage Site — Lake Baikal with its islands, the water protection zone of the lake and the specially guarded nature territories adjacent to the lake. The buffer ecological zone of the Baikal natural territory includes the bigger part of the remaining Lake Baikal watershed territory.

2007. In November Russia's environmental protection agency, Rosprirodnadzor, inspects the BPPM and concludes that the mill illegally discharges wastes into Baikal.

In December the Minister of Natural Resources directs Rosprirodnadzor to ask the Federal Prosecutor's Office to initiate proceedings against the BPPM in connection with its violations of the federal Water Law and the Law on Protection of Lake Baikal.

Rosprirodnadzor imposes a five-day ban on dumping waste into Baikal and files a lawsuit against the BPPM for $19.9 million in damages. The agency subsequently increases the legal claim to $176 million.

2008. In March the Governor of Irkutsk, Alexander Tishanin, demands that the mill should be relocated.

In the summer the global financial crisis begins. Pulp prices, including bleached and non-bleached cellulose, fall precipitously.

In August a sewage treatment system for the town of Baikalsk, separate from the BPPM facilities, begins functioning.

In September Continental Management reports that it has finally installed a closed water cycle at the BPPM, at a cost of $11.4 million. At the end of September the Russian Minister of Natural Resources visits the mill to inspect the project and states that protection of the world's largest body of fresh water justifies any expense. The Minister meets with the mill's management to discuss the problems of liquidating the mill's environmental damage, including cleaning up contaminated groundwater under the plant and the question of air pollution generated by the mill.

As the economic crisis unfolds in Russia, Russian oligarchs, including Deripaska, lose 70 to 80 percent of their wealth in a short amount of time.

On October 2, the mill abruptly comes to a halt. The mill's management cites a shortage of raw material as the reason for the stop in operations, and prepares to lay off 200 workers. Shortly thereafter BPPM management states that operation on a closed-water cycle makes production of bleached cellulose impossible, and that due to a fall in the price of unbleached cellulose the mill cannot survive without producing bleached cellulose. Continental Management demands permission to "re-open" the water cycle and resume direct discharges into Baikal.

The Irkutsk administration and the federal government call BPPM's actions "blackmail." BPPM's management responds that it will put the mill into a "conservation" mode, mothballing its capacities and laying off the majority of its workers, unless it receives permission to resume direct discharges before November 10.

In November BPPM extends suspension of production until February 10, 2009. The mill's workers hold demonstrations at the mill's ski resort and in Irkutsk, and write petitions to the federal government. The mill's owners claim they have no money for salaries. The Irkutsk administration responds to the workers' pleas and returns to the plant the value-added tax moneys that the plant paid into the budget in November and December. The mill uses this money to pay salaries for November and December

A local environmental group works with the administration of Baikalsk and the town's population on a plan for creating small and medium local businesses.

2009. In January Irkutsk scientists and economists calculate different scenarios for the BPPM and conclude that given the global decrease in cellulose demand and the cost of production at the mill, even production of bleached cellulose (with direct discharges into Baikal) will be economically unfeasible.

BPPM begins mass layoffs. In January and February the mill's management fires 1500 workers. In January mill workers receive only 12 percent of their salary. For some this amounts to 480 rubles, or less than $20. The mill's owners fail to pay unemployment benefits required under Russian law. The workers union reports that the situation in town is "critical."

Alfa Bank, part of a larger Alfa Group Holding which belongs to Russian oligarch Mikhael Fridman, claims that Deripaska's Basic Element owes Alfa $800-$1 bil-

Baikalsk lies in the foothills of spectacular East Sayan Mountains, and has a temperate winter, perfect for development of winter tourism.

lion. Basic Element says its units owe Alfa $650 million.

In February Deripaska accompanies President Medvedev on his trip across Siberia. At a meeting in Irkutsk, Medvedev states that squabbling among billionaires could not be allowed to sink Russia's biggest producers and employers. According to the BPPM union, Irkutsk administration promised the union to use Medvedev's visit to discuss the issue of the debt owed by the mill to its workers.

BPPM workers do not receive the remainder of their January salaries or any payments for February. The Irkutsk administration reports working on returning the value-added tax to the BPPM for these months, for payment of salary obligations. The mill director promises to sell the mill's ski resort, Sobolinaya Mountain, to pay salaries. The ski resort's worth is roughly estimated at 90 million rubles. At this point the mill owes about 150 million rubles to its workers.

Soon after Continental Management replaces the mill's director.

In March Medvedev defends struggling producers from individual lenders that resist rescheduling payments, stating. "It's time to end corporate selfishness."

The next day the president invites Alfa Group's chairman Mikhael Fridman to a meeting in Kremlin. Later in the day the two tycoons issue a joint statement promising to negotiate on Deripaska's debts to the bank. Several days later the Moscow Arbitration Court orders Deripaska's construction firm to pay Alfa Bank $15 million in an overdue loan and fees.

Irkutsk media reports that Continental Management sold the mill's ski resort to Grand Baikal, a tourism business half-owned by Deripaska, for an undisclosed sum of money.

The mill's union helps laid-off workers prepare legal papers for filing salary and unemployment benefit claims against their employer, in local court.

In interviews, BPPM workers state that the mill's "closed water cycle system" was never fully operational. They refer to vast amounts of pollution accumulated under the plant, on its territory, and in lignin

storage tanks on nearby slopes. Some of the storage tanks lie within 500 meters of Baikal's shore. Representatives of the mill's environmental department privately express concerns about water overflows from snow melts and earthquakes destroying the sewage tanks. The future of the mill's toxic wastes is unknown.

* * *

The Lake—and if any lake on earth deserves a capital "L," it is Baikal—never rests. Baikal is a highly seismic zone. As the continent splits along the lake, small and large earthquakes open up new hot springs on its shores, sink villages, form wide cracks in Baikal's thick winter ice. In 1862 an earthquake transformed about 200 square kilometers of the lake's shoreline (and six villages) into a large bay, now called Proval ("Fallen Through").

According to one of the latest geological theories, Baikal will actually become an ocean one day. Most lakes do not live more than 20 to 30 thousand years. They fill up with sediment and die. But Baikal's rift widens by at least a centimeter each year. Discovery in 1990 of deep hydrothermal vents, usually found on mid-oceanic ridges, on Baikal's floor lends further support to the theory that Baikal is an ocean in its infancy.

The Lake has an amazing ability to self-cleanse, because of a unique water circulation and an endemic shrimp called epischura that constantly filters and oxygenates the upper layers. Despite increased human activity of the last century, Baikal remains remarkably close to its primeval state. Some scientists say that the Lake's low-mineralized water is ideal for drinking. Baikal is the only open freshwater body on our planet where in some areas the water remains of such high quality that it can be bottled for human consumption.

Baikal's resistance to anthropogenic impact has had its downsides. Many have argued that this ability is so pervasive and miraculous that the Lake will be able to withstand yet another new source of pollution. Perhaps this wishful thinking is correct, and Baikal will eventually absorb and disperse 43 years worth of BPPM's wastes, which form a dead zone by the mill, show up in the livers of Baikal seals, and dry up Siberian pines. We will have to wait only 400 years, the amount of time it takes for Baikal waters to replenish, for the Lake to return to its pristine glory. We received a lot of cord and cardboard in return. ❑

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