

North Korea's Exploration for Oil and Gas

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Executive Summary

Despite almost 50 years of exploratory surveys, test drillings, foreign investment and assistance and tantalizing potential, North Korea has yet to definitively identify any proven commercially exploitable reserves of crude oil or natural gas. The reasons for this are somewhat complex, but they can be distilled into three broad elements:

- The failure to resolve competing maritime claims with China, and possibly with South Korea, Japan and Russia;
- The inability to acquire or produce modern drilling equipment and technology; and
- The financial and political risks that are associated with oil and gas exploration and development with North Korea.

China has an ever increasing thirst for oil to fuel its growing economy and society. It has been aggressively securing and developing oil and gas reserves throughout its economic exclusion zones for many years. During the past ten years, it has become even more aggressive by extending these efforts into disputed areas such as the Senkaku Islands and the South China Sea. With regard to North Korea, Beijing has been in a dispute with Pyongyang over maritime borders since the 1950s. This dispute has become more focused since the 1980s with the belief that there are significant oil and gas reserves within the West Sea.

North Korea has a critical requirement to acquire modern drilling rigs and technology in order to drill exploratory wells in a comprehensive and systematic manner, yet it is unable to either domestically produce or acquire overseas these same drilling rigs and associated technology. A key factor in this is that China has not permitted modern drilling equipment to be sold to North Korea, both as a means of keeping pressure on Pyongyang to resolve the existing maritime boundary dispute and in response to international sanctions on North Korea.

The financial and political risks from any oil and gas exploration and development with North Korea have been great, and they remain unacceptably large for major international conglomerates. This has left only small, ambitious, non-US firms willing to take on the risk for

the potential of great rewards. Almost all such companies have announced glittering deals only to quietly shelve them a few years later with little to show for their efforts.

The history of oil prospecting by North Korea can be broadly divided into four chronological periods: 1) *Early Oil and Gas Exploration, 1960s-1970s*; 2) *National Exploration 1980s*; 3) *Securing Foreign Investment, 1990s*; and 4) *Renewed Efforts to Attract Foreign Investments, 2000-Present*. It is a history of unique opportunities, tremendous risks, inflated promises, financial loss and ultimately, a lack of success.

Early Oil and Gas Exploration Efforts, 1960s-1970s

The first known organized effort to explore for oil and gas reserves in North Korea occurred during 1965, when North Korea established a “bureau for the management of geological survey for fuel resources” and, with Chinese assistance, conducted initial geophysical surveys and exploratory drilling in the western (Sukchon-gun) and northeastern (Kilchu-gun and Myongchon-gun) sections of the country. Two years later, during 1967, North Korea conducted a joint geological study with Soviet geologists in the Tumen estuary area using drilling equipment acquired from Romania. Neither of these efforts achieved meaningful results.¹

A number of organizational developments were initiated in support of these early efforts to ensure a future workforce of qualified scientists, technicians and workers. For example, the Coal and Oil Detection Department was among 13 departments created when the Pyongsong University of Coal Industry was established in 1968. Meanwhile, universities in Sariwon and Tanchon created “crude oil detection” departments.²

During 1976, a group of North Korean specialists traveled to the Soviet Union to examine an oil platform in the Caspian Sea, learn the basics of offshore drilling operations and acquire associated technology and equipment.³ Accompanying this, North Korea established two oil and gas exploration organizations: the Taedong-gang Survey Group (for offshore exploration) and the Tumen-gang Survey Group (for onshore exploration). The Taedong-gang Survey Group was originally headquartered on the west coast in Nampo, while the Tumen-gang Survey Group was located in Sukchon-gun.⁴ By 1978, the Taedong-gang Survey Group had acquired a “... crude

¹ Dong-hyun Lee, “Quest for Crude Oil in the North - Good Luck!” *JoongAng Ilbo*, August 20, 2001; and Alex Stewart, “Glimmers of hope seen in North Korean basins, markets,” *Oil and Gas Journal*, January 4, 1999, <http://www.ogj.com/articles/print/volume-97/issue-1/in-this-issue/exploration/glimmers-of-hope-seen-in-north-korean-basins-markets.html>.

² Ibid.

³ Yong-chong Yi, “Is North Korea an Oil-Producing Country?” *Win*, December 1998, pp. 22-28; and “State of North Korea’s Crude Oil Development,” *Naewoe T’ongsin*, November 6, 1998.

⁴ Sung-chol Kim, “North Korea Began Crude Oil Development in Mid-1970s,” *Chosun Ilbo*, June 3, 2001; Chae-sung Yi, *Technocrats Who Move North Korea*, (Seoul) 1998, pp. 33 and 305-307; “State of North Korea’s Crude Oil Development,” *Naewoe T’ongsin*, November 6, 1998; and Yu-chol Nam, “Pyongyang Pushing Oil Field Development,” *Sisa Journal*, May 20, 1993, pp. 56-58. One source suggest that the Taedong-gang Survey Group may have been established in 1968.

offshore platform...” and begun exploratory drilling operations off “...the west coast in the shallow waters of Korea Bay.”⁵ Meanwhile, the State Administrative Council authorized the “Korea Industrial Technology Corporation to engage a Singapore-based consulting firm to put together a complete package of subcontractors for offshore petroleum exploration.” North Korea’s willingness to sign a contract with a foreign oil exploration company is a strong indication of the great importance that Kim Il Sung attached to oil exploitation.⁶

In his report to the 6th Party Congress held in 1980, Kim Il Sung said: “It is necessary to open a clear prospect for production by concentrating efforts on developing oil resources.”⁷

Subsequently, during October 1983, North Korea established the General Department for Oil Exploration under the State Administration Council.⁸

Nationwide Exploration, 1980s

These efforts were augmented during 1980, when the Geophysical Company of Norway (GECO A/S) was signed to a four-year contract to conduct a joint elastic-wave survey of several exploratory blocks. While this initial four-year effort showed inconsistent results, the Tumen-gang Survey Group did identify oil at a drilling site in Sukchon-gun. The small size of this reserve and its characteristics made it uneconomical to pursue, but it provided encouragement to North Korea’s overall exploration efforts and resulted in an extension of GECO’s contract. Accompanying these developments, the Taedong-gang Survey Group continued its efforts in the Korea Bay, also with inconsistent results.⁹

During the mid-1980s, North Korea reportedly purchased a worn-out 14,000-ton drilling platform from a Singaporean company and used it to drill additional exploratory wells in the Korea Bay. Additional offshore exploration took place in the Tonghae (East Sea) Basin off the east coast port of Wonsan. On land, exploratory wells were drilled in the Paektu-san, Kilchu-gun and Myongchon-gun areas.¹⁰ During 1988, Kim Jong Il visited the Yongsong (Ryongsong) Machine Complex in Hamhung and instructed the workers there to manufacture a *Juche* drilling rig that could reach a depth of 3,000 meters.¹¹ This domestic effort would ultimately fail, but it highlighted two problems that would continue to plague North Korea’s oil and gas exploration efforts to present day: the requirement for additional modern drilling rigs and technology to drill

⁵ Dong-hyun Lee, “Quest for Crude Oil in the North—Good Luck!” *JoongAng Ilbo*, August 20, 2001; and Yong-chong Yi, “Is North Korea an Oil-Producing Country?” *Win*, December 1998, pp. 22-28.

⁶ Central Intelligence Agency. *North Korea: Energy Scene*, July 1987, Declassified.

⁷ Sung-u Yu, “DPRK Intent to Explore Oil Fields Examined,” *Hankook Ilbo*, May 29, 1995, p. 21.

⁸ This entity is sometimes identified as a “bureau” rather than a department. Yong-chong Yi, “Is North Korea an Oil-Producing Country?” *Win*, December 1998, pp. 22-28; and “State of North Korea’s Crude Oil Development,” *Naewoe T’ongsin*, November 6, 1998.

⁹ Sung-chol Kim, “North Korea Began Crude Oil Development in Mid-1970s,” *Chosun Ilbo*, June 3, 2001.

¹⁰ Yong-chong Yi, “Is North Korea an Oil-Producing Country?” *Win*, December 1998, pp. 22-28; “State of North Korea’s Crude Oil Development,” *Naewoe T’ongsin*, November 6, 1998; and “Experts Discount ‘Rumors’ of DPRK Oil Deposits,” *Yonhap*, April 21, 1993.

¹¹ Sung-chol Kim, “North Korea Began Crude Oil Development in Mid-1970s,” *Chosun Ilbo*, June 3, 2001.

exploratory wells in a comprehensive and systematic manner, and the inability to either domestically produce or acquire overseas these same drilling rigs and associated technology. A key obstacle has been China's refusal to permit modern drilling equipment to be sold to North Korea, both as a means of keeping pressure on Pyongyang to resolve maritime boundary disputes and in response to international sanctions on North Korea.

In 1986, North Korea and the Soviet Union signed a treaty delineating their economic sea zones and borders, and the nations agreed to the joint development of the continental shelves. While indications of oil deposits were identified off Hungnam, no real progress was ever achieved.¹²

Building upon the results of GECO's earlier survey of North Korean drilling efforts and other information, Australia's Meridian Oil NL made a calculated decision to acquire an exploration license in the Sohae Basin (West Sea or Korea Bay Basin) during 1987. These drilling rights were reportedly the first to be granted to a foreign company by North Korea.¹³ Accompanying this move, Great Britain's Leeward Petroleum Ltd. was awarded a contract to undertake additional survey work to supplement that done earlier by GECO.¹⁴

Figure 1. 18-meter turning lathe at the Yongsong Machine Complex.



Photo: *Democratic People's Republic of Korea.*

¹² Yong-chong Yi, "Is North Korea an Oil-Producing Country?" *Win*, December 1998, pp. 22-28.

¹³ Sung-chol Kim, "North Korea Began Crude Oil Development in Mid-1970s," *Chosun Ilbo*, June 3, 2001; and Author interview data.

¹⁴ Alex Stewart, "Glimmers of hope seen in North Korean basins, markets," *Oil and Gas Journal*, January 4, 1999, <http://www.ogj.com/articles/print/volume-97/issue-1/in-this-issue/exploration/glimmers-of-hope-seen-in-north-korean-basins-markets.html>.

North Korea's oil and gas exploratory efforts were likely buoyed in 1989 when one of the wells it had drilled, located approximately 50 kilometers north of the DMZ, had reportedly succeeded in producing—for at least a short period of time—425 barrels of oil a day.¹⁵

By the end of the 1980s, North Korea had drilled about 15 wells on both sides of the peninsula (located both onshore and offshore), conducted preliminary geophysical surveys of a number of likely oil and gas producing basins, and contracted with foreign companies to expand upon previous surveys and drill exploratory wells in the Sohae Basin. Moving into the 1990s, North Korea, while not overwhelmed by its success to date, was at least encouraged by what it had achieved.

Securing Foreign Investment, 1990s

Building upon its efforts during the 1970s and 1980s, North Korea entered the 1990s determined to aggressively pursue foreign investment and assistance for oil and gas exploration. These efforts soon acquired the utmost urgency with the suspension of oil deliveries following the dissolution of the Soviet Union, the falloff in oil deliveries at favorable prices from China, and a period of national famine and economic collapse known as the “Arduous March.” Securing overseas investment and services was extremely difficult as foreign companies—even small ones with high risk tolerance—were concerned over North Korean laws, uncertain of the profitability of such efforts and apprehensive of negative reactions from the international community.

North Korea sought to counteract some of these concerns by issuing statements and publishing data to indicate that foreign oil companies with technical assistance from Romania and China had identified vast oil reserves both in the waters off Sinuiju on the west coast and Wonsan on the east coast.¹⁶ In an October 1992 press interview, Kim Chong U, chairman of North Korea's Committee for the Promotion of External Economic Cooperation (CPEEC), stated: “The results of drillings have confirmed that we have oil in the eastern and western seas.”¹⁷ These efforts bore fruit, and in November 1982, North Korea invited representatives from six foreign companies to Pyongyang to discuss investment and cooperation for oil exploration. Among these companies were France's Total Exploration, Australia's BHP, Canada's Kantek and Sweden's Taurus Petroleum AB. These discussions extended over three months and resulted in Taurus Petroleum AB signing an agreement to undertake full-scale offshore oil field development in the Korea Bay. This effort would begin by reviewing all earlier exploration and elastic-wave data—a process that was then estimated to take upwards of two years.¹⁸ During February 1993, North Korea concluded a contract with Taurus Petroleum AB for full-scale oil field development in the

¹⁵ Yu-chol Nam, “Pyongyang Pushing Oil Field Development,” *Sisa Journal*, 20 May 1993, pp. 56-58.

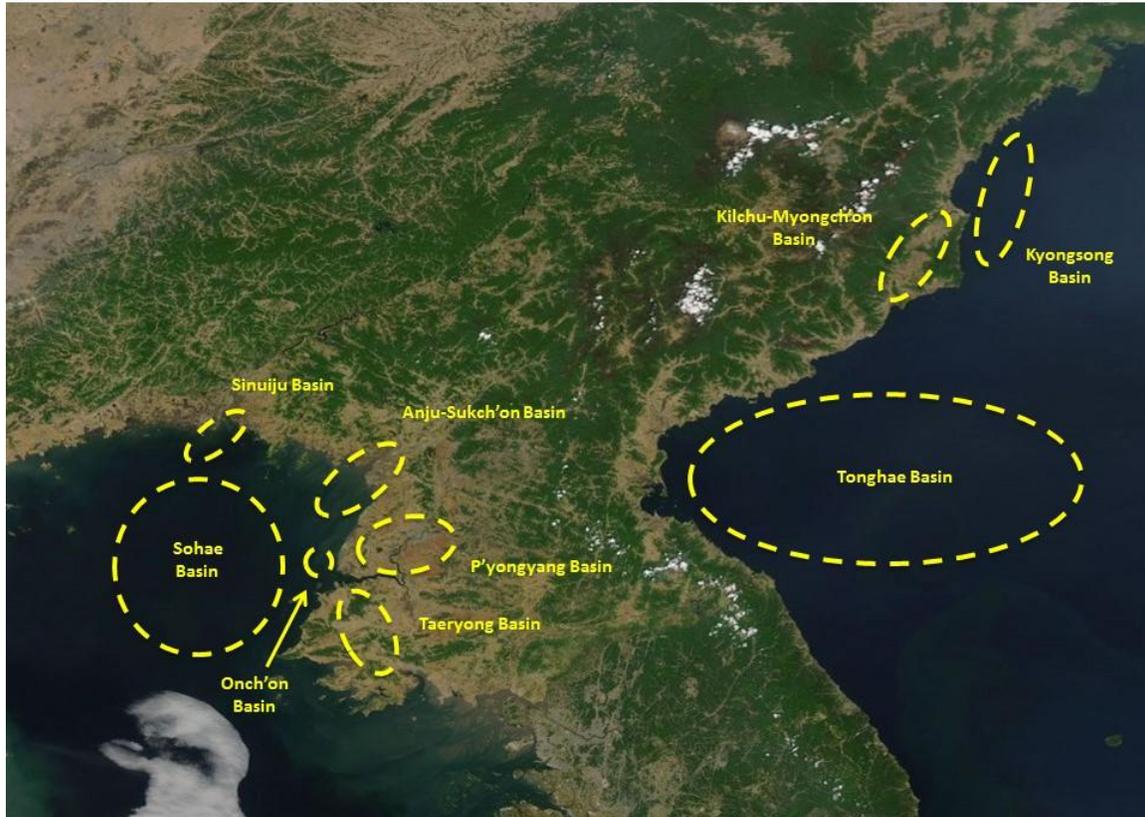
¹⁶ “Experts Discount ‘Rumors’ of DPRK Oil Deposits,” *Yonhap*, April 21, 1993.

¹⁷ Yong-chong Yi, “Is North Korea an Oil-Producing Country?” *Win*, December 1998, pp. 22-28.

¹⁸ Sung-u Yu, “DPRK Intent to Explore Oil Fields Examined,” *Hankook Ilbo*, May 29, 1995, p. 21; and Yu-chol Nam, “Pyongyang Pushing Oil Field Development,” *Sisa Journal*, May 20, 1993, pp. 56-58.

Sohae Basin, where the probability of discovering oil or gas was considered highest.¹⁹ Complementing these west coast efforts, North Korea also sought to secure investment and partners to continue oil and gas exploration off the east coast in the Tonghae Basin and on land in the Kilchu-Myongchon Basin.²⁰

Figure 2. Reported North Korea oil and gas basins.



Graphic: NASA.

In an effort to calm foreign investors' concerns over developing disputes with China concerning the borders of economic exclusion zones in the West Sea, in December 1992, North Korean Vice Premier Kim Tal Hyon told South Korean businessmen that "...although we are in a dispute with China over oilfields, it is over now."²¹ While his assertion was inaccurate, it indicated the importance North Korea had placed upon attracting foreign investment. Building upon this and other efforts to more easily attract foreign investment, the General Department of Oil Exploration was upgraded to the Ministry of Petroleum Industry in 1993.²²

¹⁹ Yu-chol Nam, "Pyongyang Pushing Oil Field Development," *Sisa Journal*, May 20, 1993, pp. 56-58.

²⁰ *Ibid.*

²¹ Yong-chong Yi, "Is North Korea an Oil-Producing Country?" *Win*, December 1998, pp. 22-28.

²² It is assumed that the Taedong-gang and the Tumen-gang Survey Groups were incorporated into the new ministry, but this remains to be confirmed. Two additional organizations were subsequently identified within the ministry:

The deepening economic crisis and famine during this period spurred North Korea in 1993 to even reach out to South Korean and Japanese companies—including Lucky-Goldstar International Corp., Toyo Engineering Co., and Samsung—to finance and conduct offshore exploration in the Tonghae Basin off Wonsan.²³

Domestically, an indication of the high priority assigned to oil exploration was seen in Premier Kang Song San's April 1994 speech to the 9th Supreme People's Assembly (SPA). In his address, Kang stated: "We will find more crude oil reserves by reinforcing exploration facilities and equipment, while making more investments in the crude oil industry sector."²⁴ That December, Kim Il Sung said: "If we explore the oilfields on our own strength, we can produce as much oil as we like. When people in other countries explore and produce oil, there is no condition that keep us from doing the same. Functionaries should convincingly strive to explore oilfields on their own."²⁵

The majority of the international efforts would not come to fruition due to North Korea's economic collapse, its antiquated business laws and the political liability of doing business with the country. There were, however, some minor successes for small, aggressive companies willing to take on the risk. During 1994, the management team from Australia's Beach Petroleum visited North Korea and accepted an offer to acquire drilling permits for a 30,000 km squared oil exploration project in the Tonghae Basin. Subsequently, a delegation of four representatives from the North's Petroleum Industry Bureau visited Australia to examine a Beach Petroleum oil exploration site.²⁶

During early 1996, the political atmosphere within Russia was right for the country to sign a protocol with North Korea that, among other things, provided for Russian assistance in exploring North Korean oil reserves. This arrangement reportedly constituted the first significant economic aid provided to North Korea since the collapse of the Soviet Union. This aid, however, failed to materialize in any meaningful manner.²⁷

Tongsong Technology and Trading Co. (responsible for contracts with foreign firms) and the October 9 Design Institute, a research office on petroleum geology. Yong-chong Yi, "Is North Korea an Oil-Producing Country?" *Win*, December 1998, pp. 22-28.

²³ "ROK Firms Reject DPRK Oil Exploration Offer," *Yonhap*, April 21, 1993.

²⁴ Sung-u Yu, "DPRK Intent to Explore Oil Fields Examined," *Hankook Ilbo*, May 29, 1995, p. 21.

²⁵ Yong-chong Yi, "Is North Korea an Oil-Producing Country?" *Win*, December 1998, pp. 22-28.

²⁶ Alex Stewart, "Glimmers of hope seen in North Korean basins, markets," *Oil and Gas Journal*, January 4, 1999, <http://www.ogi.com/articles/print/volume-97/issue-1/in-this-issue/exploration/glimmers-of-hope-seen-in-north-korean-basins-markets.html>; and "DPRK, Australia Agree to Oil Exploration" *JoongAng Ilbo*, November 21, 1995, p. 27.

²⁷ Song-kyu An, "Russia Reportedly To Give 'Large-Scale' Aid to North," *JoongAng Ilbo*, April 21, 1996, p. 1.

Figure 3. North Korea's Romanian-manufactured drilling rig working on well "No. 401" for SOCO International Plc.



Photo: SOCO International Plc.

The following year, in June 1997, North Korea reported that it had succeeded in producing 450 barrels of crude oil per day from its "No. 406" well off of Nampo.²⁸ That same year, Beach Petroleum, which likely wanted to limit its exposure in North Korea, exchanged 25 percent of its North Korean interest to a Malaysian company, Puspita Emas Sdn. Bhd., in return for funding the costs of conducting additional seismic surveys.²⁹

As a result of negotiations begun during the early 1990s, three small foreign oil exploration firms were reportedly conducting oil exploration in North Korea by the beginning of 1998: Sweden's Taurus Petroleum AB, Australia's Beach Petroleum and Canada's SOCO International Plc. In February, North Korea announced it was developing oil fields off Sinuiju and had entered into negotiations with a Taiwanese company for drilling rights in the area. Beach Petroleum acquired a concession to explore the continental shelf of Tonghae Basin, but the company withdrew from North Korea shortly afterwards.³⁰ In May 1998, SOCO International acquired a concession to

²⁸ "South Korea: Daily Questions Existence of DPRK's Oil Reserves," *JoongAng Ilbo*, October 31, 1998.

²⁹ Alex Stewart, "Glimmers of hope seen in North Korean basins, markets," *Oil and Gas Journal*, January 4, 1999, <http://www.ogj.com/articles/print/volume-97/issue-1/in-this-issue/exploration/glimmers-of-hope-seen-in-north-korean-basins-markets.html>.

³⁰ "S.Korea says to study upstream oil projects in N.Korea," *Reuters*, September 24, 2002; Jong-won Koh, "Oil

explore 7,000 square kilometers that included both onshore and offshore areas of the Anju-Sukchon and Onchon Basins. SOCO began drilling operations using a local North Korean contractor operating an old worn-out Romanian-manufactured drill rig.³¹

Later in 1998, Hyundai Group founder Chung Ju-yung visited Pyongyang and, in the first of a number of meetings with Kim Il Sung, discussed numerous economic development projects, including the exploration for oil in the Korea Bay and East Sea. While a number of the projects discussed would ultimately see fruition and some degree of success, efforts at oil exploration failed to produce tangible results.³²

By the end of the 1990s, North Korea had identified nine potential oil and gas basins of uncertain size and economic value:³³

- Anju-Sukchon, onshore to offshore
- Kilchu-Myongchon, onshore
- Kyongsong, offshore
- Onchon, offshore
- Pyongyang, onshore
- Sinuiju, offshore
- Sohae, offshore
- Taeryong, onshore
- Tonghae, offshore

Of the five foreign oil and gas firms that had been involved in three offshore exploration projects and one onshore exploration project in North Korea since 1994, none had endorsed the country's inflated estimate that it possessed between 58 and 73 billion barrels of oil in undersea reserves. In fact, none had confirmed any substantial and economically viable oil or gas reserves.³⁴ It was

Fields in North Korea?" *Digital Chosun Ilbo*, November 1, 1998; and "South Korea: Daily Questions Existence of DPRK's Oil Reserves," *JoongAng Ilbo*, October 31, 1998.

³¹ Alex Stewart, "Glimmers of hope seen in North Korean basins, markets," *Oil and Gas Journal*, January 4, 1999, <http://www.ogi.com/articles/print/volume-97/issue-1/in-this-issue/exploration/glimmers-of-hope-seen-in-north-korean-basins-markets.html>.

³² Yong-chong Yi, "Is North Korea an Oil-Producing Country?" *Win*, December 1998, pp. 22-28; "Chung Impressed with Kim Jong-il; Counters Popular Belief North Korean Leader Eccentric, Unpredictable," *Korea Herald*, November 2, 1998; "Experts Express 'Skepticism' on Claims of DPRK Oil Fields," *Chosun Ilbo*, November 1, 1998; Jong-won Koh, "Oil Fields in North Korea?" *Digital Chosun Ilbo*, November 1, 1998; "Hyundai Chairman on Results of DPRK Visit," *KBS-1*, October 31, 1998; and Hong-sop Choe, "Chong Chu-yong's Visit to North Korea," *Chosun Ilbo*, October 27, 1998.

³³ Author interview data; Mike Rego, "North Korea—Hydrocarbon Exploration and Potential," *GeoExpo*, Vol. 12, No. 4, 2015, pp. 22-27, <http://www.geoexpo.com/magazine/vol-12-no-4>; "DPRK Trying To Gain Investment for Untapped Oil Fields," *JoongAng Ilbo*, November 6, 1998; and "DPRK has 12 Mil. Barrels of Oil Reserves in Western Sea," *The People's Korea*, December 2, 1998.

³⁴ "S.Korea says to study upstream oil projects in N.Korea," *Reuters*, September 24, 2002.

likely a result of these poor showings that, in 1998, the State Administrative Council dissolved the Ministry of Petroleum Industry.³⁵

Renewed Efforts to Attract Foreign Investment, 2000-Present

North Korea entered the 2000s having emerged from the “Arduous March” and economic collapse of the 1990s and, building upon its progress with the Hyundai Group, the country upgraded its efforts to secure investment for oil and gas exploration projects by engaging new companies in South Korea, Russia and China. It reached out to the latter nation not only to secure financial investment, but also to address simmering disputes over international sea borders and the extent of economic exclusion zones in the West Sea (Bohai Gulf and Yellow Sea) and East Sea (Sea of Japan).

According to South Korea’s Korea National Oil Corp (KNOC), by the end of 2000, two new foreign firms (reportedly Petrex of Japan and Phoenix Oil of Germany) had secured drilling rights to drill exploratory wells on the continental shelf of Sohae Basin—rights formerly assigned to other companies having expired or been abandoned.³⁶

During November 2001, the Singaporean company Sovereign Ventures Pte. Ltd. announced that it had secured a concession to drill for oil and gas in northeast North Korea. The reported 25-year-long concession covered approximately 6,000 square kilometers along the Tumen River bordering China—including the Kilchu-Myongchon Basin.³⁷ By the end of 2003, however, international pressure stalled this effort before any wells were drilled.³⁸

Seeking to secure foreign assistance, North Korean Vice Premier Cho Chang Tok visited the Russian Far East during April 2002 and held talks to explore ways to promote economic cooperation between the two countries. Among the topics discussed was the joint exploration for oil on North Korea’s continental shelves.³⁹ Five months later, South Korea’s KNOC indicated its interest in joint exploration for oil and gas in the Sohae Basin, but stated that it would first conduct a study to evaluate “. . .the chances for taking part in the business as part of the government’s efforts for economic cooperation with North Korea.” Subsequently, talk of this joint development stalled and has not progressed any further.⁴⁰

Desperate to prove the viability of its oil reserves and attract foreign investment, North Korea’s own Korea Oil Exploration Company (KOEC) signed an agreement with Global Geo Services

³⁵ “State of North Korea’s Crude Oil Development,” *Naewoe T’ongsin*, November 6, 1998.

³⁶ “S.Korea says to study upstream oil projects in N.Korea,” *Reuters*, September 24, 2002.

³⁷ “Singapore firm wins N. Korea Onshore Oil License,” *Reuters*, November 16, 2001.

³⁸ James Brooke, “Quietly, North Korea Opens Markets,” *New York Times*, November 19, 2003, p. 1; and Cameron Dueck, “Politics stall Singapore firm’s N.Korea,” *Reuters*, September 8, 2003.

³⁹ “DPRK Vice Premier, Economic Delegation’s Visit to Russia Detailed,” *Yonhap*, April 13, 2002.

⁴⁰ Charles Lee, “South Korea mulls North Korean Offshore Development,” *Platt’s Oilgram News*, May 20, 2004, p. 7; and “S.Korea says to study upstream oil projects in N.Korea,” *Reuters*, September 24, 2002.

ASA during October 2003 to conduct a large seismic survey, known as “Korean Dragon,” to cover the entire offshore of the country.⁴¹

Following negotiations earlier in the year, in September 2004, the Irish-Anglo oil and gas exploration company Animex agreed to purchase 10 percent of North Korea’s state-controlled natural resources company, Kobril, for £200,000 in shares. Animex also signed a 20-year contract to help modernize and develop North Korea’s oil industry.⁴²

The CEO of Russia’s Gazprom, Alexei Miller, visited North Korea in January 2005 and met with Premier Pak Pong Ju to discuss cooperation in the oil and gas sectors. In spite of intermittent low-level follow-on meetings, nothing of significance has developed from this effort to date.⁴³

The issue of China’s concerns over North Korea’s oil and gas exploration efforts in the Sohae Basin came to the surface again in 2005, when the China National Offshore Oil Corporation announced its estimate that there were about 60 billion barrels of crude oil deposits in the basin. North Korea’s Prime Minister, Ro Tu Chol, signed a memorandum of understanding with China concerning drilling in the basin, but this arrangement floundered as China-North Korean relations deteriorated.⁴⁴

In what may be viewed as a minor step towards resolving the simmering disputes over economic exclusion zone borders, Chinese sources in December 2005 reported that they had signed an agreement with North Korea to jointly explore and develop oil fields in the Korea Bay. Repeated efforts towards this objective have been delayed in the past due to disagreements over sea boundary disputes between the two nations.⁴⁵

Five years later, during early 2010, Aminex and Singapore-based Chosun Energy formed a company, Korex Ltd., to reprocess existing seismic data and explore for gas and oil in North Korea. Subsequently, during May, Korex Ltd. succeeded in signing a production sharing contract for a 50,000 km squared block in the Tonghae Basin. Two years later, on May 16, 2012, Aminex

⁴¹ The Korea Oil Exploration Company (KOEC) is sometimes referred to as the Chosun Oil Exploration Company. Ibid.; James Brooke, “Quietly, North Korea Opens Markets,” *New York Times*, November 19, 2003, p. 1; “Global Geo Services ASA signs 12-year agreement with North Korea’s Korean Oil Exploration Company,” *Nordic Business Report*, October 22, 2003; and “North Korea wants foreign lawyers,” *Reuters*, October 28, 2003.

⁴² Kate Mackenzie, “North Korea: A new oil frontier?” *Financial Times*, June 1, 2010; “North Korea’s Newest Profession: Foreign Entrepreneur,” *Associated Press*, November 5, 2006; and Rebecca Bream, “Aminex in North Korea deal,” *Financial Times*, January 6, 2005.

⁴³ “Gazprom Chief Slips into N. Korea,” *Moscow Times*, January 24, 2005, p. 5.

⁴⁴ Soo-suk Ko, “Another unfathomable in North is Oil Reserves,” *JoongAng Ilbo*, March 24, 2015, <http://koreajoongangdaily.joins.com/news/article/Article.aspx?aid=3002247>.

⁴⁵ Ton-kwan Yi, “North Korea and China Have Already Confirmed Economic Feasibility of Oil Deposits in West Korea Bay Basin,” *Yonhap*, August 16, 2007; and “China, North Korea Agree on Joint Oil Exploitation,” *VOA*, December 25, 2005.

announced that it had decided to withdraw from exploration in North Korea due to the volatile and unpredictable politics of the area.⁴⁶

In June 2013, Mongolia's HBOil JSC purchased a 20 percent stake in North Korea's Sungri Chemical Complex for \$10 million and signed an agreement to explore inland crude oil deposits and gas fields in the Rajin-Sonbong area on the northeast coast in cooperation with KOEC.⁴⁷

The following month, reports again surfaced that China was seeking to jointly develop an oil field off the west coast of the Korean peninsula with North Korea.⁴⁸ While this possible initiative can be taken at face value, it may also be a Chinese signal to the North Korean leadership and potential foreign investors that it is growing impatient with the lack of progress in resolving the issue over the borders of the economic exclusion zones in the West Sea.

As of 2015, North Korea is continuing to work with several small foreign firms to ascertain whether it is sitting on top of economically viable oil and gas reserves. Answering this question will likely require a level of financial and technical assistance available only from a major international oil conglomerate or a national government. Such support, however, has eluded Kim Jong Un and the North Korean leadership due to a host of international political issues (e.g., human rights, nuclear proliferation, ballistic missile testing, etc.) that they are unwilling to address. Waiting behind this is the challenge of competing maritime claims with China, and possibly with South Korea.

⁴⁶ Animex, "Animex withdraws from North Korean Exploration Programme," May 16, 2012, http://www.aminex-plc.com/files/120516_IMS_2012_v2.pdf; and Kate Mackenzie, "North Korea: A new oil frontier?" *Financial Times*, June 1, 2010.

⁴⁷ The investment in the Sungri Chemical Complex is intriguing since it has laid idle in caretaker status since the 1990s. Mike Rego, "North Korea—Hydrocarbon Exploration and Potential," *GeoExpo*, Vol. 12, No. 4, 2015, pp. 22-27, <http://www.geoexpo.com/magazine/vol-12-no-4>; and Soo-suk Ko, "Another unfathomable in North is Oil Reserves," *JoongAng Ilbo*, March 24, 2015, <http://koreajoongangdaily.joins.com/news/article/Article.aspx?aid=3002247>.

⁴⁸ "N. Korea Moving To Import Oil from Iran," *Asahi*, July 18, 2013.