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SOURCE Publications as indicated.

NICKEL AND COBALT RESOURCES IN NORTH KOREA

Comment: The following report summarizes information available in FDD on nickel and cobalt resources in North Korea. The information dates from 1933 to 1950. The table on nickel and cobalt mines was prepared by compiling data obtained from sources indicated. Names of some ores were given in English in the original sources, and these spellings have been retained unless their identities have been definitely established.

In the absence of information on nickel and cobalt resources in North Korea after 1945, official price lists for nickel and extraction percentage for nickel ore have been reproduced from North Korean official publications.

Numbers in parentheses refer to appended sources.<sup>7</sup>

The Chosen no Kobutsu Shigen to sono Kogyo, published in 1943, listed the following mines in North Korea as supplying nickel to Japan: Ch'ongam Mine, Ich'on Nickel Mine, Sokkye Mine, Sumitomo Gold Mine, and Unsong Nickel Mine. The Ich'on Nickel Mine produced nickel contained in pyrite and was considered one of the most promising nickel mines in Korea. Both the Ich'on and the Unsong mines produced ores with 20 percent or more nickel content, while the Sumitomo and the Sokkye mines produced ores with about 2 percent nickel content, and the Ch'ongam Mine produced ores containing about 0.2 percent nickel. The nickel-bearing ores from the latter mine occurred in large quantities among gold ores but the nickel ores were of such low grade that they were considered to have no commercial value. Cobalt was produced in small quantities at Noksan and at the Wondong Gold Mine. (1)

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Cobaltite and erythrite ores were discovered at the Wondong Gold Mine by the Mining Section of the Government-General of Korea in 1932 according to Chosen Kogyo Kaishi, published in 1933. These minerals, contained in quartz, occurred abundantly in small crystals about one millimeter in diameter, and were of silver color with a trace of pink. The cobaltite obtained in this area contained large quantities of cobalt and arsenic, and about one percent of nickel. (2)

According to Chosen Nenkan 1945, the Ich'on Ginsei, and Hamhung mines were the three major nickel mines in North Korea around that time. The same source also states that the Japanese government directed its main effort toward development of these three mines during 1944. (3) However, other available documents do not mention the Ginsei and Hamhung mines as producing nickel.

[See table on following page.]

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## Nickel and Cobalt Mines in North Korea

<u>Name of Mine</u>	<u>Ore</u>	<u>Location</u>	<u>Approximate Coordinates</u>	<u>Area in Tsubo*</u>	<u>Source</u>
Ch'ongam	Nickel	Ch'ongam-myon, Puryong-gun, Hamgyong-pukto	42 01 N 129 60 E	No data	(1)
Hanch'ang Gold	Nickel	Hoengch'on-myon, Yonghung-gun, Hamgyong-namdo	39 32 N 127 14 E	1,000,000	(7)
Hoeryong Cobalt	Smaltite	P'alul-myon, Hoeryong-gun, Hamgyong-pukto	42 25 N 129 45 E	105,000	(7)
Ich'on Nickel	Nickel	P'angyo-myon, Ich'on-gun, Kangwon-do	38 55 N 127 17 E	No data	(1,3)
Nissen Nickel	Nickel	Ipkwan-myon, Kanggye-gun, P'yongan-pukto	40 58 N 120 36 E	962,000	(7)
Noksan	Cobalt	P'alul-myon, Hoeryong-gun, Hamgyong-pukto	42 25 N 129 45 E	No data	(1)
Sokkye	Nickel	Sujin-myon, Uiju-gun, P'yongan-pukto	40 12 N 124 32 E	No data	(1)
Sumitomo Gold	Nickel	Kumsong-myon, Kumhwa-gun, Kangwon-do	38 25 N 127 36 E	769,000	(1,7)
Taein	Nickel	Ipkwan-myon, Kanggye-gun, P'yongan-pukto	40 58 N 126 36 E	1,000,000	(7)

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<u>Name of Mine</u>	<u>Ore</u>	<u>Location</u>	<u>Approximate Coordinates</u>	<u>Area in Tsubo*</u>	<u>Source</u>
T'omak-dong	Nickel-dolomite, nickel-chlorite, nickel-breunnerite, nephrite, nickel- bearing antigorite	T'omak-dong, Ch'ongam-myon, Puryong-gun, Hamgyong-pukto	41 52 N 129 50 E	No data	(6)
Tuil	Nickel	Hamduil-myon, Tanch'on-gun, Hamgyong-namdo	40 28 N 128 54 E	3,831,000	(7)
Unsong Nickel	Nickel, cobalt, nickel-bearing pyrrhotite	Unsong-ni Hamduil-myon Tanch'on-gun, Hamgyong-namdo	40 39 N 129 01 E	887,000	(1,3,6,7)
Wondong Gold	Cobaltite, Erythrite (cobalt bloom)	Changyon-ni, Wondong-myon, Kumhva-gun, Kangwon-do	38 16 N 125 06 E	No data	(1,2,6)
Not given	Nickel	Puk-myon, Inje-gun, Kangwon-do	38 04 N 128 10 E	920,000	(7)
Not given	Nickel	Kansong-myon, Kosong-gun, Kangwon-do	38 22 N 128 28 E	No data	(7)
Not given	Nickel	Wonbuk-myon, Kumhva-gun, Kangwon-do	38 18 N 127 28 E	No data	(7)

\*One tsubo equals 3.95 square yards

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Information on cobalt and nickel after 1945 is not available in FDD. The following data taken from official North Korean publications are presented in an effort to throw some light on the recent situation on nickel resource in North Korea.

According to Naegak Kongbo Purok No 4 and No 7, published in 1948 and 1950, respectively, the official prices of nickel ores in North Korea for 1948 and 1950, indicated nickel content were as follows:

<u>Nickel Content</u> (in %)	<u>Official Price</u> (in North Korean won per short ton)	
	1948 (4)	1950 (5)
1.0	1,302	956
1.1	1,375	1,001
1.2	1,448	1,061
1.3	1,521	1,106
1.4	1,595	1,150
1.5	1,668	1,195
1.6	1,741	1,255
1.7	1,814	1,315
1.8	1,887	1,374
1.9	1,961	1,434
2.0	2,034	1,494
2.1	2,127	1,554
2.2	2,221	1,614
2.3	2,315	1,673
2.4	2,408	1,733
2.5	2,502	1,793
2.6	2,609	1,868
2.7	2,717	1,942
2.8	2,824	2,017
2.9	2,932	2,092
3.0	3,040	2,196
3.1	3,147	2,301
3.2	3,255	2,405
3.3	3,362	2,510
3.4	3,470	2,615
3.5	3,577	2,719

Naegak Kongbo Purok, No 7, published in 1950, gives the following table showing extraction percentage of nickel from ores having nickel content as indicated (5):

<u>Nickel Content</u> (%)	<u>Extraction</u> (%)
1.0	63.0
1.5	65.0
2.0	68.0
2.5	71.0
3.5	73.0
4.0	75.0

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SOURCES

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3. Chosen Nenkan 1945 (Korean Yearbook 1945), Keijo Nipposha, Seoul, 1945
4. Naegak Kongbo Purok (Cabinet Report Supplement), No 4, Cabinet, Democratic People's Republic of Korea, P'yongyang, 30 Dec 1948
5. Naegak Kongbo Purok (Cabinet Report Supplement), No 7, Cabinet, Democratic People's Republic of Korea, P'yongyang, 31 May 1950
6. Chosen Kogyo Kaishi (Korean Mining Association Report), Vol XXIII, No 1, Korean Mining Association, Seoul, 15 Jun 1940
7. Chosen Kogyoku Ichiran (List of Korean Mines), Mining Section, Industry Bureau, Government-General of Korea, Seoul, 25 Dec 1940

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