

ANNEX TO:

ESTIMATE OF OIL STORAGE CAPACITY IN THE DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA

DETAILS OF ESTIMATES OF OIL STORAGE CAPACITY BY LOCATION

AUGUST 23, 2020

David von Hippel, Peter Hayes, "ESTIMATE OF OIL STORAGE CAPACITY IN THE DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA", NAPSNet Special Reports, August 25, 2020, https://nautilus.org/?p=98305

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1 Introduction to Annex

This Annex to the Nautilus Institute Special Report *Estimate of Oil Storage Capacity in the Democratic People's Republic of Korea* provides details on many locations in the DPRK where oil storage (mostly refined oil products) have been found, have been reported in the past, or may be located. This annex is the results of an in-depth systematic review using Google Maps and Google Earth of locations in the DPRK Our review has used as a starting point the following approach for map review:

- 1. Review known oil storage locations, such as refineries and major terminals.
- 2. Review oil storage locations provided in a redacted and publicly available 1982 report by the United States Central Intelligence Agency that identifies a large number of oil storage sites thought to be active as of the time of the report.¹
- 3. Review of Google Maps images along coastlines, rivers, railroads and major roads, looking for objects that might be oil tanks.

In what follows, we provide tables that include counts of oil tanks, estimates of their diameter measured using Google Maps tools, estimates of tank heights based on the length of tank shadows as compared with those of nearby objects for which height can be roughly estimated, such as buildings, location (latitude and longitude), and images of tank locations.² We use the diameter and (roughly estimated) height data to estimate the volume of the storage tanks. We also include notes of observations about the tanks found, and use those observations, in part, to prepare a subjective assessment as to the "fraction of volume estimated to be active oil storage". So, for example, if a tank were seen to be rusty, physically compromised, and/or located in an area that appeared largely abandoned, we would set the "fraction of volume estimated to be active oil storage" at zero (or low) whereas if the tank looked new, was in an area obviously under active use, and/or in an area known to be used for oil storage, we would be likely to provide a value of "fraction of volume estimated to be active oil storage" near 100%. Note that this factor is not intended to provide any indication of whether the tank is full, empty, or somewhere in between, as that status cannot reasonably be determined from satellite image (at least without other imaging data), rather it only provides an indication of whether the tank is in use.

Many of the sites reviewed in the 1982 US CIA document included tanks reported to be underground. In these cases, we reported what the CIA document reported, and reviewed the site to see if tanks were visible and/or the site looked active. We only counted tanks that we could see, so our accounting does not explicitly include those underground tank volumes identified by the CIA, but keeps those statistics in a separate category. It is essentially certain that the DPRK has ceased to use some of the underground tanks included in the 1982 CIA database, and equally certain that the DPRK has developed (either before 1982 or since) additional underground

¹ United States Central Intelligence Agency, National Photographic Interpretation Center (CIA, 1982), *Imagery Analysis Report: POL Storage Capacity North Korea, 1982 Estimates*. Report number CIA-RDP83T00574R000102600001-7 (redacted). Available as https://www.cia.gov/library/readingroom/docs/CIA-RDP83T00574R000102600001-7.pdf.

² In some cases these Google Earth images tell interesting stories of their own independent of oil storage findings, for example, about nearby industrial facilities, fishing fleets, or other facilities.

storage that is not in the CIA database. To what extent these factors offset is impossible for us to say with the data we have at hand, all of which are derived from public sources.

The remaining sections of this Annex that follow therefore provide:

- A summary of the oil storage estimate statistics compiled from our review and from the CIA document;
- Details of the Nautilus review of selected oil storage sites;
- Details of the Nautilus review of oil storage sites also included in the 1982 U.S. Central Intelligence Agency estimates;
- A summary of 1982 CIA Estimates of oil storage volumes by location that were not reviewed using Google Maps by Nautilus (including "Naval", "Air", and "Industrial"); and
- Details of the Nautilus review of possible oil storage sites **not** included in 1982 U.S. Central Intelligence Agency Estimates (those visible above-ground).

2 Summary Oil Storage Estimate Statistics

The table that follows provides a summary of the volume of oil storage estimated in the groups of locations reviewed by Nautilus, together with the CIA estimates for locations with underground tanks that we could not see. This summary is discussed in more detail in the Special Report that this annex accompanies, but in general, we found a total of about 1.1 million cubic meters (equivalent to on the order of 900,000 to 1,000,000 metric tonnes of oil product storage) of storage volume that we feel is likely to be active storage, not counting another 0.5 million cubic meters of storage reported by the CIA that we could not measure. Taken together, these data suggest that the DPRK's oil storage facilities may be similar in volume to the total estimated by the CIA in 1982, about 1.6 million cubic meters. There is, however, substantial remaining uncertainty in these estimates due, first, to lack of knowledge about the status of those oil storage facilities identified by the CIA document as being underground, coupled with our lack of information on any underground storage developed by the DPRK that did not show up in the 1982 CIA database (because it wasn't known about or reported, or had yet to be built), and second, due to uncertainties in the measurement, designation, and assessment of active storage in identified potential tanks.

SUMMARY OIL STORAGE STATISTICS FROM NAUTILUS REVIEW

Groups of Locations Reviewed	Estimated Tank Volume, Cubic Meters
Total of volume of storage tanks measured above (including those included in CIA database)	1,116,979
Total of volume of storage tanks measured above (including those included in CIA database) and estimated to be likely to be currently used for oil storage	1,011,472
Total of volume of bunkers reported by CIA (1982) but not directly measured (excludes overlap with tanks directly measured)	544,726
Total of volume of all storage reported by CIA (1982), including "Naval", "Air", and "Industrial"	1,648,847
Total of volume of storage tanks measured by Nautilus (but not, to our knowledge, included in CIA database)	285,499
Total of volume of storage tanks measured by Nautilus (but not, to our knowledge, included in CIA database) and estimated to be likely to be currently used for oil storage	109,227

3 Nautilus Review of Selected Oil Storage Sites

ESTIMATE OF OIL STORAGE FACILITIES AT VARIOUS DPRK LOCATIONS

Location: Tumangang, Border of DPRK and Russia (and China) (size and location estimates made from Google Earth images, 5/30/18, except as noted)

	ı		0 11 1				
	Estimates	(m) of		Approximate (Coordinates		
Number	Diameter	Height	Implied Total Volume (cubic meters)	Latitude	Longitude	Notes	
10	10	8	6,283	42.409	130.610	Appear grey/brown on photo	
5	12	10	5,655	42.409	130.610	Appear grey/brown on photo	
3	25	14	20,617	42.406		Appear white/pink and recently painted on image as of 9/10/19 (were brown in earlier image); traces of several other tanks in location, now gone	
10	9.5	7	4,962	42.411	130.618	Appear rusty (or brown) in image retrieved in May	
			,			of 2019, but have been repainted white/pink in	
7	6.5	4	7,917	42.411		image retrieved 9/10/19. Appear white in image, new as of approximately March-May, 2018, from "3-band Planet Scope Scene" image obtained from NK News, dated 5/23/18. Tanks do not seem to appear at this location in recent (9/10/19) Google Maps images but 7 similar-sized objects that look like apartmer buildings with square peaked roofs do appear. Archival images should be checked when available	
Total of above			46,097		•	•	
Fraction of volume estima	ated to be active oil	storage:	90%				
Total volume estimated to	be active oil storag	e:	41,487				

Overview of Tumengang Oil Storage Area



Detailed Views of Specific Tank Locations at Tumengang



Location: Seungri Chemical Complex Refinery, estimates made from Google Earth images, 10/11/18.

					1		
	Estimates (m) of			Approximate	Coordinates		
			Implied Total Volume (cubic				
Number	Diameter	Height	meters)	Latitude	Longitude	Notes	
19	40	12	286,513	42.308	130.347	Some look newer, some older on photo	
1	32	10	8,042	42.312	130.354	Appears newer on photo	
26	22	8	79,068	42.313	130.353	Some look newer, some older on photo	
6	18	7	10,688	42.308	130.345	Some look newer, some older on photo	
50	7	5	9,621			Various locations at plant, conditions	
50	5	4	3,927			Various locations at plant, conditions, sizescount and average size are rough estimates	
Total of above			397,859		•		
Fraction of volume estima	ated to be active oil	storage:	90%				
Total volume estimated to	o be active oil storag	e:	358,073				

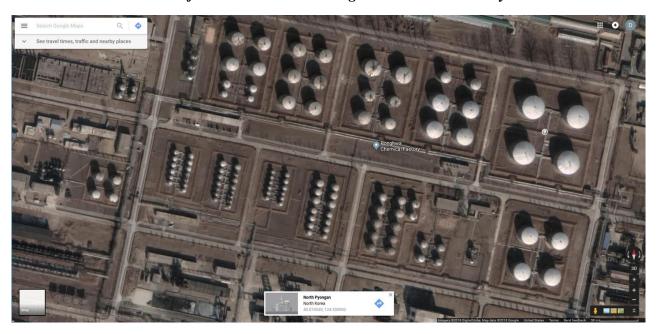
Views of Specific Tank Locations at Seungri





Location: Ponghwa C	hemical Factory	, estimates m	ade from G	oogle Earth	images, 10	<u>/11/18</u>
_						
	Estimates	(m) of		Approximate	Coordinates	
			Implied Total			
			Volume			
			(cubic			
Number	Diameter	Height	meters)	Latitude	Longitude	Notes
						Newer-looking tanks, largest in the central part of
4	30	15	42,412	40.074	124.551	the refinery
						Four newer-looking tanks, four slightly older, two
10	21	13	45,027	40.073	124.551	slightly older still
13	16	10	26,138	40.075	124.547	Mostly medium-aged tanks
5	13.5	8	5,726	40.074	124.548	Mostly medium-aged tanks
18	9	6	6,871	40.074	124.548	Mostly medium-aged and older tanks
8	7.5	5	1,767	40.074	124.548	Mostly medium-aged and older tanks
16	6.5	4.5	2,389	40.074	124.548	Mostly medium-aged and older tanks
						Mostly medium and older tanks, number
36	4	3.5		40.074	124.546	approximate, and some variation in sizes
Total of above			131,912			
Fraction of volume estima			100%			
Total volume estimated to	be active oil storag	e:	131,912			

Views of Tank Locations at Ponghwa Chemical Factory



Location: Nampo Oil	Storage Termina	al. estimates	made from	Google Earti	h images. 1	2/14/18 and 11/8/2019
200ation: Hampo On	Ctorage remine	ii, commutes		oogio Larti	ayos, i	21 11 10 4114 1 110 40 10
	Estimates (m) of				Coordinates]
Number	Diameter	Height	Implied Total Volume (cubic meters)	Latitude	Longitude	Notes
2		14		38.718	125.390	Somewhat newer-looking tanks about 2 km to the east of main oil terminal
2	23	10	8,310	38.719	125.376	Older tanks, about 500 m east of main oil termina
1	23	20	8,310	38.719	125.376	Refurbished (likely during 2019) tank, about 500 m east of main oil terminal
1	15	16	2,827	38.719	125.376	New (added during 2019) tank, about 500 m east of main oil terminal
1	20	13	4,084	38.719	125.376	Newer tank, about 500 m east of main oil terminal
1	20	16	5,027	38.719	125.376	Newer tank, about 500 m east of main oil terminal
2	13	10	2,655	38.719	125.376	Newer tanks, about 500 m east of main oil terminal
10	24	18	81,430	38.720	125.367	Mostly newer tanks, in main oil terminal area
2	17	15	6,809	38.720	125.367	Newer-looking blue tanks, in main oil terminal area
1	20	8	2,513	38.723	125.366	New Tank added to in one of the footings below between February and November of 2019.
7	20	0	_	38.723	125.366	Footings for tanks, in place since about 2016, just north of main terminal area. It is possible that construction had started on one or more tanks in addition to the completed tank above by 11/2019.
Total of above		-	134,631			, , , , , , , , , , , , , , , , , , , ,
Fraction of volume estimate			90%			
Total volume estimated to	o be active oil storag	e:	121,168			

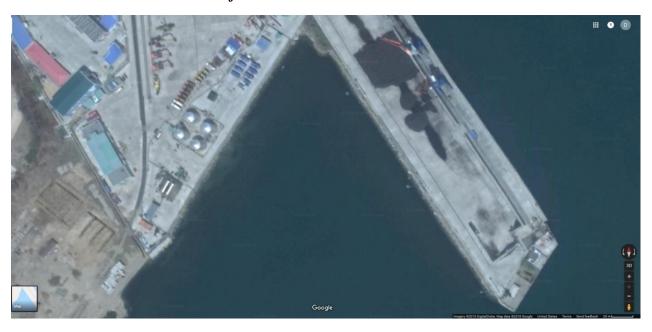
Reference: Hamish Macdonald and Leo Byrne (2017), "Construction ongoing at Nampo oil terminal despite oil measures", *NK Pro*, dated 11/10/2017, and available as https://www.nknews.org/pro/construction-ongoing-at-nampo-oil-terminal-despite-oil-measures/. Image at right, taken from Google Earth on 8/13/19, show the same area some months (6 to 8?) later, probably in winter of 2019, with dozens (hundreds, including those in nearby areas) of fishing boats docked in the area and some new in-fill and construction in the area of the docks.

View of Tank Locations at Nampo Oil Storage Terminal (as of 11/2019, Google Earth Pro)



Location: Rason Har						
Location. Nason Hai	boi, buik materia	is loading uc	or, coogle	<u> Lartii iiiage</u>	3, 12/14/10	
	Estimates	(m) of		Approximate	Coordinates	
Number	Diameter	Height	Implied Total Volume (cubic meters)		Longitude	Notes
4	10	8	2,513	42.224	130.281	New-looking tanks, probably for fuel for ships, near bulk coal loading docks
Total of above	2,513					
Fraction of volume estima	ated to be active oil s	storage:	100%			
Total volume estimated to	o be active oil storag	e:	2,513			

View of Tank Locations at Rason Harbor



Location: Pyongyang	Thermal Power	Plant. Googl	e Earth ima	aes. 12/14/18	3	
				·	_	1
	Estimates	(m) of		Approximate	Coordinates	
Number	Diameter	Height	Implied Total Volume (cubic meters)	Latitude	Longitude	Notes
12	9	6	4,580	39.012	125.712	Older looking tanks, probably for fuel oil starter for plant
2	7	5	385	39.012	125.712	Older looking tanks, probably for fuel oil starter for plant
4	5	4	314	39.012	125.712	Older looking tanks, probably for fuel oil starter for plant
10	3	2	141	39.012	125.712	Older looking tanks, probably for fuel oil starter for plant
Total of above	5,421					
Fraction of volume estima	ated to be active oil :	storage:	90%			
Total volume estimated to	o be active oil storag	e:	4,879			

View of Tank Locations at Pyongyang Thermal Power Plant



Location: East Pyongyang Thermal Power Plant, Google Earth images, 12/14/18 Estimates (m) of Approximate Coordinates Implied Total Volume (cubic Number Diameter Height meters) atitude Longitude Notes 1,100 38.970 125.690 Older looking tanks, probably for fuel oil starter for 10 503 39.012 125.712 Older looking tanks, probably for fuel oil starter for 39.012 125.712 Older looking tanks, probably for fuel oil starter for 226 Total of above 1,828 Fraction of volume estimated to be active oil storage: 90% Total volume estimated to be active oil storage: 1,646

View of Tank Locations at East Pyongyang Thermal Power Plant



Location: Chongjin C	coastline/Port/Ma	rinas. Googl	e Earth ima	aes. 12/25/18	1	
				<u> </u>		
	Estimates	(m) of		Approximate (Coordinates	
			Implied Total			
			Volume			
			(cubic			
	Diameter	Height	meters)		3	Notes
2	9			41.766		Older looking tanks
1	27	16	9,161	41.766	129.766	New looking tank, red roof, behind wall
						mostly fishing boats of various sizes (10 m to 36
4	11	8	3,041	41.758	129.762	m)
						New looking tank, red and grey roof, behind wall,
						near what seems to be iron/steelworks or possibly
1	19	20	5,671	41.761	129.756	Chongjin Power Plant
1	19	8	2,268	41.761	129 756	Older looking tank
	10	Ŭ	2,200	11.701	120.100	Class looking tarik
	_	_		=		
4	5	7	550	41.761	129.756	Older looking tanks
6	7	8	1,847	41.761	129.756	Older looking tanks
3	9	10	1,909	41.761	129.756	Older looking tanks
1	32	15		41.783		Newish looking tank, redish roof, near bayshore
Total of above	-		37,273		·	, , , , , , , , , , , , , , , , , , , ,
Fraction of volume estima	ated to be active oil	storage:	90%			
Total volume estimated to	be active oil storag	e:	33,546			

Views of Tank Locations at Chongjin Coastline/Port/Marinas









Location: Kimchaek Coastline/Port/Marinas, Google Earth images, 12/28/18 Estimates (m) of Approximate Coordinates Implied Total Volume (cubic Number Diameter Height meters) _atitude Longitude Notes 18 3,817 40.663 129.211 Newish looking tank, red roof, near marina 1 15 129.211 Newish looking tank, red roof, near marina 129.211 Newish looking tank, red roof, near marina Old looking tank; several possible old foundations 10 40.663 1 550 6 113 40.663 24 40.708 129.226 of similar-sized tanks nearby 10 4,524 Total of above Fraction of volume estimated to be active oil storage: Total volume estimated to be active oil storage: 9,004 50% 4,502

Views of Tank Locations at Kimchaek Coastline/Port/Marinas





4 Nautilus Review of Oil Storage Sites Also Included in 1982 U.S. Central Intelligence Agency Estimates

					Approx	kimate	
	Estimates	s (m) of			Coord	inates	
Number	Diameter	Height	Implied Total Volume (cubic meters) as measured	Volume as Reported in Source (converted to cubic meters)	Latitude	Longitude	Notes
	3 2	5 1	0 14,726	20,350	42.406	130.622	Heavily rusted, appear to be either silver or white in color, only three of reported four are visible. Cl 1982.
	5	8	6 1,508	6,359	42.411	130.618	Heavily rusted, appear to be either silver or white in color, five are visible. CIA 1982.
1	0	6	7 1,979	7,949	42.411	130.618	Heavily rusted, appear to be either silver or white in color, 10 are visible. CIA 1982.
	5 1	2	9 5,089	5,724	42.406	130.619	Tanks appear rusted, surrounded by trees, possibly disused. CIA 1982.
	8 1	o	5 3,142	1,113	42.408	130.612	Tanks appear rusted, surrounded by trees, possibly disused. Could only locate 8 of 10 reported by source. CIA 1982.
Total of above	26,444	41,496					
Fraction of volume estinated		70% 18,511]				

Notes: reported by CIA (reference 1) as "Yonghun Dong Pet Prods Stor #1 through 3". Source reports 4 large tanks, but only 3 are visible.

Overviews of Tank Locations at Josan-ri, Rason





Detailed View of Older Tanks at Josan-ri, Rason



Location: Sinuiju, North Pyongan, North Korea , Google Earth images, 04/29/2019

						•	
					Approximate		
	Estimates	(m) of			Coordinates		
			measured (cubic	Reported in Source (converted to			
Number	Diameter	Height	meters)	cubic meters)	Latitude	Longitude	Notes
2	80	8	80,425	61,687	40.065	124.571	Older looking tanks. CIA, 1982
							Newer looking tank, no signs of rust or wear. CIA,
4	45	15	95,426	92,213	40.066	124.580	1982
	00	40	00.050	00.050	40.000		Newer looking tank, no signs of rust or wear. CIA,
2	36		-,	22,258	40.066	124.580	
5	8	5	1,257	4,006	40.064		Older looking tanks, can only see five. CIA, 1982
9	6	4	1,018	2,003	40.064	124.578	Older looking tanks. CIA, 1982
16	0	0	-	1,068			16 horizontal tanks reported in CIA, 1982, but currently not visible or are under cover.
Total of above			198,483	183,236			
Fraction of volume estima	ated to be active oil s	95%					
Total volume estimated to	be active oil storag	e:	188,559				

Notes: reported by CIA (reference 1) as "Paengma Ri Pet Stor SE". Source reports 16 smaller horizontal tanks, but tanks are not obviously visible.

Views of Tank Locations at Sinuiju





Location: Undok, No	rth Hamovong N	orth Korea	Google Far	th images 0	5/06/2019		
Location. Ondox, No	rtii Haingyong, N	ortii Rolea,	Google Lai	tii iiilages, o	3/00/2013		
ì							
					Approx	imate]
1	Estimates	(m) of			Coordi		
	Latinates	(III) OI			Coordi	natos	
			Implied Total				
			'	Volume as			
Number (as-reported			measured	Reported in			
numbers shown for first			(cubic	Source (cubic			
three entries)	Diameter	Height	meters)	meters)	Latitude	Longitude	Notes
6	14	0	-	28,618	42.519	130.347	Appears to be removed. CIA 1982.
5	12	0	-	6,359	42.524	130.348	Appears to be removed. CIA 1982.
2			-	1,590	42.522	130.347	Appears to be removed. CIA 1982.
							Older looking tanks, difficult to make out. Only
							appears to be three tanks present of four reported
3	9	4	763	890	42.519	130.347	in source. CIA 1982.
Total of above			763	37,457			
Fraction of volume estima			30%				
Total volume estimated to	o be active oil storag	e:	229				

Notes: reported by CIA (reference 1) as "Aoji Ri Chem Synth Plnt A Syn Pet Rfy". Plant appears to be decommssioned. 3 of original four smaller tanks remain, but appear to be in poor condition. Superstructure for some of the larger tanks (including floating tanks) still present, but tanks do not appear operable.

View of Tank Locations at Undok



Location: Rajin Port, Rason, North Korea , Google Earth images, 05/07/2019										
			·							
	Estimates	(m) of			Approx Coordi					
Number (for first entry, as reported in source, second is number of tanks counted).	Diameter		(cubic	Volume as Reported in Source (cubic meters)	Latitude	Longitude	Notes			
3	40	0	-	21,940	42.224	130.273	Possibly one or more fountations or outlines of a tanks formerly on the site, or one or more tanks may be buried, though the site seems disused. CIA 1982.			
2	! 10	6	942	1,145	42.221	130.273	Dark brown, appear to be partially buried. CIA 1982.			
Total of above			942	23,085						
Total volume estimated to	60% 565									

Notes: reported by CIA (reference 1) as "Nanjin Pet Prod Stor". Some reported tanks appear to be decommssioned and the remainder appear disused, although it is possible that these remaining smaller tranks could still be functional.

Views of Tank Locations at Rajin Port





Location: Kaego, Chagang, North Korea, Google Earth images, 05/07/2019

				_			
					Approximate		
	Estimates (m) of				Coordinates		
				Volume as Reported in			
Number as reported in				Source (cubic			
source	Diameter	Height	,	meters)	Latitude	Longitude	Notes
2 bunkers w/ 25 tanks			-	3,339	40.364	126.311	Possible bunker location. CIA 1982.
3 bunkers w/ 20 tanks			-	4,006	40.364	126.311	Possible bunker location. CIA 1982.
9 bunkers w/ 18 tanks			-	10,818	40.364	126.311	Possible bunker location. CIA 1982.
4 bunkers w/ 15 tanks			-	4,006	40.364	126.311	Possible bunker location. CIA 1982.
11 bunkers w/ 10 tanks			-	7,345	40.364	126.311	Possible bunker location. CIA 1982.
1 bunkers w/ 8 tanks			-	534	40.364	126.311	Possible bunker location. CIA 1982.
Total of above			-	30,049			_
Fraction of volume estimated to be active oil storage:			0%				
Total volume estimated to be active oil storage:			-				

Notes: reported by CIA (reference 1) as "Hunchon Pet Prod Storage North". Location of bunkers not clearly identifiable, altough some candidate buildings exist in what otherwise appears to be an agricultural and forest area.

Views of Tank Locations at Kaego





Location: Kusong, North Pyongan, North Korea, Google Earth images, 05/07/2019 Estimates (m) of Approximate Implied Total Volume as Volume as measured Reported in Number as reported in (cubic Source (cubic source 3 bunkers w/ 25 tanks Height meters) tude Longitude Notes 40.037 125.209 Possible bunker location. CIA 1982. meters) atitude 5,008 5,342 4 bunkers w/ 20 tanks 40.037 125.209 Possible bunker location. CIA 1982. 5 bunkers w/ 15 tanks 5,008 40.037 125.209 Possible bunker location. CIA 1982. 3 bunkers w/ 12 tanks 2,404 40.037 125.209 Possible bunker location. CIA 1982. 17 bunkers w/ 12 tanks 13,622 40.037 125.209 Possible bunker location. CIA 1982. 400 40.037 125.209 Possible bunker location. CIA 1982. 1 bunkers w/ 6 tanks 1 bunkers w/ 4 tanks 267 40.037 125.209 Possible bunker location. CIA 1982 Total of above 32,051 Fraction of volume estimated to be active oil storage: 0% Total volume estimated to be active oil storage: Notes: reported by CIA (reference 1) as "Kusong Pet Prod Storage North". Location of bunkers not clearly identifiable, although some candidate buildings exist in what otherwise appears to be an agricultural and forest area

View of Tank Locations at Kusong



Location: Andong-ni, South Pyongan, North Korea, Google Earth images, 05/07/2019

					Approximate		
	Estimates (m) of				Coordinates		
			Implied Total				
			Volume as	Volume as			
			measured	Reported in			
Number as reported in			(cubic	Source (cubic			
source	Diameter	Height	meters)	meters)	Latitude	Longitude	Notes
1 bunkers w/ 25 tanks			-	1,669	39.808	126.294	Possible bunker location. CIA 1982.
4 bunkers w/ 20 tanks			-	5,341	39.808	126.294	Possible bunker location. CIA 1982.
1 bunkers w/ 16 tanks				1,068	39.808	126.294	Possible bunker location. CIA 1982.
10 bunkers w/ 15 tanks				10,016	39.808	126.294	Possible bunker location. CIA 1982.
9 bunkers w/ 12 tanks				7,211	39.808	126.294	Possible bunker location. CIA 1982.
7 bunkers w/ 2 tanks				4,674	39.808	126.294	Possible bunker location. CIA 1982.
Total of above			-	29,979		-	

Notes: reported by CIA (reference 1) as "Tokchon Pet Prod Storage PUG". Location of bunkers not clearly identifiable, although some candidate buildings exist in what otherwise appears to be an agricultural and forest area.

Views of Tank Locations at Andong-ni





Location: Sollyong-ni, North Korea, Google Earth images, 05/07/2019 Approximate Estimates (m) of Coordinates Implied Total Volume as Volume as measured Reported in (cubic Number as reported in Source (cubic Height source meters) meters) atitude Longitude Notes 5 bunkers w/ 25 tanks 1,669 41.272 128.634 Possible bunker location. CIA 1982. 128.634 Possible bunker location. CIA 1982. 16 bunkers w/ 20 tanks 1,135 41.272 7 bunkers w/ 15 tanks 4,006 41.272 128.634 Possible bunker location. CIA 1982. 6,810 Total of above 0% Fraction of volume estimated to be active oil storage: Total volume estimated to be active oil storage:

Notes: reported by CIA (reference 1) as "Yongha Ri Pet Prod Storage PUG". Location of bunkers not clearly identifiable, although some candidate buildings exist, including building with new roof, as well as what could be former storage areas, in what otherwise appears to be an agricultural and forest area.

View of Tank Locations at Sollyong-ni



Location: Yongha, South Pyongan, North Korea, Google Earth images, 05/07/2019

							-
					Approx	imate	
	Estimates (m) of				Coordinates		
			Implied Total				
			Volume as	Volume as			
Number as reported in			measured	Reported in			
source (except last			(cubic	Source (cubic			
entry)	Diameter	Height	meters)	meters)	Latitude	Longitude	Notes
1 bunkers w/ 25 tanks			-	1,669	39.591	126.362	Possible bunker location.
1 bunkers w/ 17 tanks			٠	1,135	39.591	126.362	Possible bunker location. CIA 1982.
3 bunkers w/ 20 tanks			٠	4,006	39.591	126.362	Possible bunker location. CIA 1982.
8 bunkers w/ 15 tanks			٠	8,012	39.591	126.362	Possible bunker location. CIA 1982.
11 bunkers w/ 10 tanks			٠	7,345	39.591	126.362	Possible bunker location. CIA 1982.
1 bunkers w/ 5 tanks			ı	333	39.591	126.362	Possible bunker location. CIA 1982.
							Possible oil tanks, but shapes are somewhat
12	2.5	3	177	-	39.595	126.367	irregular. Google Maps.
Total of above			177	22,500			
Fraction of volume estimated to be active oil storage:			10%				
Total volume estimated to be active oil storage:			18				

Notes: reported by CIA (reference 1) as "Pukchang Ni Pet Prod Storage PUG". Location of bunkers not clearly identifiable, although some candidate buildings exist, including building with new roof, as well as what could be former storage areas, in what otherwise appears to be an agricultural and forest area.

Views of Tank Locations at Yongha





Location: Pyŏngsŏng, South Pyongan, North Korea, Google Earth images, 05/21/2019									
Location: Pyongson	g, South Pyongar	<u>1, North Ko</u>	rea, Google E	arth images	, 05/21/2019	<u> </u>			
	Estimates	(m) of			Approx Coordi				
Number (first entry as reported in sourcejust total volume reported)	Diameter	Height	measured (cubic	Volume as Reported in Source (cubic meters)		Longitude	Notes		
NA			-	59,620	39.289	125.898	Location as indicated in CIA 1982. Bunkers, but no tanks, may be present, but not possible to measure volume.		
			-	· -					
Total of above			-	59,620	1				
Fraction of volume estimated to be active oil storage:			0%						
Total volume estimated t	-								

Notes: reported by CIA (reference 1) as "Sain Ni Petr Prod Stor". Type of storage not specified in source. Location of bunkers not clearly identifiable, although some candidate areas exist. Area does not seem to have been heavily used recently. Agricultural and forest area.

View of Tank Locations at Pyŏngsŏng



Location: Hamhung, South Hamgyong, North Korea, Google Earth images, 05/08/2019

				=			_
			1 '	1	Approximate		
	Estimates	(m) of	<u> </u>	<u> </u>	Coordi	nates	
Number (first entry as reported in source)	Diameter		measured (cubic	Volume as Reported in Source (cubic	Latitude	Longitude	Notes
5 bunkers w/ 6 tanks						_	
each		·	-	23,848	39.962	127.833	Possible bunker location. CIA 1982.
4	10	0	-	-	39.962	127.833	Possible foundations of old tanks. Google Maps.
Total of above		1	-	23,848			
Fraction of volume estima	0%		•				
Total volume estimated to	o be active oil storag	je:	-	i			

Notes: reported by CIA (reference 1) as "Samho-dong POL Stor". Location of bunkers not clearly identifiable, although some candidate buildings exist, as well as what could be foundations of older tanks, in what otherwise appears to be an mountain and forest area.

Views of Tank Locations at Hamhung





Location: Hwangju, North Hwanghae, North Korea, Google Earth images, 05/08/2019 Approximate Estimates (m) of Coordinates Implied Total Volume as Volume as measured Reported in (cubic Source (cubic Number Diameter Height meters) meters) Latitude Longitude Notes 4 bunkers w/ 6 tanks 19,078 each 38.696 125.826 Possible bunker location. CIA 1982. Foundations of old tanks at at least four locations 18 38.695 125.821 Google Maps. Total of above 19,078 Fraction of volume estimated to be active oil storage: 0% Total volume estimated to be active oil storage

Notes: reported by CIA (reference 1) as "Hwangiu-up Petr Prods Stor". Location of bunkers possibly where foundations of old tanks appear, although some newer buildings appear nearby; mountain and forest area with some agriculture.

Views of Tank Locations at Hwangju



Coogle

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Location: Kwail, South Hwanghae, North Korea, Google Earth images, 05/08/2019

					Approx	imate	
	Estimates	(m) of			Coordi	nates	
			Implied Total				
			Volume as	Volume as			
			measured	Reported in			
			(cubic	Source (cubic			
Number	Diameter	Height	meters)	meters)	Latitude	Longitude	Notes
7 bunkers w/ 6 tanks		_	-	33,387	38.438	125.079	Possible bunker location. CIA 1982.
2 bunkers w/ 10 tanks			-	1,335	38.442	125.081	Possible bunker location. CIA 1982.
1 bunkers w/ 7 tanks			-	467	38.442	125.081	Possible bunker location. CIA 1982.
Total of above			-	35,189			
Fraction of volume estima	ated to be active oil	storage:	0%		•		
Total volume estimated to	n be active oil storag	е.	_				

Notes: reported by CIA (reference 1) as "Kwail POL Storage Area E". Location of bunkers not immediately obvious, although some potential candidate buildings appear nearby; forest area with some agriculture.

Views of Tank Locations at Kwail





Location: Ich'ŏn-kun, Kangwon, North Korea, Google Earth images, 05/09/2019

	Estimates (m) of				Approx Coordi		
			measured	Volume as Reported in Source (cubic			
Number	Diameter	Height	meters)	meters)	Latitude	Longitude	Notes
1 bunkers w/ 5 tanks			-	3,974	38.580	126.733	Possible bunker location. CIA 1982.
1 bunkers w/ 4 tanks			-	3,179	38.580	126.733	Possible bunker location. CIA 1982.
1 bunkers w/ 3 tanks			-	2,384	38.580	126.733	Possible bunker location. CIA 1982.
5 bunkers w/ 2 tanks			-	7,949	38.580	126.733	Possible bunker location. CIA 1982.
1 bunkers w/ 15 tanks			-	1,001	38.580	126.733	Possible bunker location. CIA 1982.
Total of above			-	18,487			
Fraction of volume estima	ated to be active oil	storage:	0%		•		
Total volume estimated to	be active oil storag	e:	-				

Notes: reported by CIA (reference 1) as "Chiha Ri Petr Prod Stor South". Location of bunkers not immediately obvious, although some potential candidate buildings appear nearby; forest area with limited agriculture.

Views of Tank Locations at Ich'ŏn-kun





Location: Hwasong-ni, North Korea, Google Earth images, 05/09/2019 Approximate Estimates (m) of Coordinates Implied Total Volume as Volume as measured Reported in (cubic Source (cubic Number 2 bunkers w/ 3 tanks tude Longitude Notes 38.608 126.587 Possible bunker location. CIA 1982. 38.608 126.587 Possible bunker location. CIA 1982. Height meters) meters) Diameter Latitude 4,769 3 bunkers w/ 2 tanks 4,769 Total of above 9,538 Fraction of volume estimated to be active oil storage: 0% Total volume estimated to be active oil storage:

Notes: reported by CIA (reference 1) as "Chuyon Ni Petr Prod Stor". Location of bunkers not immediately obvious, although some potential candidate buildings appear nearby; sparse forest area with agricultural fields surrounding.

Views of Tank Locations at Hwangsong-ni





Location: Sonchon, North Pyongan, North Korea, Google Earth images, 05/09/2019 Approximate Coordinates Estimates (m) of Implied Total Volume as Volume as measured Reported in Source (cubic (cubic Height tude Longitude Notes 39.755 124.998 Buried, not visible. CIA 1982. Number Diameter meters) meters) Latitude 12,718 10 Total of above 12,718 Fraction of volume estimated to be active oil storage: 0% Total volume estimated to be active oil storage

Notes: reported by CIA (reference 1) as "Munjong Ni Petr Prod Stor". Location of bunkers not immediately obvious, although some potential candidate buildings appear nearby; sparse forest area with agricultural fields surrounding and a newer irrigation canal (including a tunnel under a hill for the canal). Also close to a main highway.

Views of Tank Locations at Sonchon





Location: Kaechon, South Pyongan, North Korea, Google Earth images, 05/09/2019 Approximate Estimates (m) of Coordinates Implied Total Volume as Volume as measured Reported in (cubic Source (cubic Number Diameter Height meters) meters) Latitude Longitude Notes Older looking tanks, difficult to make out. Only eight visible, possibly a foundation for a ninth. Most appear decayed and un-usable (perhaps only one or two even potentially usable). Nine total 16 3,217 7,154 39.656 125.924 reported by CIA 1982. Difficult to make out, likely only foundations of 2,861 39.656 125.924 tanks, at most, remaining. CIA 1982 Possible location of horizontal tanks, although not entirely clear what these objects are. Area appears to be well-maintained, indicating ongoing 3,619 3,205 39.643 125.944 operations. CIA 1982. Total of above 6,836 13,220

Notes: reported by CIA (reference 1) as "Chongdong POL Stor Area NE". Location of 48 horizontal tanks not certain, but objects found appear to be about the right size and number. Larger tanks clearly disused; most or all appear abandoned. Hill and valley farming area. Area of what appear to be tailings next to area of ~48 possible tanks suggest possibility of a nearby mine.

50%

3,418

Fraction of volume estimated to be active oil storage:

Total volume estimated to be active oil storage:

Views of Tank Locations at Kaechon





Location: Munchon,	Kangwon, North	Korea, Goog	le Earth im	ages, 05/10/2	019		
	<u> </u>		1	Ī			1
				Approx			
	Estimates	(m) of			Coordi	nates	
			Implied Total Volume as	Volume as			
			measured (cubic	Reported in Source (cubic			
Number	Diameter	Height	(meters)	Latitude	Longitude	Notes
4 bunkers w/ 3 tanks			´ -	15,262	39.304	127.370	Possible bunker location. CIA 1982.
1 bunker w/ 6 and 2							
tanks			-	467	39.304	127.370	Possible bunker location. CIA 1982.
							Large, newer tank, though could possibly be a round building for a different use. Other new
1	24	10	4,524		39.286	127.378	buildings in area.
2	8	7	704		39.286	127.378	Older tanks adjacent to newer buildings.
4	22	12	18,246		39.227	127.367	Two older (rusted), two newer tanks. Different heightsestimate of average is provided.
							One older (rusted), one newer tank. Different
2	14	8	2,463		39.227	127.367	heightsestimate of average is provided.
Total of above			25,937	15,729			
Fraction of volume estima			90%				
Total volume estimated to	be active oil storag	e:	23,343				

Notes: reported by CIA (reference 1) as "Munchon Up Petr Prod Stor N". Location of bunkers not certain, but candidate building are nearby. CIA 1982 coordinates point to location in the hills above the coastal town. Other oil tanks found from Google Earth along the coastline, probably serving marine traffic. Some of these tanks look quite new.

Views of Tank Locations at Munchon







	Estimates	, σ.	IP. I.T.		Coordi	incree	
			measured	Volume as Reported in Source (cubic			
Number	Diameter	Height	`	meters)	Latitude	Longitude	Notes
2 bunkers w/ 6 tanks			-	9,539	38.841	125.328	Possible bunker location. CIA 1982.
Total of above			-	9,539			
Fraction of volume estim	nated to be active oil	storage:	0%				
Total volume estimated	to be active oil storage	je:	-				

View of Tank Locations at Aewol-li



Location: North Kore	ea, Ryanggang, G	oogle Earth	images, 05/	10/2019				
								_
	Estimates	(m) of		Approximate	Coordinates			
Number	Diameter	Height	(cubic	Volume as Reported in Source (cubic meters)	Latitude	Longitude	Notes	
bunkers w/ 10 tanks	Biamotoi	rioigni	-	6,009	41,428		Possible bunker location. CIA 1982.	
Total of above			-	-				
Fraction of volume estimate	ated to be active oil s	storage:	0%		1			
Total volume estimated to	o be active oil storag	e:	-					
Notes: reported by CIA (i		-		I ation of bunkers	not certain.	but candidat	te building are nearby.	

View of Tank Locations at Ryanggang



Location: Sungjibaegam, Paekam-rodongjagu, Ryanggang, North Korea, Google Earth images, 05/10/2019 Approximate Coordinates Estimates (m) of Implied Total Volume as Volume as measured Reported in (cubic Source (cubic Number 3 bunkers w/ 25 tanks ttude Longitude Notes 41.224 128.715 Possible bunker location. CIA 1982. 41.224 128.715 Possible bunker location. CIA 1982. Height meters) meters) Diameter _atitude 5,008 3 bunkers w/ 20 tanks 4,006 1 bunkers w/ 15 tanks 95 41.224 128.715 Possible bunker location. CIA 1982. Total of above 9,109 Fraction of volume estimated to be active oil storage: 0% Total volume estimated to be active oil storage:

Notes: reported by CIA (reference 1) as "Yongha Ri Sup Dep A Pet". Location of bunkers not certain, but candidate building and what looks like a fortified concrete area are nearby.

Views of Tank Locations at Sungjibaegam





L							T	
Location: Chaewon-	<u>ni, North Korea, (</u>	<u>Google Earth</u>	n images, 05	<u>/10/2019</u>				
				1	A = = = = =			
					Approx			
	Estimates	(m) of			Coordi	nates		
			Implied Total					
			Volume as	Volume as				
			measured	Reported in				
			(cubic	Source (cubic				
Number	Diameter	Height	meters)	meters)	Latitude	Longitude	Notes	
12 bunkers w/ 10 tanks			-	8,012	40.287	127.315	Possible bunker location. CIA 1982.	
Total of above			-	8,012				
Fraction of volume estima	ated to be active oil:	storage:	0%		=			
Total volume estimated to	o be active oil storag	je:	-					
				-				
Notes: reported by CIA (r	reference 1) as "Cha	ngiin Un Pet Pr	od Stor S" Lo	ocation of bunke	ers not certai	n but candi	date buildings and cleared	
areas are nearby	0.0.0.00	gj op . o	04 010. 0 . 2	bodilon or built	oro riot cortain	ii, but buildi	aato bananigo ana oloaroa	

View of Tank Locations at Chaewon-ni

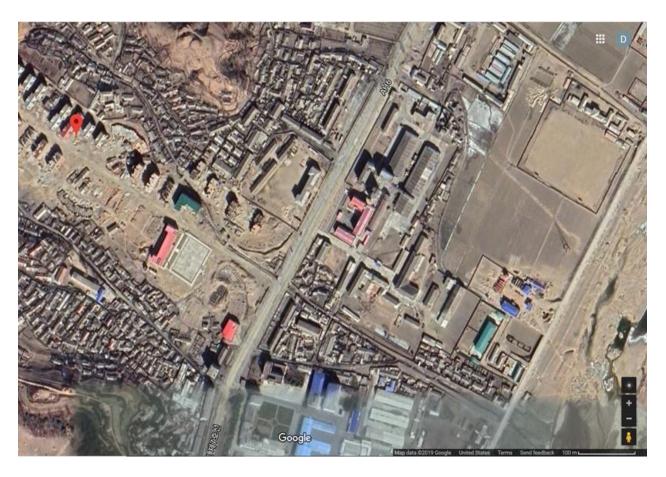


Location: Hoesang-guyok, Hamhung, South Hamgyong, North Korea, Google Earth images, 05/10/2019 Approximate Estimates (m) of Coordinates Implied Total Volume as Volume as measured Reported in (cubic Source (cubic tude Longitude Notes 39.950 127.554 Possible bunker location. CIA 1982. 39.950 127.554 Possible bunker location. CIA 1982. Number 5 bunkers w/ 20 tanks Height meters) meters) Diameter Latitude 6,677 5 bunkers w/ 10 tanks 3,338 Total of above 10,015 Fraction of volume estimated to be active oil storage: 0% Total volume estimated to be active oil storage:

Notes: reported by CIA (reference 1) as "Hamhung Pet Prod Stor". Location of bunkers not certain, but candidate buildings and areas of concrete are nearby. Close to river and main road. Near city of Hamhung.

Views of Tank Locations at Hoesang-guyok

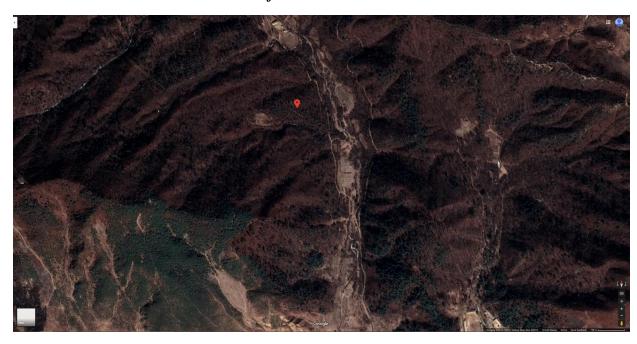




10 bunkers w/ 10 ta Total of above	nks		-	6,677 6,677	39.953	125.462	Possible bunker location. CIA 1982.
Number	Diameter	Height	measured (cubic	Volume as Reported in Source (cubic meters)	Latitude		Notes
	Estimates	(m) of			Approx Coordi		

Notes: reported by CIA (reference 1) as "Taechon Pet Prod Stor". Location of bunkers not certain, but candidate buildings and cleared areas are nearby. Close to river, dam, and reservoir.

Views of Tank Locations at Taechon





Location: Hoesang-guyok, Hamhung, South Hamgyong, North Korea, Google Earth images, 05/10/2019 Approximate Estimates (m) of Coordinates Implied Total Volume as Volume as measured Reported in (cubic Source (cubic tude Longitude Notes 39.861 125.963 Possible bunker location. CIA 1982. 39.861 125.963 Possible bunker location. CIA 1982. Diameter Height meters) meters) atitude 4 bunkers w/ 20 tanks 5,341 6 bunkers w/ 10 tanks 4,006 Total of above 9,347 Fraction of volume estimated to be active oil storage: 0% Total volume estimated to be active oil storage:

Notes: reported by CIA (reference 1) as "Kujang Up Pet Prds Stor". Location of bunkers not certain, but candidate buildings and cleared areas are nearby. Forested area.

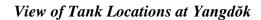
Views of Tank Locations at Hoesang-guyok





Location: Yangdŏk, South Pyongan, North Korea, Google Earth images, 05/22/2019 Approximate Coordinates Estimates (m) of Implied Total Volume as Volume as measured Reported in (cubic Source (cubic _atitude Number Height Longitude Notes Diameter meters) meters) 10 bunkers w/ 10 tanks 6,677 39.174 126.670 Possible bunker location. CIA 1982. Total of above 6,677 Fraction of volume estimated to be active oil storage: 0% Total volume estimated to be active oil storage:

Notes: reported by CIA (reference 1) as "Yangdok Pet Prds Stor SE". Location of bunkers not certain, but candidate buildings and cleared areas are nearby. Hilly area.





Location: Kangdong,	, Pyongyang, Nor	th Korea, Go	ogle Earth	images, 05/2	<u>2/2019</u>		
							<u>-</u>
							1
					Approx	rimate	
	Estimates	(m) of			Coordi		
		ĺ					
			Implied Total				
			Volume as	Volume as			
				Reported in			
			`	Source (cubic			
Number	Diameter	Height	meters)	meters)	Latitude	Longitude	Notes
451				10.010	00.000	400.074	Described and analysis of Addition
15 bunkers w/ 10 tanks	0	0	-	10,016	39.038	126.074	Possible bunker location. CIA 1982.
Total of above			-	10,016			
Fraction of volume estima	ated to be active oil s	storage:	0%				
Total volume estimated to	be active oil storag	e:	-				

Notes: reported by CIA (reference 1) as "Sungho Pet Prds Stor". Location of bunkers not certain, but candidate buildings and cleared areas are nearby. Hilly area with some forest.

View of Tank Locations at Kangdong



Location: Unhung U	o. Rvanggang, No	orth Korea. G	oogle Eart	h images. 05/	22/2019		
	-,, u.,	,					
				I			1
					Approx	imate	
	Estimates	(m) of			Coordi		
Number	Diameter	Height	measured (cubic	Volume as Reported in Source (cubic meters)		Longitude	Notes
Turribor	Diamotor	Tioign	motoroj	motoroy	Latitudo	Longitudo	rotes
10 bunkers w/ 10 tanks	0	0	-	6,677	41.315	128.523	Possible bunker location. CIA 1982.
Total of above			-	6,677			
Fraction of volume estima	ated to be active oil	storage:	0%		=		
Total volume estimated to	be active oil storag	je:	-				

Notes: reported by CIA (reference 1) as "Pongdu Ri Pet Prds Stor". Location of bunkers not certain, but candidate buildings and cleared areas are nearby. Forested area.

View of Tank Locations at Unhung Up



Location: Munchon,	rangwon, worth	110.00,000	no Laitii iii	<u>ugoo, oo, zz, z</u>			
	Estimates	(m) of			Approx Coordi		
Number	Diameter	Height	measured (cubic	Volume as Reported in Source (cubic meters)	Latitude	Longitude	Notes
10 bunkers w/ 10 tanks	0	0	-	6,677	39.306	127.255	Possible bunker location. CIA 1982.
Total of above			-	6,677		•	•
Fraction of volume estima	ated to be active oil	storage:	0%		=		
Total volume estimated to	be active oil storag	e:	-				
	eference 1) as "Muc			tion of bunkers	not certain, I	but candidat	te buildings and cleared areas

View of Tank Locations at Muchon



Location: Wonsan, Ka	angwon, North K	orea, Google	Earth Imag	jes, 05/22/20	19		
[Approx	cimate	
	Estimates	(m) of			Coordi	nates	
Number	Diameter		measured (cubic	Volume as Reported in Source (cubic	Latitude	Longitude	Notes
10 bunkers w/ 10 tanks	0	0	_	6,677	39.047	127.418	Possible bunker location. CIA 1982.
Total of above	,		-	6,677			,
Fraction of volume estima	ated to be active oil s	storage:	0%		,		
Total volume estimated to	be active oil storag	e:	-	1			

are nearby. Hilly and barren area.

View of Tank Locations at Wonsan



Location: Sinuiju, No	rth Pyongan No	rth Korea Go	oogle Farth	images 05/2	22/2019			
Location: Cinana, 110	Turr yongan, no	rui itoroa, ot	Jogic La.t.	mages, sorz	LIZUIU			
							_	
		ļ			Approx	cimate		
	Estimates	(m) of			Coordi			
ļ			Implied Total					
				Volume as Reported in				
j				Source (cubic				
Number	Diameter			,		Longitude	Notes	
						_		
14 bunkers w/ 10 tanks	0	0	-	9,348	40.094	124.581	Possible bunker location. CIA 1982.	
Total of above			-	9,348				
Fraction of volume estima	ated to be active oil	storage:	0%					
Total volume estimated to	be active oil storag	je:	-					

Notes: reported by CIA (reference 1) as "Paengma Ri Pet Prod Stor". Location of bunkers not certain, but candidate buildings and cleared areas are nearby, likely near the main road. Hilly and barren area.

View of Tank Locations at Sinuiju



Location: Kanggye, Chagang, North Korea, Google Earth images, 05/23/2019										
Location, managery, onagany, worth Norea, Google Later mayers, 03/23/2019										
							1			
	1			1 '	Approx	rimate				
	Estimates (m) of			1 '	Coordinates					
		,	†			,				
	1		Implied Total	1 '	1 '	'				
	1		Volume as	Volume as	1 '	'				
	1		measured	Reported in	1 '	'				
	1			Source (cubic	1 '	'				
Number	Diameter		`	meters)		Longitude	Notes			
1 bunkers w/ 22 tanks	1	-	-	1,469	40.914	126.613	Possible bunker location. CIA 1982.			
1 bunkers w/ 17 tanks	1		-	1,135	40.914	126.613	Possible bunker location. CIA 1982.			
3 bunkers w/ 15 tanks			-	3,004	40.914	126.613	Possible bunker location. CIA 1982.			
2 bunkers w/ 9 tanks	1		-	1,201	40.914	126.613	Possible bunker location. CIA 1982.			
3 bunkers w/ 6 tanks	1		-	1,201	40.914	126.613	Possible bunker location. CIA 1982.			
Total of above			-	8,010						
Fraction of volume estimated to be active oil storage:			0%							
Total volume estimated to	-	1								

Notes: reported by CIA (reference 1) as "Kanggye Pet Prod Stor South". Location of bunkers not certain, but candidate buildings and cleared areas are nearby, likely near the main road in what looks to be a military compound. Hilly with farmland.

View of Tank Locations at Kanggye



Leastion: Kunlauran North Karea Coogle Forth images 05/22/2010									
Location: Kup'awon, North Korea, Google Earth images, 05/23/2019									
							<u>.</u>		
					Approx	imate			
	Estimates (m) of				Coordinates				
			Implied Total						
			•	Volume as					
			measured	Reported in					
				Source (cubic					
Number	Diameter	Height	`	,	Latitude	Longitude	Notes		
1 bunkers w/ 14 tanks	Diamotor	neign	-	1,589	40.494	3	Possible bunker location, CIA 1982.		
1 bunkers w/ 13 tanks	0	0	_	934	40.494		Possible bunker location. CIA 1982.		
2 bunkers w/ 12 tanks	0	0	_	868	40.494		Possible bunker location. CIA 1982.		
2 bunkers w/ 10 tanks	0	0	_	1,602	40.494		Possible bunker location. CIA 1982.		
5	0	0	-	111	40.494		Unable to find, CIA document states tanks are		
Total of above	-		-	5,104			,		
Fraction of volume estimated to be active oil storage:			0%	·	1				
Total volume estimated to be active oil storage:			-						
TELES ELECTION DOLLMAROU I									

Notes: reported by CIA (reference 1) as "Koin Nodongjagu Pet Prod Stor South". Location of bunkers not certain, but candidate buildings and cleared areas are nearby, likely near the main road. Hilly and forested, with sparse farmland.

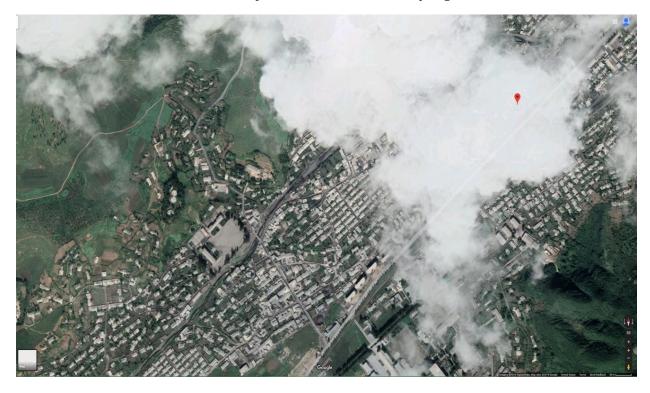
View of Tank Locations at Kup'awon



Location Helliana vi North Koros Coords Forth images 05/02/040								
Location: Hallyong-ni, North Korea, Google Earth images, 05/23/2019								
			1	T	1		1	
					Approx	rimate		
	Estimates (m) of				Coordinates			
			Implied Total					
			Volume as	Volume as				
				Reported in				
			(cubic	Source (cubic				
Number	Diameter	Height	meters)	meters)	Latitude	Longitude	Notes	
							Possible bunker location, clouds and other	
11 bunkers w/ 15 tanks	C)	-	11,017	39.483	126.007	buildings make it difficult to determine precise	
Total of above			-	11,017				
Fraction of volume estima	0%		-					
Total volume estimated to	-							

Notes: reported by CIA (reference 1) as "Kuyon Ni Pet Prod Stor N". Location of bunkers not certain, but candidate buildings and cleared areas are nearby, likely near the main road. Hilly and forested, with sparse farmland, southeast of Pukchang Airport.

View of Tank Locations at Hallyong-ni



Location: Kup'awon, North Korea, Google Earth images, 05/23/2019									
							1		
					Approximate				
	Estimates (m) of				Coordinates				
Number	Diameter	Height	measured (cubic	Volume as Reported in Source (cubic meters)	Latitude	3	Notes		
							Possible tank location, appears only to be four tanks, with two of them appearing to only be the foundation of the tanks. Source reports 6 total		
4	11	3	1,140	4,769	38.875	125.506	tanks. CIA 1982.		
3 bunkers w/ 10 tanks			-	2,003	38.881	125.503	Possible bunker location. CIA 1982.		
1 bunkers w/ 6 tanks			-	400	38.881	125.503	Possible bunker location. CIA 1982.		
Total of above			1,140	7,172					
Fraction of volume estimated to be active oil storage:			100%						
Total volume estimated to be active oil storage:			1,140						

Notes: reported by CIA (reference 1) as "Kangso Up Ni Pet Prod Stor". Location of bunkers not certain, but candidate buildings and cleared areas are nearby, likely near the main road. Hilly and forested, with sparse farmland, southeast of Pukchang Airport.

Views of Tank Locations at Kup'awon





Location: Yangdŏk, S	South Pyongan N	Jorth Korea	Google Far	th images 0	5/24/2019		
Location: Tangaon, C	Journ yongun, i	tortir rtorcu,	Coogic Lai	tir irrages, o	0/E-4/E0 10		
					Approx	imate]
	Estimates	(m) of			Coordi		
			Implied Total				
			Volume as	Volume as			
			measured	Reported in			
			(cubic	Source (cubic			
Number	Diameter	Height	meters)	meters)	Latitude	Longitude	Notes
3 bunkers w/ 24 tanks			-	4,807	39.210	126.723	Possible bunker location. CIA 1982.
1 bunkers w/ 13 tanks			-	868	39.210	126.723	Possible bunker location. CIA 1982.
1 bunkers w/ 12 tanks			-	801	39.210	126.723	Possible bunker location. CIA 1982.
1 bunkers w/ 10 tanks			-	667	39.210	126.723	Possible bunker location. CIA 1982.
1 bunkers w/ 8 tanks			-	534	39.210	126.723	Possible bunker location. CIA 1982.
Total of above			-	7,677			
Fraction of volume estimate		-	0%				
Total volume estimated to	o be active oil storag	e:	-				

Notes: reported by CIA (reference 1) as "Yangdok Pet Prod Stor East". Location of bunkers not certain, but candidate buildings and cleared areas are nearby, likely near the main road. Hilly and forested, with dry and barren regions, near Naedong Train Station.

View of Tank Locations at Yangdŏk



Location: Sinpo, South Hamgyong, North Korea, Google Earth images, 05/24/2019 Approximate Estimates (m) of Coordinates Implied Total Volume as Volume as measured Reported in (cubic Source (cubic Number Diameter Height meters) meters) Latitude Longitude Notes 39.997 128.199 Document states the tanks are buried. CIA 1982. 39.997 128.199 Document states the tanks are buried. CIA 1982. 1,271 1,271 1,271 2 39.997 128.199 Document states the tanks are buried. CIA 1982. Total of above 3,813 Fraction of volume estimated to be active oil storage: Total volume estimated to be active oil storage: 0%

Notes: reported by CIA (reference 1) as "Mayangdo Pet Prod Stor NW". Location of tanks not certain, but cleared areas are nearby. Dry and barren, with industrial buildings and ports. On an island off the coast from Sinpo city.

Views of Tank Locations at Sinpo





Location: Ryanggang	ocation: Ryanggang, North Korea, Google Earth images, 05/24/2019							
				1	Approx	imate	1	
	Estimates	(m) of			Coordi			
		Ì						
			Implied Total					
			Volume as	Volume as				
			measured	Reported in				
			(cubic	Source (cubic				
Number	Diameter	Height	meters)	meters)	Latitude	Longitude	Notes	
1 bunkers w/ 24 tanks			-	1,602	41.903	128.413	Possible bunker location. CIA 1982.	
2 bunkers w/ 21 tanks			-	2,804	41.903	128.413	Possible bunker location. CIA 1982.	
5			-	333	41.895	128.410	Horizontal Tanks possible location. CIA 1982.	
1 bunkers w/ 12 tanks			-	400	41.903	128.413	Possible bunker location. CIA 1982.	
14			-	467	41.895	128.410	Horizontal Tanks possible location. CIA 1982.	
1 bunkers w/ 18 tanks			-	1,201	41.903	128.413	Possible bunker location. CIA 1982.	
1 bunkers w/ 5 tanks			-	333	41.903	128.413	Possible bunker location. CIA 1982.	
3			-	98	41.895	128.395	Horizontal Tanks possible location. CIA 1982.	
Total of above			i -	7,238				
Fraction of volume estima	ated to be active oil:	storage:	0%					
Total volume estimated to	o be active oil storag	je:	-					

Notes: reported by CIA (reference 1) as "Samyijon Airfield". Location of bunkers not certain, but candidate buildings and cleared areas are nearby, likely near the main road. Dry and forested.

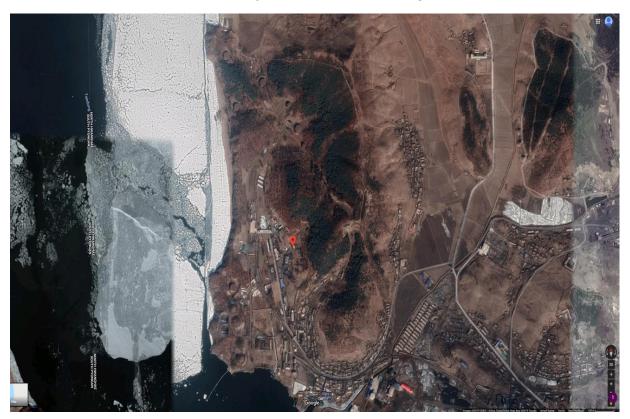
View of Tank Locations at Ryanggang



Location: Songnim,	Pyongyang, Norti	yongyang, North Korea, Google Earth images, 05/24/2019								
				1			1			
					Approx	rimate				
	Estimates	(m) of			Coordi	nates				
			Implied Total							
			Volume as	Volume as						
			measured	Reported in						
			(cubic	Source (cubic						
Number	Diameter	Height	meters)	meters)	Latitude		Notes			
1	50	0	-	23,053	38.750	125.592	May be partially buried or removed. CIA 1982.			
							Older, rusty tank, may be disused, with similar-			
							sized tank foundations and possibly buried tanks			
	35	15	14,432		38.752	125.592				
4			19,792	44.516	38.759		Older looking tanks. CIA 1982.			
	19		3,969	11,010	38.759		Older looking tanks.			
		-	5,555				Silvery tanks with some rust, looks to be			
•	27	5	5,726	10,175	38.746	125 500	somewhat aged. CIA 1982.			
•	21		3,720	10,173	30.740	120.000	-			
			=				Newer-looking tank next to railroad siding with			
					38.748		newer-looking buildings			
23				1,535	38.754		Horizontal tanks. CIA 1982.			
			50		38.745		Small silver tanks. Google Maps.			
	7		462		38.745		Silver tanks, one appears to have been removed.			
1					38.745		Silver tank. Google Maps.			
2					38.744		Tanks appear to have been removed. Google			
1			-,		38.744		Large silver tank. Google Maps.			
	17				38.741		Tanks appear to have been removed. Google			
			,		38.742		Dark, older looking tank. Google Maps.			
1			4,072		38.741		Dark, older looking tank. Google Maps.			
3			942		38.741		Dark, older looking tanks. Google Maps.			
	12		-		38.739		Offshore, may be partially submerged. Google			
1			,		38.736		New looking tank. Google Maps.			
1	1 24	8	-,	== ===	38.736	125.621	New looking tank. Google Maps.			
Total of above		1	71,332	79,279	l					
Fraction of volume estim			90%	1						
Total volume estimated to	to be active oil storaç	je:	64,199							

Notes: reported by CIA (reference 1) as "Songnim Pet Prds Str NW". Location of all tanks not certain, but cleared areas are nearby. Dry and forested, east and along the Taedong River.

Views of Tank Locations at Songnim













							·
Location: Tanchon, S	South Hamgyong	<u>, North Kore</u>	<u>a, Google E</u>	arth images,	05/24/2019	<u> </u>	
				1	Approx	rimate	
	Estimates	(m) of			Coordi	inates	
			Implied Total				
			Volume as	Volume as			
			measured	Reported in			
			(cubic	Source (cubic			
Number	Diameter	Height	meters)	meters)	Latitude	Longitude	Notes
							Somewhat aged, only appears to be two, though
2	21	5	3,464	7,949	40.421	128.922	source reports 5. CIA 1982.
4	13	8	4,247	5,087	40.432	128.916	Heavily rusted. CIA 1982.
1	11	3	285	794	40.422	128.910	Blue tank. CIA 1982.
Total of above			7,996	13,830			
Fraction of volume estima	ated to be active oil s	storage:	80%		=		
Total volume estimated to	o be active oil storag	je:	6,397				
				•			

Notes: reported by CIA (reference 1) as "Tanchon Pet Prds Str Magnesia Plant". Location of all tanks not certain, but potential areas are nearby. Large industrial facility along the coast.

Views of Tank Locations at Tanchŏn





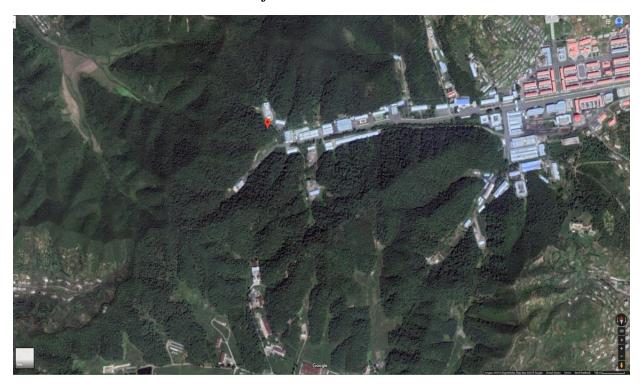




Location: Kanch'am, North Korea, Google Earth images, 05/24/2019 Approximate Coordinates Estimates (m) of Implied Total Volume as Volume as measured Reported in Source (cubic (cubic meters) ttude Longitude Notes 39.568 125.829 Silvery, newish looking tanks. CIA 1982. 39.568 125.829 Rusted, older looking tank. CIA 1982. Number Diameter Height meters) atitude 2 2,543 382 1 191 794 39.567 125.831 Horizontal tanks. CIA 1982. 39.567 125.831 Horizontal tanks. CIA 1982. 21 1,402 14 701 39.567 125.831 Horizontal tanks. CIA 1982. 30 1.001 Total of above 573 6,441 Fraction of volume estimated to be active oil storage: 80% Total volume estimated to be active oil storage

Notes: reported by CIA (reference 1) as "Yongwon Ni Pet Prds Stor". Location of bunkers not certain, but candidate buildings and cleared areas are nearby, likely near the main road. Forested with some farmland and possible storage facilities.

Views of Tank Locations at Kanch'am





North Hamgyong	, North Korea	a, Google E	arth images,	06/25/2019		
						1
				Approx	imate	
Estimates	(m) of			Coordi	nates	
		Volume as	Volume as			
		measured	Reported in			
		(cubic	Source (cubic			
Diameter	Height	meters)	meters)	Latitude	Longitude	
			8,744	41.830		CIA 1982.
						Round structure near road and possible railway
		2,036		41.829		line. Possible oil tank
17	7	1,589		41.761	129.756	Older grey tank. Google Maps.
7						Older grey tanks. Google Maps.
7	3	346		41.761	129.756	Older grey tanks. Google Maps.
_	_					
						Older grey tanks. Google Maps.
5	3	59		41.761	129.756	Older grey tank. Google Maps.
3	1	28		41.760	129.756	Older small grey tanks. Google Maps.
3	2	71		41.762		Older small grey tanks. Google Maps.
18	8	2,036		41.762	129.755	Large structure, possible tank. Google Maps.
11	6	2,281		41.757	129.761	Older grey tanks. Google Maps.
				44 750	400 757	Oldson and a Constant
4	2	/5		41.758	129.757	Older grey tanks. Google Maps.
6	3	424		41.759	129.757	Older grey tanks. Google Maps.
		9,815	8,744		L.	
ated to be active oil	storage:	50%				
be active oil storag	e:	4,908				
	Estimates	Estimates (m) of Diameter Height 18 8 17 7 7 4 7 3 6 3 5 3 3 1 3 2 2 18 8 8	Estimates (m) of Implied Total Volume as measured (cubic meters) 18 8 2,036 17 7 1,589 7 4 616 7 3 346 6 3 254 5 3 59 3 1 28 3 2 71 18 8 2,036 11 6 2,281 4 2 75 6 3 424 2 9,815 ated to be active oil storage: 50%	Estimates (m) of Implied Total Volume as measured (cubic meters) 8,744	Estimates (m) of Coordi Implied Total Volume as measured (cubic meters) Latitude	Implied Total Volume as measured (cubic meters)

Notes: reported by CIA (reference 1) as "Chongjin Pet Prod Stor PUG N". Location is stated to have large amounts of underground storage.

Location of bunkers or tanks is not certain, but candidate buildings and cleared areas are nearby, likely near the main roads. Dry and hilly near farmland. 'Many of tanks found seem to be associated with Chongjin Coal Refinery.

Views of Tank Locations at Chongjin













5 Summary of 1982 CIA Estimates of Oil Storage Volumes by Location that were Not Reviewed using Google Maps by Nautilus (including "Naval", "Air", and "Industrial")

Source: United States Central Intelligence Agency, National Photographic Interpretation Center (CIA, 1982), *Imagery Analysis Report: POL Storage Capacity North Korea, 1982 Estimates*. Report number CIA-RDP83T00574R000102600001-7 (redacted). Available as https://www.cia.gov/library/readingroom/docs/CIA-RDP83T00574R000102600001-7.pdf.

Oil Storage Locations Identified in Source 1 (CIA, 1982) but Not Reviewed on Google Maps

Avang Chon Petr Prod Stor 4,200 667 39.195 125.870 Page 14 of Source 1 Approximate Coordinates Total storage volume (bb), all tanks at location Total storage volume (bb), all tanks at location tame of Facility as Described Total storage volume (bb), all tanks at location Total storage				A	0	1
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Noturne (bb), all tanks at location Latitude Longitude Notes						
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lame of Facility as Described location meters) Approximate Coordinates Total storage solume (bb), all tanks at location It location Total storage solume (bb), all tanks at location It location I		` ''				
Avang Chon Petr Prod Stor 4,200 667 39.195 125.870 Page 14 of Source 1 Approximate Coordinates Total storage volume (bb), all tanks at location Total storage volume (bb), all tanks at loca		all tanks at	(cubic			
Total storage volume (bbl), all tanks at location all tanks at loc	Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
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Total storage volume (bbl), all tanks at location Total						1
Total storage volume (bbl), all tanks at location Total		1	T-4-1	Approximate (Coordinates	
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all tanks at location meters) Latitude Longitude Notes 2				ĺ	1	
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Total storage volume (bbl), all tanks at location Agric Country Country	Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Total storage volume (bbl), all tanks at location Agric Country Country						
In the proof of Facility as Described and Indiana and	Pyonggang Pet Prods	12,600	1,589	38.404	127.291	Page 14 of Source 1
In the proof of Facility as Described and Indiana and			Takal	1		Т
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all tanks at location meters) Latitude Longitude Notes Manpo-up Agri Stor Area 5,460 868 41.157 126.408 Page 15 of Source 1 Total storage volume (bbl), all tanks at location with meters) Latitude Longitude Notes Latitude Longitude Notes		_	-	1		
Alame of Facility as Described location meters) Latitude Longitude Notes Summary				ĺ	1	
Manpo-up Agri Stor Area 5,460 868 41.157 126.408 Page 15 of Source 1 Total storage volume (bbl), all tanks at location meters) Latitude Longitude Notes	Name of English on Described			Latituda	Longitudo	Notes
Total storage storage volume (bbl), all tanks at location	INAME OF FACILITY AS DESCRIDED	location	meters)	Latitude	Longitude	INOIGS
Total storage storage volume (bbl), all tanks at location	Manpo-up Agri Stor Area	5.460	868	41.157	126.408	Page 15 of Source 1
Total storage volume (bbl), all tanks at location storage volume (cubic meters) Latitude Longitude Notes		2,100	, 300			1 -0
volume (bbl), all tanks at location weters) Latitude Longitude Notes			Total			
volume (bbl), all tanks at location weters) Latitude Longitude Notes		Total storage	storage	ĺ	1	
all tanks at location meters) Latitude Longitude Notes			volume	ĺ	1	
lame of Facility as Described location meters) Latitude Longitude Notes		all tanks at		1		
	Name of Facility as Described			Latitude	Longitude	Notes
Santong Ni Pet Prods Stor 12,600 1,589 40.092 127.314 Page 15 of Source 1						
	Santong Ni Pet Prods Stor	12,600	1,589	40.092	127.314	Page 15 of Source 1

		I	1	1	
	T-4-1 -4	Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Equility on Department	all tanks at	(cubic	Latituda	Longitudo	Notoo
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Kuyon Ni Pet Prods Stor NE	10,080	1,602	38.479	126.067	Page 16 of Source 1
rayon in our road our inc	10,000	1,002	00.170	120.001	i age to di coaloc i
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Sukchon Pet Prds Stor	16,800	2,670	39.411	125.614	Page 16 of Source 1
	1	Total	I	1	T
	Total atorogo	Total			
	Total storage	storage			
	volume (bbl), all tanks at	volume (cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
ramo or radiity as Described	iocation	motoraj	Latitude	Longitude	11000
Pukchang Ni Pet Prods Stor	15,120	2,403	39.495	126.288	Page 16 of Source 1
	•			,	. •
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Kasan Dat Drada Star C	0.005	4 202	20.052	407 400	Dama 4C of Course 4
Kosan Pet Prods Stor S	8,085	1,282	38.852	127.420	Page 16 of Source 1
1		Total			
	Total storage	Total storage			
	Total storage	storage			
	volume (bbl),	storage volume			
Name of Facility as Described	volume (bbl), all tanks at	storage volume (cubic	Latitude	Lonaitude	Notes
Name of Facility as Described	volume (bbl),	storage volume	Latitude	Longitude	Notes
Name of Facility as Described Panjong Ni Pet Prds Stor	volume (bbl), all tanks at	storage volume (cubic	Latitude 38.347		Notes Page 16 of Source 1
·	volume (bbl), all tanks at location	storage volume (cubic meters)			
·	volume (bbl), all tanks at location 10,920	storage volume (cubic meters) 1,067			
·	volume (bbl), all tanks at location 10,920	storage volume (cubic meters) 1,067 Total storage			
·	volume (bbl), all tanks at location 10,920 Total storage volume (bbl),	storage volume (cubic meters) 1,067 Total storage volume			
Panjong Ni Pet Prds Stor	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at	storage volume (cubic meters) 1,067 Total storage volume (cubic	38.347	127.461	Page 16 of Source 1
·	volume (bbl), all tanks at location 10,920 Total storage volume (bbl),	storage volume (cubic meters) 1,067 Total storage volume			
Panjong Ni Pet Prds Stor Name of Facility as Described	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,067 Total storage volume (cubic meters)	38.347	127.461	Page 16 of Source 1 Notes
Panjong Ni Pet Prds Stor	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at	storage volume (cubic meters) 1,067 Total storage volume (cubic	38.347	127.461	Page 16 of Source 1
Panjong Ni Pet Prds Stor Name of Facility as Described	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,067 Total storage volume (cubic meters) 1,068	38.347	127.461	Page 16 of Source 1 Notes
Panjong Ni Pet Prds Stor Name of Facility as Described	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location 6,720	storage volume (cubic meters) 1,067 Total storage volume (cubic meters) 1,068 Total	38.347	127.461	Page 16 of Source 1 Notes
Panjong Ni Pet Prds Stor Name of Facility as Described	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location 6,720 Total storage	storage volume (cubic meters) 1,067 Total storage volume (cubic meters) 1,068 Total storage	38.347	127.461	Page 16 of Source 1 Notes
Panjong Ni Pet Prds Stor Name of Facility as Described	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location 6,720 Total storage volume (bbl),	storage volume (cubic meters) 1,067 Total storage volume (cubic meters) 1,068 Total storage volume	38.347	127.461	Page 16 of Source 1 Notes
Panjong Ni Pet Prds Stor Name of Facility as Described Sinwon Ni Prob Pet Prods Stor Caves	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location 6,720 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,067 Total storage volume (cubic meters) 1,068 Total storage volume (cubic cubic meters)	38.347 Latitude 38.218	127.461 Longitude 125.711	Page 16 of Source 1 Notes Page 17 of Source 1
Panjong Ni Pet Prds Stor Name of Facility as Described	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location 6,720 Total storage volume (bbl),	storage volume (cubic meters) 1,067 Total storage volume (cubic meters) 1,068 Total storage volume	38.347	127.461	Page 16 of Source 1 Notes
Panjong Ni Pet Prds Stor Name of Facility as Described Sinwon Ni Prob Pet Prods Stor Caves	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location 6,720 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,067 Total storage volume (cubic meters) 1,068 Total storage volume (cubic cubic meters)	38.347 Latitude 38.218	Longitude 125.711 Longitude	Page 16 of Source 1 Notes Page 17 of Source 1
Panjong Ni Pet Prds Stor Name of Facility as Described Sinwon Ni Prob Pet Prods Stor Caves Name of Facility as Described	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location 6,720 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,067 Total storage volume (cubic meters) 1,068 Total storage volume (cubic meters)	38.347 Latitude 38.218 Latitude	Longitude 125.711 Longitude	Page 16 of Source 1 Notes Page 17 of Source 1 Notes
Panjong Ni Pet Prds Stor Name of Facility as Described Sinwon Ni Prob Pet Prods Stor Caves Name of Facility as Described	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location 6,720 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,067 Total storage volume (cubic meters) 1,068 Total storage volume (cubic meters)	38.347 Latitude 38.218 Latitude	Longitude 125.711 Longitude	Page 16 of Source 1 Notes Page 17 of Source 1 Notes
Panjong Ni Pet Prds Stor Name of Facility as Described Sinwon Ni Prob Pet Prods Stor Caves Name of Facility as Described	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location 6,720 Total storage volume (bbl), all tanks at location 10,710 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,067 Total storage volume (cubic meters) 1,068 Total storage volume (cubic meters) 1,701	38.347 Latitude 38.218 Latitude	Longitude 125.711 Longitude	Page 16 of Source 1 Notes Page 17 of Source 1 Notes
Panjong Ni Pet Prds Stor Name of Facility as Described Sinwon Ni Prob Pet Prods Stor Caves Name of Facility as Described	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location 6,720 Total storage volume (bbl), all tanks at location 10,710 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,067 Total storage volume (cubic meters) 1,068 Total storage volume (cubic meters) 1,701 Total storage volume (cubic meters) 1,701	38.347 Latitude 38.218 Latitude	Longitude 125.711 Longitude	Page 16 of Source 1 Notes Page 17 of Source 1 Notes
Panjong Ni Pet Prds Stor Name of Facility as Described Sinwon Ni Prob Pet Prods Stor Caves Name of Facility as Described Pyongyang Pet Prds Str	Total storage volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location 6,720 Total storage volume (bbl), all tanks at location 10,710 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,067 Total storage volume (cubic meters) 1,068 Total storage volume (cubic meters) 1,701 Total storage volume (cubic meters) 1,701	38.347 Latitude 38.218 Latitude 39.110	127.461 Longitude	Page 16 of Source 1 Notes Page 17 of Source 1 Notes Page 17 of Source 1
Panjong Ni Pet Prds Stor Name of Facility as Described Sinwon Ni Prob Pet Prods Stor Caves Name of Facility as Described	volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location 6,720 Total storage volume (bbl), all tanks at location 10,710 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,067 Total storage volume (cubic meters) 1,068 Total storage volume (cubic meters) 1,701 Total storage volume (cubic meters) 1,701	38.347 Latitude 38.218 Latitude	Longitude 125.711 Longitude	Page 16 of Source 1 Notes Page 17 of Source 1 Notes
Panjong Ni Pet Prds Stor Name of Facility as Described Sinwon Ni Prob Pet Prods Stor Caves Name of Facility as Described Pyongyang Pet Prds Str	Total storage volume (bbl), all tanks at location 10,920 Total storage volume (bbl), all tanks at location 6,720 Total storage volume (bbl), all tanks at location 10,710 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,067 Total storage volume (cubic meters) 1,068 Total storage volume (cubic meters) 1,701 Total storage volume (cubic meters) 1,701	38.347 Latitude 38.218 Latitude 39.110	Longitude 125.711 Longitude 125.792 Longitude	Page 16 of Source 1 Notes Page 17 of Source 1 Notes Page 17 of Source 1

		I=	ı	1	T
	T-4-1 -4	Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Facility as Described	all tanks at location	(cubic meters)	Latitude	Longitude	Notes
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Hwangju-up Pet Prods Stor	15,120	2,404	38.696	125 826	Page 17 of Source 1
rmangja ap r ot r road oto.	10,120	2,	00.000	120.020	1. ago 1. o. oom oo 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Hamhung Pet Prods Stor North	13,860	2,202	39.995	127.541	Page 17 of Source 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Name of Facility as Described	TO GALLOTT		Latitudo	Longitudo	1.101.00
Sondong Ni Pet Prods Stor	4,200	667	39.722	127.447	Page 17 of Source 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Sariwon Pet Prods Stor	18.900	3,004	38.492	125 904	Page 17 of Source 1
Sanwon r et r rous stor	10,300	3,004	30.492	125.004	rage in or oduice i
		Total			
	Total storage	Total storage			
	Total storage volume (bbl),				
	_	storage			
Name of Facility as Described	volume (bbl),	storage volume	Latitude	Longitude	Notes
	volume (bbl), all tanks at location	storage volume (cubic meters)			
Name of Facility as Described Sahgpan Ni Pet Prods Stor	volume (bbl), all tanks at	storage volume (cubic	Latitude 39.852		Notes Page 17 of Source 1
	volume (bbl), all tanks at location	storage volume (cubic meters)			
	volume (bbl), all tanks at location 7,980	storage volume (cubic meters) 1,268			
	volume (bbl), all tanks at location 7,980	storage volume (cubic meters) 1,268 Total storage			
	volume (bbl), all tanks at location 7,980 Total storage volume (bbl),	storage volume (cubic meters) 1,268 Total storage volume			
Sahgpan Ni Pet Prods Stor	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at	storage volume (cubic meters) 1,268 Total storage volume (cubic	39.852	125.266	Page 17 of Source 1
	volume (bbl), all tanks at location 7,980 Total storage volume (bbl),	storage volume (cubic meters) 1,268 Total storage volume			
Sahgpan Ni Pet Prods Stor	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at	storage volume (cubic meters) 1,268 Total storage volume (cubic	39.852	125.266 Longitude	Page 17 of Source 1
Sahgpan Ni Pet Prods Stor Name of Facility as Described	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,268 Total storage volume (cubic meters)	39.852	125.266 Longitude	Page 17 of Source 1 Notes
Sahgpan Ni Pet Prods Stor Name of Facility as Described	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,268 Total storage volume (cubic meters)	39.852	125.266 Longitude	Page 17 of Source 1 Notes
Sahgpan Ni Pet Prods Stor Name of Facility as Described	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,268 Total storage volume (cubic meters) 667	39.852	125.266 Longitude	Page 17 of Source 1 Notes
Sahgpan Ni Pet Prods Stor Name of Facility as Described	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location 4,200 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,268 Total storage volume (cubic meters) 667 Total	39.852	125.266 Longitude	Page 17 of Source 1 Notes
Sahgpan Ni Pet Prods Stor Name of Facility as Described Kaesong Pet Prods Stor SE	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location 4,200 Total storage	storage volume (cubic meters) 1,268 Total storage volume (cubic meters) 667 Total storage	39.852	125.266 Longitude	Page 17 of Source 1 Notes
Sahgpan Ni Pet Prods Stor Name of Facility as Described	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location 4,200 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,268 Total storage volume (cubic meters) 667 Total storage volume	39.852	125.266 Longitude	Page 17 of Source 1 Notes
Sahgpan Ni Pet Prods Stor Name of Facility as Described Kaesong Pet Prods Stor SE Name of Facility as Described	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location 4,200 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,268 Total storage volume (cubic meters) 667 Total storage volume (cubic meters)	39.852 Latitude 37.953 Latitude	Longitude 126.577	Page 17 of Source 1 Notes Page 18 of Source 1 Notes
Sahgpan Ni Pet Prods Stor Name of Facility as Described Kaesong Pet Prods Stor SE	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location 4,200 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,268 Total storage volume (cubic meters) 667 Total storage volume (cubic cubic meters)	39.852 Latitude 37.953	Longitude 126.577	Page 17 of Source 1 Notes Page 18 of Source 1
Sahgpan Ni Pet Prods Stor Name of Facility as Described Kaesong Pet Prods Stor SE Name of Facility as Described	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location 4,200 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,268 Total storage volume (cubic meters) 667 Total storage volume (cubic meters) 1,201	39.852 Latitude 37.953 Latitude	Longitude 126.577	Page 17 of Source 1 Notes Page 18 of Source 1 Notes
Sahgpan Ni Pet Prods Stor Name of Facility as Described Kaesong Pet Prods Stor SE Name of Facility as Described	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location 4,200 Total storage volume (bbl), all tanks at location Total storage volume (bbl), all tanks at location 7,560	storage volume (cubic meters) 1,268 Total storage volume (cubic meters) 667 Total storage volume (cubic meters) 1,201 Total	39.852 Latitude 37.953 Latitude	Longitude 126.577	Page 17 of Source 1 Notes Page 18 of Source 1 Notes
Sahgpan Ni Pet Prods Stor Name of Facility as Described Kaesong Pet Prods Stor SE Name of Facility as Described	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location 4,200 Total storage volume (bbl), all tanks at location Total storage volume (bbl), all tanks at location 7,560 Total storage	storage volume (cubic meters) 1,268 Total storage volume (cubic meters) 667 Total storage volume (cubic meters) 1,201 Total storage	39.852 Latitude 37.953 Latitude	Longitude 126.577	Page 17 of Source 1 Notes Page 18 of Source 1 Notes
Sahgpan Ni Pet Prods Stor Name of Facility as Described Kaesong Pet Prods Stor SE Name of Facility as Described	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location 4,200 Total storage volume (bbl), all tanks at location 7,560 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,268 Total storage volume (cubic meters) 667 Total storage volume (cubic meters) 1,201 Total storage volume (cubic meters) 1,201	39.852 Latitude 37.953 Latitude	Longitude 126.577	Page 17 of Source 1 Notes Page 18 of Source 1 Notes
Name of Facility as Described Kaesong Pet Prods Stor SE Name of Facility as Described Oryongpo Pet Prods Stor	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location 4,200 Total storage volume (bbl), all tanks at location 7,560 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,268 Total storage volume (cubic meters) 667 Total storage volume (cubic meters) 1,201 Total storage volume (cubic meters) 1,201	39.852 Latitude	125.266 Longitude	Page 17 of Source 1 Notes Page 18 of Source 1 Notes Page 18 of Source 1
Sahgpan Ni Pet Prods Stor Name of Facility as Described Kaesong Pet Prods Stor SE Name of Facility as Described	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location 4,200 Total storage volume (bbl), all tanks at location 7,560 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,268 Total storage volume (cubic meters) 667 Total storage volume (cubic meters) 1,201 Total storage volume (cubic meters) 1,201	39.852 Latitude 37.953 Latitude	Longitude 126.577	Page 17 of Source 1 Notes Page 18 of Source 1 Notes
Sahgpan Ni Pet Prods Stor Name of Facility as Described Kaesong Pet Prods Stor SE Name of Facility as Described Oryongpo Pet Prods Stor	volume (bbl), all tanks at location 7,980 Total storage volume (bbl), all tanks at location 4,200 Total storage volume (bbl), all tanks at location 7,560 Total storage volume (bbl), all tanks at location	storage volume (cubic meters) 1,268 Total storage volume (cubic meters) 667 Total storage volume (cubic meters) 1,201 Total storage volume (cubic meters) 1,201	39.852 Latitude	Longitude 126.577 Longitude 126.061 Longitude	Page 17 of Source 1 Notes Page 18 of Source 1 Notes Page 18 of Source 1

		Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Facility on Decembed	all tanks at	(cubic	Latitude	Langituda	Notes
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Kaechon Pet Prods Stor	9,765	1,552	39.685	125.911	Page 18 of Source 1
		Total			
	Total storage	storage			
	volume (bbl), all tanks at	volume (cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
, , , , , , , , , , , , , , , , , , ,		,		J	
Samsa Dong POL Stor	10,290	1,634	39.042	126.929	Page 18 of Source 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Facilities as Deposits of	all tanks at	(cubic	1 -414	l an alterda	Nata
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Tongnim Pol Stor Area	8,400	1,335	39.864	124.722	Page 18 of Source 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Tokchon Pol Stor Area PUG W	16,800	2,670	39.751	126.258	Page 18 of Source 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Nanjin Port Facilites	13,470	2,139	42.225	130.288	Page 19 of Source 1
	1	Total	I		
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Chongjin Pet Prods	12,660	2,011	41.769	129.781	Page 19 of Source 1
	1	Total	<u> </u>		
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Chongjin Shipyard	12,620	2,002	41.771	129.797	Page 19 of Source 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Facility on Described	all tanks at	(cubic	ا منند، ما -	l amais: -1-	Notes
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Chongjin PT Fac	3,600	572	41.779	129.827	Page 19 of Source 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Facility as Described	all tanks at location	(cubic meters)	Latitude	Longitude	Notes
Chongjin Pt Facs West	3,745				
TOTOTIQUE EL FACS WEST	3,745	595	41.760	129.766	Page 19 of Source 1

			ı	1	,
	-	Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Equility on Department	all tanks at	(cubic	Latituda	Longitudo	Notoo
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Odaejin-nodongjagu Port Facs	16,000	2,543	41.383	120 783	Page 19 of Source 1
Caacjiii licaoligjaga i olt i acs	10,000	2,040	41.000	123.700	i age 13 of Godiec 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Yongdae-nodongjagu Port Facilities	5,250	834	40.476	129.061	Page 19 of Source 1
		I	1	ı	T
	-	Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Facility on Decaribed	all tanks at	(cubic	l atituda	l ammituda	Notes
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Yongamni Chung Chon Pet Prod Stor	4,340	689	40.407	128 910	Page 19 of Source 1
Tongamini Chang Chom Fet Flod Stor	4,540	009	40.407	120.310	l age 19 of Gource 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
·					
Tong Ni Port Fac	3,080	489	40.070	128.273	Page 20 of Source 1
		1	1	1	T
		Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Facility on Described	all tanks at	(cubic	1 -4:4	l an aitenda	Natas
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Tojin Port Facility	1,785	283	40.070	128 240	Page 20 of Source 1
TOJITT OTT ACIITY	1,703	203	40.070	120.240	age 20 of Gource 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
•					
Hongwon Port Fac A Pet Prod Stor	4,760	756	40.020	127.979	Page 20 of Source 1
		Total			
		storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Marriage and ad Not Depart 17 14 20 112	1000	00-	22.25	400.000	D 00 -f 0 4
Mayangdori Nv Repair Yard A Stor UG	1,800	285	39.995	128.203	Page 20 of Source 1
	.,				
	1 .,,,,,	Total			
		Total			
	Total storage	storage			
	Total storage volume (bbl),	storage volume			
Name of Facility as Described	Total storage volume (bbl), all tanks at	storage volume (cubic	Latitude	Longitude	Notes
Name of Facility as Described	Total storage volume (bbl),	storage volume	Latitude	Longitude	Notes
Name of Facility as Described Samhodong Boatyard	Total storage volume (bbl), all tanks at	storage volume (cubic	Latitude 39.938		Notes Page 20 of Source 1

	1	I	1	1	
	Tatal ataus as	Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Escility as Described	all tanks at location	(cubic meters)	Latitude	Longitude	Notes
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Yoho Ri Naval Base	5,040	801	39.874	127 782	Page 20 of Source 1
TOTO TATAWAI BAGO	0,010	001	00.07 1	127.702	1 ago 20 01 couldo 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Hungdogi Dong Pet Prod Stor	12,215	1,942	39.831	127.635	Page 20 of Source 1
	1	I	1	ı	
		Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Equility on Departhed	all tanks at	(cubic	Latituda	Longitudo	Nietos
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Munchon Up Nvb and Shipyard	5,355	850	39.314	127 401	Page 20 of Source 1
Widnerforf op 14%b and ompydra	0,000	000	33.514	127.401	i age 20 of course i
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Nampo Supreme Nav Hg A Shp Rp Yrd	2,100	333	38.719	125.384	Page 21 of Source 1
	T	Total	I	I	
	Tatal ataus as	Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Facility as Described	all tanks at location	(cubic meters)	Latitude	Longitude	Notes
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Cho-do Naval Facility	7,560	1,201	38.533	124 873	Page 21 of Source 1
one de marar aomy	.,000	1,201	55.555	12.10.0	1. ago 21 0. coa.co 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Cho-do Naval Base South	840	133	38.503	124.865	Page 21 of Source 1
	T	I .	ı	l	
	Takal at	Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Facility on Described	all tanks at	(cubic	ا منند، اما -	-ا-نائمسا	Nietos
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Pipa Got Naval Base A	1,680	267	38.588	12/ 020	Page 21 of Source 1
i ipa Sot Havai Daso A	1,000	201	30.300	127.300	i ago 21 di dodice i
		Total			
	Total storage	storage			
	volume (bbl),	volume			
		(cubic			
	all tanks at	(Cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
	location	meters)			
Name of Facility as Described Haeju Naval Rp Yard		,	Latitude 37.996		Notes Page 21 of Source 1

	L .	Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Sangon Ni Pet Prods Stor	12,415	1,972	37.830	125.348	Page 21 of Source 1
	1	Tatal			Т
		Total			
		storage			
		volume			
Name of Facility on Deposits of	1	(cubic	L - Alta and -	l an aitenda	Nata
Name of Facility as Described	1	meters)	Latitude	Longitude	Notes
Orong Airfield	10,920	1 725	41.427	120 651	Dago 22 of Course 4
Orang Airfield	10,920	1,735	41.427	129.651	Page 22 of Source 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	,	Latitudo	Longitudo	Notes
Ivanic of Facility as Described	iocation	meters)	Latitude	Longitude	Notes
Hyesan Airfield	4,095	650	41.376	128 207	Page 22 of Source 1
i iyosan Ailiiciu	4,035	030	41.370	120.201	I ago 22 of Gource I
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
INAME OF ACTIVE AS DESCRIBED	location	meters)	Latitude	Longitude	Inotes
Manpo Airfield	7,980	1,267	41.137	126 359	Page 22 of Source 1
Manpo 7 timola	7,000	1,201	11.107	120.000	1 ago 22 of Courso 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Facility as Described	volume (bbl), all tanks at	volume (cubic	I atitude	I onaitude	Notes
Name of Facility as Described	volume (bbl),	volume	Latitude	Longitude	Notes
	volume (bbl), all tanks at location	volume (cubic meters)		Ŭ	
Name of Facility as Described Hwangsuwon Airfield	volume (bbl), all tanks at	volume (cubic	Latitude 40.679	Ŭ	Notes Page 22 of Source 1
	volume (bbl), all tanks at location	volume (cubic meters)		Ŭ	
	volume (bbl), all tanks at location 17,220	volume (cubic meters) 2,735		Ŭ	
	volume (bbl), all tanks at location 17,220	volume (cubic meters) 2,735 Total storage		Ŭ	
	volume (bbl), all tanks at location 17,220 Total storage volume (bbl),	volume (cubic meters) 2,735 Total storage volume		Ü	
Hwangsuwon Airfield	volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at	volume (cubic meters) 2,735 Total storage volume (cubic	40.679	128.153	Page 22 of Source 1
	volume (bbl), all tanks at location 17,220 Total storage volume (bbl),	volume (cubic meters) 2,735 Total storage volume		Ü	
Hwangsuwon Airfield	volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at	volume (cubic meters) 2,735 Total storage volume (cubic	40.679	128.153	Page 22 of Source 1
Hwangsuwon Airfield Name of Facility as Described	volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location	volume (cubic meters) 2,735 Total storage volume (cubic meters)	40.679 Latitude	128.153	Page 22 of Source 1 Notes
Hwangsuwon Airfield Name of Facility as Described	volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location	volume (cubic meters) 2,735 Total storage volume (cubic meters)	40.679 Latitude	128.153	Page 22 of Source 1 Notes
Hwangsuwon Airfield Name of Facility as Described	volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location 9,240	volume (cubic meters) 2,735 Total storage volume (cubic meters) 1,469 Total	40.679 Latitude	128.153	Page 22 of Source 1 Notes
Hwangsuwon Airfield Name of Facility as Described	volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location 9,240	volume (cubic meters) 2,735 Total storage volume (cubic meters)	40.679 Latitude	128.153	Page 22 of Source 1 Notes
Hwangsuwon Airfield Name of Facility as Described	volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location 9,240 Total storage	volume (cubic meters) 2,735 Total storage volume (cubic meters) 1,469 Total storage volume	40.679 Latitude	128.153	Page 22 of Source 1 Notes
Hwangsuwon Airfield Name of Facility as Described	Total storage volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location 9,240 Total storage volume (bbl),	volume (cubic meters) 2,735 Total storage volume (cubic meters) 1,469 Total storage	40.679 Latitude	128.153	Page 22 of Source 1 Notes
Name of Facility as Described Changjin Up Airfield	Total storage volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location 9,240 Total storage volume (bbl), all tanks at location	volume (cubic meters) 2,735 Total storage volume (cubic meters) 1,469 Total storage volume (cubic meters)	40.679 Latitude 40.365	128.153 Longitude 127.264	Page 22 of Source 1 Notes Page 22 of Source 1
Name of Facility as Described Changjin Up Airfield	Total storage volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location 9,240 Total storage volume (bbl), all tanks at location	volume (cubic meters) 2,735 Total storage volume (cubic meters) 1,469 Total storage volume (cubic meters)	40.679 Latitude 40.365	Longitude 127.264 Longitude	Page 22 of Source 1 Notes Page 22 of Source 1
Name of Facility as Described Changjin Up Airfield Name of Facility as Described	Total storage volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location 9,240 Total storage volume (bbl), all tanks at location	volume (cubic meters) 2,735 Total storage volume (cubic meters) 1,469 Total storage volume (cubic meters)	Latitude 40.365 Latitude	Longitude 127.264 Longitude	Page 22 of Source 1 Notes Page 22 of Source 1 Notes
Name of Facility as Described Changjin Up Airfield Name of Facility as Described	Total storage volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location 9,240 Total storage volume (bbl), all tanks at location	volume (cubic meters) 2,735 Total storage volume (cubic meters) 1,469 Total storage volume (cubic meters)	Latitude 40.365 Latitude	Longitude 127.264 Longitude	Page 22 of Source 1 Notes Page 22 of Source 1 Notes
Name of Facility as Described Changjin Up Airfield Name of Facility as Described	Total storage volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location 9,240 Total storage volume (bbl), all tanks at location	volume (cubic meters) 2,735 Total storage volume (cubic meters) 1,469 Total storage volume (cubic meters) 2,068	Latitude 40.365 Latitude	Longitude 127.264 Longitude	Page 22 of Source 1 Notes Page 22 of Source 1 Notes
Name of Facility as Described Changjin Up Airfield Name of Facility as Described	Total storage volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location 9,240 Total storage volume (bbl), all tanks at location 13,020	volume (cubic meters) 2,735 Total storage volume (cubic meters) 1,469 Total storage volume (cubic meters) 2,068 Total	Latitude 40.365 Latitude	Longitude 127.264 Longitude	Page 22 of Source 1 Notes Page 22 of Source 1 Notes
Name of Facility as Described Changjin Up Airfield Name of Facility as Described	volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location 9,240 Total storage volume (bbl), all tanks at location 13,020 Total storage volume (bbl), all tanks at location	volume (cubic meters) 2,735 Total storage volume (cubic meters) 1,469 Total storage volume (cubic meters) 2,068 Total storage volume (cubic meters) 2,068	Latitude 40.365 Latitude	Longitude 127.264 Longitude	Page 22 of Source 1 Notes Page 22 of Source 1 Notes
Name of Facility as Described Changjin Up Airfield Name of Facility as Described	Total storage volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location 9,240 Total storage volume (bbl), all tanks at location 13,020 Total storage volume (bbl), all tanks at location	volume (cubic meters) 2,735 Total storage volume (cubic meters) 1,469 Total storage volume (cubic meters) 2,068 Total storage volume (cubic meters) 2,068	Latitude 40.365 Latitude	128.153 Longitude 127.264 Longitude 124.499	Page 22 of Source 1 Notes Page 22 of Source 1 Notes
Name of Facility as Described Changjin Up Airfield Name of Facility as Described Uiju Airfield	Total storage volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location 9,240 Total storage volume (bbl), all tanks at location 13,020 Total storage volume (bbl), all tanks at location	volume (cubic meters) 2,735 Total storage volume (cubic meters) 1,469 Total storage volume (cubic meters) 2,068 Total storage volume (cubic meters) 2,068	40.679 Latitude 40.365 Latitude 40.152	128.153 Longitude 127.264 Longitude 124.499	Page 22 of Source 1 Notes Page 22 of Source 1 Notes Page 23 of Source 1
Name of Facility as Described Changjin Up Airfield Name of Facility as Described Uiju Airfield	Total storage volume (bbl), all tanks at location 17,220 Total storage volume (bbl), all tanks at location 9,240 Total storage volume (bbl), all tanks at location 13,020 Total storage volume (bbl), all tanks at location	volume (cubic meters) 2,735 Total storage volume (cubic meters) 1,469 Total storage volume (cubic meters) 2,068 Total storage volume (cubic meters) 2,068	40.679 Latitude 40.365 Latitude 40.152	Longitude 127.264 Longitude 124.499 Longitude	Page 22 of Source 1 Notes Page 22 of Source 1 Notes Page 23 of Source 1

	1	IT-4-1			
	Total storage	Total storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Taechon Airfield	1,260	200	39.901	125.491	Page 23 of Source 1
	1	Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Toksan Airfield	4,620	735	39.994	127.615	Page 23 of Source 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Kaechon Airfield	12,180	1,936	39.751	125.904	Page 23 of Source 1
	,	, , , , , , , , , , , , , , , , , , ,			
	Total -4-	Total			
	Total storage	storage			
	volume (bbl), all tanks at	volume (cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
0 11 1:511	40.400	0.000	00.745	407.474	5 00 10
Sondok Airfield	18,480	2,938	39.745	127.474	Page 23 of Source 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Facility on Department	all tanks at	(cubic	L - 414 d -	l an aite da	Nata
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Pukchang Airfield	4,830	768	39.502	125.967	Page 23 of Source 1
	1	IT-4-1		I	
	Total atoraga	Total			
	Total storage volume (bbl),	storage volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
0 1 1:511	0.070	4 000	00.400	405.000	5 04 10
Sunchon Airfield	2,878	1,068	39.409	125.893	Page 24 of Source 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Facility as Described	all tanks at location	(cubic meters)	Latitude	Longitude	Notes
reality as Described	iocation	11101013)	Lantuuc	Longitude	110003
Sunan Airfield	18,480	2,938	39.203	125.673	Page 24 of Source 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Facility on Described	all tanks at	(cubic	Latituda	Longitude	Notes
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Miram Airfield	1,260	200	39.014	125.846	Page 24 of Source 1
	1	Total			
	Total storage	Total storage			
	Total storage volume (bbl),	storage			
	Total storage volume (bbl), all tanks at				
Name of Facility as Described	volume (bbl),	storage volume	Latitude	Longitude	Notes
Name of Facility as Described Wonsan Airfield	volume (bbl), all tanks at	storage volume (cubic	Latitude 39.164		Notes Page 24 of Source 1

	1	I 			
	Tatal ataus as	Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Escility as Described	all tanks at location	(cubic	Latitude	Longitudo	Notes
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Onchon Airfield	11,760	1,870	38.907	125 234	Page 24 of Source 1
CHOTOT / MILIOR	11,700	1,070	00.007	120.201	1 490 2 1 01 004100 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Koksan Airfield	14,070	2,237	38.687	126.606	Page 25 of Source 1
	1	I -	Ī		
		Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Equility on Departured	all tanks at	(cubic	Latituda	Longitudo	Notes
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Hyon-ni Airfield	9,240	1,469	38.611	127 454	Page 25 of Source 1
Try of the Admicia	3,240	1,403	30.011	127.404	1 age 23 of Goulee 1
		Total			
	Total storage	storage			
	volume (bbl),	volume			
	all tanks at	(cubic			
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Kwail Airfield	11,760	1,870	38.423	125.021	Page 25 of Source 1
	1	I 			
	Tatal ataus as	Total			
	Total storage	storage			
	volume (bbl),	volume			
Name of Facility as Described	all tanks at location	(cubic meters)	Latitude	Longitude	Notes
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Taetan Airfield	12,600	2,003	38.128	125 247	Page 25 of Source 1
Taotair / iiiiota	.2,000	2,000	00.120	.20.2	. ago 20 0. Coaroo .
		Total			
	Total atomore	1 - 4			
	Total storage	storage			
	volume (bbl),	volume			
	_				
Name of Facility as Described	volume (bbl),	volume	Latitude	Longitude	Notes
·	volume (bbl), all tanks at location	volume (cubic meters)			
Name of Facility as Described Haeju Airfield	volume (bbl), all tanks at	volume (cubic	Latitude 38.004		Notes Page 25 of Source 1
·	volume (bbl), all tanks at location	volume (cubic meters)			
·	volume (bbl), all tanks at location 1,890	volume (cubic meters) 300			
·	volume (bbl), all tanks at location 1,890	volume (cubic meters) 300 Total storage			
·	volume (bbl), all tanks at location 1,890 Total storage volume (bbl),	volume (cubic meters) 300 Total storage volume			
Haeju Airfield	volume (bbl), all tanks at location 1,890 Total storage volume (bbl), all tanks at	volume (cubic meters) 300 Total storage volume (cubic	38.004	125.781	Page 25 of Source 1
·	volume (bbl), all tanks at location 1,890 Total storage volume (bbl),	volume (cubic meters) 300 Total storage volume			
Haeju Airfield Name of Facility as Described	volume (bbl), all tanks at location 1,890 Total storage volume (bbl), all tanks at location	volume (cubic meters) 300 Total storage volume (cubic meters)	38.004	125.781	Page 25 of Source 1 Notes
Haeju Airfield	volume (bbl), all tanks at location 1,890 Total storage volume (bbl), all tanks at	volume (cubic meters) 300 Total storage volume (cubic	38.004	125.781	Page 25 of Source 1
Haeju Airfield Name of Facility as Described	volume (bbl), all tanks at location 1,890 Total storage volume (bbl), all tanks at location	volume (cubic meters) 300 Total storage volume (cubic meters)	38.004	125.781	Page 25 of Source 1 Notes
Haeju Airfield Name of Facility as Described	volume (bbl), all tanks at location 1,890 Total storage volume (bbl), all tanks at location	volume (cubic meters) 300 Total storage volume (cubic meters) 467 Total	38.004	125.781	Page 25 of Source 1 Notes
Haeju Airfield Name of Facility as Described	volume (bbl), all tanks at location 1,890 Total storage volume (bbl), all tanks at location 2,940	volume (cubic meters) 300 Total storage volume (cubic meters)	38.004	125.781	Page 25 of Source 1 Notes
Haeju Airfield Name of Facility as Described	volume (bbl), all tanks at location 1,890 Total storage volume (bbl), all tanks at location 2,940 Total storage	volume (cubic meters) 300 Total storage volume (cubic meters) 467 Total storage	38.004	125.781	Page 25 of Source 1 Notes
Haeju Airfield Name of Facility as Described	volume (bbl), all tanks at location 1,890 Total storage volume (bbl), all tanks at location 2,940 Total storage volume (bbl), all tanks at location	volume (cubic meters) 300 Total storage volume (cubic meters) 467 Total storage volume	38.004	125.781	Page 25 of Source 1 Notes
Name of Facility as Described Nuchon Ni Airfield Name of Facility as Described	volume (bbl), all tanks at location 1,890 Total storage volume (bbl), all tanks at location 2,940 Total storage volume (bbl), all tanks at location	volume (cubic meters) 300 Total storage volume (cubic meters) 467 Total storage volume (cubic meters)	38.004 Latitude 38.236 Latitude	Longitude 126.125 Longitude	Page 25 of Source 1 Notes Page 25 of Source 1 Notes
Name of Facility as Described Nuchon Ni Airfield	Total storage volume (bbl), all tanks at location 1,890 Total storage volume (bbl), all tanks at location 2,940 Total storage volume (bbl), all tanks at location	volume (cubic meters) 300 Total storage volume (cubic meters) 467 Total storage volume (cubic cubic defenses	38.004 Latitude 38.236	Longitude 126.125 Longitude	Page 25 of Source 1 Notes Page 25 of Source 1

Name of Facility as Described	Total storage volume (bbl), all tanks at location	Total storage volume (cubic meters)	Latitude	Longitude	Notes
Kwaksan Airfield	3,360	534	39.729	125.113	Page 25 of Source 1
Name of Facility on Described	Total storage volume (bbl), all tanks at	Total storage volume (cubic	Latituda	Lancituda	Nata
Name of Facility as Described	location	meters)	Latitude	Longitude	Notes
Sonchon Airfield	1,890	300	39.917	124.841	Page 25 of Source 1

6 Nautilus Review of Possible Oil Storage Sites Not Included in 1982 U.S. Central Intelligence Agency Estimates (visible aboveground)

Oil Storage Locations Not Identified in Source 1 (CIA, 1982) but Reviewed on Google Earth.									
Location: Nampo, So	outh Pyongan, No	orth Korea, G	oogle Earth	images, 06/	26/2019				
Visible Tanks	Estimates Diameter	(m) of Height	Implied Total Volume as measured (cubic meters)	Approximate Longitude	Coordinates Lattitude	Notes			
1	11	8	760	38.734	125.230	Silvery tank, appears slightly worn.			
Total of above			760						
Fraction of volume estimated to be active oil storage: Total volume estimated to be active oil storage:			100% 760						

View of Tanks at Nampo



Location: Nampo, South Pyongan, North Korea, Google Earth images, 06/26/2019									
	, <u>, , , , , , , , , , , , , , , , , , </u>			y ,		1			
l			Implied Total Volume as						
			measured						
	Estimates	(m) of	(cubic meters)	Approximate (Coordinates				
Visible Tanks	Diameter	Height	meters)	Longitude		Notes			
1	24	10	4,524	38.696	125.292	Newish silver tank, near dock area.			
1	15	6	1,060	38.696	125.292	Newish silver tank.			
1	23	9	3,739	38.696	125.292	Worn silver tank.			
2	18	8	4,072	38.696	125.292	Worn silver tanks.			
6	6	5	848	38.696	125.292	Worn white tanks.			
						Silver tanks, connected together. May hold			
						industrial product or intermediate rather than oil			
10	8	6	3,016	38.696	125.292	products.			
_			44	00.700	405.000	Constitution to the			
7	2	2	44	38.703	125.303	Small white tanks.			
2	10	0	_	38.703	125 300	Appear to be buried or removed tanks.			
	10	0		30.703	123.300	propositio de bulleu di Terrioveu tariko.			
Total of above Fraction of volume estimates	Lated to be active oil	storage:	17,303 75%						
Fraction of volume estimated to be active oil storage: Total volume estimated to be active oil storage:			12,977						

Views of Tanks at Nampo





Location: Kwail, Sou	th Hwanghae, No		Implied Total Volume as measured (cubic			
	Estimates	(m) of	meters)	Approximate	Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
2	12	0	-	38.558	124.996	Appear to be buried or removed tanks.
Total of above			-			_
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to be active oil storage:			-			

View of Tanks at Kwail



Location: Monggump	oo, Monggumpo-	ri, South Hwa	anghae, Nor	th Korea, 06	/26/2019	
	Estimates		Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height	Í	Longitude	Lattitude	Notes
2	8	4	402	38.295	124.876	Tanks at coastal facility.
Total of above			402			
Fraction of volume estima	100%					
Total volume estimated to	be active oil storag	e:	402			

View of Tanks at Monggumpo



Location: Hyu-dong,	North Korea, 06/	27/2019				
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height	,			Notes
1	7	4	154	37.928	124.989	Possible tank, difficult to make out.
Total of above			154			
Fraction of volume estima	Fraction of volume estimated to be active oil storage:					
Total volume estimated to	be active oil storag	e:	139			

View of Tanks at Hyo-dong



Location: Changdae			Implied Total Volume as measured (cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
3	11	4	1,140	37.807		Older looking tan tanks. May be used for something other than oil. Coastal facility, probabl fish ponds.
Total of above			1,140			
Fraction of volume estima	50%					
Total volume estimated to	o be active oil storag	e:	570			

View of Tanks at Changdae



Location: Changdae			Implied Total Volume as measured			
	Estimates	(m) of	(cubic meters)	Approximate (Coordinates	
Visible Tanks		Height	,		Lattitude	Notes
		2	112	27.760	125 276	Older legking top topke
2	6	2	113	37.769	125.376	Older looking tan tanks.
Total of above			113			
Fraction of volume estima	50%					
Total volume estimated to	o be active oil storag	e:	57			

View of Tanks at Changdae



ocation: Haeju, South Hwanghae, North Korea, 06/27/2019									
Location: Haeju, Sou	ith Hwanghae, No	ortn Korea, U	6/2//2019						
			1			1			
			Implied Total						
			Volume as						
			measured						
			(cubic						
	Estimates	(m) of	meters)	Approximate (Coordinates				
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes			
1	7	3	115	38.028	125.653	Older looking tan tanks.			
						•			
1	14	4	616	38.028	125.653	Older looking tan tanks.			
Total of above			731						
Fraction of volume estima	Fraction of volume estimated to be active oil storage:								
Total volume estimated to	o be active oil storag	e:	658						

View of Tanks at Haeju



Location: Haeiu. Sou	ocation: Haeju, South Hwanghae, North Korea, 06/27/2019									
Location: Hacja, coa	tii iiwangnae, itt	ortin reorea, o	O/E//EU/J							
			Implied Total							
			Volume as							
			measured							
			(cubic		- " ·					
	Estimates		meters)	Approximate (
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes				
2	10	3	471	38.030	125.666	Older looking tan tanks.				
4	14	6	3,695	38.030	125.666	Older looking tan tanks, connected at the center.				
						Appears to be processing unit of some type,				
1	6	3	85	38.030	125 666	probably not an oil tank.				
-										
						Appears to be processing unit of some type,				
4	18	0	_	38.030	125 666	probably not an oil tank.				
	10			30.000	123.000	probably not an on tank.				
						Appears to be presenting unit of some time				
2	20	0		20 020	105 600	Appears to be processing unit of some type,				
2	26	0	-	38.030	123.000	probably not an oil tank.				
						<u>.</u>				
3	23	0	-	38.030	125.666	Appears to be removed.				
1	11	0		38.030	125.666	Appears to be removed.				
Total of above			4,251							
Fraction of volume estima			75%							
Total volume estimated to	be active oil storag	e:	3,188							

Views of Tanks at Haeju





Location: Hadajon-ni	i, North Korea, 06	6/28/2019				
			Implied Total			
			Volume as			
			measured			
			(cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks		Height	motors)			Notes
VIOLDIO TATIKO	Diamotor	rioigne		Lorigitado	Lattitudo	110100
						Appears to be removed as busined but image
		2	382	20.700		Appears to be removed or buried, but image
2	9	3	382	38.799	128.132	quaility is low and the tanks may still exist.
1	3	2	14 396	38.799	128.132	Small white tank, possibly servicing nearby tank.
Total of above	Total of above					
Fraction of volume estima	ated to be active oil s	storage:	75%			
Total volume estimated to	o be active oil storag	e:	297			

View of Tanks at Hadajon-ni



Location: Wonsan, Kangwon, North Korea, 06/28/2019									
Location: Wonsan, Ka	angwon, North K	orea, 06/28/2	<u>019</u>						
Г									
			Implied Total						
			Volume as						
			measured						
			(cubic						
	Estimates	(m) of	meters)	Approximate (Coordinates				
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes			
1	9	4	254	38.799	128.132	Newer-looking tank.			
						3			
1	12	3	339	38.799	128.132	Appears to be removed or set into the ground.			
Total of above			594		•				
Fraction of volume estimated to be active oil storage:			60%						
Total volume estimated to	be active oil storage	e:	356						

Views of Tanks at Wonsan





Location: Munchon,	Kangwon, North	Korea, 06/28	/2019 Implied Total Volume as			
			measured			
	Estimates	(m) of	(cubic meters)	Approximate (Coordinates	
Visible Tanks		Height	motors			Notes
						White-colored tank, probably there to service
1	11	5	475	39.264	127.365	nearby dock areas.
Total of above			475			
Fraction of volume estimated to be active oil storage:			100%			
Total volume estimated to	o be active oil storag	e:	475			

View of Tanks at Munchon



ocation: Sinpo, South Hamgyong, North Korea, 07/01/2019									
Location: Sinpo, Sou	itti namgyong, No	orui Korea, u	7/01/2019						
						1			
			Implied Total						
			Volume as						
			measured						
			(cubic	l					
	Estimates	` '	meters)	Approximate (
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes			
1	11	6	570	40.030	128.172	Older rusted tank.			
1	5	3	59	40.030	128.172	Older rusted tank.			
Total of above	otal of above		629						
Fraction of volume estima	Fraction of volume estimated to be active oil storage:								
Total volume estimated to	be active oil storag	e:	440						

View of Tanks at Sinpo



Location: Kimchaek,	North Hamgyong	ą, North Kore	Implied Total Volume as			
			measured (cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
						Older rusted tanks. Appears to also have been a
2	9	3	382	40.616		third tank, though it appears to have been removed.
Total of above			382			
Fraction of volume estimated to be active oil storage:			20%			
Total volume estimated to	o be active oil storag	e:	76			

View of Tanks at Kimchaek



Location: Osang-dor	ocation: Osang-dong, North Korea, 07/01/2019									
<u>,</u>	Estimates		Implied Total Volume as measured (cubic meters)	Approximate (Coordinates					
Visible Tanks	Diameter	Height	,	Longitude	Lattitude	Notes				
1	5	2	39	41.322	129.766	Small white tank.				
Total of above	Total of above									
Fraction of volume estimated to be active oil storage:			100%							
Total volume estimated to	be active oil storag	e:	39							

View of Tanks at Osang-dong



Location: June 16	Thermal Power P	ant, Sonbong	, Rason, No	rth Korea, 07	7/01/2019	
		Estimates (m) of		Approximate (
/isible Tanks	Diameter	Height		Longitude	Lattitude	Notes
	2 1	7 8	3,632	42.328	130.381	Older rusted tanks.
	2	8 3	3 302	42.328	130.381	Older rusted tanks.
	7	7 4	1,078	42.328	120 201	Older rusted tanks.
		6 3		42.328		Older rusted tanks.
	2	4 2	50	42.328	130.381	Older rusted tanks. Older looking tanks, small and difficult to make
	6	6 3	509	42.328	130.381	out.
otal of above			5,994			
raction of volume esti	nated to be active oi	storage:	80%	1		
	to be active oil stora		4,795	1		

View of Tanks at June 16 Thermal Power Plant



Location: Changyon,	South Hwangha	e, North Kore	ea, 07/01/20	<u>19</u>		1
	Estimates		Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
2	11	0		38.250		Tanks appear to be very short, may be partially buried or removed.
Total of above			-			
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to	be active oil storag	e:	-			

View of Tanks at Changyon



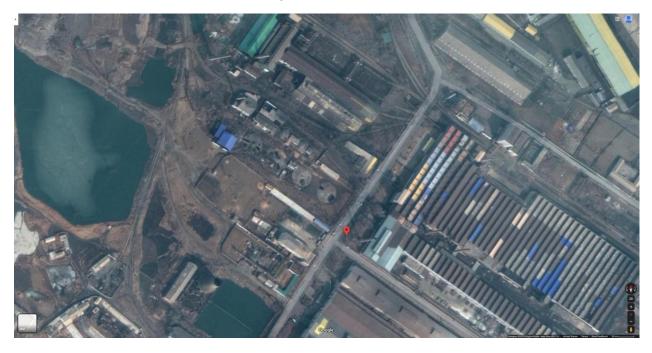
Location:Chollima, P	yongyang, North	Korea, 07/01	/2019			
			Implied Total Volume as measured (cubic			
	Estimates	` /	meters)	Approximate (
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
3	12	4	1,357	38.889	125.579	Older looking tanks.
1	20	8	2,513	38.891		Large yellow tank. Part of what appears to be a minerals processing facility.
Total of above			2,513			
Fraction of volume estima	Fraction of volume estimated to be active oil storage:					
Total volume estimated to			2,011			

View of Tanks at Chollima



	N	1/ 0=/0/	F/0040			
Location: Chollima, F	yongyang, North	Norea, 07/0	5/201 <u>9</u>			
			I			1
			Implied Total			
			Volume as			
			measured			
			(cubic		- " <i>'</i>	
Minible Tealer	Estimates		meters)	Approximate (NI-4
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
2	24	6	5,429	38.917	125.584	Older tanks, appear to be damaged.
						Older looking tanks. In an industrial area that
2	24	6	5,429	38.917	125.584	appears to be partly disused.
Total of above	Total of above					
Fraction of volume estimated to be active oil storage:			30%			
Total volume estimated to	be active oil storag	e:	1,629			

View of Tanks at Chollima



Location: Chollima, F	Pyongyang, North		Implied Total Volume as			
			measured			
			(cubic		_	
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
1	16	4	804	38.927	125.587	Older looking tank.
Total of above	Total of above					
Fraction of volume estima	Fraction of volume estimated to be active oil storage:					
Total volume estimated to	be active oil storag	e:	402			

View of Tanks at Chollima



ocation: Pyongyang, North Korea, 07/08/2019										
Location: Pyongyang	, North Korea, 07	<u>//08/2019</u>								
			1	1		1				
			Implied Total Volume as measured (cubic							
	Estimates	(m) of	meters)	Approximate (Coordinates					
Visible Tanks		Height			Lattitude	Notes				
	2.4000			_o.igitado						
1	18	7	1,781	39.084	125.708	Newish looking tanks.				
2	11	6	1,140	39.084	125.708	Newish looking tanks.				
1	17	6	1,362	39.084	125.708	Older looking tanks.				
1	12	5	565	39.084	125.708	Older looking tanks.				
Total of above			4,849							
Fraction of volume estimated to be active oil storage:			70%							
Total volume estimated to			3,394							

View of Tanks at Pyongyang



Location: South Pyo	ngan, North Kore	ea, 07/11/2019	Implied Total Volume as measured (cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
2	12	3	679	39.572		Older looking tanks. May be partially buried or removed.
Total of above			679			
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to	o be active oil storag	e:	-			

View of Tanks at South Pyongan



Location: Yongha, Se	outh Pyongan, No	orth Korea, 0	7/11/2019]
	Estimates		Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
1	6	3	85	39.594	126.265	Possible tank.
Total of above			85			
Fraction of volume estimated to be active oil storage:			100%			
Total volume estimated to	o be active oil storag	e:	85			

View of Tanks at South Yongha



Location: Yongha	a, Sc	outh Pyongan, No	orth Korea, 0	7/11/2019			
	Г			I			1
			Implied Total Volume as measured				
		Estimates	(m) of	(cubic meters)	Approximate (Coordinates	
Visible Tanks			Height	motoroj	Longitude	Lattitude	Notes
	2	20		5,655	39.586		Silvery new looking tanks. Located near Pukchang thermal power plant, largest in DPRK.
	2	11	7	1,330	39.586	126.298	Silvery new looking tanks.
	4	9	6	1,527	39.586	126.298	Older looking tanks.
	3	4	3	113	39.586	126.298	Older looking tanks.
	8	3	2	113	39.586	126.298	Older looking tanks.
		-					
	8	3	2		39.586	126.298	Older looking tanks.
Total of above	Fraction of volume estimated to be active oil storage:			8,851			
				90%			
Total volume estimat	tea to	o de active oil storag	e:	7,966	1		

View of Tanks at Yongha



Location: Sungho, Py	ongyang, North	Korea, 07/13	<u>/2019</u>							
			Implied Total							
			Volume as							
			measured							
			(cubic							
	Estimates	(m) of	meters)	Approximate (Coordinates					
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes				
2	9	4	509	38.955	125.975	Silvery new looking tanks.				
						-				
2	9	3	382	38.955	125 975	Silvery new looking tanks.				
	,		302	30.333	120.570	envery new looking tanks.				
2	14	7	2,155 3,046	38.955	125.975	Green tanks.				
Total of above	otal of above									
Fraction of volume estima	80%									
Total volume estimated to	be active oil storag	e:	2,437							

View of Tanks at Sŭngho



Location: Sangwon, I	<u>Pyongyang, Nortl</u>	n Korea, 07/1	<u>3/2019</u>							
_										
			Implied Total							
			Volume as							
			measured							
			(cubic							
	Estimates	(m) of	meters)	Approximate (Coordinates					
Visible Tanks	Diameter	Height	meters)	Longitude	Lattitude	Notes				
VISIBLE TALKS	Diametei	neigni		Longitude	Lattitude	Notes				
						Newish looking tanks, but likely to hold industrial				
						product or intermediates, not oil. Located at large				
2	23	20	16,619	38.878	126.038	factory outside of Pyongyang with rail lines on site.				
						Newish looking tanks, but likely to hold industrial				
8	16	20	32,170	38.878	126.038	product or intermediates, not oil.				
5	5	2	196	38.878	126.038	Small tanks, difficult to make out.				
Total of above			48,985							
Fraction of volume estima	10%									
Total volume estimated to	be active oil storage	e:	4,899							

View of Tanks at Sangwon



Location: Anju, Sou	th Pvongan, Norti	n Korea. 07/1:	3/2019			
Locationi / trju; oca	yongan, mora	1110104, 0171	<u> </u>			
			Implied Total Volume as measured (cubic			
	Estimates		meters)	Approximate (
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
	4 22	6	9,123	39.650	125 689	Newish looking tanks.
	7 22		3,123	33.030	120.000	received tooking tanks.
	5 12	4	2,262	39.650	125.689	Newish looking tanks.
	3 6	2	170	39.650	125.689	Newish looking tanks.
	2 5	2	79	39.650	125.689	Newish looking tanks.
	2 11		760	39.650		Older looking tanks, may be removed.
Total of above	- <u>''</u>	-	12,394	33.330	120.000	joide. Josiang tainto, may be formered.
Fraction of volume estim	90%					
Total volume estimated			11,154			
Total volume colimated	to so dolive on storaç	,··.	11,104			

View of Tanks at Anju



Location: Nyŏngbyŏr	n, North Pyongan	, North Kore	a, 07/13/201	9		
	Estimates	1 / -	Implied Total Volume as measured (cubic meters)	Approximate	Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
						Tan colored tanks with roofs with 12-segments.
						May or may not be oil tanks, as they are not near
						a railroad or major road. Part of a new-looking
						facility that may be residential or institutional, in an
6	12	5	3,393	39.708	125.794	area that is mostly forested and agricultural.
Total of above	Total of above					
Fraction of volume estima	50%					
Total volume estimated to	be active oil storag	e:	1,696			

View of Tanks at Nyŏngbyŏn



Location: Nyŏngbyŏr	n, North Pyongan	, North Kore	a, 07/14/201	9		
Visible Toples	Estimates	` '	Implied Total Volume as measured (cubic meters)	Approximate (Netro
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
1	17	6	1,362	39.801		Newish-looking tanks (or at least regularly maintained). Associated with DPRK nuclear research center (also called "Yongbyon"). Tanks
1	12	4	452	39.801		may or may not be for oil products, but are located adjacent to what appears to be the motor pool for the facility.
Total of above	12	4		39.001	120.701	the facility.
			1,814			
Fraction of volume estima	75%					
Total volume estimated to	be active oil storag	e:	1,361			

View of Tanks at Nyŏngbyŏn



Location: Hamhung,	South Hamqyond	a. North Kore	a. 07/14/201	19		
<u>J</u>						
			Implied Total			
			Volume as			
			measured			
			(cubic			
	Estimates		meters)	Approximate (
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
3	0	,	254	39.849	407 570	Dusted leaking tenks
3	6	3	254	39.849	127.572	Rusted looking tanks.
3	11	7	1,996	39.851	127.576	Rusted looking tanks.
						-
						Newish looking tank, associated with factory,
						possibly for processing mineral products? As
						such, tank may or may not be for storage of oil
1	24	9	4,072	39.854	127.577	products.
2	22	0		39.850	127 500	Older tanks, may be removed.
	22	0	-	39.850	127.580	Older tanks, may be removed.
2	9	6	763	39.850	127.584	Newish looking tanks.
Total of above			7,085		•	-
Fraction of volume estimated to be active oil storage:			25%			
Total volume estimated to	be active oil storag	e:	1,771			

Views of Tanks at Hamhung







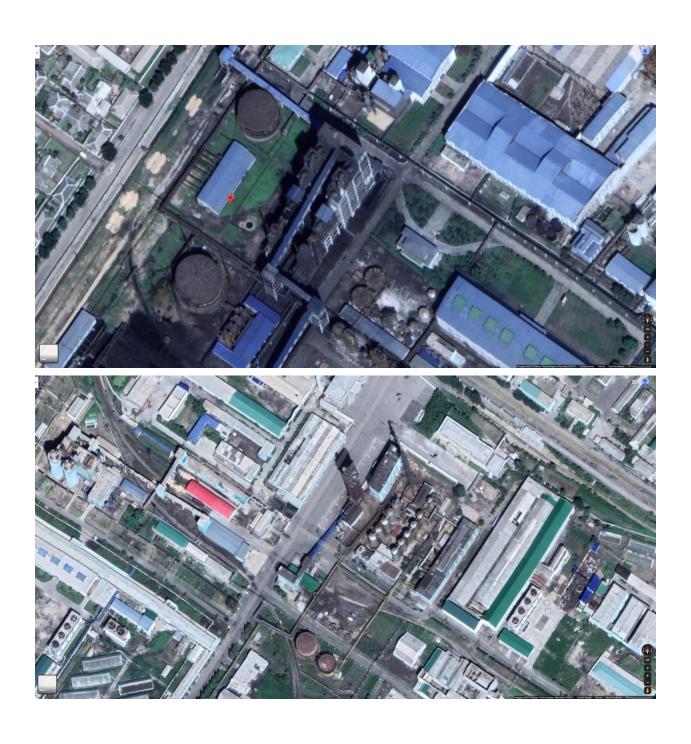


Location: Heungnam	Union Fertilizer	Company, Ha	amhung. Sc	outh Hamqvoi	na. North k	Korea. 07/28/2019
						1
			Implied Total Volume as measured (cubic	Approximate Coordinates		
Visible Tanks	Estimates Diameter	Height	meters)	Longitude	Lattitude	Notes
visible falls	Diametei	rieigiit		Longitude	Latinude	Titles
15	23	7	43,625	39.839	127.622	Bluish tanks. May be used to store liquid fertilizer.
2	28	8	9,852	39.837	127.618	Large black tanks. May be used to store liquid fertilizer.
2	12	4	905	39.837	127.618	Dark colored tanks. May be used to store liquid fertilizer.
2	5	2	79	39.837	127.618	Small silver tanks. May be used to store liquid fertilizer.
5	6	3	424	39.837	127.618	Dark colored tanks. May be used to store liquid fertilizer.
1	18	10	2,545	39.840	127.627	Large brown tank. May be used to store liquid fertilizer.
1	22	10	3,801	39.840	127.627	Large brown tank. May be used to store liquid fertilizer.
11	7	9	3,810	39.841	127.628	Slender silver tanks. May be used to store liquid fertilizer.
4	6	2	226	39.840	127.627	Small, older looking tanks. May be used to store liquid fertilizer.
2 Total of above	14	12	3,695 68,961	39.842	127.623	Large blue silos, may be tanks. May be used to store liquid fertilizer.
Fraction of volume estima	ated to be active oil s	torage:	30%			

Views of Tanks at Heungnam Union Fertilizer Company







Location: South Ham	ngyong, North Ko	rea, 07/28/20	19 Implied Total			
	Estimates	(m) of	Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks		Height	,		Lattitude	Notes
						Possible tank, difficult to make out. Appears to be
1	12	4	452	40.448	128.286	in the middle of a pond, so probably not an oil tank.
Total of above			452			
Fraction of volume estima	0%					
Total volume estimated to be active oil storage:			-			

View of Tanks at South Hamgyong



Location: South Han	ngyong, North Ko	orea, 07/28/20	Implied Total Volume as measured (cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
2	8	3	302	40.482		Possible tanks, difficult to make out. Appear to be in the middle of ponds that are surrounded by trees, so probably not oil tanks.
Total of above			302			
Fraction of volume estima	0%					
Total volume estimated to be active oil storage:			-			

View of Tanks at South Hamgyong



ocation: South Hamgyong, North Korea, 07/29/2019								
Location: South Han	ngyong, North Ko	rea, u <i>1</i> /29/20	<u> 19</u>					
			ı			1		
			Implied Total Volume as measured (cubic					
	Estimates	(m) of	meters)	Approximate (Coordinates			
Visible Tanks		Height			Lattitude	Notes		
2	9	4	509	40.511	40.511	Possible tanks, difficult to make out.		
1	4	1	13	40.511	40.511	Possible tank, small and difficult to make out.		
Total of above			522		ı	,		
Fraction of volume estima	Fraction of volume estimated to be active oil storage:							
Total volume estimated to be active oil storage:			80% 417					

View of Tanks at South Hamgyong



Location: South Ham	ngyong, North Ko	rea, 07/29/20	<u>19</u>			1
	Estimates		Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height	Í	Longitude	Lattitude	Notes
5	23	6	12,464	40.917		Possible tanks, difficult to make out, may not be be for oil storage. Appears to be a mining/minerals processing facility. Adjacent to railroad.
Total of above			12,464			
Fraction of volume estima	0%					
Total volume estimated to be active oil storage:			-			

View of Tanks at South Hamgyong



Location: Anbyon, Ka	Estimates		Implied Total Volume as measured (cubic meters)	Approximate 0	Coordinates	
Visible Tanks	Diameter	Height	meters)			Notes
2		0	_	39.033		Possible tanks, may have been buried or removed. Probably not for oil storage; in an agricultural area.
Total of above			-			
Fraction of volume estima	0%					
Total volume estimated to be active oil storage:			-			

View of Tanks at Anbyon



Location: Anbyon, Ka			Implied Total Volume as measured (cubic			
Visible Tanks	Estimates	` '	meters)	Approximate (Notes
VISIBLE TAIKS	Diameter	Height		Longitude	Lattitude	Notes
						Possible tanks, difficult to make out. Near large
2	12	4	905	39.056		facilityschool? Close to rail line.
Total of above			905		•	•
Fraction of volume estima	50%					
Total volume estimated to	452					

View of Tanks at Anbyon



Location: Kangwon,	North Korea, 08/		Implied Total Volume as measured (cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
1	12	2	226	39.053		Appears to be partially buried. In an agricultural area, possibly not for oil.
Total of above		_	226			In any harmany
Fraction of volume estimated to be active oil storage: Total volume estimated to be active oil storage:			0%			



Location: Kangwon,	North Korea, 08/		Implied Total Volume as measured (cubic meters)	Approximate 0	Coordinates	
Visible Tanks		Height	,		Lattitude	Notes
1	11		190	39.143		Appears to be partially buried.
Total of above			190		•	
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to	o be active oil storag	e:	-			



Lagation, Cong. Kan	ocation: Sepo, Kangwon, North Korea, 08/01/2019								
Location: Sepo, Kan	gwon, North Kor	ea, 06/01/2013	9						
]			
			Implied Total						
			Volume as						
			measured						
			(cubic						
	Estimates	(m) of	meters)	Approximate	Coordinates				
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes			
	44			00.050		Possible tanks, difficult to make out. May be			
3	11	0	-	38.656	127.372	buried or removed.			
						Possible tanks, difficult to make out. May be			
3	8	0	_	38.656		buried or removed. In a largely agricultural area.			
Total of above			-			, , , , , , , , , , , , , , , , , , , ,			
Fraction of volume estimated to be active oil storage:		0%							
Total volume estimated to	be active oil storag	e:	-						

View of Tanks at Sepo



	ocation: Kosan, Kangwon, North Korea, 08/01/2019								
Location: Kosan, Kai	ngwon, North Ko	rea, 08/01/20	<u>19</u>						
			Implied Total						
			Volume as						
			measured						
	Entimotos	(m) of	(cubic	Approximate (Coordinatoo				
Misikla Taraka	Estimates	`	meters)	Approximate (Ni-t			
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes			
						Appears to be partially buried. Near a set of new-			
						looking large buildings, with other buildings newer			
1	17	2	454	38.894	127.463	roofs in area. Mostly agricultural, near reservoir.			
						, ,			
•	40			00.000	407.450	Annual to be builted			
2	12	0	-	38.896	127.458	Appears to be buried.			
Total of above		454							
	Fraction of volume estimated to be active oil storage:		50%						
Total volume estimated to	be active oil storag	e:	227						

Views of Tanks at Kosan





Location: Kosan, Kar	ngwon, North Ko	•	Implied Total			
			Volume as measured			
			(cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
						Appears to be buried. Could be decommissioned
2	12	0	-	38.894		tanks or silos. Appears to be an agricultural area.
Total of above			-		•	
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to	o be active oil storag	e:	-			

View of Tanks at Kosan



Location: Kosan, Kar	ngwon, North Ko	rea, 08/02/20	19 Implied Total			
	Estimates	(m) of	Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height	,		Lattitude	Notes
1	5	2	39	38.908		Possible tank, difficult to make out. Mostly agricultural area.
Total of above			39			
Fraction of volume estima	100%					
Total volume estimated to	o be active oil storag	e:	39			

View of Tanks at Kosan



Location: Kangwon,	North Korea, 08/	02/2019				1
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
1	5	2	39	38.973		Possible tank, difficult to make out. Mostly agricultural area.
Total of above			39			
Fraction of volume estimated to be active oil storage:			50%			
Total volume estimated to	be active oil storag	e:	20			



Location: Kangwon,	North Korea, 08/		Implied Total Volume as measured			
	Fatimates	(m) of	(cubic	A manayima ata 1	Oo a ralia ataa	
	Estimates	` '	meters)	Approximate (
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
2	12	0	-	38.981		Possible tanks appear to be buried. Mostly agricultural and residential area, but not far from tracks.
Total of above			-			
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to	o be active oil storag	e:	-			



Location: Kangwon,	North Korea, 08/	<u>02/2019</u>	Implied Total Volume as measured (cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
1	17	4	908	39.207		Grey tank, appears octaganol. Newer facility that appears likely to be added to in the future, but not clear what it will be used for. Tank may be for water or some other purpose.
Total of above			908			
Fraction of volume estimated to be active oil storage:			10%			
Total volume estimated to	be active oil storag	e:	91			



Location: Muchon, K			Implied Total Volume as measured (cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
6	13	0	_	39.231		Possible tanks appear to be buried. Newer or updated facility in a mostly agricultural area.
Total of above			-			_
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to	be active oil storag	e:	-			

View of Tanks at Muchon



Location: Chŏnnae,			Implied Total Volume as measured (cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
2	11	0	_	39.356		Possible tanks appear to be buried or decommissioned.
Total of above			_	00.000	127.200	decommissioned.
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to	o be active oil storag	e:	-			

View of Tanks at Chŏnnae



Location: Chŏnnae,	North Korea, 08/0	04/2019				
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate	Coordinates	
Visible Tanks	Diameter	Height	Í	Longitude	Lattitude	Notes
20	6	9	5,089	39.351		Most of tanks appear to be for product storage. Industrial facility, possibly for processing products of a nearby mine. May be more tanks, difficult to make them out.
1	5	5	98	39.351	127.202	Small tank near perimeter of facility.
Total of above			5,188		•	
Fraction of volume estimated to be active oil storage:			2%			
Total volume estimated to	o be active oil storag	e:	104			

View of Tanks at Chŏnnae



Lacation, Chămaca I	Namble Marca 00/	14/2040				
Location: Chonnae, I	North Korea, U8/C	<u>14/2019</u>				
	,		Implied Total Volume as measured (cubic	e as		
	Estimates		meters)	Approximate (
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
1	20	9	2,827	39.369		Large tank. Probably not for oil, but for products storage. Active industrial site, possibly for cement manufacture.
4	7	5	770	39.369		Larger grey tanks, but probably for product storage, not for oil.
4	5	2	157	39.369	127.214	Small cluster of grey tanks.
1	5	2	39	39.369	127.214	Small grey tank.
Total of above			3,793			
Fraction of volume estima	ated to be active oil s	storage:	5%			
Total volume estimated to			190			

View of Tanks at Chŏnnae



Location: Jonthan-ri, North Korea, 08/04/2019										
Location. Jonthan-H,	North Rolea, 00	104/2019								
	Estimates		Implied Total Volume as measured (cubic meters)	Approximate (
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes				
4	7	3	462	39.384	127.226	Grey tanks.				
3	8	3	452	39.384		Possible tanks, difficult to make out. Some or all could be disused.				
3	9	0		39.382		Tanks appear to be buried or removed. Part of a large, active industrial installation, but the area where the tanks are appears to be disused.				
1	7	3	115	39.383	127,225	Brown, rusty tank.				
Total of above			1,030	22.300		,				
Fraction of volume estimated to be active oil storage:			20%							
Total volume estimated to			206							

View of Tanks at Jonthan-ri



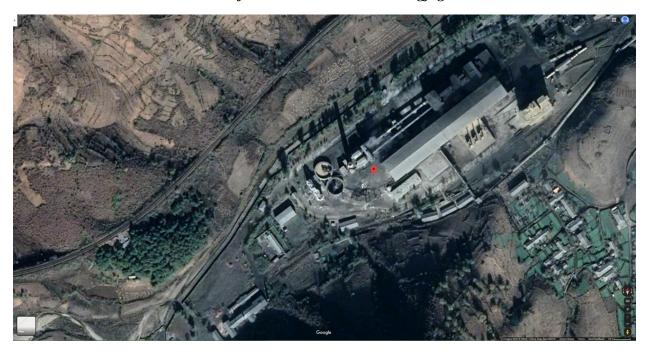
Location: Songhung	ri, South Hamgy	ong, North K	orea, 08/05/	<u>2019</u>		
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks		Height	meters)		Lattitude	Notes
1	10		79	39.413		May be more tanks, difficult to make them out. Tank identified may be buried or may be the foundation of an old tank. Area looks as though a building or compound formerly stood nearby, but now has been demolished.
Total of above			79			
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to	o be active oil storag	e:	-			

View of Tanks at Songhung-ri



Location:Puraesan-r	odongjagu, Sout	h Hamgyong	, North Kore	ea, 08/05/2019	9	
	Estimates	. /	Implied Total Volume as measured (cubic meters)	Approximate (
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
2	20	5	3,142	39.427		Tanks appear to be part of a large and active industrial facilty, served by a rail spur. Tanks seem more likely to be for product or input storage than for oil storage, based on their appearance.
Total of above			3,142			
Fraction of volume estima	0%					
Total volume estimated to	be active oil storag	e:	-			

View of Tanks at Puraesan-rodongjagu



Location:Sinchang-r	Estimates		Implied Total Volume as measured (cubic meters)		Coordinates	
Visible Tanks	Diameter	Height	ĺ		Lattitude	Notes
1	12	4	452	39.495		Possible tank, difficult to make out. Could be a water tank. Associated facilty could be a school or a training facility.
Total of above			452			
Fraction of volume estima	0%					
Total volume estimated to	o be active oil storag	e:	-			

View of Tanks at Songhung-ri



Location: Munchon,	Kangwon, North	Korea, 08/06	<u>/2019</u>			
			Implied Total			
			Volume as			
			measured			
			(cubic		o " .	
	Estimates	` '	meters)	Approximate (
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
						Older rusted tanks. Industrial site with
2	9	6	763	39.282	127.357	smokestack and what appears to be a waste pond.
_						
_	_	_				
3	5	3		39.281	127.354	Older looking tanks, difficult to make out.
Total of above	Total of above		940			
Fraction of volume estima	ated to be active oil s	storage:	50%			
Total volume estimated to	be active oil storag	e:	470			

View of Tanks at Munchon



Location:Pusung, Py			Implied Total Volume as measured (cubic			
	Estimates	` /	meters)	Approximate (
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
2	36	0	_	39.111		Possible tanks, appear to be buried. Near buildings with newer roofs and railroad, but may be for another purpose.
Total of above			-			
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to			-			

View of Tanks at Pusung



Location: Pyongyang	, North Korea, 08	3/06/2019				
						.
			Implied Total Volume as measured (cubic meters)	ume as asured oic		
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
2	17	7	3,178	39.083	125.707	One older, one newer-looking tank.
10	2.5	3	147	39.083	125 707	Older looking small tanks.
10	2.0	3	147	55.005	120.101	order rooming arrian turing.
3	11	6	1,711	39.083	125.707	One older, two newer-looking tanks.
Total of above			4,888			
Fraction of volume estima	ated to be active oil s	storage:	90%			
Total volume estimated to	be active oil storag	e:	4,399			

View of Tanks at Pyonyang



Location: Pyongyano	ocation: Pyongyang, North Korea, 08/07/2019									
			Implied Total Volume as measured (cubic meters)	Approximate Coordinates						
Visible Tanks		Height	,		Lattitude	Notes				
2	14	6	1,847	39.006	125.621	Older looking tanks.				
2	7	3	231	39.006	125.621	Older looking tanks, appear to be decommissioned.				
Total of above	Total of above		2,078							
Fraction of volume estima	ated to be active oil s	storage:	90%							
Total volume estimated to	o be active oil storag	e:	1,870							

View of Tanks at Pyonyang



ocation: Chollima, Pyongyang, North Korea, 08/07/2019								
Location: Chollima, F	yongyang, North	Korea, 08/0	<u>//2019</u>					
			1			1		
			Implied Total					
			Volume as					
			measured					
			(cubic					
	Estimates	(m) of	meters)	Approximate (Coordinates			
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes		
						Older looking tanks, near industrial facility with tall		
2	18	6	3,054	38.922	125.556	smokestack and partial new roof.		
						·		
1	6	2	57	38.922	125.556	Older, small looking tank.		
Total of above			3,110			-		
Fraction of volume estima	ated to be active oil s	storage:	90%					
Total volume estimated to	o be active oil storag	e:	2,799					

View of Tanks at Chollima



ocation: Chollima, Pyongyang, North Korea, 08/07/2019								
Location: Chollima, F	yongyang, North	Korea, 08/0	<u>7/2019</u>					
						1		
			Implied Total					
			Volume as					
			measured					
			(cubic					
	Estimates	(m) of	meters)	Approximate (Coordinates			
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes		
						Tank appears to be buried. Near a large active		
1	26	0	-	38.922	125.568	industrial facility (Chollima) and railroad.		
1	11	4	380	38.922	125.568	Older looking tank.		
Total of above	Total of above		380					
Fraction of volume estima	ated to be active oil s	storage:	100%					
Total volume estimated to	be active oil storag	e:	380					

View of Tanks at Chollima



Location:Nampo, Sou	uth Pyongan, Nor	th Korea, 08	<u>/07/2019</u>			I
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height	,	Longitude	Lattitude	Notes
1	13	4	531	38.750		Possible tank, difficult to make out, but could be segmented roof for a round building, not an oil tank. Older industrial facility nearby, could be wastewater treatment plant.
Total of above			531			
Fraction of volume estimated to be active oil storage:						
Total volume estimated to	be active oil storag	e:	-			

View of Tanks at Nampo



Location: Kangdong	, Pyongyang, Nor	th Korea, 08	<u>/07/2019</u>			
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height	ĺ		Lattitude	Notes
1	9	3	191	39.143		Possible tank, difficult to make out, but in area of buildings with new roofs and near a railroad and what appears to be a recreational facility. Could be for water.
Total of above			191			
Fraction of volume estimated to be active oil storage:			50%			
Total volume estimated to	o be active oil storag	e:	95			



Location:Songchŏn,	South Pyongan,	North Korea	, 08/08/2019			1
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
1	11	4	380	39.254		Possible tank, difficult to make out. Immediately adjacent to road and river, but structure of roof suggests may be a water tank or building for some other purpose, not an oil tank.
Total of above			380			
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to	Total volume estimated to be active oil storage:					

View of Tanks at Songchŏn



Location:Milchon-ni,	North Korea, 08	<u>/08/2019</u>	Implied Total Volume as measured (cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
1	17	6	1,362	39.477		Older looking tank, near railroad and industrial
Total of all and	17			39.477	120.172	pacinty.
Total of above			1,362			
Fraction of volume estimated to be active oil storage:			100%			
Total volume estimated to	o be active oil storag	e:	1,362			

View of Tanks at Milchon-ni



l aceticus Mileben mi	Namela Kamaa 00	/00/0040				
Location: Milchon-ni	, North Korea, 08	708/2019				
			Implied Total			
			Volume as			
			measured			
			(cubic			
	Estimates	` '	meters)	Approximate (
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
						Older looking tank, possibly foundation of
1	14	4	616	39.472	126.164	decommissioned in-ground tank.
						Older looking tank, partially buried. Small
						industrial facility nearby, possibly for minerals
1	12	4	452	39.472	126.164	processing?
Total of above			1,068			
raction of volume estimated to be active oil storage:		40%				
Total volume estimated to	o be active oil storag	e:	427			

View of Tanks at Milchon-ni



						1
Location:Yongha, So	outh Pyongan, No	rth Korea, 0	3/08/2019			
			Implied Total			
			Volume as			
			measured			
			(cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
1	5	3	59	39.570	126.320	Possible tank, difficult to make out.
						Grey structure, but probably not a tank, possibly a
						building overlooking a river. There is what appears
						to be a memorial tower nearby in the center of a
1	7	5	192	39.571	126.323	town square. Adjacent to builiding with new roof.
Total of above		251 0%				
	Fraction of volume estimated to be active oil storage:					
Total volume estimated to	o be active oil storag	e:	-			

View of Tanks at Yongha



Location:Yodok, Sou	th Hamgyong, No	orth Korea, 0	8/08/2019			
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks		Height			Lattitude	Notes
2	13	4	1,062	39.618		Possibly buried tanks, but not likely used for oil storage, given no roads nearbly. Adjacent to what appears to be a small hydroelectric facility in the lpsok river, fed by a canal.
Total of above			1,062			
Fraction of volume estima	0%					
Total volume estimated to	be active oil storag	e:	-			

View of Tanks at Yodok



Location:Kumya, Sou	uth Hamgyong, N	orth Korea, (08/08/2019			1
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
2	14	5	1,539	39.546		Possible tanks, may be damaged or removed. Adjacent to railroad.
Total of above			1,539			
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to be active oil storage:			-			

View of Tanks at Kumya



Location:Yongha, So	outh Pyongan, No	rth Korea, 08	<u>3/09/2019</u>			
			Implied Total			
			Volume as			
			measured			
			(cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks		Height	ĺ			Notes
				-		
						Newish looking tanks, probably to service nearby
2	16	8	3,217	42.325	130.395	
3	5	3	177	42.325	130.395	Newish looking tanks.
Total of above			3,394			
Fraction of volume estimated to be active oil storage:			100%			
Total volume estimated to	o be active oil storag	e:	3,394			

View of Tanks at Yongha



Location:Chongju, N			Implied Total Volume as measured (cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
5	15	5	4,418	39.676		Red tanks in what appears to be an active industrial area, possibly for minerals processing. These appear to be processing units, probably not for oil storage.
Total of above			4,418			1
Fraction of volume estimated to be active oil storage:			0%			

View of Tanks at Chongju



Location:Chongju, N	orth Pyongan, No	orth Korea, 0	<u>8/09/2019</u>			
			Implied Total			
			Volume as			
			measured			
			(cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height	, , ,		Lattitude	Notes
				-		
						Older looking tanks in what appears to be a
						partially abandoned industrial area, but with an
3	8	4	603	39.674		active area nearby. Adjacent to railroad.
						,
2	5	3	118	39.674	125.222	Older looking tanks.
Total of above			721			
Fraction of volume estimated to be active oil storage:			50%			
Total volume estimated to	o be active oil storag	e:	360			

View of Tanks at Chongju



North Korea, 08	3/09/2019				
Fatimata		Implied Total Volume as measured (cubic	Annovinanto		
	,	meters)			Notes
iameter	Height		Longitude	Lattitude	Notes
12	4	905	38.510		Tanks appear to be partially buried. Adjacent to building with newer roof. Could be tanks to service nearby motor pool and small harbor. Height is a guess.
3	2	14			Small tanks, a Adjacent to building with newer roof.
7	4	154	38.510		Green structure adjacent to building, but probably not a tank.
		1,059			
ed to be active oil s	torage:	60%			
	•				
1	Estimates (ameter 12 3 3 7 7 dt to be active oil s	Estimates (m) of ameter Height	Estimates (m) of meters) 12 4 905 3 2 14 7 4 154 1,059 d to be active oil storage: 60%	Estimates (m) of meters) Approximate (cubic meters)	Implied Total Volume as measured (cubic meters) Approximate Coordinates

View of Tanks at Arang-dong



		0 41 11		14 00/0	2/22/2	
Location:Sinpo Nucl	ear Power Plant,	South Hamg	yong, North	Norea, 08/0	9/2019	
			I	Π		1
			Implied Total			
			Volume as			
			measured			
			(cubic			
	Estimates	(m) of	meters)	Approximate	Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
2	12	4	905	40.102	128.344	Older looking tanks.
						Newer-looking tanks near newer building. Several
						much smaller tanks nearby. Adjacent to site for
						Simpo nuclear power plant, construction of which
						has been suspended since the mid-2000s, so
2	. 6	2	113	40.102	128.344	possibly a caretaker facility.
Total of above	otal of above					
Fraction of volume estimated to be active oil storage:			11%			
Total volume estimated t	o be active oil storag	e:	112			

View of Tanks at Sinpo Nuclear Power Plant



Location:Kilju, North	Hamgyong, Nort	h Korea, 08/0	<u> </u>			
						•
			Implied Total			
			Volume as			
			measured			
			(cubic			
	Estimates	` '	meters)	Approximate (
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
2	10	4	628	40.961	129.315	Older looking tanks.
						Older looking tanks. Location adjacent to several
						large buildings with new roofs, suggesting an active
3	6	2	170	40.961	129.315	factory or warehouse.
Total of above	al of above		798			
Fraction of volume estimated to be active oil storage:			80%			
Total volume estimated to	be active oil storag	e:	638			

View of Tanks at Kilju



Г						
Location:Kilju, North	Hamgyong, Nort	h Korea, 08/	<u>19/2019</u>			
			T	ı		1
			Implied Total Volume as measured (cubic meters)	Approximate Coordinates		
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
1	12	4	452	40.960		Older looking tank in the middle of s set of buildings, some of which have new roofs so are likely in use. Not clear that this is an oil tank-it may be a round building or tank for storage of something else.
3	10	4	942	40.961		Appear to have been removed, and are open at the top. Tanks are on what appears to be a decommissioned factory site, and appear disused,
4	5	2	157	40.961		Appear to have been removed, and are open at the top. Tanks are on what appears to be a decommissioned factory site, and appear disused,
Total of above			1,552		•	
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to	be active oil storag	e:	-			

View of Tanks at Kilju



Location: Kilju, Nortl	n Hamgyong, Nor	th Korea, 08	/19/2019 Implied Total			
			Volume as			
			measured			
	Estimates	(m) of	(cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height	,		Lattitude	Notes
						Offshore tank located over a reservoir formed by a
						dam across a river, perhaps as a part of a diversion
						scheme. Its location and a pipe leading to a small
						settlement on shore suggests that it is more likely
1	13	5	664	40.916	129.250	a water tank than an oil tank.
Total of above			664			
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to	o be active oil storag	e:	-			

View of Tanks at Kilju



Location: Paekam, R	yanggang, North	Korea, 08/20	0/2019			1
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height	ĺ	Longitude	Lattitude	Notes
1	10	4	314	41.563		Silver tank. Not immediately adjacent to a road for easy oil delivery, and appears to be octagonal, not round, so may in fact be a water tank or for some other purpose. Located in an agricultural area.
Total of above			314		•	•
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to	o be active oil storag	e:	-			

View of Tanks at Paekam



Location: Taeosich'o	ol-lodongjagu, No	orth Korea, 0	8/20/2019			1
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height	,		Lattitude	Notes
3	11	5	1,425	41.383		White tanks with what appear to be walkways on top. Near what appears to be an active industrial facility supplied with coal, and with several new roofs, and connected to a tall smokestack 380 meters away.
Total of above			1,425			
Fraction of volume estimated to be active oil storage:			75%			
Total volume estimated to	be active oil storag	e:	1,069			

View of Tanks at Taeosich'ol-lodongjagu



Location: Taeosich'd	ol-lodongjagu, No		Implied Total Volume as measured (cubic	Approximate (Coordinatoo	
Visible Tanks	Diameter	Height	meters)	Longitude	Lattitude	Notes
4	8	3	603	41.380		Rusted tanks. Near what appears to be an active industrial facility supplied with coal, and with several new roofs, and connected to a tall smokestack 380 meters away.
Total of above			603		•	_
Fraction of volume estimated to be active oil storage:			25%			
Total volume estimated to	o be active oil storag	e:	151			

View of Tanks at Taeosich'ol-lodongjagu



Location: Puryong, N	lorth Hamgyong,	North Korea	, 08/21/2019			
	Estimates		Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height	Í	Longitude	Lattitude	Notes
1	13	4	531	42.071		Round structure that appears to be an island in the middle of a frozen pond. Probably not an oil tank. May be part of an agricultural facility.
Total of above			531			·
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to	o be active oil storag	e:	-			

View of Tanks at Puryong



Location: Komusan,	North Hamgyong	, North Kore	a, 08/21/201	9		1
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks		Height			Lattitude	Notes
4	8	6	1,206	42.121		Newish looking tanks, directly adjacent to railway. Seem to be associated with an active factory, possibly a cement manufacturer. Tanks may not be for oil, but rather for another factory input or product.
Total of above			1,206		•	
Fraction of volume estimated to be active oil storage:			50%			
Total volume estimated to	be active oil storag	e:	603			

View of Tanks at Komusan



Location: Musan, No	rth Hamgyong, N	orth Korea,	08/21/2019			
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate	Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
4	9		1,018	42.221		Rusted looking tanks. Site is adjacent to railroad. Probably two additional foundations of tanks that have been removed. New buildings or roofs, maintained parking areas, and the presence of vehicles suggest an active site.
Total of above			1,018		•	
Fraction of volume estimated to be active oil storage:			50%			
Total volume estimated to	be active oil storag	e:	509			

View of Tanks at Musan



Location: Musan, No	rth Hamgyong, N	orth Korea, (08/22/2019			1
	Estimates		Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
8	6	3	679	42.212		Older looking tanks, adjacent to railroad. Many new roofs on nearby buildings suggest an active industrial site.
Total of above			679			
Fraction of volume estimated to be active oil storage:			50%			
Total volume estimated to	be active oil storag	e:	339			

View of Tanks at Musan



Location: Musan Iron	n Mine, North Ha	mgyong, Nor	th Korea, 08	3/22/2019		1
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
3	6	3	254	42.226		Older looking tanks, but many new roofs on nearby buildings, plus piles of coal and/or ore, suggest an active industrial site.
Total of above			254			
Fraction of volume estimated to be active oil storage:			100%			
Total volume estimated to	o be active oil storag	e:	254			

View of Tanks at Musan Iron Mine



Location: Undok, North Hamgyong, North Korea, 08/23/2019								
	gjeg,		<u> </u>					
			Implied Total					
			Volume as					
			measured					
			(cubic					
	Estimates	(m) of	meters)	Approximate	Coordinates			
Visible Tanks	Diameter	Height	, , ,	Longitude		Notes		
				Ŭ				
4	8 ا	4	804	42.535	130.362	Green and red tanks.		
6	4	2	151	42.535	130.362	Small silver tanks.		
						Rusted tanks, may be more, very difficult to make		
6	5	2	236	42.536	130.364	out.		
						Tanks appear to have been removed or buried, but		
						site in general looks like it is being regularly		
21	7	0	-	42.536	130.357	maintained.		
						Rusted tanks, may be more, very difficult to make		
6	4	2	151	42.534	130.363	out.		
						Rusted tanks, may be more, very difficult to make		
						out. Appears to be a factory location, but may or		
17	3	2	240	42.534	130.363	may not be operating.		
Total of above			1,582					
Fraction of volume estimated to be active oil storage:			75%					
Total volume estimated to be active oil storage:			1,186					

Views of Tanks at Undok





Location: Undok, No	ocation: Undok, North Hamgyong, North Korea, 08/23/2019									
	1		1	T		1				
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate Coordinates						
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes				
1	20	0	-	42.538	130.365	Tank appear to have been removed. Near the Tumen River and Chinese border.				
1	9	5	318	42.538	130.365	Rusted looking tank.				
1	5	0	_	42.538	130.365	Tank appear to have been removed.				
Total of above		Ĭ	318	:=:300		1				
Fraction of volume estim	25%									
Total volume estimated t	80									
otal volumo collinated t	00									



Location: Undok, No	rth Hamgyong, N	orth Korea, (08/26/2019			
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height			Lattitude	Notes
1	8	3	151	42.574		Possible tank, but difficult to make out. Large buildings that may be disused are nearby, possibly a factory that is not longer functioning. Near the Chinese border and Tumen River.
1	6	8	226	42.574	130.328	Tank appears rusted, probably disused.
1	6	4	113	42.574	130.328	Tank appears rusted, probably disused.
Total of above			490		•	
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to be active oil storage:			-			



Location: Undok, No			Implied Total Volume as measured (cubic			
	Estimates	(m) of	meters)	Approximate	Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
20	9	0	_	42.575		Tanks appear to have been removed or buried. Location is adjacent to a paved road and a railroad line, and about 3 km from the border with China and the Tumen River.
Total of above			-			_
Fraction of volume estima	0%					
Total volume estimated to	-					



Location: Undok, No	rth Hamgyong, N	orth Korea, (08/28/2019			I
	Estimates	(m) of	Implied Total Volume as measured (cubic meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height	Í	Longitude	Lattitude	Notes
3	13	5	1,991	42.585		Older looking tanks. Location is near border with China and the Tumen River. Tanks are difficult to characterize due to quality of image.
Total of above			1,991			
Fraction of volume estima	25%					
Total volume estimated to	498					

View of Tanks at Undok



Location: Undok, No	rth Hamgyong, N	orth Korea, (Implied Total			
			measured			
			(cubic			
	Estimates	(m) of	meters)	Approximate (Coordinates	
Visible Tanks	Diameter	Height		Longitude	Lattitude	Notes
3	21	0	_	42.504		Possible buried tank. May also be a bunker built for some other purpose. Location is near a main road in the Sonbong area.
Total of above			-			-
Fraction of volume estimated to be active oil storage:			0%			
Total volume estimated to be active oil storage:			-			

