Next 3 Page(s) In Document Exempt

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GMB 559/64
1 July 1964
Copy No. 1

MEMORANDUM FOR: Chief, Military Division, OCI

1 ATTENTION: [redacted]

THRU: Chief, RG/RB/CGS

FROM: Chief, CIA/PID (NPIC)

SUBJECT: Submarine Support Installations, Avachinskaya Bay, Petropavlovsk-Kamchatskiy, USSR, Photo Study

REFERENCES:
(a) Requirement No. C-CI3-80,816 (Project No. C 1670-63)
(b) CIA/PID/GMB Memorandum 350/64 of 29 April 1964
(c) NPIC/R-193/64 Petropavlovsk Naval Base Tar'ya Bay Petropavlovsk-Kamchatskiy, USSR
(d) NPIC/R-52/64 Probable Missile Facility Near Petropavlovsk-Kamchatskiy Submarine Base, USSR

1. In response to Requirement No. C-CI3-80,816 (C 1670-63), a detailed photographic analysis was performed on all available aerial photography of the Avachinskaya Bay region, Petropavlovsk-Kamchatskiy, USSR (53 OON-158 30E) in order to determine the status of all installations in this area known or suspected to be in support of the submarines based at the Petropavlovsk-Kamchatskiy Submarine Base, Tar'ya Bay.

2. The following submarine-associated installations were re-examined in this study:

(a) Petropavlovsk-Kamchatskiy Submarine Base, Tar'ya Bay (52 55N-158 30E). A steady expansion in the facilities associated with this base has been noted since [redacted]

(1) The pier facilities at the submarine base proper have been and are continuing to be expanded westward. ("E" Class SSGN's have been observed berthed in this pier area). Two new large piers having rock-filled approaches were built between [redacted] the latter between [redacted] A new rock-filled pier approach was observed under construction approximately 400 feet NW of the newest completed pier on [redacted] coverage dated [redacted] (See Encl (1), photos # 4, 8, 27, and I-13.)

Reviewed by NGA.

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(2) A complex containing eight single-story barracks/storage-type buildings was constructed during the period of [redacted] on the eastern end of the Tar'ya Peninsula at 52 55N-158 32E. (See Encl (1), photo #I-12.)

(3) A new SA-3 SAM site located 0.5 nm north of the submarine base in the middle of the Tar'ya Peninsula has been identified on photography of [redacted] (See Encl (1), photos # 12A, 17, and 24B.)

(4) A secured storage area containing five possible buried tanks has recently been identified on the north coast of the Tar'ya Peninsula at 52 56N-158 29E from [redacted] coverage dated [redacted] (See Encl (1), photo # 24B.)

(b) Naval Missile and Storage and Handling Facility, Tar'ya Peninsula (52 56N-158 23E). This installation has previously been described in NPIC/R-52/64 (ref d), utilizing [redacted] coverage obtained through [redacted]

(1) Analysis of later KH-7 photography through [redacted] has confirmed the identification of the missile storage and handling area; [redacted]

(2) Upon examination of the larger scale KH-7 photography the area previously identified as a secured storage area (see Figure 4 of reference d) now appears to be a possible missile re-cycling and/or missile check-out area. This area is connected to the main pier area for the missile facility by means of a switch-back road - so configured in order to negotiate the steep gradient along the coast. The possible re-cycling and/or check-out area is surrounded by a double-security fence and contains a small two-story and a larger single-story building with four possible large entry bays fronting onto a wide parking area along the access road. Continuing beyond the two buildings, the road terminates in a long narrow loop which is separately secured within the double-security of the entire compound. The turning radii of the access/loop road appear tight - but not so sharp as to preclude the possibility of missile transportation. (See Encl (1), photo # 30.)

(3) Vessels were observed at the port area serving the missile facility in [redacted] At that time three unidentified surface vessels (LOA approximately 360 feet) were observed Mediterranean-moored to the marginal wharf. (See Encl (1), photo # 10.)

In [redacted] an unidentified surface vessel, similar in appearance to the three noted in [redacted] was observed Med-moored at the same location. Possible supplies and/or vehicles were observed on the marginal wharf on [redacted] coverage dated [redacted] The only activity identified thus far along the main pier has been a possible submarine and a floating crane in [redacted] and a small lighter and a possible truck-mounted crane in [redacted] (See Encl (1), photos # 18 and 30.)

(c) Naval Repair Facility, Seldevaya Bay (52 54N-158 26E). A large transporter dock (LOA approximately 440 feet) and a large floating drydock (LOA approximately 455 feet) have been observed since [redacted] at this minor repair facility located 3.5 nm WSW across Tar'ya Bay from the main submarine base. Submarines, destroyers, and auxiliaries have been observed at this facility. Shore-based facilities include one large multi-story building and approximately 10 smaller shop buildings. Housing areas adjoin this facility on the north and west. (See Encl (1), photos # 11, 14, and 20.)

(d) Petropavlovsk-Kamchatskiy Shipyard 412 (52 58N-158 41E). This small shipyard contains a drydock, a floating drydock, a large quayed area, and several shop buildings. Submarines have been observed inboard of the drydock area in [redacted] and one auxiliary vessel was observed in the dry-dock in [redacted] (See Encl (1), photos # 6, 19, and 22.)

(e) Naval Berthing Facility, Rakovaya Bay (52 58N-158 40E). This minor facility contains one large L-head pier, two finger piers, and one small secured underground POL storage area. Several probable destroyer-type vessels were observed here in [redacted] (See Encl (1), photos # 6, 15, and 22.)

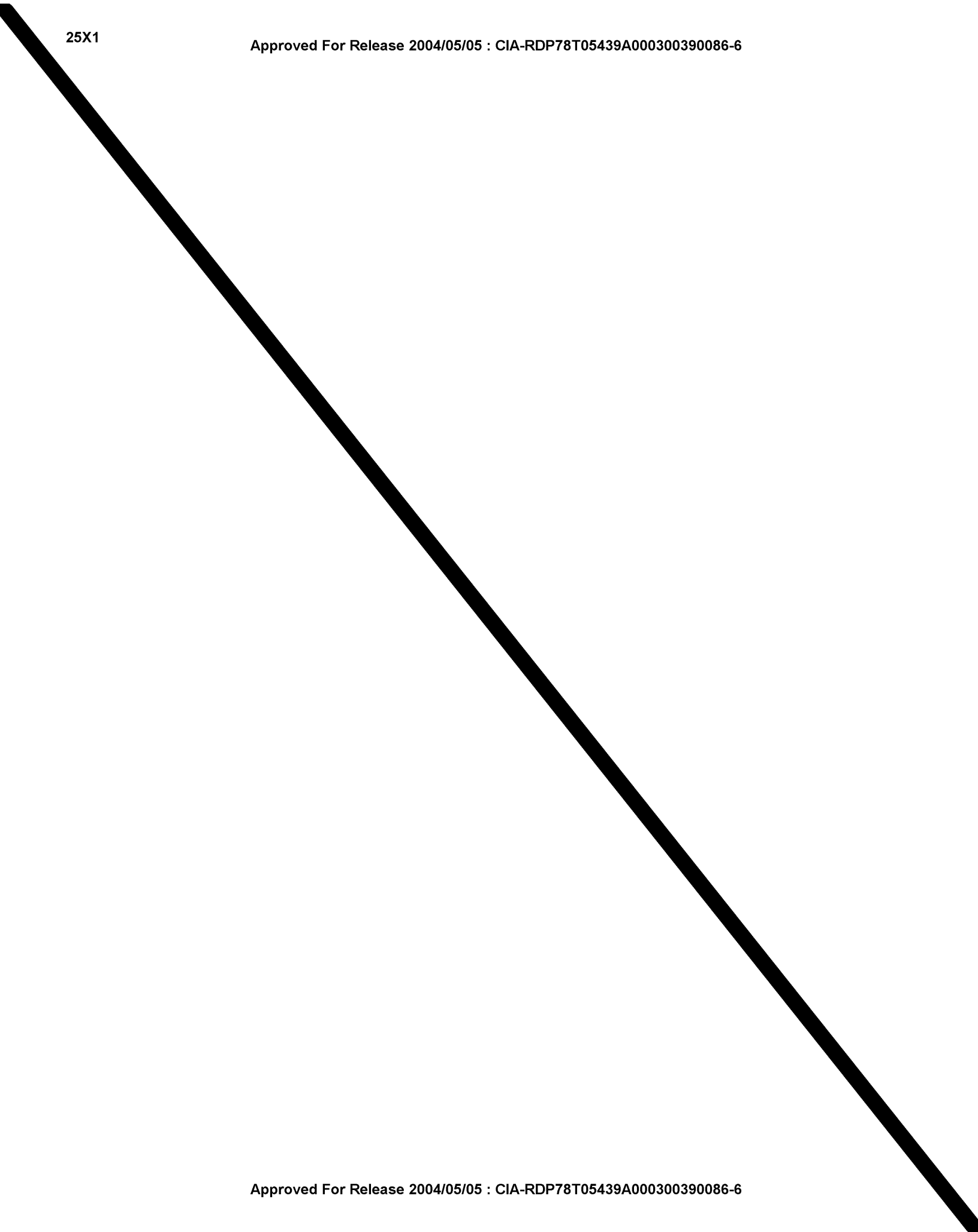
(f) Munitions Storage Areas, Bogatyrevka Bay (Mys Kosa) (52 55N-158 36E). This installation has been identified as "Petropavlovsk Naval Mining and Torpedo Depot Kosa" - [redacted] (See annotation # 32 to the map included in Encl 1). The main storage area is located at the head of a small backwater just south of Bogatyrevka Bay. In photography dated [redacted] a wide, snow-cleared, improved road can be seen connecting this installation with a single pier at Mys Kosa approximately one nm to the NW. This site is surrounded by a double-security fence and contains 8 partially revetted munitions storage buildings and two larger single-story support buildings. Each of the munitions buildings appears to have 3 unloading bays. (See Encl (1), photos # 7, 24B, 31 and 32.)

(1) An open munitions storage area surrounded by a double-security fence is located just north of the main storage area. At least 12 separated, level, open stockpile patterns are visible on KH-7 photography. The stockpile area is road connected to the main pier area at Mys Kosa. (See Encl (1), photos # 24B, 31, and 32.)

(2) A triple-secured storage area is located at 52 54 50N-158 35 10E, approximately 0.3 nm SE of the pier area at Mys Kosa. This newly-identified compound contains one long narrow building which is possibly ventilated. The building is not revetted but appears to be located along the base of a ridge which affords it some blast protection from the main conventional munitions storage compound located 0.5 nm to the SE. This site is served by an improved snow-cleared road to the pier area at Mys Kosa. (Note: the conventional munitions storage at Mys Kosa, as well as the previously identified naval missile, high explosive, and probable nuclear storage at the Naval Missile Facility, Tar'ya Bay, would appear to make it unlikely that this newly-identified site at Mys Kosa should serve a similar function. Since this site is (a) triple-secured, (b) unrevetted, (c) topographically isolated, and (d) possibly ventilated - the possiblity of naval (submarine) CW storage storage should be considered). (See Encl (1), photos 7, 31 and 33.)

(g) Seaplane Station, Yagodnaya Bay (52 53 30N-158 32 20E). Facilities consist of a small ramp area occupying a sand spit protruding from the north coast of Yagodnaya Bay, several small open storage areas, a small barracks building, and several very small miscellaneous support buildings. MADGE seaplane counts observed on [redacted] coverage from [redacted] were as follows: [redacted] Yagodnaya Bay was observed to be completely covered with heavy ice in [redacted] the beginning of the ice break-up was visible in [redacted] (See Encl (1) photos # 7, 12A, 17 and 24B.)

[redacted]



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[redacted]

4. A compilation of all identifiable naval activity observed in Avachinskaya Bay during the period [redacted] has been tabulated and forwarded as enclosure (2). It should be noted that KH-7 photography has enabled identification, for the first time, of barracks ships as a standard element in support of Soviet submarine force. A total of six large, new, Finnish-built BOLVA Class APL's has been observed on [redacted] and small format photography of Litsa Bay (4), Polyarnyy (1), and Petropavlovsk (1). (See list of photo references attached to this memorandum). Of additional interest was the first sighting on [redacted] photography of the DESNA Class AGM in this area. (See Encl (1), photo# 13,17,19 and 26.)

5. Specific dimensions utilized in the preparation of this project were performed on materials derived from [redacted] by the Technical Analysis Branch, TID (NPIC). Mensural data on these missions was computed from orbital emphemeris information; due to excessive obliquity angle and other degradations in some of this photography the measurements obtained can be considered to be approximate. Mensural data on [redacted] was PI-derived from the averages of several measurements utilizing computerized orbital information and should be considered to be approximate.

6. A table listing each of the twelve currently active SAM sites in the Petropavlovsk area has been included on page 7 of the map section to Encl 1. It will be noted that four SA-3 sites ring the Petropavlovsk complex. Two additional sites at 53 02N-158 18E and 52 52N-158 37E appear to be inactive at this time and are not listed in this report.

7. All coordinates referenced in this memorandum were derived from USATC 0194-17HL, third edition, September 1963. It should be noted that the coordinates given in reference (b) were obtained from Provisional H.O. No. 5818-A, first edition, November 1950.

8. Forwarded for your retention is a notebook entitled Submarine Support Installations, Avachinskaya Bay (CIA/PID/GMB/P-1937/64, copy 1). The notebook contains fifty-three (53) annotated print enlargements, one (1) annotated map, six (6) pages of map annotations, a three (3) page extract from JPRS 24, 051, a nine (9) page extract from H.O. 98 (formerly H.O. 122A), and one (1) US NAVPIC briefing board.

9. The photo analysis on this project was performed by [redacted] CIA/PID/GMB (NPIC), who may be contacted on ext. [redacted] for any additional information. Specific sections of this project concerning missile, nuclear, POL, conventional munitions, and suspect CW storage, as well as SAM deployment, have been coordinated with the various branches of CIA/PID (NPIC) assigned these functions.

10. This memorandum, with enclosures, completes the referenced requirement.

[redacted]

ENCLOSURES:
(1) Notebook (CIA/PID/GMB/P-1937/64, copy 1).
(2) Table entitled Identifiable Naval Order of Battle Observed at Avachinskaya Bay (Petropaylovsk), Kamchatka, USSR, from June 1963 thru April 1964, copy 1.

REFERENCES

1

MAPS OR CHARTS

US Air Target Chart, Series 200, Sheet 0194-17HL, 3rd ed, Sep 63, scale: 1:200,000 (SECRET)

Provisional H.O. 5818-A, 1st ed, Nov 50, scale: 1:50,000 (FOR OFFICIAL USE ONLY)

The Ministry of Geology of the USSR, The Geology Map of the USSR, Map Sheet # 12, Scale: 1:250,000, pub 1956

NIS 26, Chapter II, Part IV, Figure 24-26, Central and Eastern Siberia - Rock Types, (CONFIDENTIAL)

DOUCMENTS

NPIC. R-52/64, Probable Naval Missile Facility near Petropavlovsk-Kamchatskiy, USSR, Jan 64 (TOP SECRET)

NPIC. R-193/64, Petropavlovsk Naval Base Tar'ya Bay, Petropavlovsk-Kamchatskiy, USSR (TOP SECRET)

CIA/PID/GMB Memorandum 350/64 of 29 April 1964

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JPRS 24,051, Problems in Engineering Seismology, No. 8, "On the Seismic Micro-regioning of the Territory of Petropavlovsk-Kamchatskiy," pp 4-6, 75-82

Vlasov, G.M., and Chemekov, F.F., "Basic Stages of the Formation of the Relief of Kamchatka," News of the All-Union Geographical Society, pp 262-272

H.O. 98, pp 156-164

Pacific Command, Weekly Intelligence Digest, Number 46-63 of 22 November 1963, "Soviet Northern Sea Route Naval Transfers," pp 2-3, 6-9 (SECRET)

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IDENTIFIABLE NAVAL ORDER OF BATTLE OBSERVED AT

AVACHINSNAYA BAY (PETROPAVLOVSK), KAMCHATKA, USSR, FROM [ ]

Date Observed	Submarines					Surface Combatants		Auxiliaries			Portable Docks	
	E	G	F/Z	W	U/I	DD	DE	AS	ASL	APL	Floating	Transporter
25X1 [ ]	-	-	-	-	4	3	-	1	-	-	2	1
	-	-	-	-	3	-	-	2	-	1	1	1
64	3	-	-	-	5	-	-	2	-	2	2	1
	3	2	3	10	2	7	2	2	1	2	2	1
	1	1	2	3	1	1	-	1	1	2	-	-

NOTES: (1) Figures above include vessels identified as "probable" or "possible".

25X1 (2) [ ] - All of Avachinskaya Bay was visible on haze-covered photography.

(3) [ ] - SE portion of Avachinskaya Bay, including Rakovaya Bay, was cloud covered; forward camera blurring precluded utilization of stereo mode.

25X1 (4) [ ] - Entire Avachinskaya Bay covered on cloud-free photography.

(5) [ ] Entire Avachinskaya Bay covered on cloud-free photography; excessive obliquity distorted stereo imagery.

25X1 (6) [ ] - Eastern shore of Avachinskaya Bay cloud-covered. Seldevaya Bay and eastern portion of Tar'ya Bay Submarine Base obscured by clouds and/or cloud shadow.

Enclosure (2)

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GROUP 1
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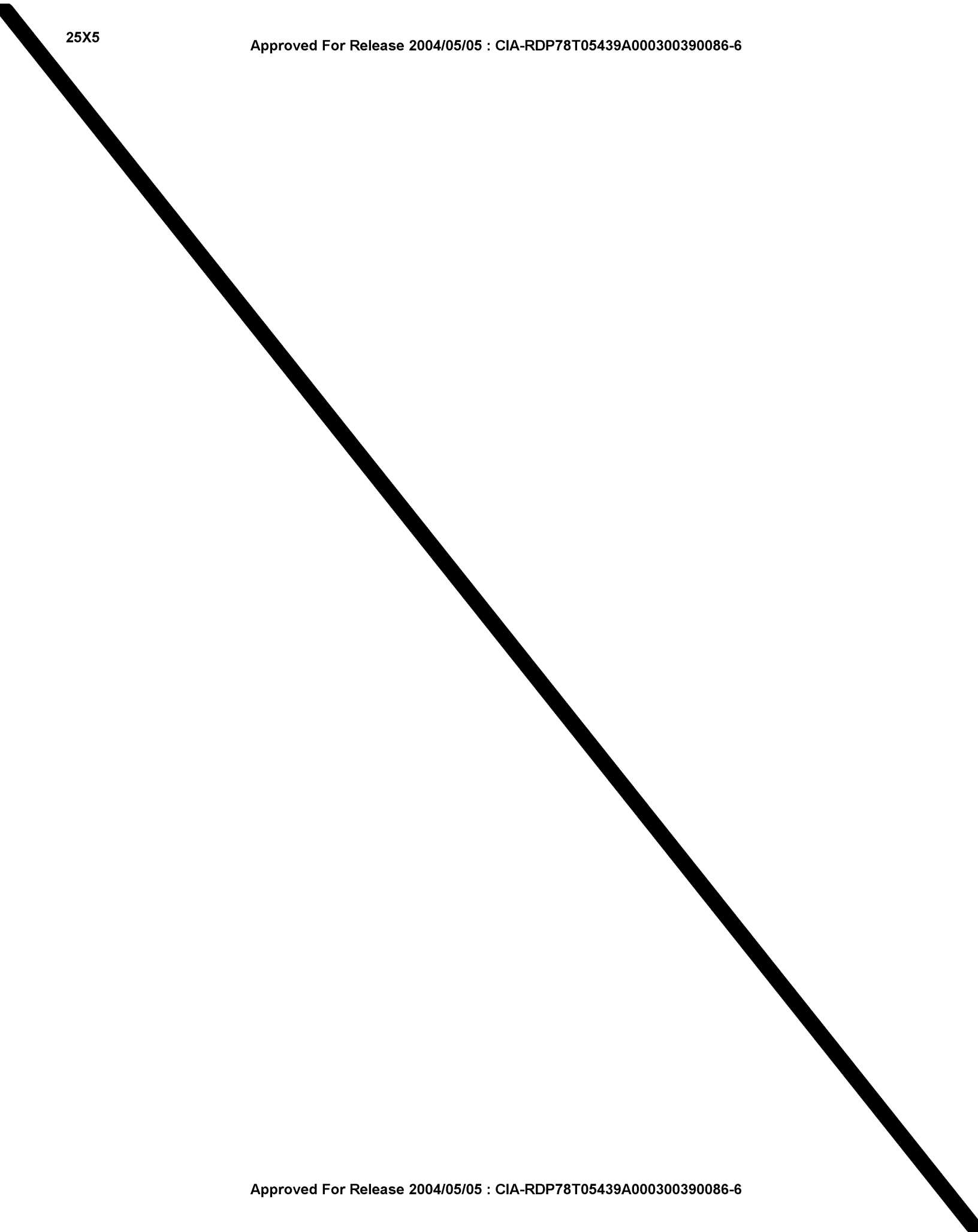

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Reference Number	B.E. Number	Annotation
		INTELLIGENCE COMPILATION DATE
1		**Petropavlovsk/Severnyy Koryaki Airfield** Military airfield. Runway 6,600 ft. by 180 ft., 040/220 (MAG.), asphalt. Overrun 300 ft. by 180 ft. at SW end of runway, graded earth. Parallel taxiway SE of runway, 60 ft. wide, asphalt. Facilities include two asphalt assembly aprons, one parking apron, one control tower 25 ft. high with three small support buildings, 18 miscellaneous workshops and support buildings, height 15 ft., and 42 personnel quarters, height 15 ft. (Date of Intel: 1963.)
2		**Petropavlovsk Kamchatskiy SAM Site C32 2** Soft type with hexagonal (star) link configuration. Facilities include six launch pits, guidance control and three missile hold revetments. Support area contains four barracks and storage building, predominant height 15 ft. (Date of Intel: 1963.)
3		**Petropavlovsk/Koryaki Airfield** Military airfield. Runway 6,400 ft. by 180 ft., 070/250 (MAG.), concrete. Overrun 1,400 ft. by 180 ft. at W end of runway, graded earth. Parallel taxiway S of runway 80 ft. wide, concrete. Emergency landing area SE of runway 6,000 ft. long, sod. Facilities include twenty earthen revetments, 20 workshops and support buildings, 15 ft. high, one control tower, 25 ft. high, 36 personnel quarters, 15 ft. high, and a secured storage area. (Date of of Intel: 1963.)
4		**Storage Area Koryaki** Secured area contains 29 sparsely spaced storage buildings; predominant height 10 ft. (Date of Intel: 1963.)
5		**Yelizovo Ammunition Depot Avacha River** Secured area contains 11 revetted storage buildings, nine warehouses, and one administration building; predominant height 30 ft. (Date of Intel: 1963.)
6		**Petropavlovsk/Yelizovo Airfield** Major military and civil airfield. Runway 8,300 ft. by 240 ft., 160/340 (MAG.), concrete. Parallel taxiway 80 ft. wide, concrete. Facilities include one small concrete parking apron, concrete hangar apron, concrete assembly apron, former concrete runway utilized for parking, operations building with control tower, 40 ft. high, hangar, 25 ft. high, six workshops, 15 ft. high, administration building, 30 ft. high, nine barracks, 25 ft. high, many personnel quarters, 15 ft. high, 20 storage buildings, 15 ft. high, secured ammunition storage area, and underground POL storage. Petropavlovsk/Yelizovo Military Headquarters [redacted] Air Force, [redacted] is also located on t[redacted] (Date of Intel: 1963.)

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7 .....

Krug DF Site Petropavlovsk N.W.

Area contains an antenna system consisting of three concentric circles. The innermost circle is formed by 38 stickmasts supporting a reflector screen and encompassing a control building. The next circle is the antenna ring formed by 40 cage antennas. The outer circle is formed by a low fence and a guard shelter. Support facilities located 1,700 ft. southeast, predominant height 20 ft.
(Date of Intel: 1963.)

8

Petropavlovsk Krug DF Site No. 2

Area contains an antenna system consisting of three concentric circles. The innermost circle is formed by 38 stickmasts supporting a reflector screen and encompassing a control building. The next circle is the antenna ring formed by 4 cage antennas. The outer circle is formed by a low fence and a guard shelter. Support facilities located 7,000 ft. northwest, predominant height 20 ft.
(Date of Intel: 1963.)

9

Storage Area Petropavlovsk Northwest

Secured area contains four storage buildings and two revetted storage bunkers, predominant height 20 ft.
(Date of Intel: 1963.)

10

Petropavlovsk Kamchatskiy SAM Site A06 2

Soft type with hexagonal (star) link configuration. Facilities include six launch pits, guidance control and three missile hold revetments. Support area contains four barracks and storage building, predominant height 15 ft.
(Date of Intel: 1963.)

11

Petropavlovsk Kamchatskiy Military Supply Depot

Area contains five storage buildings, administration building, seven barracks, eight personnel quarters, and nine small support buildings, predominant height 20 ft.
(Date of Intel: 1963.)

12

Petroleum Storage Petropavlovsk

Two secured storage areas. Contain a total of 17 large tanks, four medium tanks and 18 small tanks, height 25 ft.
(Date of Intel: 1963.)

13

Petropavlovsk Kamchatskiy Petroleum Storage Sero

Contains eleven above ground storage tanks, height 40 ft., powerhouse, boilerhouse, three warehouses, administration building, ten support buildings, and pier, predominant height 20 ft. Road and water served.
(Date of Intel: 1963.)

Reference Number	B.E. Number	Annotation
14		**Petropavlovsk Kamchatskiy Petroleum Products Storage** Contains eleven large and 8 medium above ground storage tanks, height 35 ft., and pumping station. Road and water served. (Date of Intel: 1963.)
15		**Petropavlovsk Military Supply Depot** Contains three multistory warehouses, 13 storage buildings, and four support buildings, predominant height 35 ft. (Date of Intel: 1963.)
16		**Petropavlovsk Army Barracks** Area contains 33 barracks, 12 administrative type buildings, 9 storage buildings, four personnel quarters, and four support buildings; predominant height 25 ft. (Date of Intel: 1963.)
17		**Petropavlovsk Kamchatskiy SAM Support** Contains an administration building, two assembly buildings, two check-out buildings, four warehouses, 12 workshops and miscellaneous buildings, 44 personnel quarters, and a vehicle parking area, predominant height 20 ft. Booster, warhead and fuze storage located on loop-road to the S.E. (Date of Intel: 1963.)
18		**Petropavlovsk Kamchatskiy SAM Site B28 2** Soft type with hexagonal (star) link configuration. Facilities include six launch pits, guidance control and three missile hold revetments. Support area contains three barracks, operations building, and storage building, predominant height 15 ft. (Date of Intel: 1963.)
19		**Petropavlovsk Army Barracks N.N.E.** Area contains six multistory barracks and nine support buildings, predominant height 30 ft. (Date of Intel: 1963.)
20		**Petropavlovsk Military Barracks and Training Center** A military headquarters area and drivers training school. Facilities include two multistory administration buildings, 10 barracks, two large garages, motor pool, vehicle training course, and 33 miscellaneous buildings, predominant height 25 ft. (Date of Intel: 1963.)
21		**Petropavlovsk/Ozero Khalakhtyrka Seaplane Station** Minor seaplane station on Lake Khalakhtyrka. Facilities include two hangars, two transition ramps, five multistory barracks 14 single-story barracks and 25 miscellaneous buildings, predominant height 20 ft. Area also includes a landing strip 3,400 ft. by 150 ft., 120/300 (MAG.), graded earth, west of seaplane station. (Date of Intel: 1963.)

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22

Petropavlovsk Krug DF Site No. 1

Area contains an antenna system consisting of three concentric circles. The innermost circle is formed by 38 stickmasts supporting a reflector screen and encompassing a control building. The next circle is the antenna ring formed by 40 cage antennas. The outer circle is formed by a low fence and 4 guard shelter. Support facilities, located 5,000 ft. north, consist of 12 miscellaneous buildings, height 15 ft.
(Date of Intel: 1963.)

23

Petropavlovsk Port Facilities

Small sheltered port containing a concrete and steel mole, two offshore wooden piers and 2,000 ft of concrete quayage. Water depths range from 15 to 30 ft. Facilities include ten portal jib cranes, six warehouses, L-shaped administration building, cold-storage plant, electric power plant, many support buildings, and open coal storage area, predominant height 30 ft. Petropavlovsk Naval Base [redacted] is located in the outer harbor area. Facilities include a 500 ft. concrete and steel quay and nine storage and support buildings, predominant height 20 ft.
(Date of Intel: 1963.)

24

Petropavlovsk Government Control Center

Concentration of multistory administration and support buildings, predominant height 40 ft.
(Date of Intel: 1963.)

25

Petropavlovsk Naval Headquarters Kamchatka Flotilla

Contains two multistory administration buildings and eight barracks, predominant height 35 ft.
(Date of Intel: 1963.)

26

Naval Berthing Facility Petropavlovsk Rakovaya

Minor naval facility on Rakovaya Bay. Area contains a concrete quay, 200 ft. long, large L-shaped pier, two small piers, administration building, support building, and underground petroleum storage; predominant height 15 ft.
(Date of Intel: 1963.)

27

Petropavlovsk Kamchatskiy Shipyard 412

Major products are 60-ton fishing vessels and small patrol craft. Yard contains 800 ft. concrete quay, drydock, floating drydock, two jib cranes, several portal cranes, five shops, five large warehouses, many small miscellaneous buildings, and open storage, predominant height 40 ft.
(Date of Intel: 1963.)

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28

Petropavlovsk Naval Base Mys Izmennyy

A naval rescue and defense station includes an administration area, helicopter landing area, and a small naval base containing three piers. Facilities include two administration building, 18 barracks, 14 personnel quarters, four warehouses, and seven miscellaneous buildings, predominant height 20 ft.
(Date of Intel: 1963.)

29

Petropavlovsk Kamchatskiy SAM Site A16 2

Soft type with hexagonal (star) link configuration. Facilities include six launch pits, guidance control and three missile hold revetments. Support area contains four barracks and one storage building, predominant height 15 ft.
(Date of Intel: 1963.)

29A

29B

Petropavlovsk Naval Missile Support Facility
(Date of Intel: 1963.)

30

Petropavlovsk Naval Base Tarya Bay

Naval base and shipyard supporting long range submarines. Area contains five piers, six multistory administration buildings, 24 workshops and warehouses, diesel power plant, and seven miscellaneous support buildings, predominant height 20 ft.
(Date of Intel: 1963.)

31

Petropavlovsk Naval Supply Depot Novaya Tarya

Contains two multistory administration buildings, 12 warehouses, and 23 small storage and support buildings, predominant height 25 ft.
(Date of Intel: 1963.)

32

Petropavlovsk Naval Mining and Torpedo Depot Kosa

Area contains 10 storage buildings, seven partly underground storage bunkers, four barracks, administration building, five support buildings, pier and vehicle parking area, predominant height 15 ft. Water served
(Date of Intel: 1963.)

33

Petropavlovsk Kamchatskiy SAM Site A20 2

Soft type with hexagonal (star) link configuration. Facilities include six launch pits, guidance control and three missile hold revetments. Support area contains four barracks and storage building, predominant height 15 ft. Water served.
(Date of Intel: 1963.)

34

Petropavlovsk Army Barracks West

Area contains nine barracks and seven support buildings, predominant height 30 ft.

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Petropavlovsk Kamchatskiy SAM Site A
20A-2

Soft type with hexagonal (star) link configuration. Facilities include six launch pits; guidance control and three missile hold revetments. Support area contains four barracks and storage building, predominant height 15 ft. Water served.
(Date of Intel: 1968.)

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CURRENT LISTING OF NPIC TARGETED SAM INSTALLATIONS

PETROPAVLOVSK-KAMCHATSKIY, USSR

SA-2 SITES

PETROPAVLOVSK-KAMCHATSKIY	A06-2	53 05N-158 51E
PETROPAVLOVSK-KAMCHATSKIY	A16-2	52 55N-158 45E
PETROPAVLOVSK-KAMCHATSKIY	A20-2	52 54N-158 37E
PETROPAVLOVSK-KAMCHATSKIY	B21-2	52 45N-158 29E
PETROPAVLOVSK-KAMCHATSKIY	B28-2	53 02N-158 18E
PETROPAVLOVSK-KAMCHATSKIY	C32-2	53 20N-158 10E
MYS SHIPUNSKI	A36-2	53 14N-159-59E
MYS SHIPUNSKI	B31-2	53 12N-159 46E

SA-3 SITES

PETROPAVLOVSK-KAMCHATSKIY	A06-3	53 05N-158 51E
PETROPAVLOVSK-KAMCHATSKIY	A16-3	52 55N-158 45E
PETROPAVLOVSK-KAMCHATSKIY	A23-3	52 55N-158 30E
PETROPAVLOVSK-KAMCHATSKIY	B30-3	53 08N-158 23E

SAM SUPPORT FACILITY

PETROPAVLOVSK-KAMCHATSKIY	53 04N-158 46E

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Probable Naval
Missile Facility
Submarine Base
Zeldevaya Bay
Naval Repair Facility
Yagodnaya Bay Seaplane Station
(5 MADGE seaplanes on ramp)
AVACHINSKAYA BAY - SOUTHWEST
(TAR'YA BAY)
52 54N-158 28E

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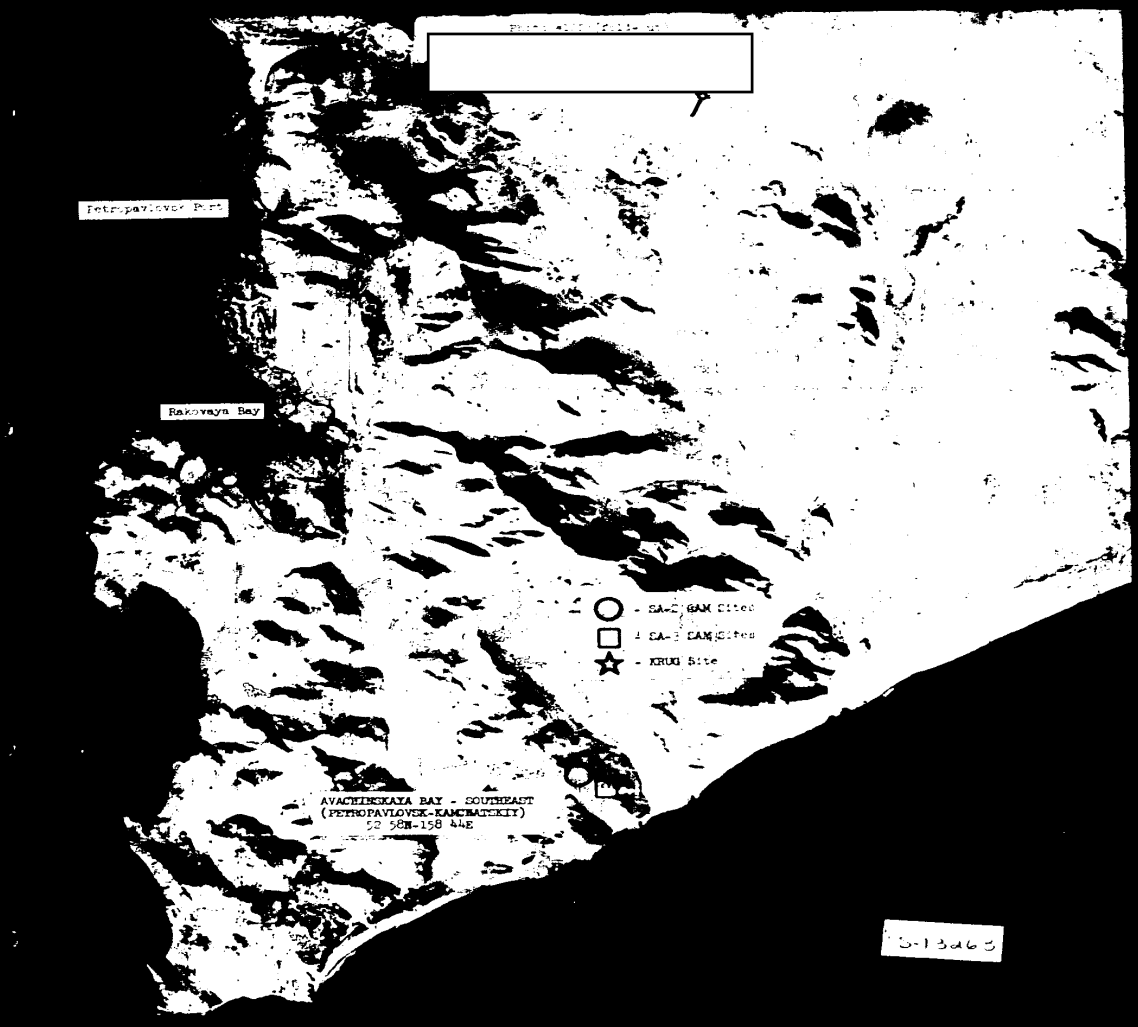
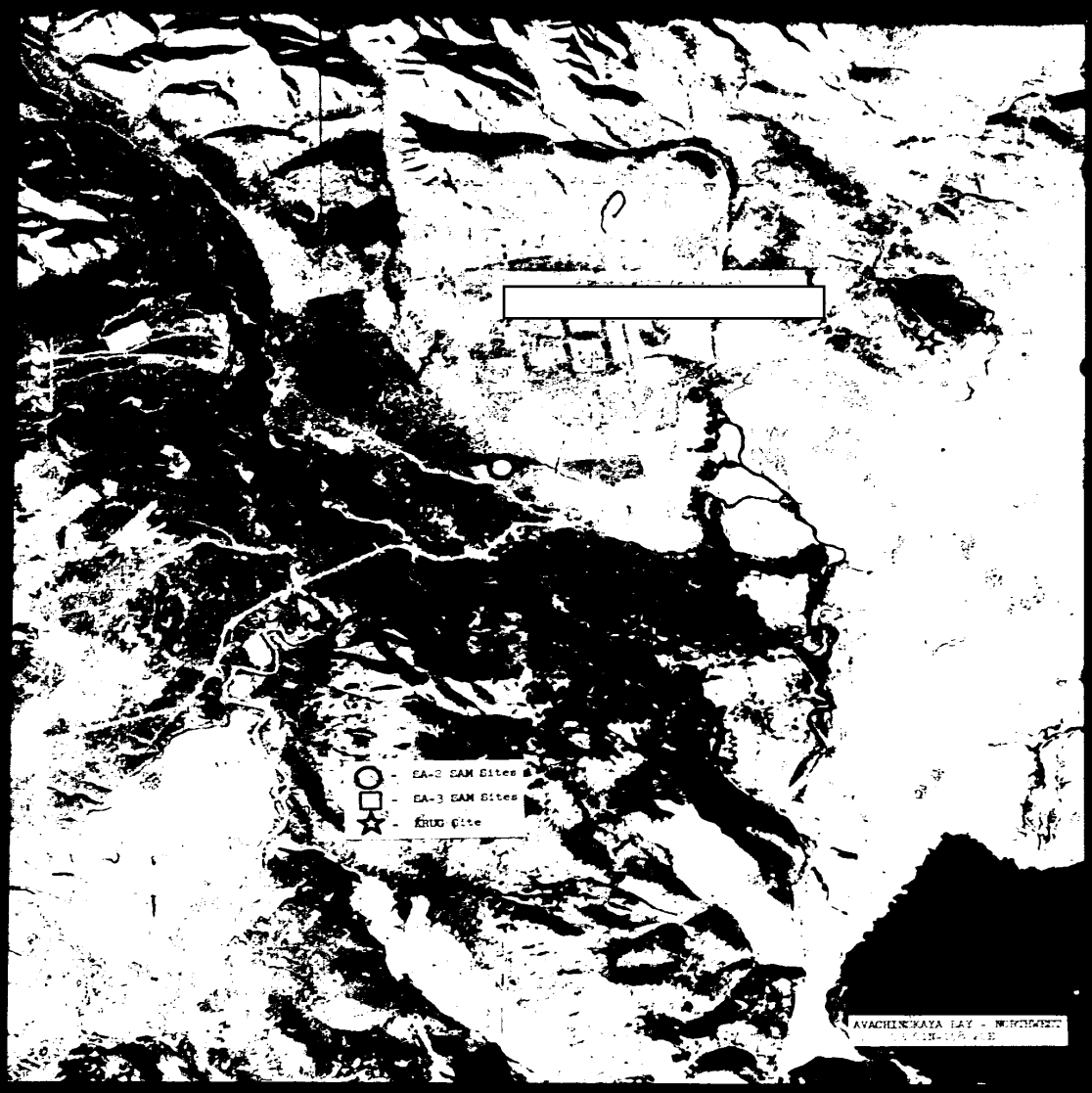

Petropavlovsk Port
Rakovaya Bay
- SA-2 SAM Sites
- SA-3 SAM Sites
- KRUG Site
AVACHINSKAYA BAY - SOUTHEAST
(PETROPAVLOVSK-KAMCHATSKIY)
52 58N-158 44E
5-13d63


- SA-2 SAM Sites
- SA-3 SAM Sites
- SRUG Site
AVACHINSKAYA BAY - NORTHWEST

S-13268

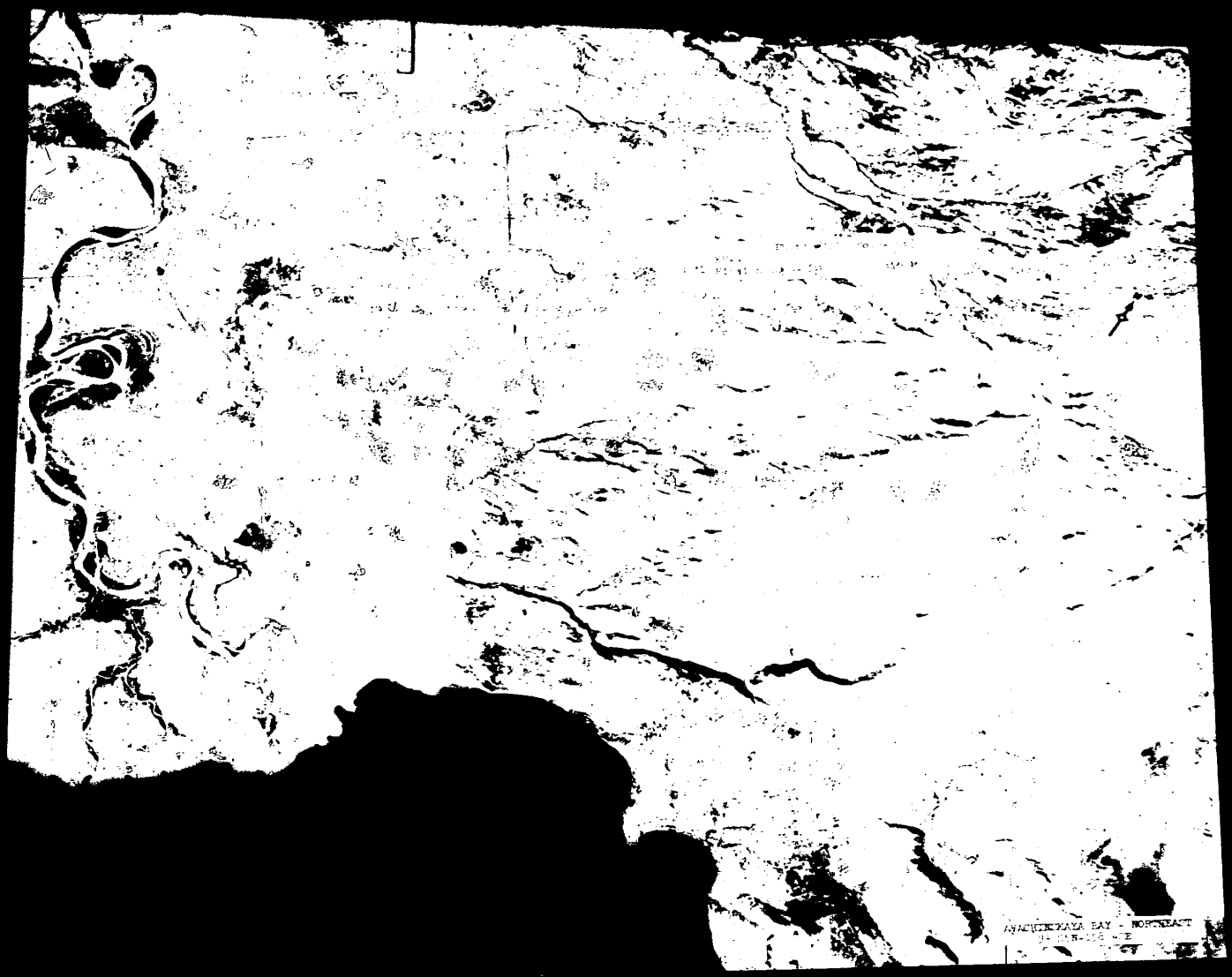


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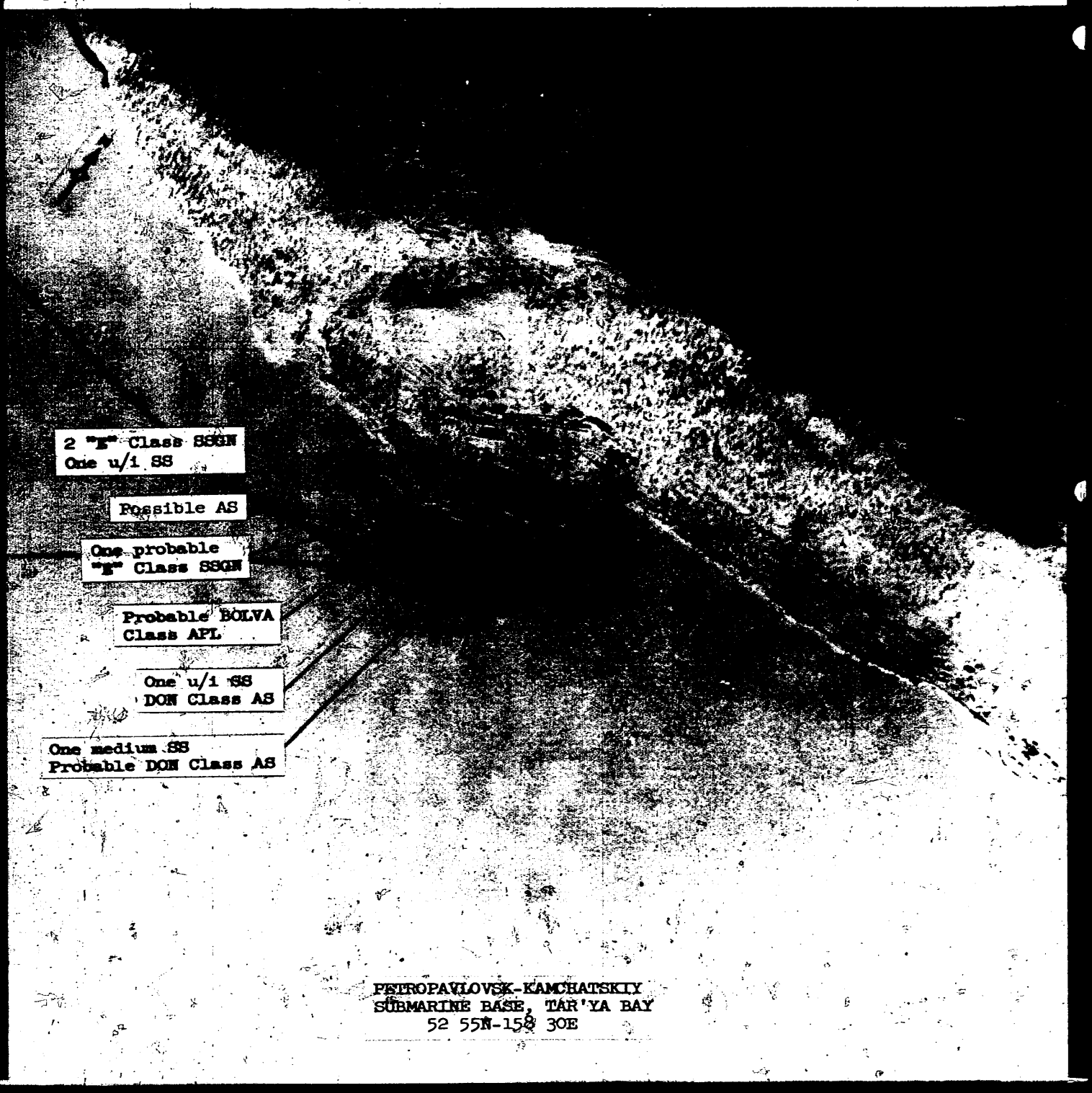
Photo #13

X1

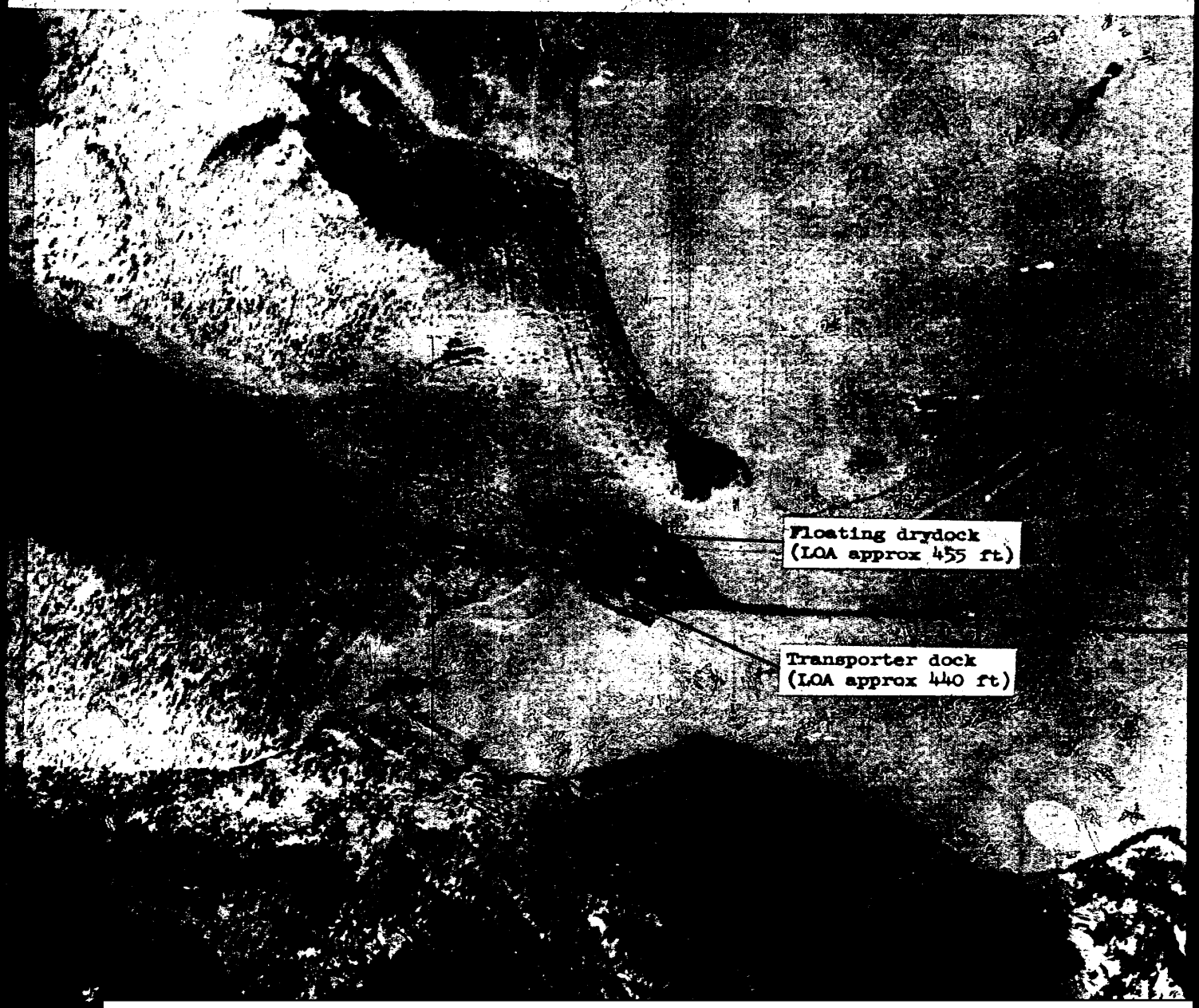


PETROPAVLOVSK-KAMCHATSKIY
SUBMARINE BASE, TAR'YA BAY
52 55N-158 30E

S-13263

Photo #14

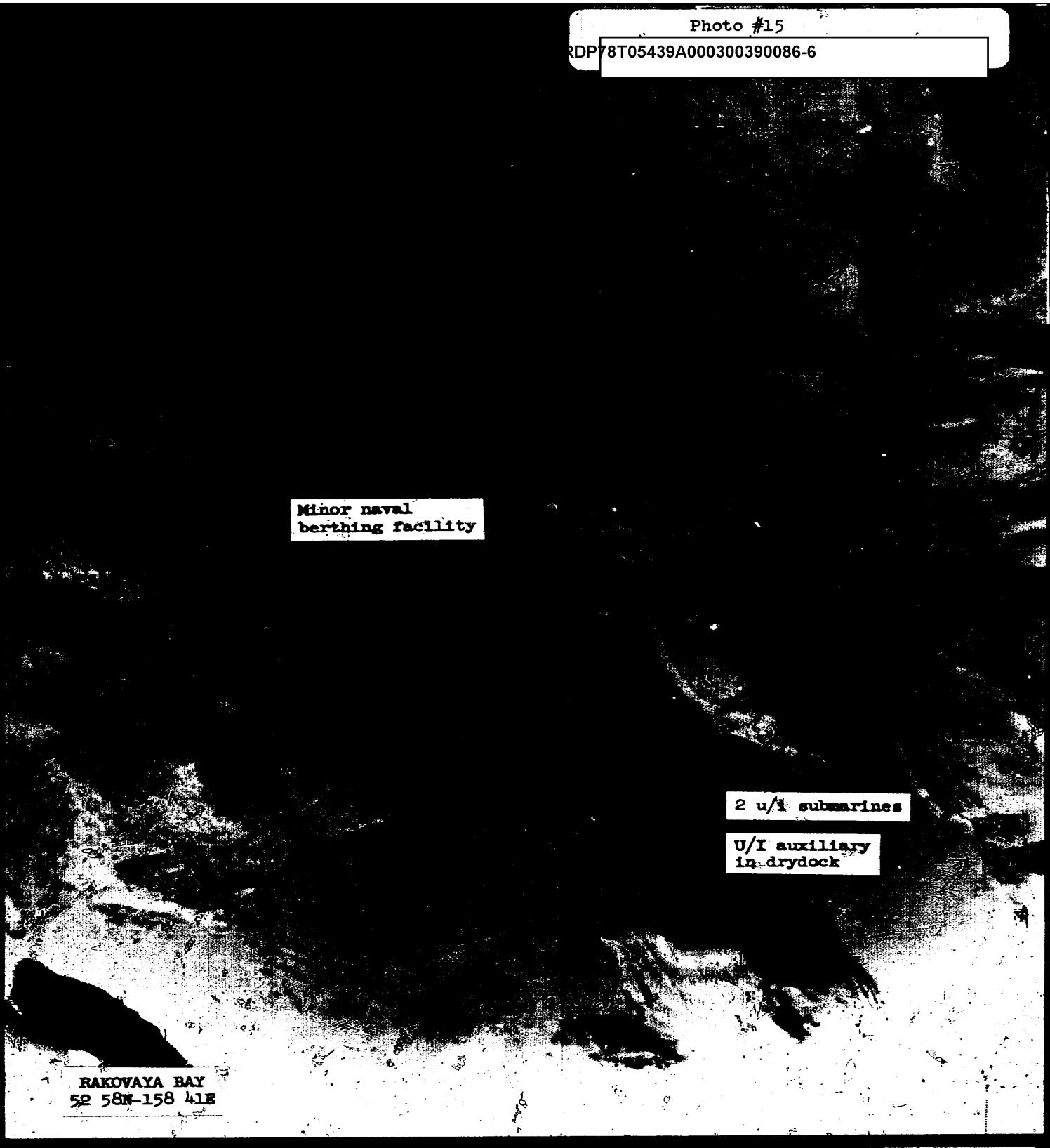
X1



NPIC

SEVERNAYA BAY
NAVAL REPAIR FACILITY
52 54N-158 26E

S-13263



S-13263

Next 1 Page(s) In Document Exempt


[redacted]
Missile storage and handling area
[redacted]
Possible SS and floating crane on each side of pier
NAVAL MISSILE FACILITY
TAR'IA BAY
32 50N-158 23E

S-13263

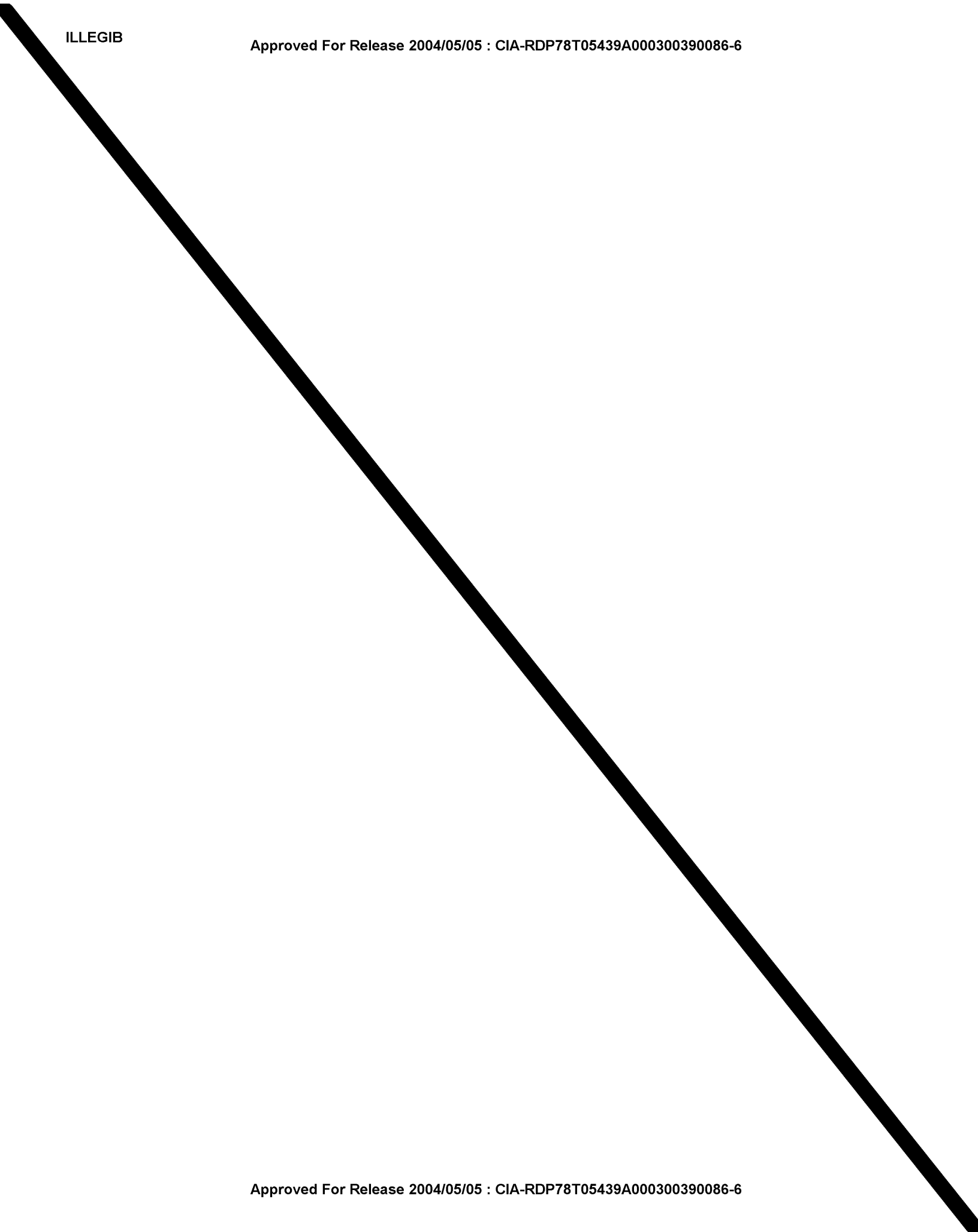


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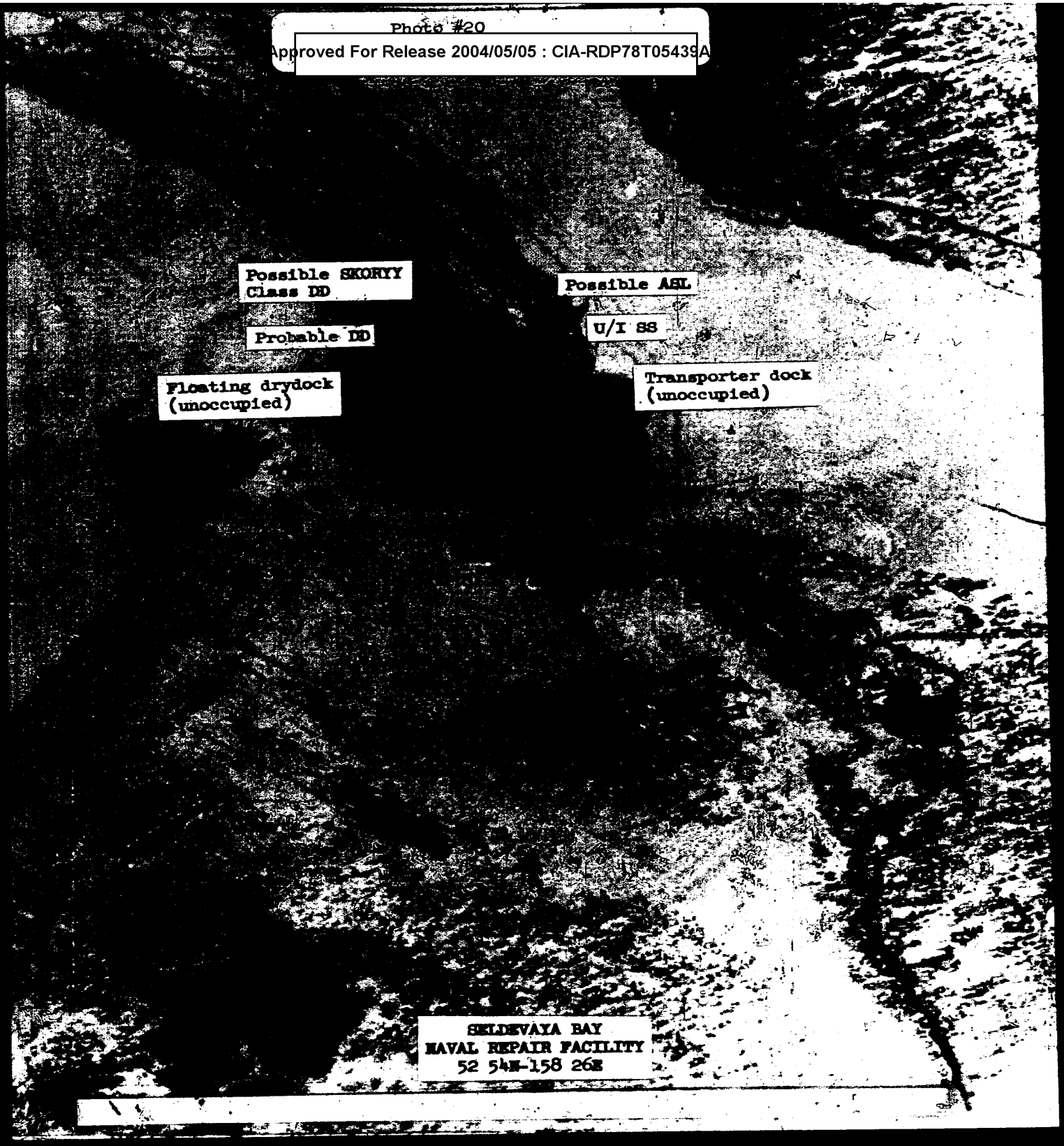
Photo #19

NAVAL ORDER OF BATTLE PRESENT AT PETROPAVLOVSK-KAMCHATSKIY SUBMARINE BASE

Annotation #	Vessel Description
1	One SS(B) (possible "G" Class)
2	One SS(B) (probable "G" Class)
3	One SS (probable "W" Class)
4	Two SS(B) (possible "F/Z" Class)
5	One possible APU
6	One SS (possible "W" Class)
7	One DON Class AS
8	One possible YGB
9	One "W" Class SS
10	One SS(GN) (probable "E" Class)
11	One SS(B) (possible "F/Z" Class)
12	Two SS (probable "W" Class)
13	One DON Class AS
14	Two SS (probable "W" Class)
15	One possible ASL
16	One BOLVA Class APL
17	One possible ASL
18	One probable APL
19	One possible AO
20	One "E" Class SSGN
21	One "E" Class SSGN
22	One SS (probable "W" Class)

S-13263

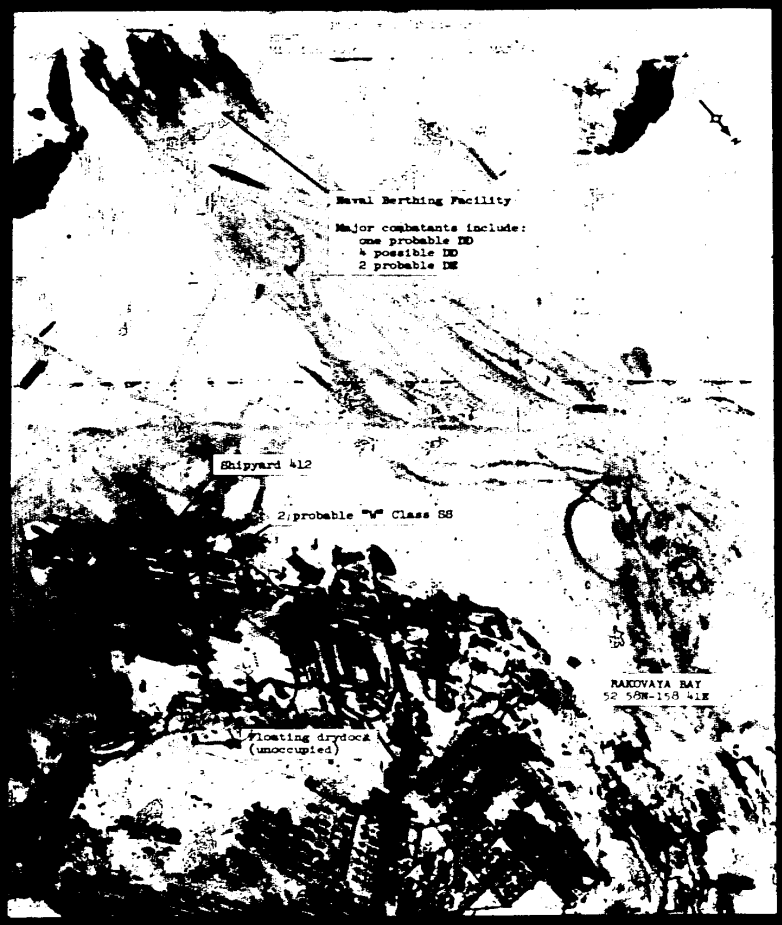
Photo #20



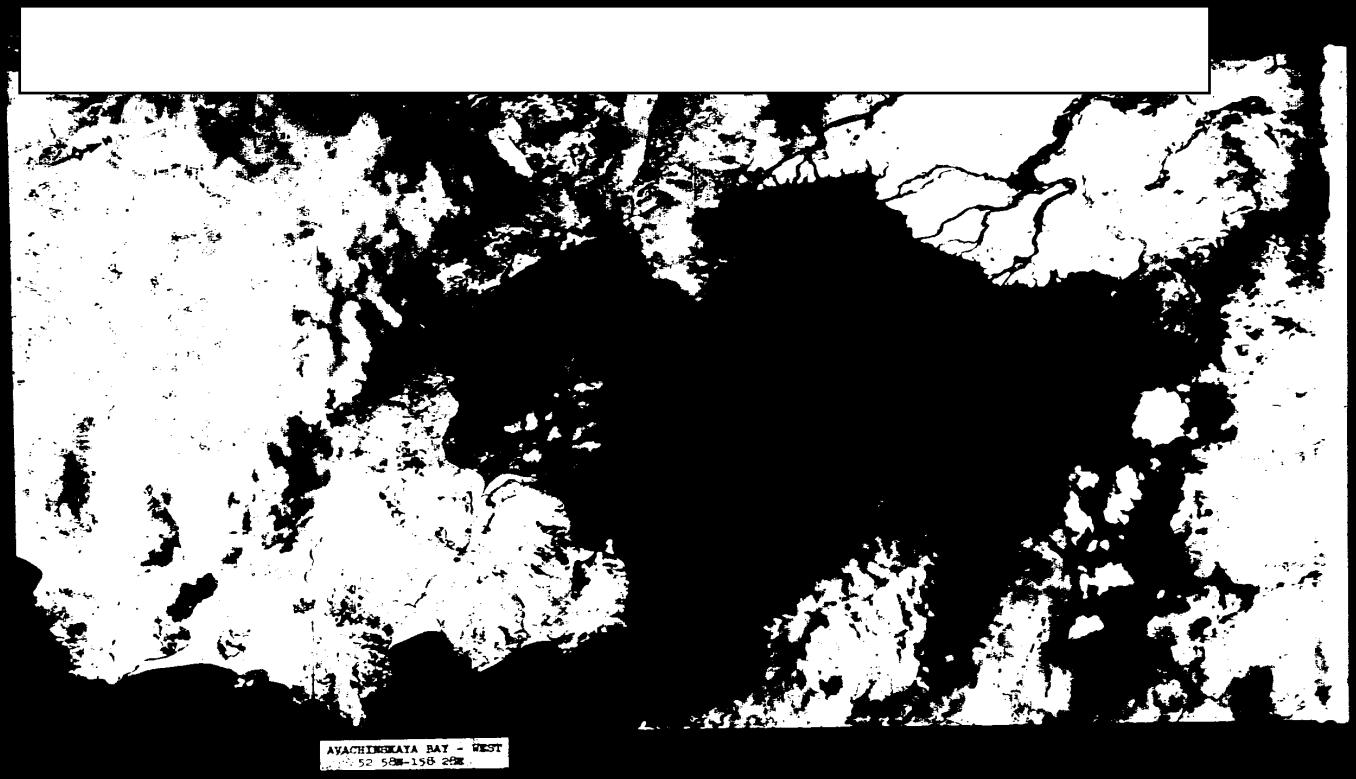
S-13263


Rakovaya Bay
Petropavlovsk Port
PETROPAVLOVSK-KAMCHATSKIY
53 01N-158 37E

S-13263


Naval Berthing Facility
Major combatants include:
one probable DD
4 possible DD
2 probable DE
Shipyard 412
2/probable "V" Class SS
RAKOVAYA BAY
52 56N-158 41E
Floating drydock
(unoccupied)

S-13265



S-13866

[redacted]


Severnaya Bay
Naval Repair Facility
New construction activity
(see Appendix I photos 1&2)
Probable power/commo trace
[redacted]
TAR'YA BAY - SOUTH
52 54N-158 29E
SLBM

PETROPAVLOVSK-KAMCHATSKIY
SUBMARINE BASE, TAR'YA PENINSULA
52 55N-158 30E

S-13263

TOP SECRET

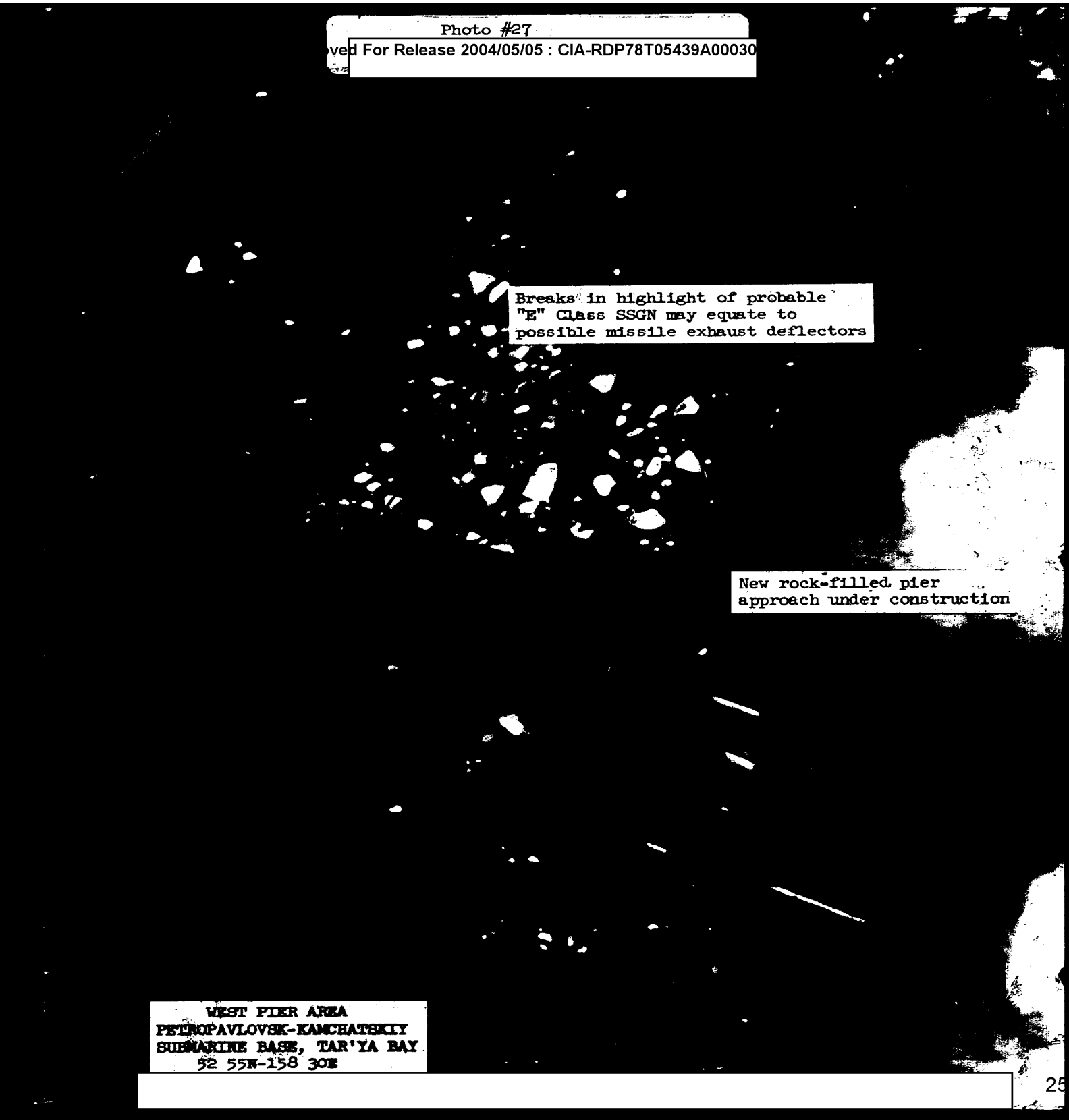
Photo # 26

NAVAL ORDER OF BATTLE PRESENT AT PETROPAVLOVSK-KAMCHATSKIY SUBMARINE BASE

Annotation #	Vessel Description
1	One SS(GN) (probable "E" Class)
2	One probable APL
3	One probable ASL (possible ANADIR Class)
4	One BOLVA Class APL
5	One probable DD
6	Two "W" Class SS
7	One SS(B) (possible "G" Class)
8	One unidentified SS
9	One SS(B) (probable "Z/F" Class)
10	One "W" Class SS
11	One SS(B) (probable "Z/F" Class)
12	One possible DON Class AS

TOP SECRET

S-13263

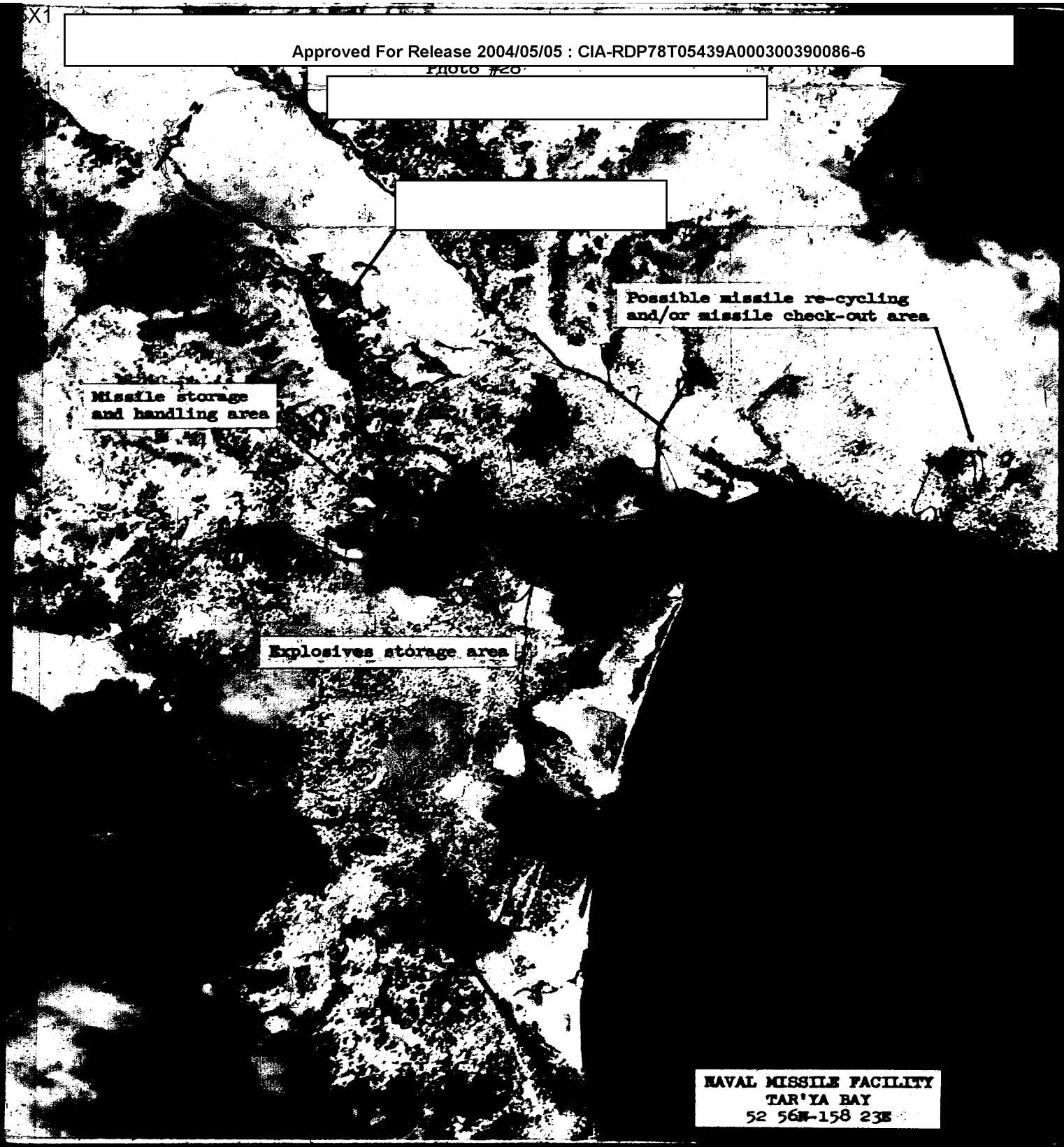


WEST PIER AREA
PETROPAVLOVSK-KAMCHATSKIY
SUBMARINE BASE, TAR'YA BAY
52 55N-158 30E

S-13263

X1

Photo #28



NAVAL MISSILE FACILITY
TAR'YA BAY
52 56N-158 23E

S-13263

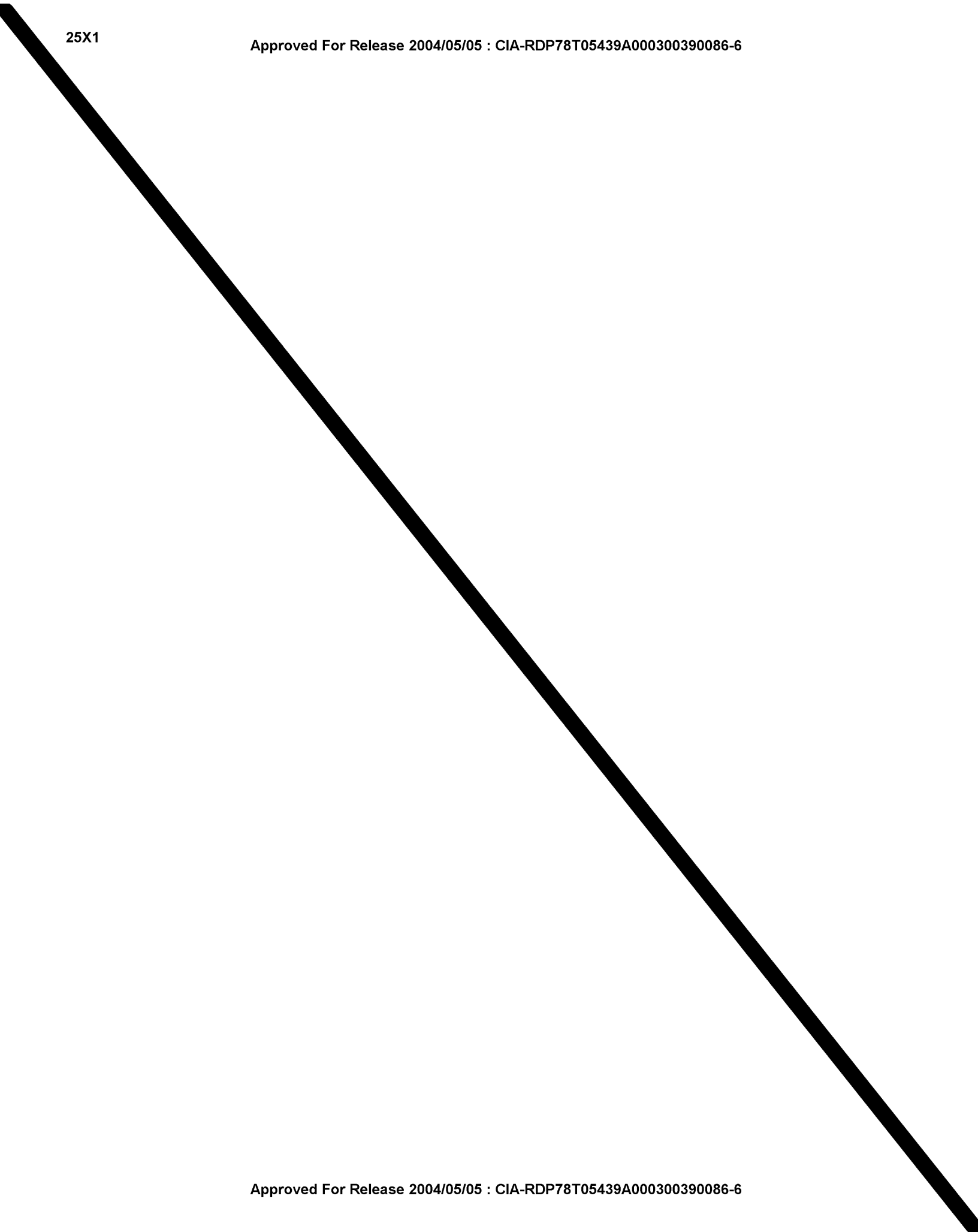


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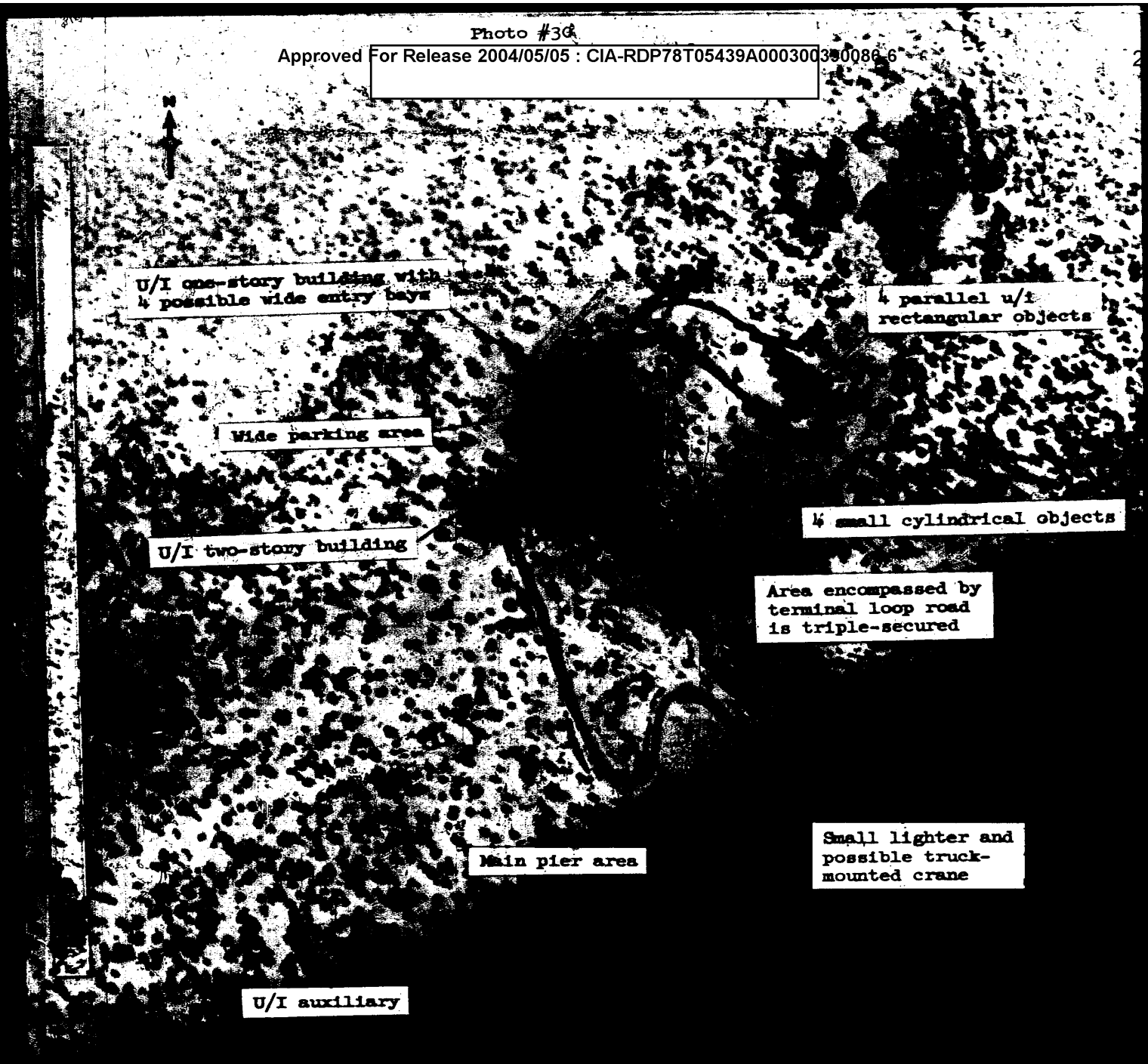
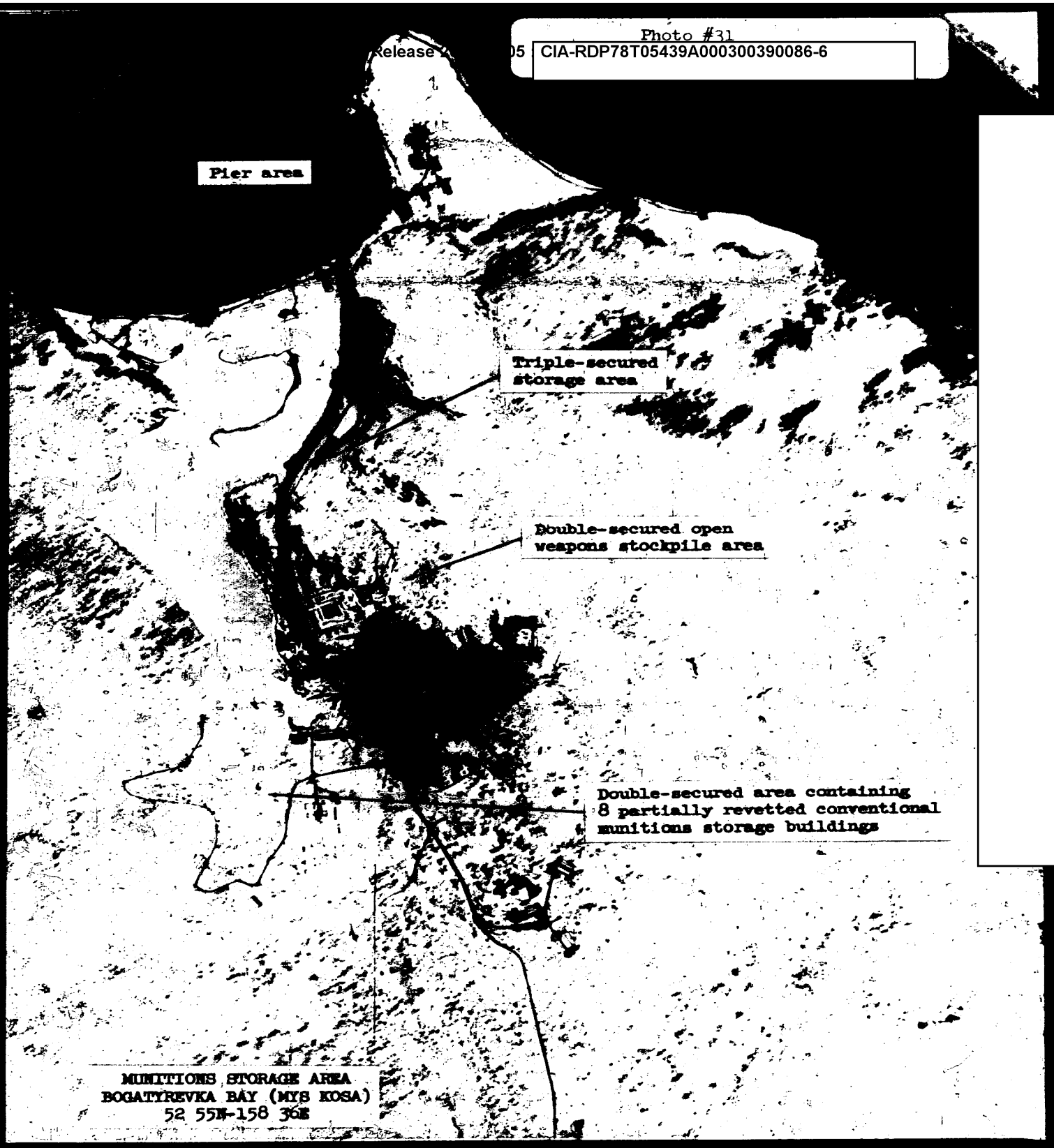
Photo #3



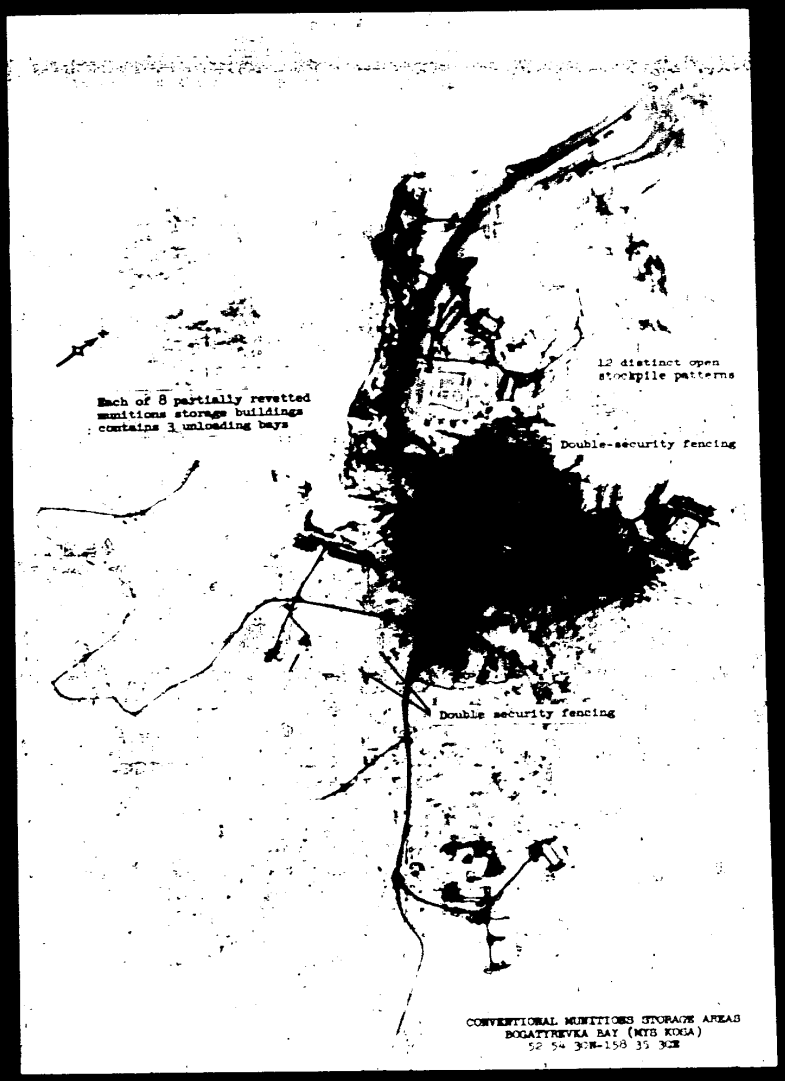
POSSIBLE MISSILE RE-CYCLING AND/OR MISSILE CHECK-OUT AREA, NAVAL MISSILE FACILITY, TAR'YA BAY
52 57N-158 26E

S-13263

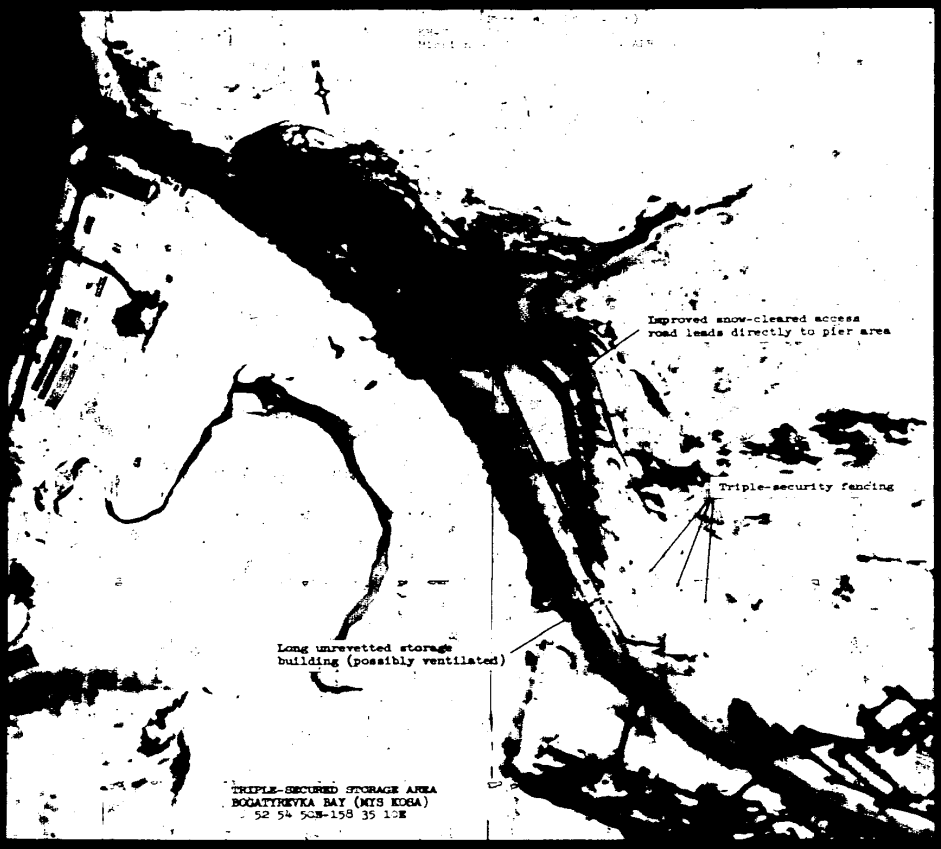


MUNITIONS STORAGE AREA
BOGATYREVKA BAY (MYS KOSA)
52 55N-158 36E

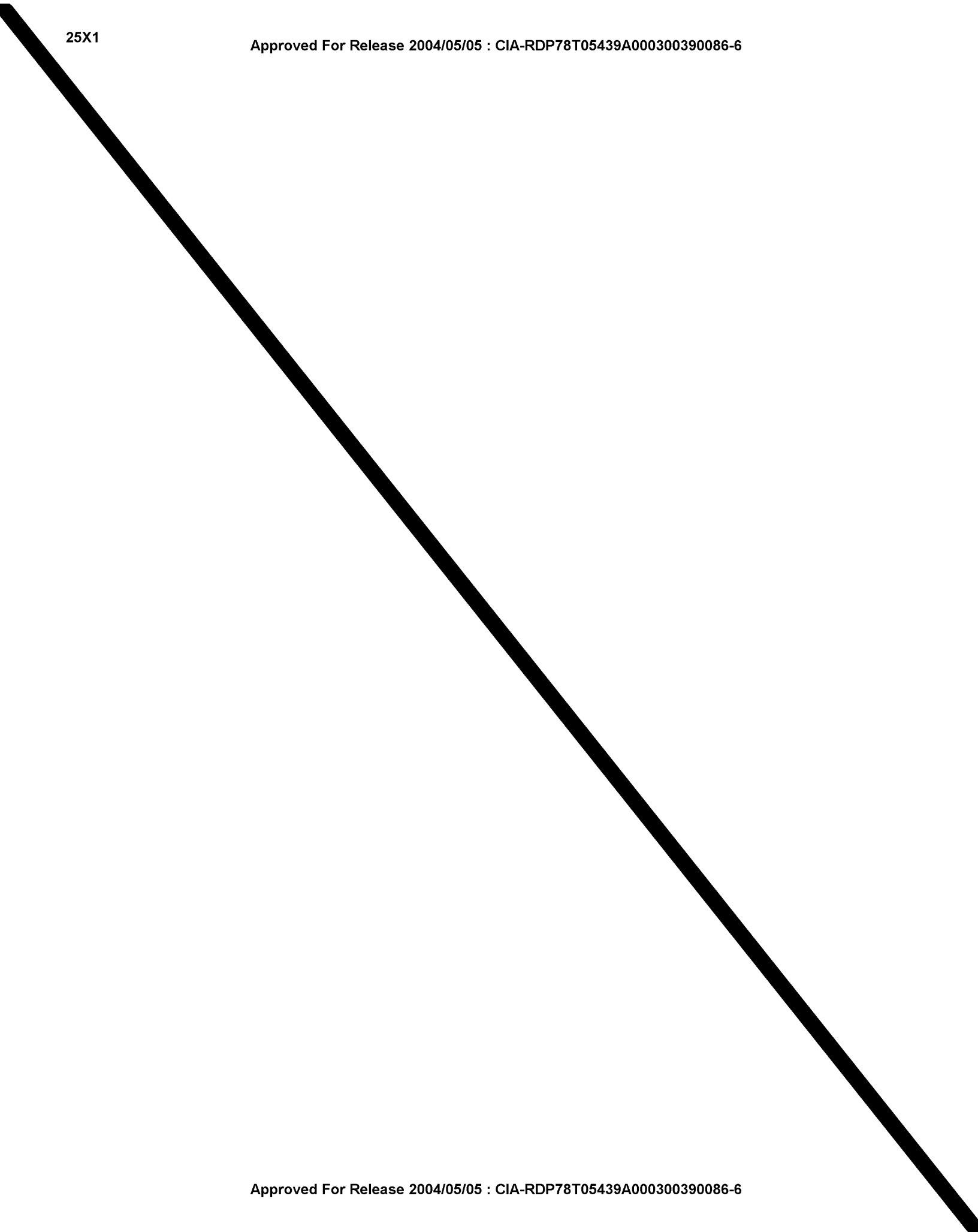
S-13263


Each of 8 partially revetted munitions storage buildings contains 3 unloading bays
12 distinct open stockpile patterns
Double-security fencing
Double security fencing
CONVENTIONAL MUNITIONS STORAGE AREAS
BOGATYREVKA BAY (MYS KOSA)
52 54 30N-158 35 30E

S-13863


Improved snow-cleared access road leads directly to pier area
Triple-security fencing
Long unrevetted storage building (possibly ventilated)
TRIPLE-SECURED STORAGE AREA
BOGATYREVKA BAY (MYS KOGA)
52 54 50N-158 35 10E

S-13,046 3



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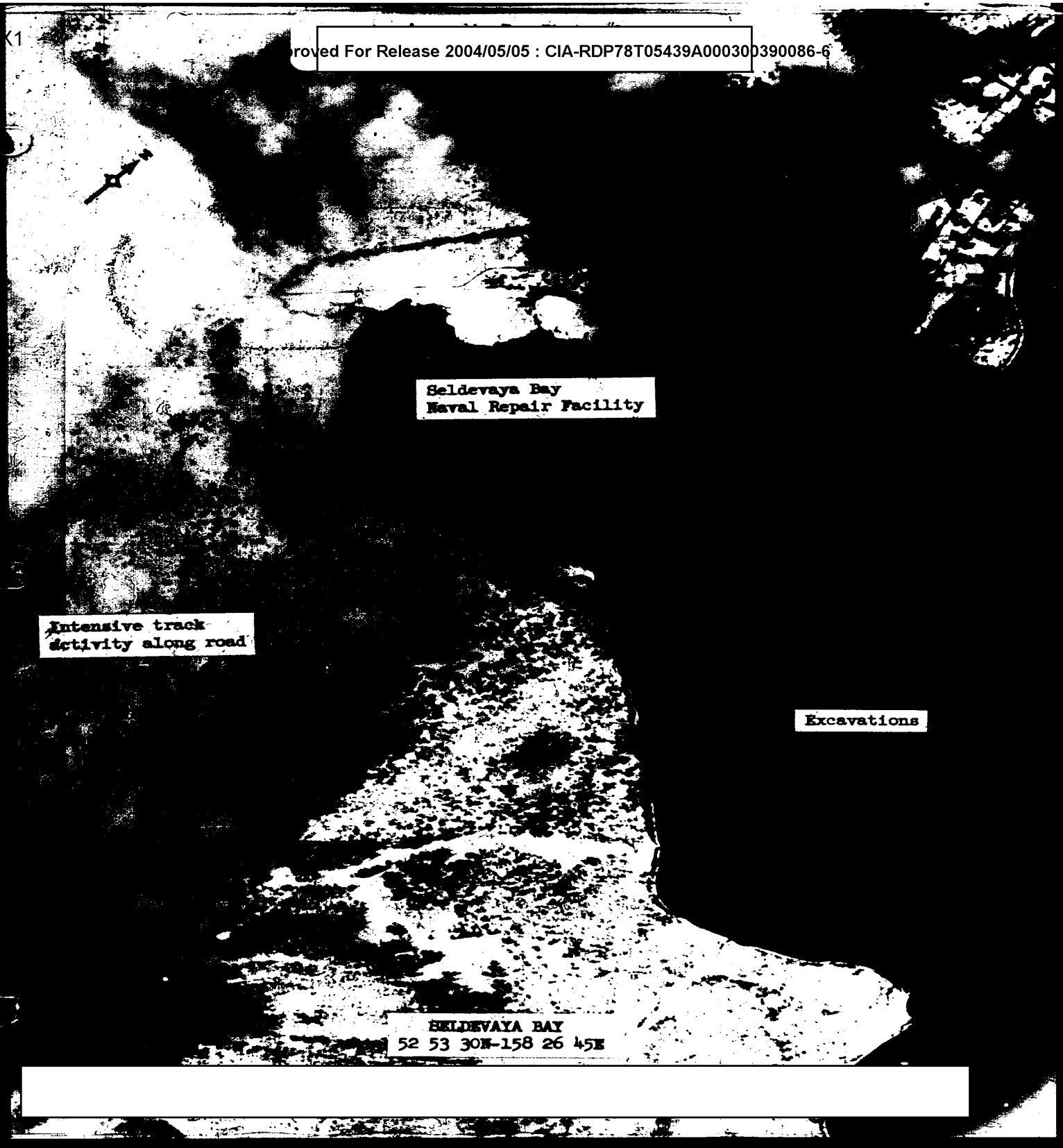
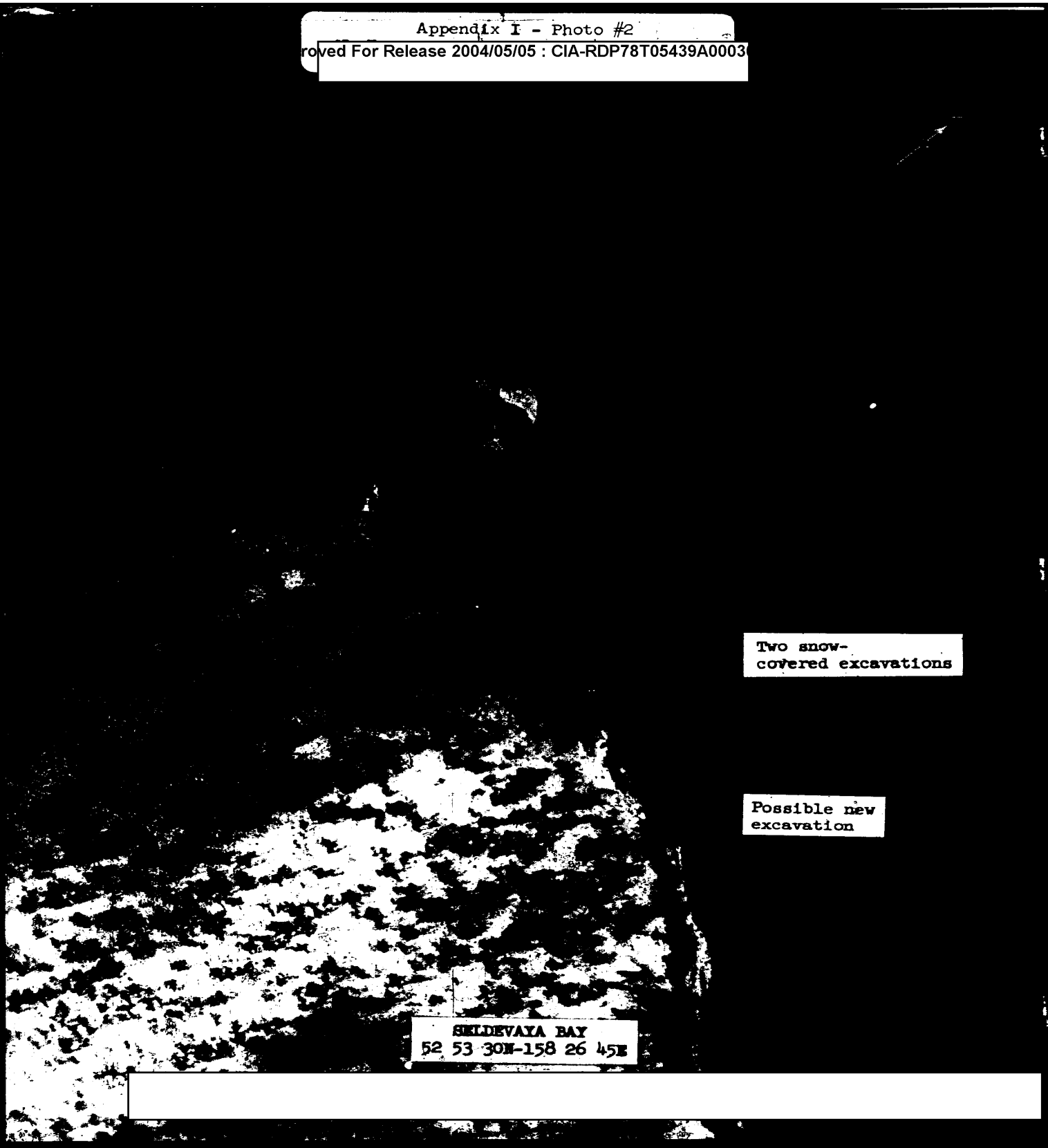


S-13263



S-13263

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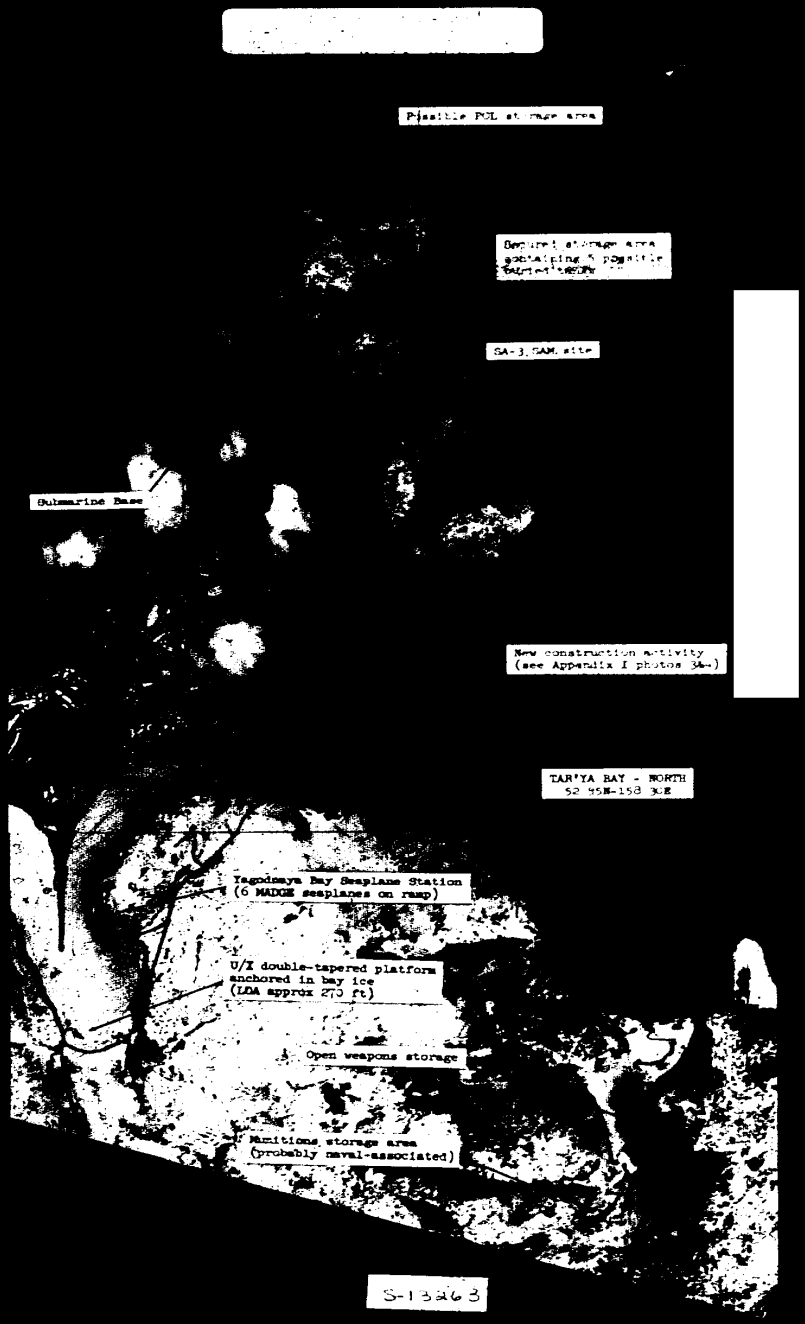
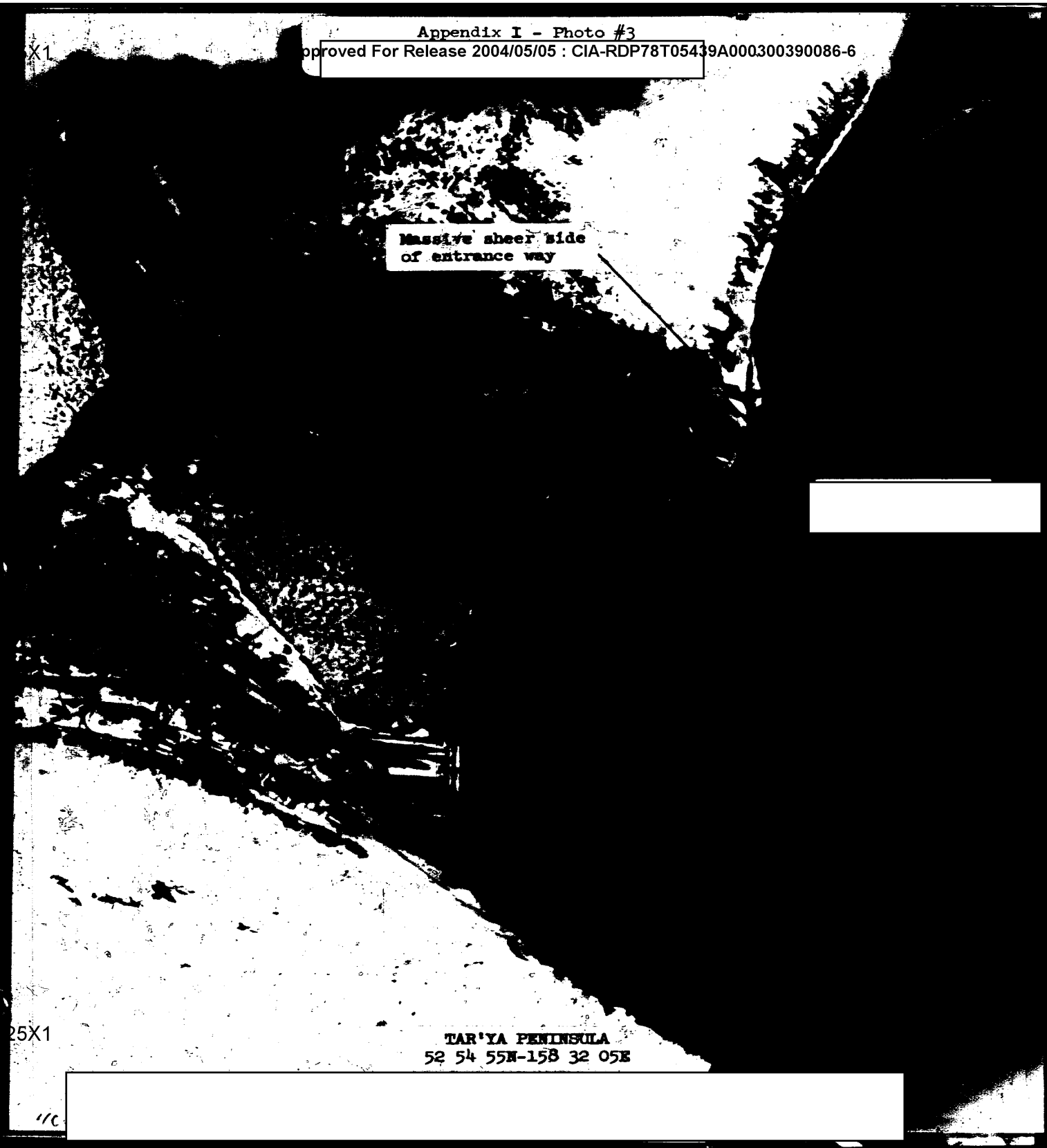


S-13263

S-13268

Appendix I - Photo #3

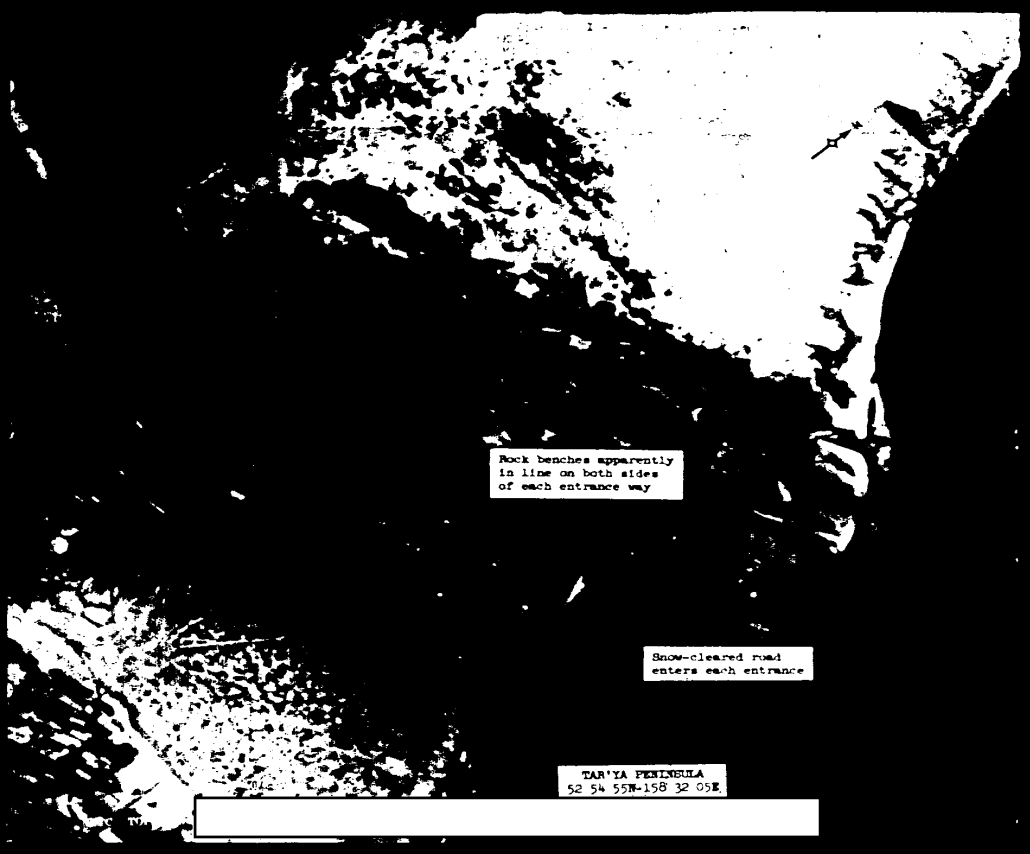


[redacted]

TAR'YA PENINSULA
52 54 55N-158 32 05E

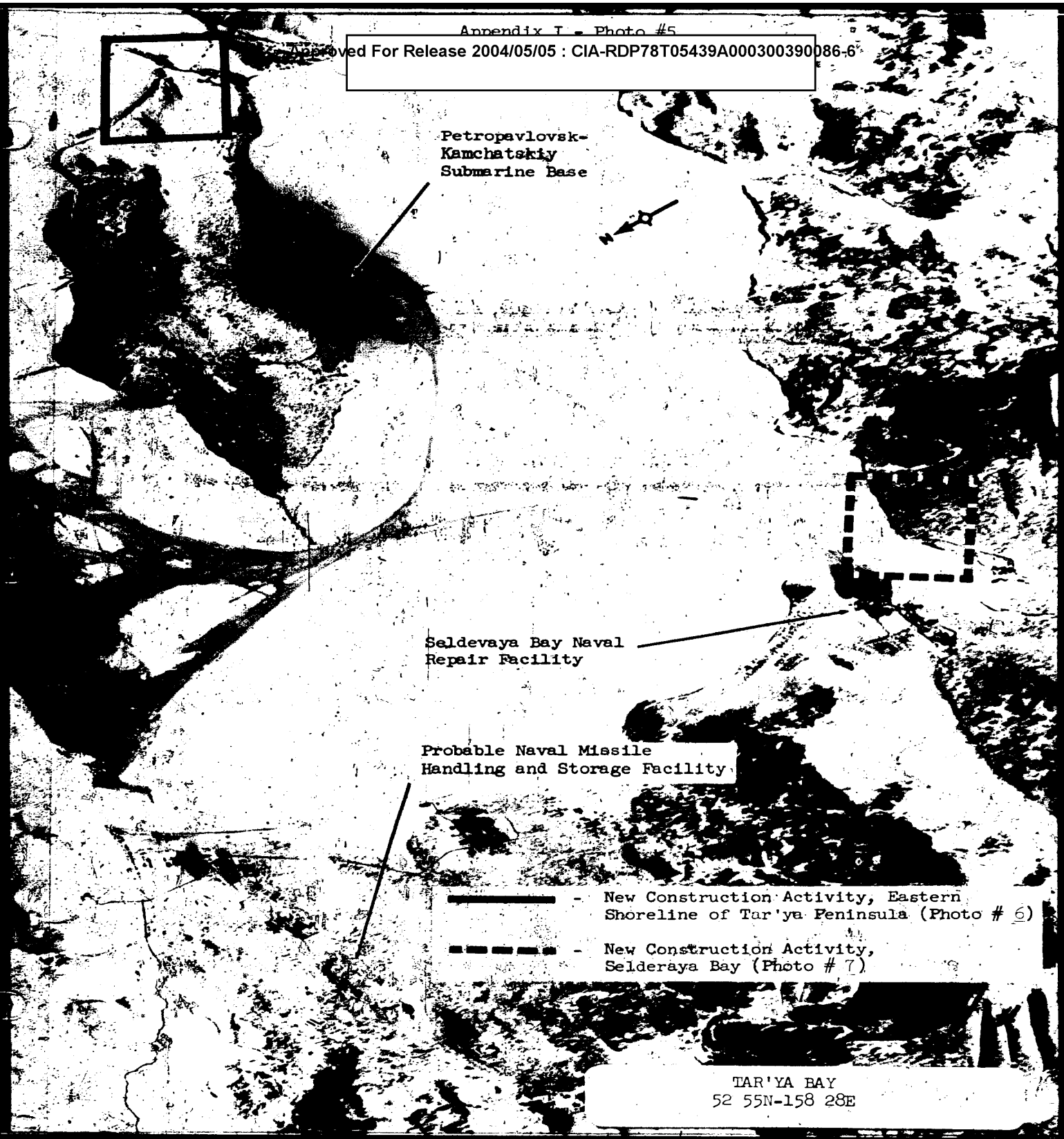
[redacted]

S-13263


Rock benches apparently in line on both sides of each entrance way
Snow-cleared road enters each entrance
TAR'YA PENINSULA
52 54 55N-158 32 05E

S-13263

Appendix I - Photo #5



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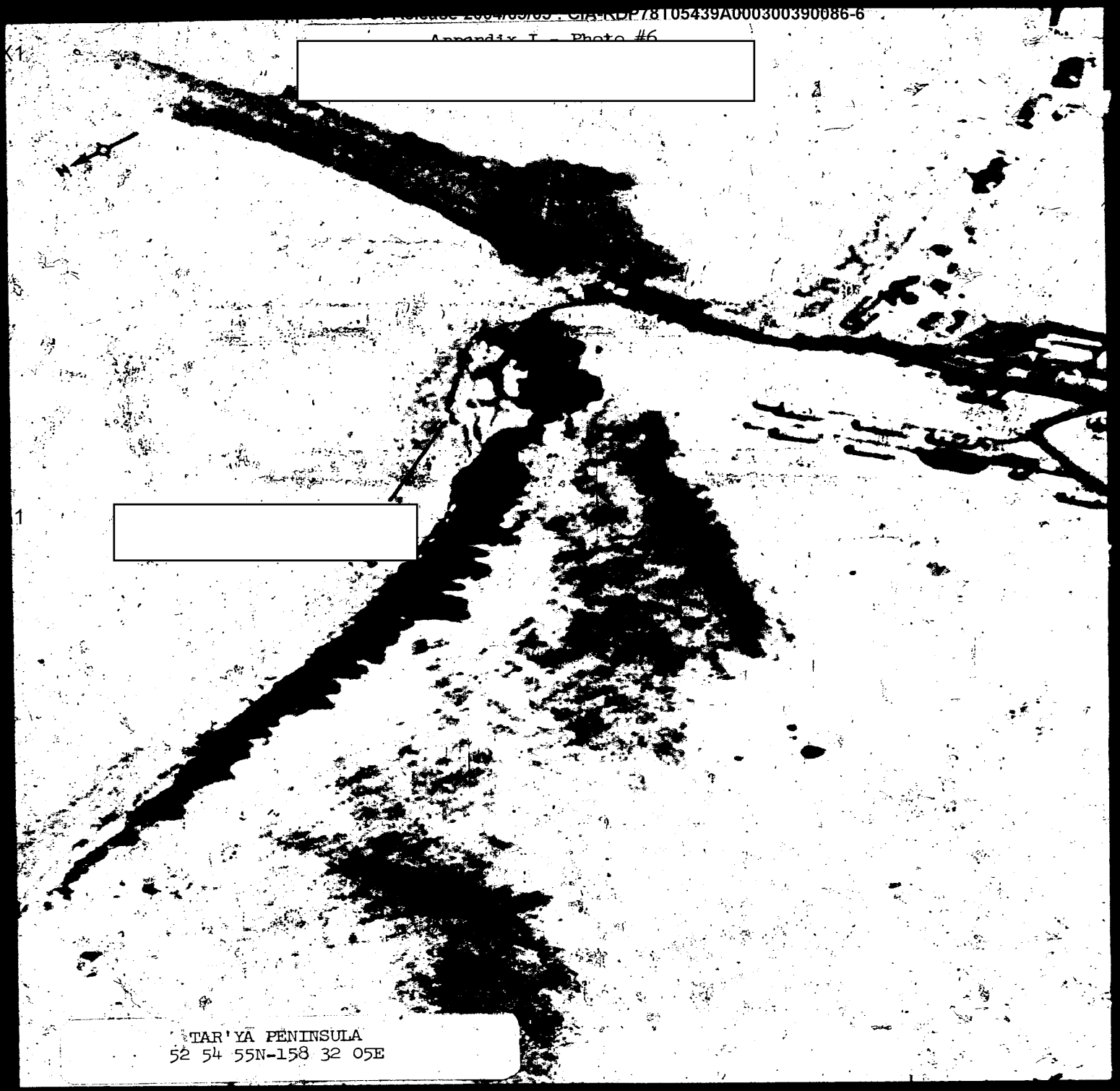
Appendix I - Photo #6

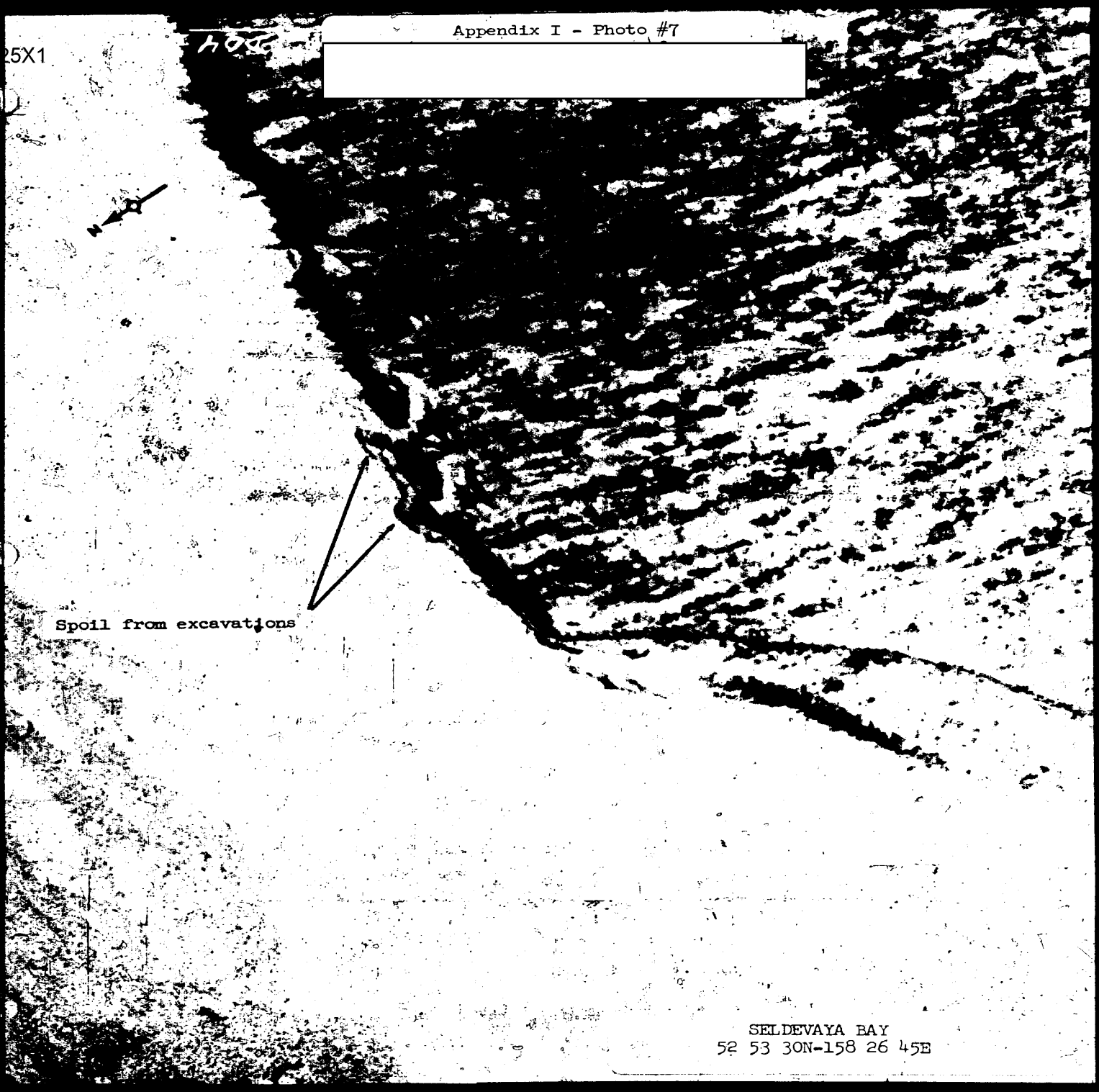


TAR'YA PENINSULA
52 54 55N-158 32 05E

S-13263

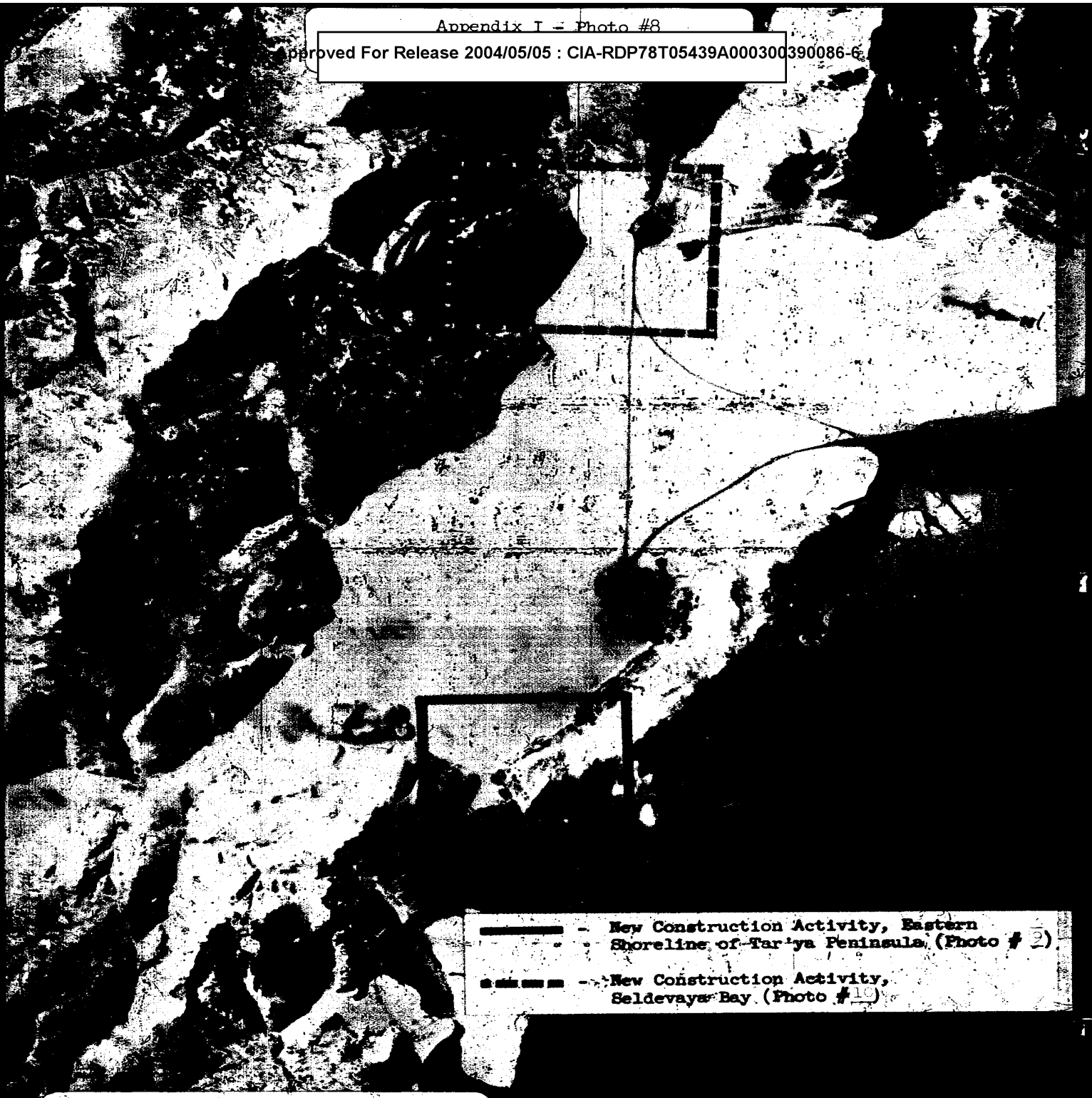
Appendix I - Photo #7

25X1



SELDEVAYA BAY
52 53 30N-158 26 45E

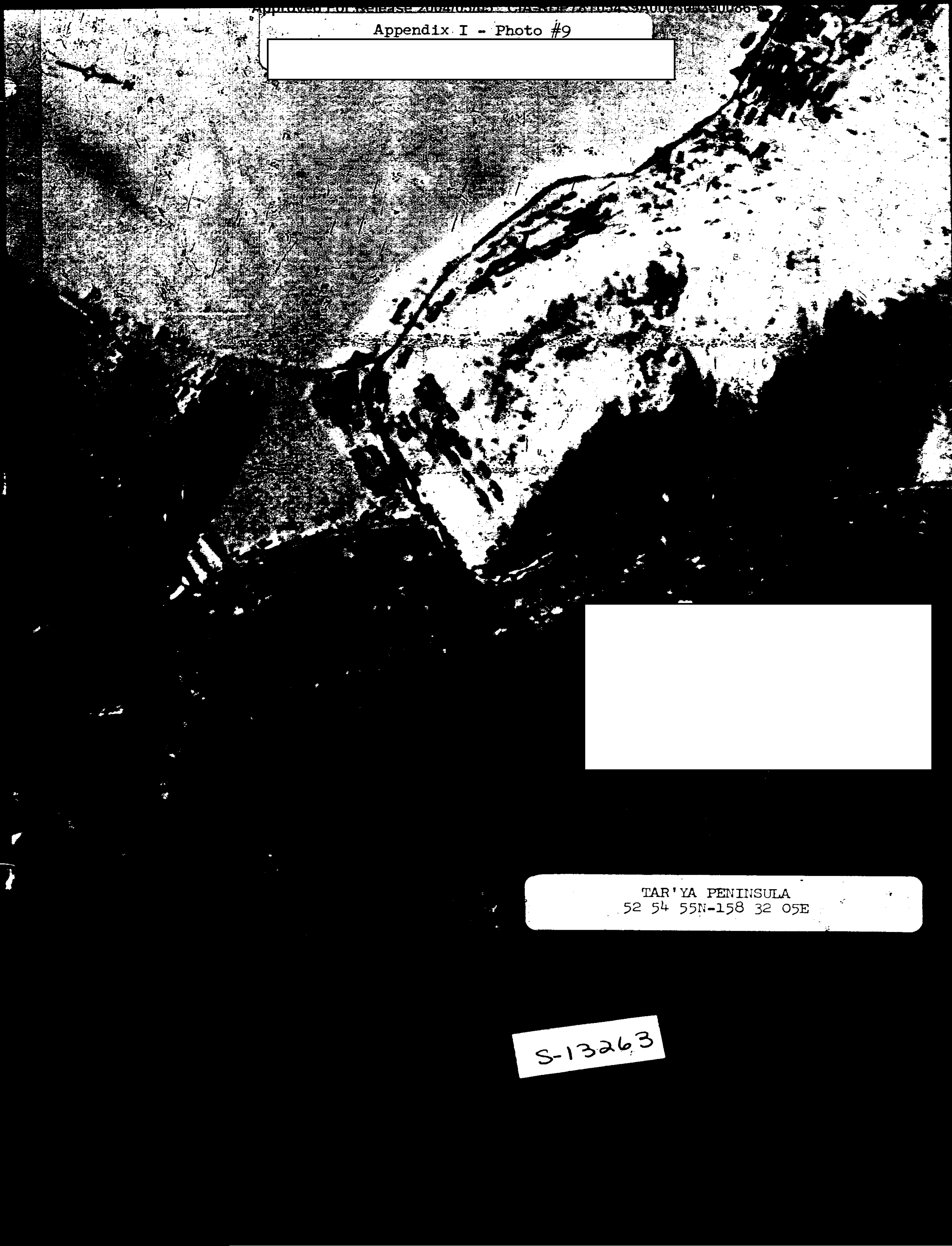
S-13263



TAR'YA BAY
52 54N-158 32E

S-13263

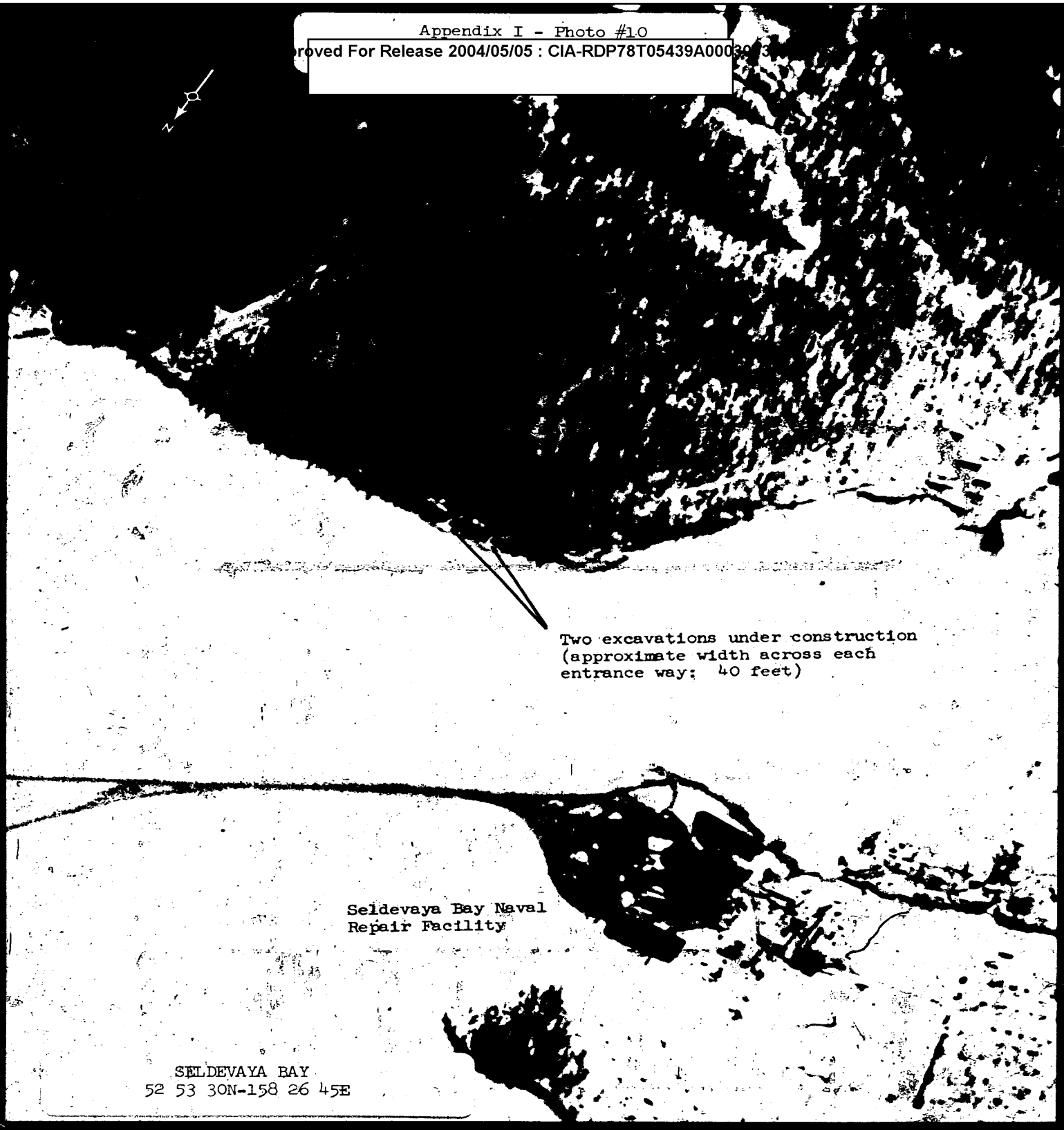
Appendix I - Photo #9



TAR'YA PENINSULA
52 54 55N-158 32 05E

S-13263

Appendix I - Photo #10



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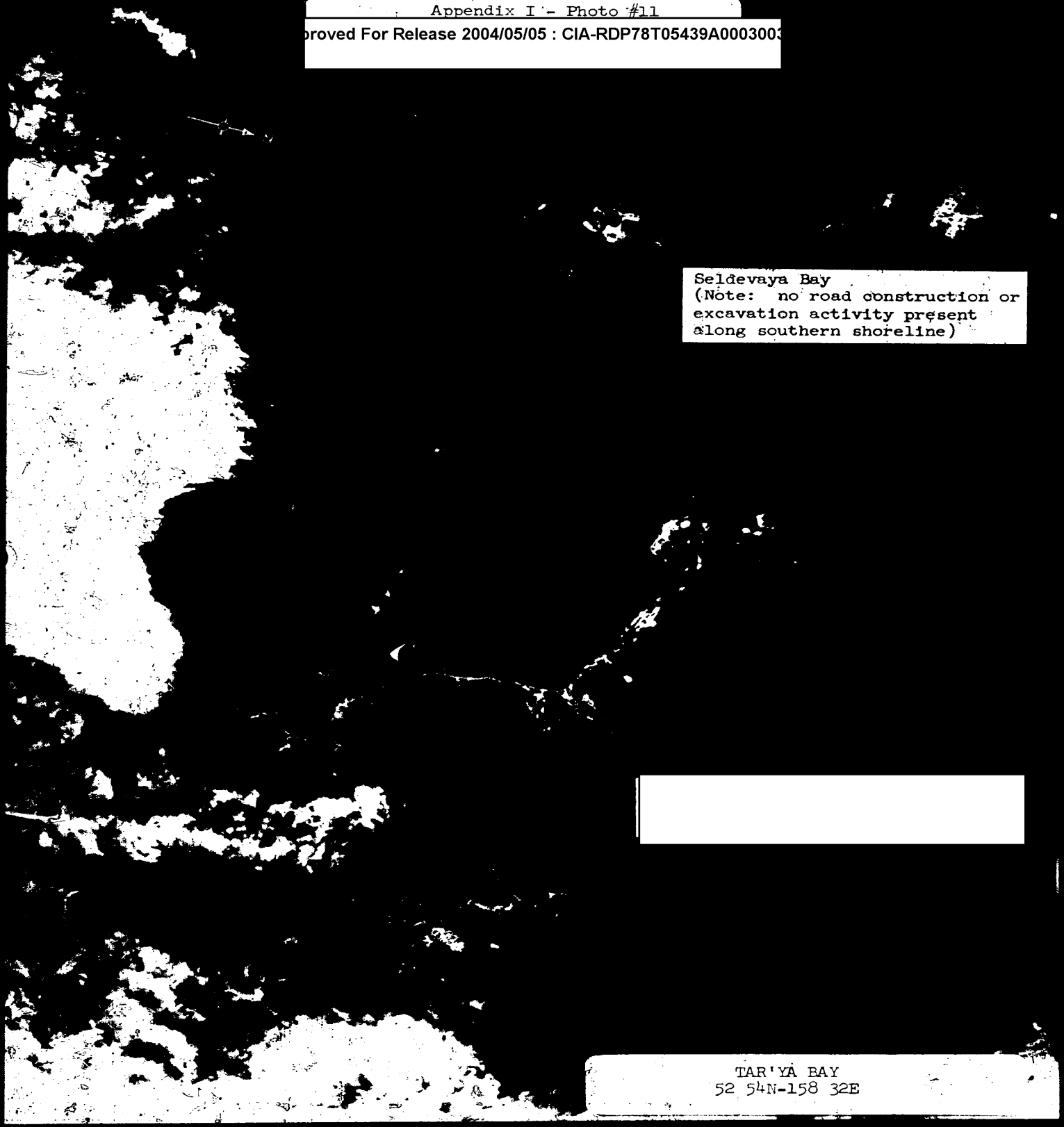
Appendix I - Photo #11

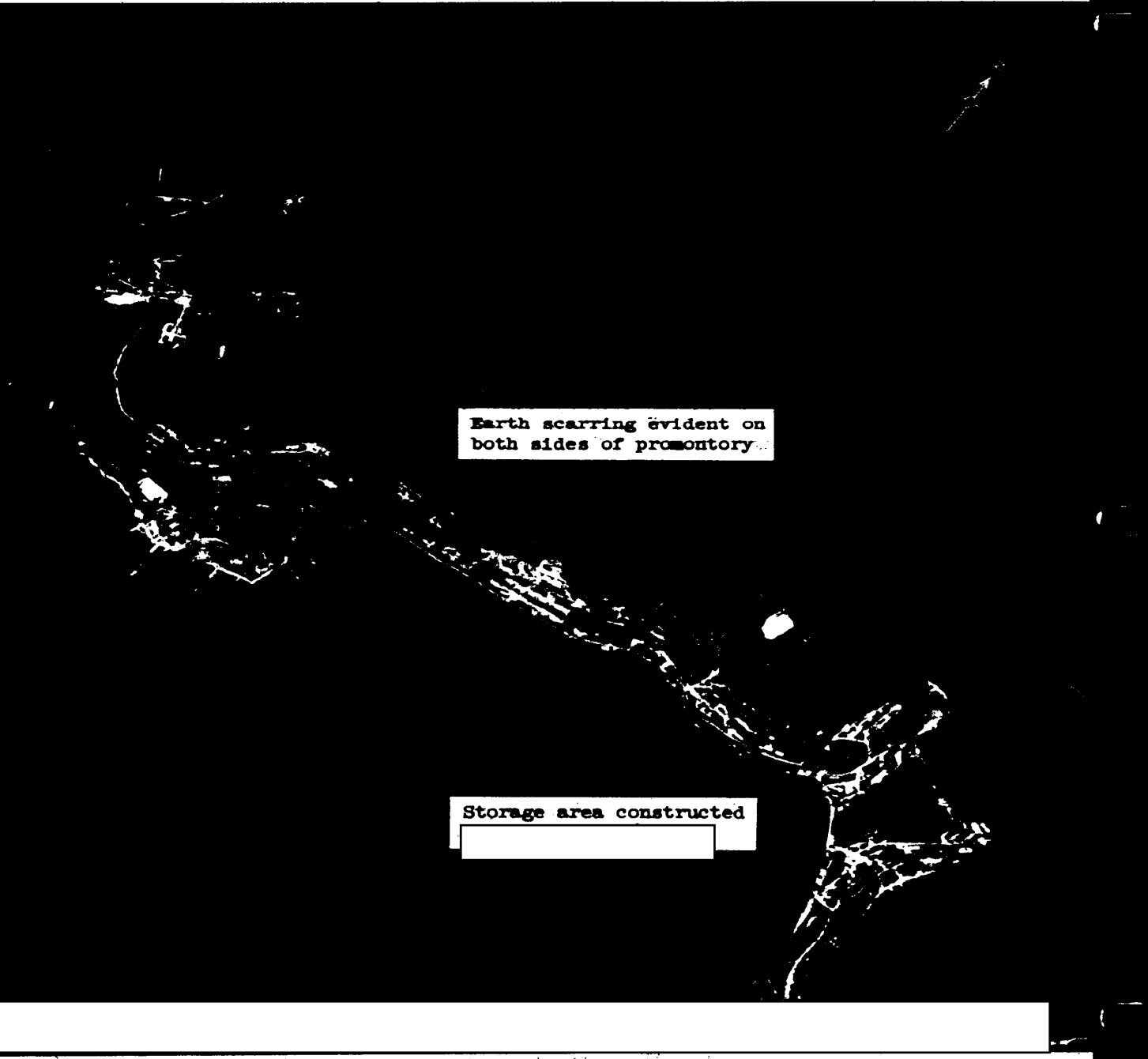


Seldevaya Bay
(Note: no road construction or excavation activity present along southern shoreline)

TAR'YA BAY
52 54N-158 32E

S-13263

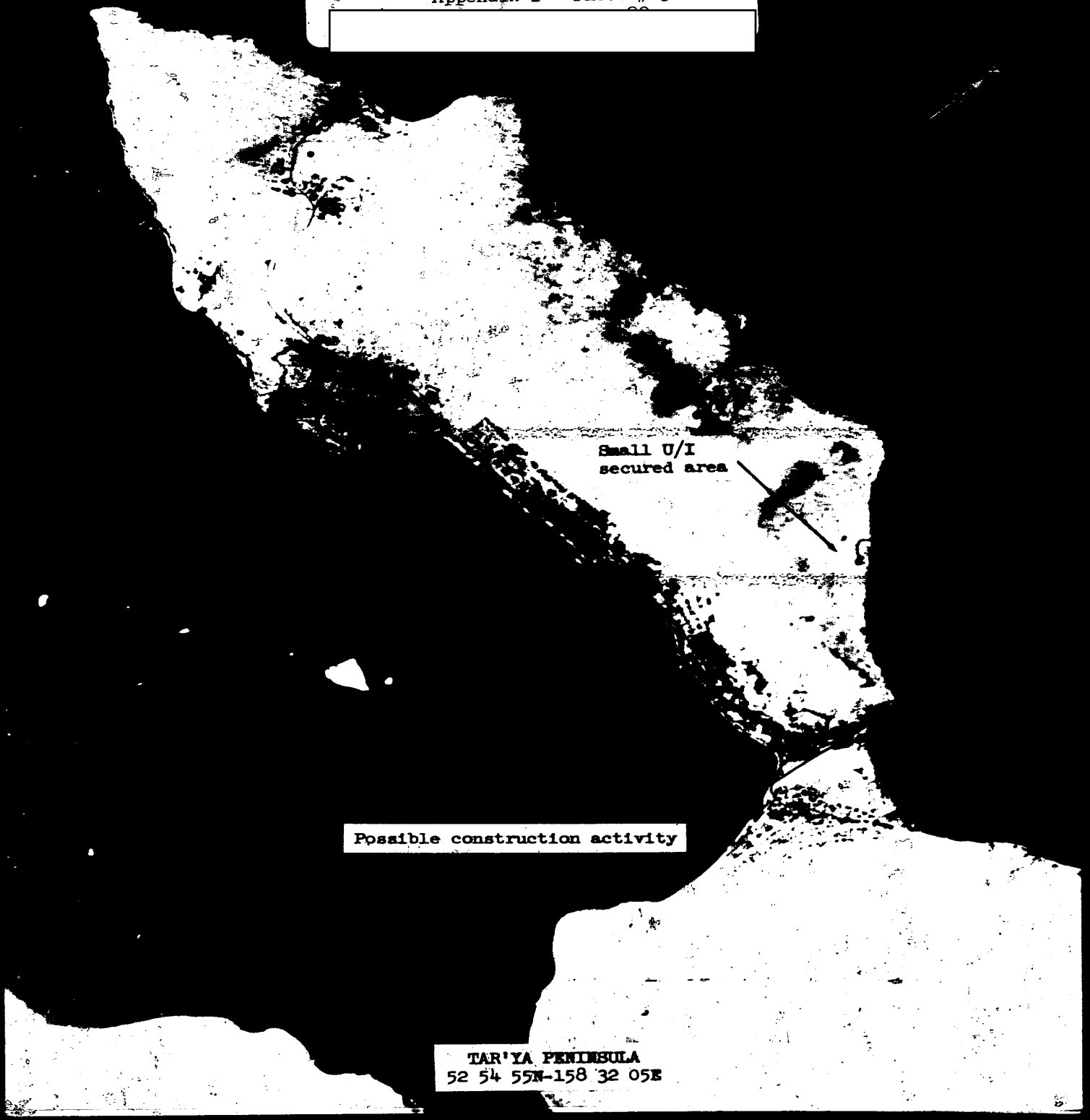
X1



TAR'YA PENINSULA
52 54 55N-158 32 05E

S-13263

Appendix I - Photo #13



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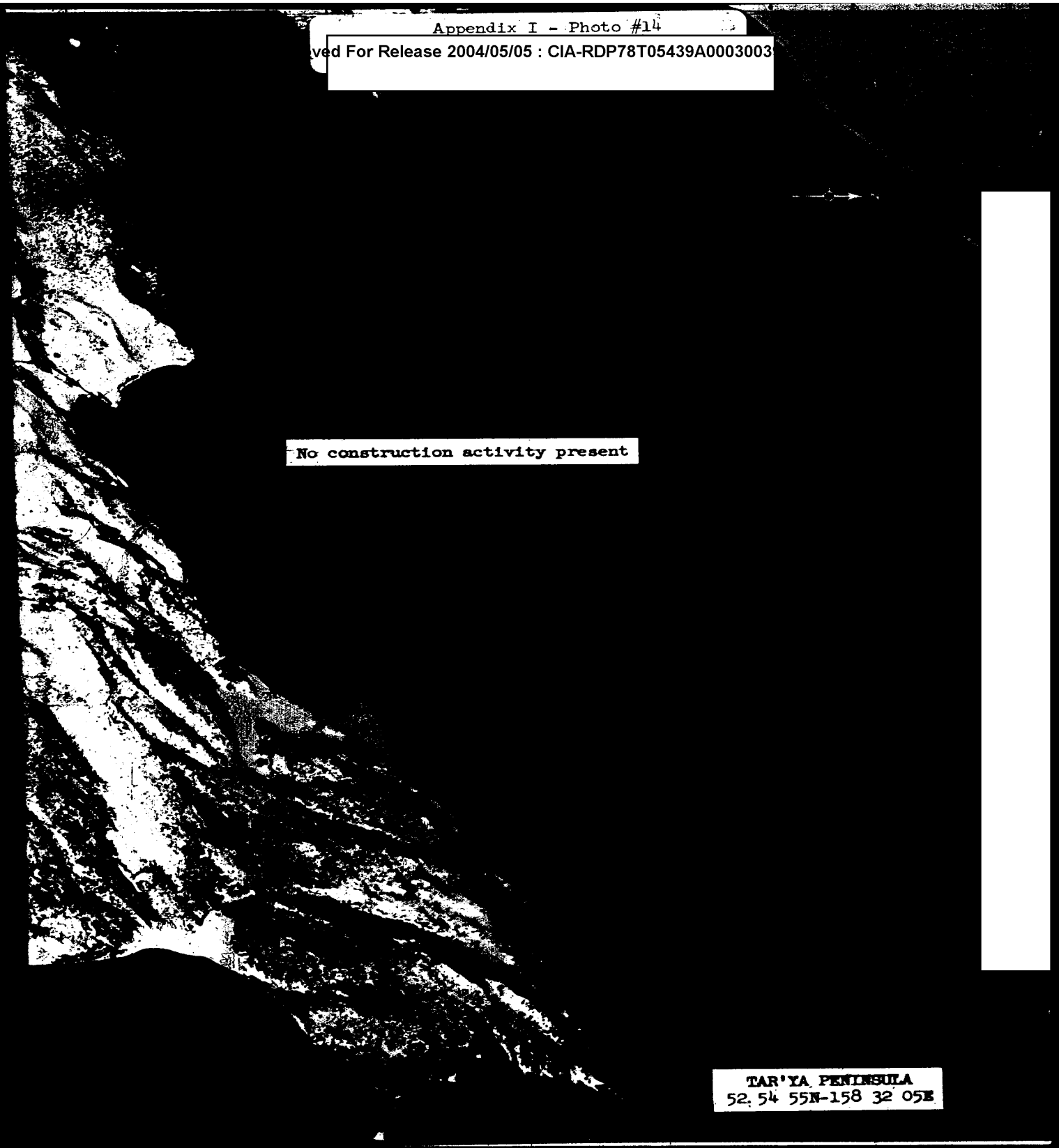

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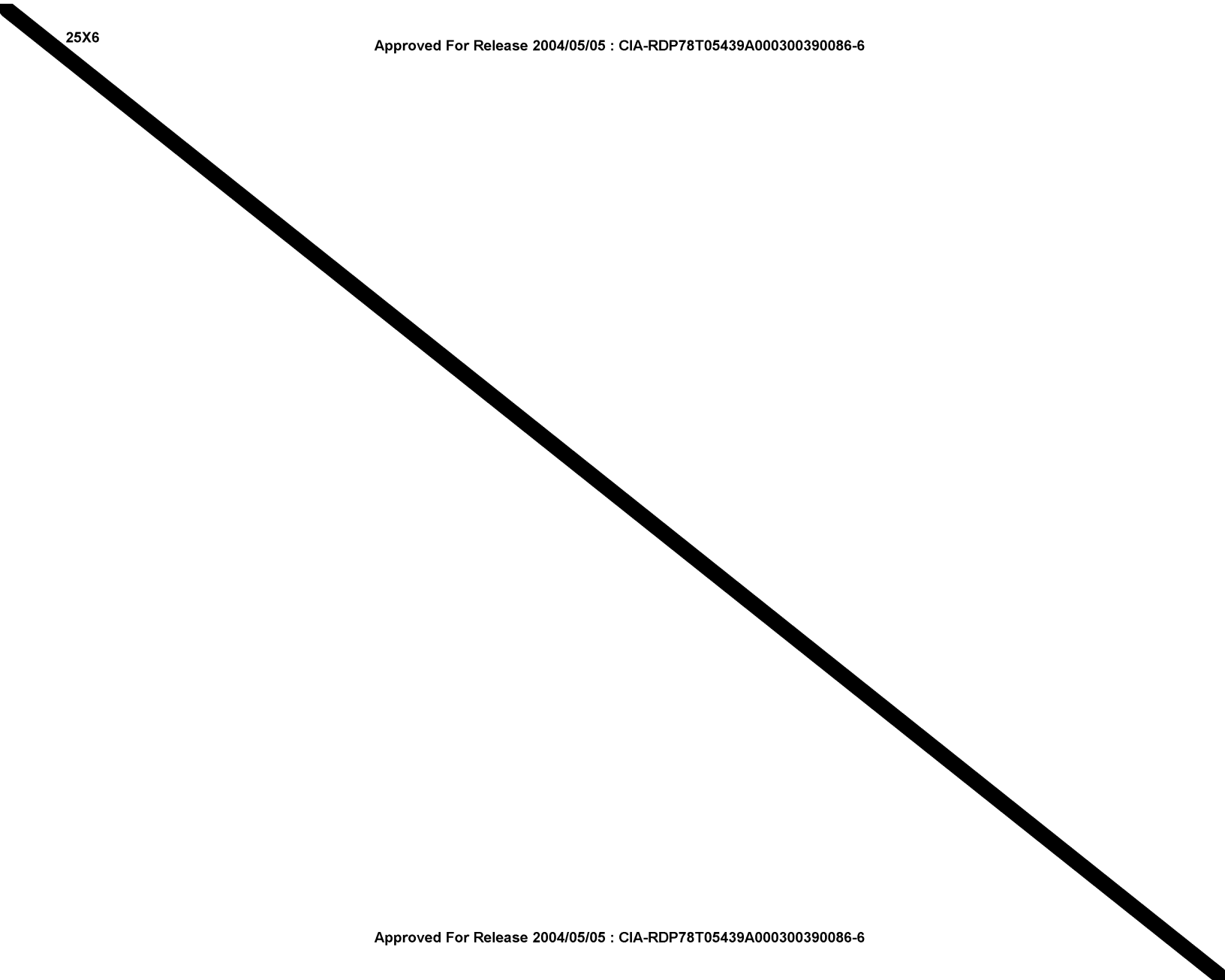

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from the settlement of Industrial'nyy to the southeast to Kamchatskiye Cheremushki (8th kilometer) to the northwest. The city is expanding in the vicinity of Lake Kultuchnoye, where housing areas are surrounding the lake on all sides, and in the region where the city occupies the depression between Zerkal'naya and Petrovskaya peaks. According to the design for urban planning, the city will surround Mishennaya Peak on all sides. Aside from this, the city includes the settlement of Seroglazka to the south, and Kamchatskiye Cheremushki in the north, and in the future construction will be directed toward Mokhovoye and along the Yelizovo road.

The region of the Industrial'nyy settlement also is included in the territory of Greater Petropavlovsk, but it is not expected to expand the city south of Rakovaya Bay. The total area of Greater Petropavlovsk will reach 80-100 km^2.

2. Geomorphological Conditions and the Neotectonics of the Petropavlovsk Region

Petropavlovsk is located on the slopes of the mountains around Lake Kultuchnoye and occupies the bottoms of the ravines, and also the depressions (saddles) between the peaks.

Petropavlovsk is located within the limits of the Petropavlovsk horst, which is composed of metamorphosed rocks of Mesozoic (Upper Cretaceous) and Paleogene age, contorted in sloping folds and covered by Quaternary lavas, pyroclastic ash-tuff accumulations, and eluvial-diluvial stony mantle sandy loams, loams, and rock debris, reaching a considerable thickness at the feet of the mountain slopes. The bottoms of the ravines and the creeks are made of gravel-rock waste and sand-clay accumulations of alluvium and alluvio-proluvium. The colluvial complex of ground that is not rocky facilitates the building up of the city.

In the vicinity of Petropavlovsk, the following types of relief are developed [9]:

1. Low-mountain erosion-tectonic relief — Mishennaya, Zerkal'naya, Petrovskaya, Nikol'skaya, and other mountains, composed of hard rocks of Mesozoic and Paleogene age, and also of Anthropogene lavas (the andesites of Mishennaya Peak, which is an extrusive dome):

a) gentle and steep slopes of the mountains and their summits;

b) the precipitous and rocky sections of the shore of Avachinskaya Bay.

2. Erosion-accumulative relief of hills and plains:

a) an extensive hilly plain to the north and northwest of Petropavlovsk, formed by the surface of the converging proluvial talus slopes of pyroclastic material during the Anthropogene eruptions of Koryakskiy, Kozel'skiy, and, mainly, Avachinskiy volcanoes;

b) the alluvial swampy plain of the valley of the Kirpichnaya River, with Lake Khalakhtyrskoye;

c) the gently sloping and level bottoms of the mouth sections of the small creeks and brooks, formed by their alluvium, including the parts on the shore of Lake Kultuchnoye.

In considering the nature of the geomorphology of the territory of the city of Petropavlovsk, and its neotectonic features, we may see that in the territory of the city two large neotectonic zones are defined — the region of uplift (Petropavlovsk horst) and the region of depression (Avachinskiy graben); the boundary between them approximately coincides with the eastern side of Avachinskaya Bay.

To the junction of these two neotectonic zones are proper the contrasting motions of the region, which were manifested most noticeably at the middle and the end of the Anthropogene /16/.

Along the northern edge of Petrovskaya and Zerkal'naya peaks passes the presumed Anthropogene Khalakhtyrskiy fault (according to the data of A.N. Neyelov — 1952, A.F. Marchenko — 1953, and S.Ye. Aprelkov — 1960, and others), limiting the region of uplift to the north from the Khalakhtyrskaya tectonic depression.

The passage of the Anthropogene faults is reflected in the diagram (Fig. 1). Here are defined the following faults: to the southwest of the settlement of Industrial'nyy and the Khalakhtyrskiy fault, extending far to the northwest, along the eastern side of the valley of the river Avacha. Also shown are a lateral fault in the vicinity of the settlement of Mokhovoye, and a line of faults referred to a group of volcanoes — Kozel'skiy, Avachinskiy, and Koryakskiy /10, 62, 63/. Here it is assumed that there is a large fault, apparently complexly constructed at the junction of the Ganal'sko-Petropavlovsk horst with the Nalychevskiy depression. A.N. Zavaritskiy /21, 22/ continued this tectonic zone, already weakened, to Bakening Volcano.

There is little data concerning the neotectonic movements in the region being described, but we may consider (according

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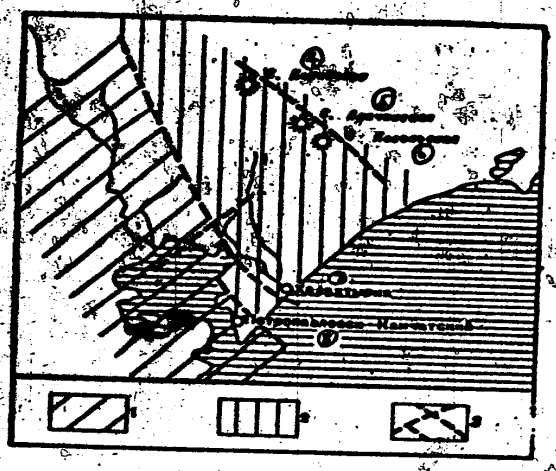
Problems of Engineering Seismology No.8



★ - new coastal excavations

Fig. 1. Diagram of the neotectonics of the Petropavlovsk-Kamchatskiy region: 1) Avachinskiy graben – a region of Anthropogene downwarping; 2) Petropavlovsk horst – a region of Anthropogene uplifting; 3) Anthropogene faults; 4) Koryakskaya Peak; 5) Avachinskaya Peak; 6) Kozel'skaya Peak; 7) Khalakhtyrka; 8) Petropavlovsk-Kamchatskiy.

to the data of A.V. Goryachev [15, 16], that the region adjacent to Petropavlovsk is part of a large zone embraced by a latitudinal submergence, enclosed between zones of uplifting – in the form of the capes located to the north and south.

Petropavlovsk itself does not fall within the limits of the zone of strong contrasting motions, it is referred to a zone that is quite distant from these regions [2, 4, 7, 38, 73, 79 82, 83]. Petropavlovsk is within the limits of the smaller structural neotectonic zones, it is located on the boundary of the junction of the Petropevlovsk horst and the Avachinskiy graben, which must be considered in the estimate of the seismic activity of the region.

Earthquakes are felt at Petropavlovsk that originate under the floor of the Pacific Ocean, primarily in the vicinity of Cape Shipunskiy, and also local earthquakes sometimes located within the limits of the Avachinskiy graben [14, 15, 57, 64, 68].

Extracted from JPRS 24,051
Problems of Engineering Seismology No.8

of Reka Mutnaya, the mouth of which is about 9½ miles west-southwestward of Reka Nalachëva, give a dull yellowish color to the sea for several miles seaward. A light is shown in the vicinity of the mouth of Reka Mutnaya from a red pyramidal metal tower with red and white horizontally striped panels on the seaward upper parts. There is a small settlement at the mouth of Reka Kalakhtyrka. Abreast the mouth of Reka Kalakhtyrka and about 1,600 yards offshore lies a rock-islet, which, being covered with guano, has a whitish color; halfway between this rock-islet and the shore stands a sharp-peaked pillar-rock. A reef extends between these two rocks and is marked by breakers.

The coast from the mouth of Reka Kalakhtyrka trends first in a southwesterly direction for about 5¼ miles to Mys Vertikal'nyy and then in a west-southwesterly direction for about 1¼ miles to Mys Mayachnyy. An unnamed rivulet discharges into the sea about 1¾ miles north-northeastward of Mys Vertikal'nyy. Along this section the coast is high, cliffy, and fronted by foul ground extending for about 1 mile offshore.

The bottom is uneven and the depths at a distance about 1¼ miles offshore range between 7 and 14 fathoms, sand and gravel with occasional patches of shells or rock.

Ostrov Toporkov is an islet lying about midway between Reka Kalakhtyrka and Mys Vertikal'nyy and 600 yards offshore. It is a quadrangular rock of dark color, void of vegetation. It is conspicuous only from southwestward.

A dangerous patch with a least depth of 2¼ fathoms is charted about 2 miles east-northeastward of Mys Vertikal'nyy.

6-65 AVACHINSKAYA GUBA—General remarks.—Avachinskaya Guba, an extensive bay that includes Bukhta Tar'ya, Bukhta Rakovaya, and Petropavlovskaya Gavan', all of which afford well-sheltered anchorages, recedes for about 13 miles in a general northwesterly direction. Petropavlovsk, situated on the eastern side of the bay, is the principal port of Kamchatka.

Depths of 11 to 13 fathoms are prevalent in the central part of the bay. The shores of the bay, with the exception of the shallow water area southward of Bukta Z (see sec. 6-70) and the northwestern shore of the bay between the mouth of Reka Avacha and Reka Paratunka, are fairly steep-to, having depths of 4 fathoms close inshore.

Entrance channel.—Avachinskaya Guba, entered between Mys Mayachnyy and Mys Bezymyannyy, about 3¼ miles southwestward, is connected with the sea by a comparatively narrow channel. Extending in a north-northwesterly direction, this channel is about 4½ miles long and has a navigable width of nearly 1¼ miles. The mid-channel is clear of dangers, and passing through it on a clear day presents no difficulties.

The depths of 10 to 11 fathoms at the entrance to the channel gradually decrease and are from 6 to 7 fathoms in the northern part of the channel, but then increase again inside the bay.

The eastern shore of the entrance channel extends from Mys Mayachnyy in a general north-northwesterly direction for nearly 4 miles to an unnamed point that forms the southwestern extremity of Poluostrov Izmenyy, abreast of which point the fairway with depths of 5 fathoms or greater narrows to about 460 yards.

6-66 Mys Mayachnyy (Dal'niy Pt.) *(52°53' N., 158°42' E., H. O. Chart 5810)* a cape situated 1¼ miles west-southwestward of Mys Vertikal'nyy, forms the northeastern entrance point to the Avachinskaya Guba. It fronts the sea on all sides with precipices about 500 feet high, and is fringed on its western side by drying rocks.

In 1945 it was reported that a small-craft wharf and some structures are situated at Mys Mayachnyy.

A broad reef extends from this cape in a general southeasterly direction for a distance

of nearly 1¼ miles. Being steep-to, this reef is dangerous in thick weather.

Mys Mayachnyy Light is shown from a conical iron tower, 50 feet high, painted in white and red bands. A dwelling stands nearby.

A fog signal is sounded at the light station.

A radiobeacon is installed at the light station.

Kamni Tri Brata (Three Brothers) is a group of three very conspicuous basaltic pillar rocks standing on the coastal reef about three-fourths mile northwestward of Mys Mayachnyy and about one-fourth mile offshore.

Two detached rocky patches marked by breakers and occasionally drying lie respectively 1,200 and 1,700 yards north-northwestward of Kamni Tri Brata.

6-67 Pinnacle Point, which is very conspicuous, lies about 1¾ miles north-northwestward of Kamni Tri Brata and is identified by a high pinnacle rock standing close off its extremity. The point is fringed by rocks and has shallow water extending one-fourth mile westward from it, as defined by the 5-fathom curve.

Mys Izmennyy, a comparatively low and cliffy cape located 1¾ miles north-northwestward of Pinnacle Point, forms the southern extremity of Poluostrov Izmennyy, a fairly large peninsula extending from the mainland in a westerly direction for about 1¾ miles.

A reef extends nearly one-half mile southward from the cape. The southern end of the reef is steep-to.

Ostrov Izmennyy, an islet about 30 feet high, stands about 250 yards within the southern end of the reef just described.

A light is exhibited from a red iron skeleton structure, 6 feet high, on Ostrov Izmennyy.

Buoy.—A lighted buoy is reported (1953) to be moored about ½ mile west-northwestward of the southern extremity of Ostrov Izmennyy.

Zaliv Izmennyy, an open bay, lies southward of Poluostrov Izmennyy and is entered between Mys Izmennyy and Pinnacle Point. It has low sandy shores with reddish-brown cliffs in places. A fishing station is situated in the northwestern recess of the bay.

A small pier is located near the western end of a beach at the head of Zaliv Izmennyy.

Two similar cliffs, known as the Second Cliff and the First Cliff, are located on the eastern shore of the bay, at 1,300 yards and 2,300 yards respectively north-northeastward of Pinnacle Point. These cliffs are used as landmarks.

The western shore of the entrance channel from Mys Bezymyannyy trends in a general northerly direction for a distance of 4½ miles to Mys Uglovoy.

6-68 Mys Bezymyannyy (Venus Pt.), a headland projecting into the sea in an easterly direction, has reddish-brown precipitous sides about 660 feet high. This headland is identified by a sharp-peaked pillar rock standing a short distance eastward of it and inclined toward the shore. The pillar rock is conspicuous from northward and southward.

Light.—A light is shown on Mys Bezymyannyy from a red metal pyramid the upper part of which is framework.

6-69 Bukhta Bezymyannaya, a bay entered between Mys Bezymyannyy and Mys Sredniy, about 1¾ miles northward, indents the coast in a westerly direction for about 1½ miles. The northern and the southern shores are composed of precipitous cliffs, 550 to 650 feet high, with numerous rocks close inshore. These high shores descend steeply to the rounded head of the bay that is skirted with a low sandy beach. A rivulet, flowing through a wide valley thickly covered with grass and some trees, discharges at the head of the bay.

The depths of about 10 fathoms at the entrance gradually decrease to about 5 fathoms near the middle of the bay; the western half of the bay has depths less than 5 fathoms. Anchorage sheltered from a southerly and a southeasterly swell can be obtained in the southeastern part of the bay. Magnetic variation in this bay is abnormal and in 1940 was 8½° W.

Mys Sredniy, the northern entrance point of Bukhta Bezmyannaya, is a precipitous reddish projection terminating in a conspicuous sharp-pointed pyramid, 423 feet high, with a saddle-shaped slope toward the land. Two cone-shaped rocks lie 600 yards eastward of the point.

Rocky ledges and numerous rocks lie within 200 yards on all sides of the point.

Mys Stanitskogo is a headland lying about 1½ miles north-northeastward of Mys Srednly. It is about 330 feet high and its cliffy sides are fringed with above-water and submerged rocks. A rocky ledge extending from the extremity of the headland in a southerly direction for about 1,000 yards terminates in two drying rocks, which are marked by breakers at high water.

Lighted buoy.—A red and white vertically striped lighted buoy is moored about 800 yards south-southeastward of the southern extremity of Mys Stanitskogo.

Babushkin Kamen' is a conspicuous rocky islet situated on the western side of the fairway in a position about 1 mile northward of Mys Stanitskogo and about 400 yards offshore; it is 203 feet high and has the appearance of a black cap with its top slanting seaward.

6-70 Mys Uglovoy lies about 1¼ miles north-northwestward of Mys Stanitskogo and is the northernmost point of the western shore of the entrance channel to the Avachinskaya Guba. It is a slender, wedge-shaped, greenish projection about 260 feet high, which extends from the mainland in a northeasterly direction for a distance of about 800 yards. Its steep and cliffy sides are fringed with numerous rocks close inshore.

A light is shown from a trilateral wooden pyramid, 10 feet high, standing near the extremity of Mys Uglovoy.

Banka Z.—A wide wedge-shaped area with depths of 3 fathoms or less extends westward and northwestward from Mys Uglovoy. A patch with a least depth of 1¾ fathoms, known as Banka Z, is located within the northern part of this shallow area in a position about 2 miles northwestward of Mys Uglovoy.

6-71 The tidal currents in the entrance channel to Avachinskaya Guba, as observed near Mys Stanitskogo, are as follows: the flood current sets northward and attains a rate of 1½ knots; the ebb current sets southward and attains a rate of 2½ knots. The ebb current at springs starts immediately after high water.

6-72 Rakovaya Mel', a dangerous shoal, with a least depth of less than 6 feet, extending about three-fourths of a mile in a west-northwesterly to east-southeasterly direction, lies with its western extremity about three-fourths of a mile northwestward of the northern extremity of Poluostrov Izmennyy. This shoal, being steep-to on all sides, is dangerous in thick weather.

The westernmost pillar rock of Kamni Tri Brata bearing 158° and open southwestward of the Poluostrov Izmennyy leads close westward of this shoal.

Lighted buoys.—A black and white vertically striped lighted buoy, moored about 1 mile northwestward of the northernmost extremity of Poluostrov Izmennyy, marks the western side of Rakova Mel'. A red and white vertically striped lighted buoy, moored about 1/3 mile northeastward of the same point, marks the eastern side of the shoal.

Buoys.—A white spar buoy, surmounted by a black cone, point up, marks the northern side of Rakova Mel'. A red spar buoy, surmounted by a red cone, point down, marks the southern side of the shoal.

6-73 Bukhta Rakovaya, the bay located immediately northward of Poluostrov Izmennyy, recedes principally in a southeasterly and then in an easterly direction for a total distance of slightly over 2 miles. A small shallow cove at the head of the bay is known as Bukhta Bab'ya; this cove dries partly at low water. Bukhta Rakovaya is well sheltered from all winds and affords excellent anchorage in convenient depths.

Vessels have been known to anchor with one anchor down forward and stern made fast to the spit extending from the northern shore.

The entrance to Bukhta Rakovaya is about 1 mile wide, but is substantially obstructed by Rakovaya Mel'. The two entrance passages to the bay lie southward and northward of the

Rakovaya Mel', respectively; the northern one is about 900 yards wide and is recommended.

Depths.—Depths of 9 fathoms are prevalent over the greater part of the bay; however, an area about 100 yards long with depths about 6½ fathoms is located approximately 600 yards south-southeastward of the northern entrance point of the bay. A small patch with a least depth of 3 feet lies 500 yards south-southwestward of the extremity of the spit that projects from the northern shore of the bay. The bottom of the bay is mostly mud, but is sand in depths of less than 5 fathoms.

Range lights.—Two range lights, each shown from a 16-foot lattice-work rectangle painted white with a black vertical stripe, are located on the southern shore near the head of Bukhta Rakovaya. The lights are 470 yards apart and in range bearing about 139° lead into the harbor.

Directions.—Steer on the Petropavlovskaya Gavan' range lights, bearing 43°, and when the range lights located in Bukhta Rakovaya bear 139°, steer for them on this bearing until Rakovaya Mel' and the shoal extending northward from the northern end of Poluostrov Izmennyy have been passed.

6–74 Poluostrov Signal'nyy, with its southern end situated 2¼ miles northward of the northern end of Poluostrov Izmennyy, is a slender but elevated peninsular projection that extends 1,200 yards from the mainland in a southerly direction. Gora Nikol'skaya, a hill 200 feet high, is situated at the base of the peninsula, and Gora Signal'naya, a hill 140 feet high, with steep slopes stands at the southern extremity of the peninsula. Poluostrov Signal'nyy is conspicuous from southwestward.

6–75 Petropavlovskaya Gavan' *(H.O. Chart, 5810)* is a well sheltered but not extensive harbor lying eastward and eastsoutheastward of Poluostrov Signal'nyy. A gravel spit, about 52 feet wide and 3 feet above high water, extends from the eastern shore of the harbor in a northwesterly direction to within about 120 yards of the Poluostrov Signal'nyy, dividing the harbor in two parts. The outer harbor is called Vneshnaya Petropavlovskaya Gavan'; and the inner harbor is called Vnutrennaya Petropavlovskaya Gavan', or Kovsh.

The depths at the entrance to the outer harbor, which is about 100 yards wide, are 5½ to 9 fathoms, small stones.

The depths at the entrance to the inner harbor are not less than 5¼ fathoms in the midchannel, but the depths increase toward the extremity of the spit. The central part of the inner harbor has depths of 6 to 6½ fathoms, fine sand, and the 5-fathom curve is only about 150 yards offshore.

6–76 Mys Signal'nyy—Reef.—Mys Signal'nyy is the southeastern extremity of the Poluostrov Signal'nyy. Shoal ground, known as the Signal'nyy Rif, extends from Mys Signal'nyy on all sides and particularly in a southeasterly direction, narrowing the entrance channel to Petropavlovskaya Gavan'.

Dredging has taken place in the vicinity of Signal'nyy Rif and, according to one source, the entrance is clear. The sand from the dredging was deposited at Mys Signal'nyy and is said to form a spit about 300 feet in length.

It was reported that a seaplane anchorage is immediately southward of Mys Signal'nyy and is marked by two buoys.

6–77 A light buoy, painted in red and white vertical stripes, with a red and white superstructure and showing a flashing red light, is moored about 600 yards east-southeastward of Mys Signal'nyy. Vessels entering are recommended to pass eastward of but close to the light buoy.

6–78 A wreck lies about ⅓ mile east-southeastward of the southernmost tip of Mys Signal'nyy.

Lights.—Lighted Range Beacons.—An entrance light is shown from the end of the spit that separates the outer from the inner harbor. The structure is a red pyramidal

metal tower the upper part of which is framework.

Range lights are located, 125 yards apart, in the center of the city of Petropavlovsk. Both lights are shown from red rectangular panel beacons with white vertical median stripes. The rear light bears 043° from the front light.

Range lights for entrance to the inner harbor are located, 225 yards apart, on the eastern side of the entrance to Petropavlovsk Bay. Both lights are shown from red rectangular panel beacons with black vertical median stripes. The rear light bears 325° from the front light.

Section 6–79 has been deleted.

6–80 Adjustment of compasses.—Two beacons in the inner harbor form a range for ascertaining deviation.

The front beacon consists of a 13-foot latticework rectangular shield, with the upper corners cut off, painted white with a black vertical stripe, located on Poluostrov Signal'nyy at three-fourths mile northward of its extremity.

The rear beacon, similar to the front beacon, is located on the eastern side of the inner harbor in a position 700 yards 90° from the front beacon.

6–81 Anchorage in the approach to Petropavlovskaya Gavan' can be obtained about 600 to 800 yards southward of Mys Signal'nyy in 10 fathoms, mud, or in a position westward or southwestward of Mys Signal'nyy.

The outer harbor is sheltered from the wind and the sea by Poluostrov Signal'nyy. The depths are 6½ to 8 fathoms, mud.

Vessels either go alongside the various wharves in the outer harbor, or moor offshore with their sterns made fast to the shore. There is a naval mooring area on the eastern side of the harbor.

The inner harbor has a triangular shape with sides about one-fourth mile in length. It connects with the outer harbor by means of a passage between the western extremity of the Main Mole Wharf and the eastern shore of Poluostrov Signal'nyy. The passage is about 120 yards wide. The inner harbor has been dredged to take large vessels. Merchant vessels and colliers tie up broadside to the heads of the two jetties on the northwestern shore of the inner harbor, or moor at various places in the harbor with their sterns made fast to shore. A stranded wreck is located on the northern side of the Main Mole Wharf.

A hand-operated narrow gauge railroad is built along the wharf and quays. The inner harbor affords perfect shelter from all winds and the sea.

Regulations for merchant vessels.—See section 1–35.

6–82 Winds.—Southerly winds prevail from May through August. From September through April northwesterly winds are prevalent and ordinarily are of a force not less than 3 Beaufort Scale; they blow steadily and produce considerable sea in Avachinskaya Guba. The strongest winds usually blow from October to April.

There is a certain regularity on clear summer days in the shifting of the wind. Calms, or very gentle land breezes from north to north-northwest, are prevalent in the morning. Between 9 and 11 o'clock in the morning the wind begins to shift gradually through west to south and falls to calm about 2 o'clock in the afternoon, but later in the afternoon it is superseded by a light to moderate sea breeze from the southeastern quadrant.

6–83 Weather.—January and February are the coldest months of the year and have an average monthly temperature of 16° F. Snow occurs from the latter part of October through March, with the maximum fall in the latter month. The warmest part of the year is a period of approximately 3 weeks ending about August 10. The mean monthly temperature for

the month of July is 51° F., and that for August is 53° F.

Fog in Avachinskaya Guba is uncommon. Frequently during the summer the peaks of mountains that surround the bay are enveloped by fog, but Avachinskaya Guba remains clear. With easterly winds the fog from the sea rolls occasionally into Avachinskaya Guba; with westerly winds, however, fog may cover the peaks of the western shore of the bay, and spreads gradually over the entrance. Fog is observed most frequently from June through August.

Ice.—Except in severe winters only the narrows and coves of Avachinskaya Guba are covered with ice. In winters colder than average Avachinskaya Guba is icebound from January through early March. At the beginning of April the prevailing southerly winds bring in the drift ice from the bay entrance into the inner part of Avachinskaya Guba. (See ice charts in sec. 1–68.)

In Petropavlovskaya Gavan' the earliest recorded first appearance of ice was November 20; the latest, January 7; the earliest final disappearance of ice was March 10; the latest, May 9; the average number of days with ice was 115. The harbor is reported to be easy to keep open, and icebreakers work in the severe months. (See sec. 1–38.)

In the past Russian vessels are reported to have entered Zaliv Izmennyy, which is never completely frozen over although there is drifting ice, and unloaded their cargoes for Petropavlovsk, across 6 miles of intervening ice.

6–84 Tides at Petropavlovskaya Gavan' are of a mixed type. When the moon is near the Equator the tides are semidiurnal, but as the moon recedes from the Equator the tides lose gradually their semidiurnal character. About 2 days before the moon has reached its maximal declination, the tides become diurnal, and have their maximum rise of approximately 4½ feet. The phase of the moon does not affect the type of the tide. The mean high water interval is 4 hours 8 minutes.

Tidal currents.—The flood current enters the inner harbor from the eastern side of the outer harbor and sets in a clockwise direction. The velocity at the entrance to Petropavlovskaya Gavan' is believed to be 1 knot, but some sources give a velocity of as much as 4 knots.

6–85 Pilots.—Before proceeding through the danger zone in the approach to Avachinskaya Guba, vessels pick up a pilot at Bukhta Akhtomen, about 35 miles southward of Petropavlovskaya Gavan'. (See sec. 6–105.)

It was reported (1950) that a vessel picked up the pilot to the eastward of Ostrov Starichkov. (See sec. 6–96.) It was further reported that a customs official and guards boarded the vessel with the pilot.

Tugs are always available.

6–86 Directions.—The approach to the entrance of the Avachinskaya Guba on a clear day presents no difficulties, but when the visibility is poor it should be borne in mind that:

1. When the bearing of the entrance is less than 304°, the cliffs of both sides of the entrance appear as a continuous coast.

2. There is a section of a low coast northward of the entrance, but the coast southward of the entrance is high.

3. An extensive bank with depths less than 100 fathoms lies northward of the parallel 52°55′ N., while southward of this parallel the depths are much greater and the 100-fathom curve is much closer to the coast.

4. Depths of 22 to 25 fathoms will indicate a close proximity of the coast; therefore, in case of poor visibility or a doubtful position, a vessel upon obtaining such depths should anchor immediately and wait until able to check her position.

When passing through the entrance channel it should be remembered that at the northern end of the channel, westward of Mys Izmennyy, the fairway with depths of 5 fathoms or greater

narrows to about 460 yards.

Vessels should exercise care to avoid two dangerous shoals inside Avachinskaya Guba, Banka Z to the westward and Rakovaya Mel' to the eastward. In order to pass Banka Z, vessels should not steer westward of the range of Babushkin Kamen' with Mys Stanitskogo until Mys Izmennyy comes in range with 1st Cliff in Zaliv Izmennyy, bearing 122°. In order to pass the Rakovaya Mel', vessels should pass westward of the spar buoy marking the western extremity of this shoal, or should steer by keeping the westernmost pillar rock of Kamni Tri Brata bearing 158° and open southwestward of Poluostrov Izmennyy. This course leads close westward of the Rakovaya Mel' and should be continued until the Petropavlovskaya Gavan' range-light beacons are in range, bearing 43°; thence vessels should steer for the range beacons on this bearing until quite close to the light buoy painted red and white, which should be passed eastward of and very close aboard in order to avoid the shoals fringing the eastern shore of the harbor. From the light buoy vessels should steer a course 325° on the range of two beacons already described in section 6—78.

Vessels intending to enter the inner harbor should take a midchannel course to the entrance, steering somewhat westward of the extremity of the spit, but when passing through the entrance, vessels should favor the extremity of the spit, which is steep-to.

6—87 PETROPAVLOVSK (*53°01' N., 158°39' E.*, H.O. Chart 5810) is situated on the northern, northeastern, and eastern shores of the inner harbor. The Russians have been developing Petropavlovsk as a naval base. The population in 1959 was about 86,000; it is probable, however, that this figure includes also populations of an indeterminate number of suburbs. Furthermore, the population of Petropavlovsk is subjected to considerable seasonal changes, being increased in the spring by numerous workers arriving here for the fishing season.

Among the suburbs of Petropavlovsk the settlement of AKO (Kamchatka Corporation) should be noted. This settlement, located near Ozero Kul'tuchnoye just northward of Petropavlovsk, has a population of 2,000 (1938), consisting principally of the employees of the corporation.

Wharves.—Vessels either go alongside the wharves or moor with their sterns made fast to the shore. The information given below on the wharves and facilities at them is from various sources up to 1958.

Main Quay, with a berthing length of 1,525 feet, is located on the eastern side of the outer harbor. Ocean-going vessels can be accommodated, and this vicinity was reported dredged to a depth of 30 feet. A number of portal jib cranes are located on the quay, and there is truck access to shipside. At least 10 covered storage buildings back the quay.

A naval quay, about 500 feet long, with a least depth alongside of 12 feet, is located close southward of the aforementioned quay. It was reported (1958) that facilities for oil storage stand in this vicinity.

Harbor craft include about 10 tugs, at least one of which is equipped for salvage operations, and about 30 barges of varying sizes. Travelling cranes up to 50-ton capacity and a shore crane, reported by one source to be of 100-ton capacity and by another to be of 200-ton capacity, are available. There is a jetty located near the mouth of the Rechka Poganka, and in 1950, a large vessel was observed to be moored just off the jetty with her stern to the jetty.

A wharf, about 300 feet in length, fronts on the eastern face of the peninsula northward of Mys Signal'nyy, the western entrance point of the harbor, and has depths of 23 feet alongside. This is an offshore wharf of open wood piling construction with a wood plank deck, access to which is obtained by three approaches of similar construction, each about 100 feet long and 25 feet wide, and spaced about 100 feet apart. It is used principally for the transfer of coal, but is also suitable for use for the transfer of general cargo. A quay, about 450 feet long, with a least depth alongside of 17 feet, suitable for the transfer of general cargo, and with road clearance, lies close southward of this wharf.

An offshore wharf, about 200 feet long, similar in construction to the aforementioned offshore wharf, with a depth alongside of 23 feet, is located on the northern side of the inner harbor. Access is obtained by two approaches, each about 50 feet long and 25 feet wide, spaced about 100 feet apart. This wharf is used for the transfer of general cargo, and is backed by several covered storage buildings. Wharves have been constructed for naval craft on the eastern side of the inner harbor and the northern side of the spit. Several large cranes of unknown capacity were reported to be located at the naval wharves. It was reported (1958) that a number of medium-sized floating drydocks are located in this vicinity.

Main Mole Wharf, extending northwestward from the northern end of Main Quay, divides the outer harbor from the inner harbor. The wharf is used for mixed general cargoes, including refrigerated fish products. The wharf has a berthing length of 1,570 feet with depths ranging from 15 to 30 feet alongside. There is truck access to shipside.

Most of the wharves are lighted and have fresh water connections.

Shipyard Quay, used for repair and fitting out of vessels, lies on the northern side of Bukhta Rako-

ways (sec. 6–73) and has a berthing length of 800 feet with depths of 22 feet alongside. There is truck access to shipside.

Fish Pier, with a berthing length of 540 feet and depths of 12 to 15 feet alongside, lies close eastward of Shipyard Quay.

Repairs.—Rakovaya Shipyard, in Bukhta Rakovaya, is equipped for construction of small fishing vessels. A floating drydock, has a lifting capacity of 5,000 long tons. Several smaller drydocks are located at Petropavlovsk.

Supplies.—All vessels controlled by the Government, AKO, and Crabtrust take their coal supply in Petropavlovsk. Some supply of coal is always on hand, and vessels are said to load by conveyors.

Provisions in moderate quantity are obtainable.

Fresh water of good quality is taken at the wharves.

There are oil depots at Bukhta Tar'ya (sec. 6–92) and at Seroglaska, described below.

Communications.—Regular steamship communication during the navigational season is maintained with Vladivostok. Ordinarily vessels bound for the Bering Sea call at Petropavlovsk.

There is a post office and a telegraph office in Petropavlovsk. The telegraph system of Kamchatka has a line extending from Petropavlovsk as far northward as Tigil' on the western coast and another line from Petropavlovsk as far northward as Kozyrevsk in the interior.

An all weather highway connects Petropavlovsk with Ust'-Bol'sheretsk, on the west coast.

Radio.—There is a radio station open for public correspondence.

Hospital.—The city has several hospitals.

Meteorological table.—See Appendix II.

6–88 Coast.—From Mys Signal'nyy the eastern shore of Avachinskaya Guba trends in a general northwesterly direction for about 5½ miles to the mouth of Reka Avacha. The settlement of Avacha is situated on the eastern bank of the mouth of the river.

At Seroglaska, about 3 miles east-southeastward of Avacha, are two petroleum terminals with numerous oil tanks, and, according to one source, some radio masts. Vessels have been known to moor offshore, stern toward the shore, bunker by floating hose, and also obtain water.

Direction Bluff, a very conspicuous headland which projects from the mainland in a southerly direction, is located about 2½ miles east-southeastward of the mouth of Reka Avacha. This headland is about 140 feet high and faces the bay with a precipice.

Light.—A light is shown on Direction Bluff from a red frame pyramid.

Range Beacons.—It was reported (1953) that two beacons, in range 165°, are located on Direction Bluff.

The northwestern shore of the Avachinskaya Guba extends from the mouth of Reka Avacha in a general southwesterly direction for about 6 miles to the mouth of Reka Paratunka. The entire shore is a low swampy valley thickly covered with grass and some trees; numerous creeks discharge into the bay. Shoal ground extending for about a mile offshore and drying at low water fringes this entire section of the shore.

6–89 Mys Kazak (*52°58′ N., 158°28′ E., H. O. Chart 5810*) is the eastern extremity of a small hilly peninsula that projects from the mainland in an easterly direction just southward of the mouth of Reka Paratunka; it is a sharp, wedge-shaped point of yellowish color, about 105 feet high. A high pillar rock stands close off the point, and numerous above-water rocks and submerged rocks lie close under the shore on all sides. The depths 400 yards off the point are about 8 fathoms to southward and southeastward, about 6½ fathoms to eastward, and about 3 fathoms or less to northward.

A light is located at Mys Kazak.

Prohibited anchorage.—Anchorage is prohibited in the entrance to Bukhta Tar'ya.

6–90 Bukhta Tar'ya is a bay entered between Mys Kazak and Mys Artishok, located 2 miles southward. It is separated from the Avachinskaya Guba by Poluostrov Tar'ya, a slender, hilly peninsula which, projecting nearly 3 miles from the mainland in a west-northwesterly direction, forms the northern shore of the bay. This peninsula connects to the mainland by a short, low isthmus having a width

of one-quarter mile and almost entirely occupied by a lake.

From its entrance, the bay first recedes westward, and then curves southward and southeastward for a total distance of about 6 miles, terminating in a small oblong cove, known as Bukhta Yagodnaya. Bukhta Tar'ya has a width that averages slightly more than 1½ miles.

The depths at the entrance are 12 fathoms, but decrease to 10 fathoms, mostly mud and sand, in the inner part of the bay.

Bukhta Tar'ya affords excellent anchorage sheltered from all winds, and except for the patch of foul ground surrounding Ostrov Khlebalkin, described below, is clear of dangers.

Mys Artishok, the southern entrance point of Bukhta Tar'ya, is the western extremity of Poluostrov Tar'ya. It is a moderately high, sharp, rocky point thickly covered with stunted trees. The point is steep-to and clear of dangers; depths of 12 fathoms are found 200 yards off the point.

Ostrov Khlebalkin, an islet, about 16 feet high, covered with grass and bush, lies about 1¼ miles south-southwestward of Mys Artishok. The islet stands on a rocky reef, which extends from it southward for about 200 yards. A shoal with depths of about 3 fathoms extends from the islet in a southwesterly direction.

6-91 **Lights** are exhibited on Mys Artishok, Ostrov Khlebalkin, and also on Mys Lagernyy, which is located on the northern shore of the bay in a position about 1½ miles east-southeastward of Mys Artishok.

6-92 **SETTLEMENTS.**—**Novaya Tar'ya**, comprising a settlement and a fishing station, is situated on the low sandy shore of the isthmus in the northeastern recess of the bay. Loading operations are carried out by means of local boats called "Kungas" and vessels calling here anchor about 800 to 1,000 yards offshore either inside the Bukhta Tar'ya or on the side of Avachinskaya Guba. The settlement of Staraya Tar'ya is situated in the northwestern recess of Bukhta Tar'ya. Some auxiliary establishments of the Petropavlovsk naval base are located in Bukhta Tar'ya, and there is reported to be a lumber yard, brickyard, and sawmill.

Pier.—A wooden pier reported to have a length of 180 feet and a depth of not more than 15 feet at its head extends from the northern shore of the bay. Large vessels are said to moor stern made fast to the pier.

Supplies.—Fresh water of excellent quality can be obtained from a pipe installed on the northern shore of the bay. Vessels may anchor close inshore, making their sterns fast to the trees, and take water through a hose. Two beacons located about 400 yards northeastward of Mys Lagernyy in range (nearly true north) facilitate the location of the water pipe.

In 1945 a vessel anchored on the northern side of Poluostrov Tar'ya and loaded fuel oil by pipeline; the terminal was marked by buoys. The existence of this pipeline was doubtful in 1962.

6-93 **Coast.**—From Mys Artishok the coast trends in a general easterly direction for about 4½ miles to Mys Kosa, which is a low, roundish sand and shingle cape projecting from the mainland in a west-northwesterly direction for about 600 yards. The cape is steep-to on its northwestern, western, and southwestern sides. Depths of 12 fathoms are found 200 yards off the cape, but shallow water extends northward, northeastward, and eastward from the cape.

Bukhta Bogatyrëvka, is a small cove, about one-half mile wide, lying just southward of Mys Kosa and indenting the land for about 600 yards in an east-southeasterly direction. The northern and eastern shores of the cove are low and sandy but the southern shore is cliffy. The depths at the entrance are 12 fathoms, mud and sand, and decrease gradually toward the head of the cove. A small fishing station and a concrete pier reported to have a length of 50 feet and a depth of 16 feet at its head are situated in the cove. Small craft can anchor in this cove, which gives good shelter from all winds except those from the northwestward.