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June 1962

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PHOTOGRAPHIC INTERPRETATION REPORT

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GEOGRAPHIC STUDY

ARAL SEA AREA, USSR

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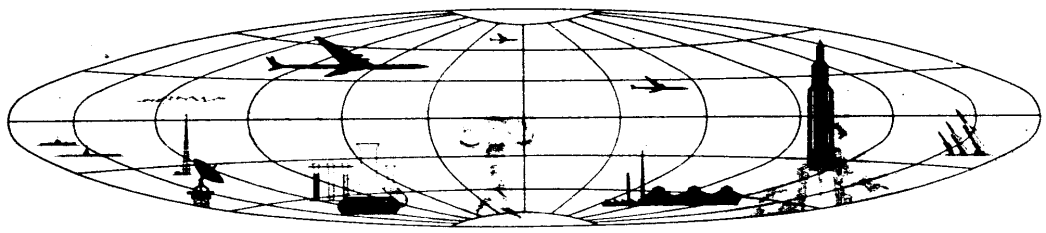


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PHOTOGRAPHIC INTERPRETATION REPORT

GEOGRAPHIC STUDY
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PREFACE

This photographic interpretation report was prepared by Army, Navy, Air Force and Central Intelligence Agency analysts of the National Photographic Interpretation Center in response to a Scientific Intelligence Committee requirement. It supplements PIC/JR-1031/61 which gave details of the [redacted]

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Usable photographic coverage of the Aral Sea is restricted to approximately the northern half of the Aral Sea and adjacent shoreline areas. Cloud cover and lapses of photography preclude detailed interpretation of certain areas within this general coverage.

It should be noted that the map of the Aral Sea area (Figure 2) in this report is a composite drawing constructed from several maps and includes corrections from aerial photography. Many place names on this map have been obtained from collateral sources and will not appear on standard maps of the Aral Sea area.

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NPIC/R-1023/62

TABLE OF CONTENTS

	<u>Page</u>
SUMMARY	1
INTRODUCTION	1
GENERAL DESCRIPTION OF ARAL SEA AREA	2
MILITARY INSTALLATIONS	3
Possible Military Installation at Zhelgy Zagem	6
Possible Military Installation Southwest of Aral'sk	6
Possible Police Posts at Kazalinsk and Novo-Kazalinsk	7
TRANSPORTATION FACILITIES	8
Air	8
Sea	8
Rail	23
Road	24
COMMUNICATIONS FACILITIES	24
Vozrozhdeniya Island-Aral'sk Microwave Link	25
Aktyubinsk-Tashkent Microwave Link	25
Radio Communications at Aral'sk	27
FISHERIES	28
Fishing Villages	28
Comparison of Facilities on Vozrozhdeniya Island with Fishing Installations	30
Ice Storage	31
Fishing Installations on the Aral Sea	32

- v -

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NPIC/R-1023/62

TABLE OF CONTENTS (Continued)

INSECTICIDE TESTS AT TUP-BUGUTSKIY	35
REFERENCES	35

LIST OF ILLUSTRATIONS

	<u>Page</u>
Figure 1. Location of the Aral Sea	2
Figure 2. Map of Aral Sea Area	5
Figure 3. Locations of Possible Military Installations in the Aral Sea Area	6
Figure 4. Possible Military Installation at Zhelgy Zagem	7
Figure 5. Locations of Air Transport Facilities within 150-nm Radius of Aral Sea Coast	9
Figure 6. Aral'sk Harbor	15
Figure 7. The Alexander Nevskiy	23
Figure 8. Locations of Probable and Suspect Microwave Stations in the Aral Sea Area	27
Figure 9. Mys Kokchukat Operational Headquarters on Vozrozhdeniya Island	32
Figure 10. Typical Fishing Kolkhoz	33

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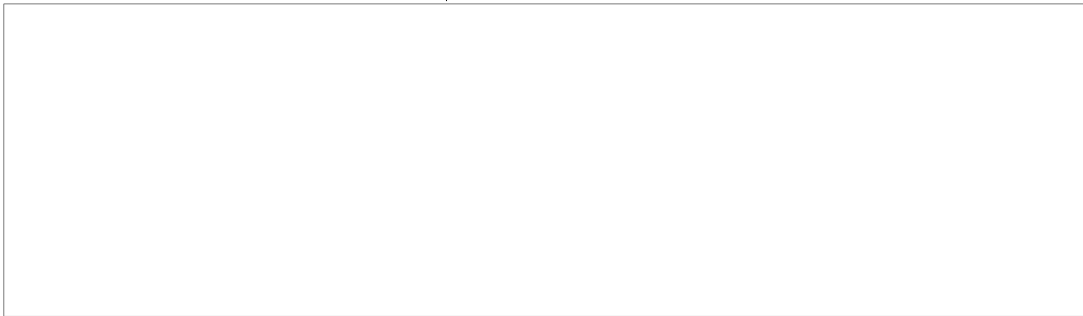
SUMMARY

This report describes the military installations, transportation facilities, and industries surrounding the Aral Sea which appear on aerial photography of 1957, 1959, and 1960. The installations and industries are largely at Aral'sk, where a major port, described here in detail, is located. Airfields within 150 nautical miles of the Aral Sea coast have also been described. Communications in the area were traced, in particular the suspect microwave links from Vozrozhdeniya Island to Aral'sk and the probable microwave links from Aktyubinsk to Tashkent. The fishing industry of the Aral Sea was observed and described in part at several fishing ports, canneries, and settlements.

INTRODUCTION

This report is part of a continuing study of the Aral Sea area by various elements of the intelligence community in order to establish, if possible, the relationship between activities in this area and the military establishment on Vozrozhdeniya Island. 1/ This report is intended to supplement the other studies by supplying whatever information can be obtained from aerial photography.

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GENERAL DESCRIPTION OF ARAL SEA AREA

The Aral Sea is a large inland lake of approximately 26,000 square miles located about 300 nautical miles (nm) east of the northern end of the Caspian Sea (Figure 1). This slightly saline body of water occupies a shallow depression into which drain the Syr-Dar'ya and Amu Dar'ya Rivers (Figure 2) whose sources are in the snow-capped mountains of southern Asia. These rivers bring down large quantities of sediment, which causes frequent shifting of channels in the deltas and makes river navigation hazardous.

The climate of the Aral Sea area is a desert regime characterized by hot, dry summers and cold, dry winters. The sea expanse exerts a slight warming effect on air temperature from north to south

and causes a very slight amelioration of the climate near the shore. Coastal portions of the sea are usually frozen from the middle of November until April; the entire sea freezes over only during very severe winters.

The eastern and southern coasts of the Aral Sea are fringed with numerous small islands. Several large islands lie off the western and northern coasts where the greatest depths of the sea (about 200 feet) are found. Frequent and violent storms and the scarcity of safe harbors hinder navigation in the Aral Sea, but have not prevented the development of an important fishing industry. Regular passenger service and freight shipping are maintained during the ice-free season between Aral'sk (46-48N 61-30E)

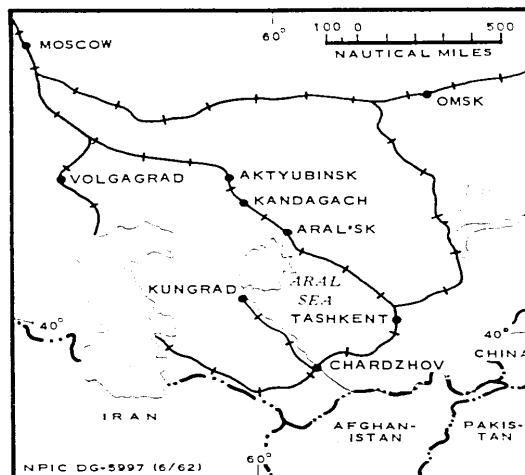


FIGURE 1. LOCATION OF THE ARAL SEA.

- 2 -

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at the northern end of the sea and several transshipping points in the Amu Dar'ya delta at the southern extremity.

The relatively sparse population of the Aral Sea area is grouped into small villages and a few small towns along the northern, eastern, and southern shorelines, along the Syr-Dar'ya and Amu Dar'ya rivers, and along the railroad that traverses the northeastern quadrant of the area. Aral'sk is the only town of moderate size located on the seashore. Most of the people in the small villages along the shore are engaged in fishing. Major fish-processing facilities are located in the larger towns of Aral'sk and Muynak (43-44N 59-00E). Some agriculture and cattle grazing are practiced in the deltas and river valleys where irrigation water is available. An important salt (sodium sulfate and magnesium sulfate) extraction industry is located in a former lake bottom near Aral'sk.

A list of geographic place names which appear in Figure 2 are presented in Table 1.

MILITARY INSTALLATIONS

The area within 20 nm of the coast of the Aral Sea was searched for military installations which might be associated with the proving ground on Vozrozhdeniya Island. It would be expected that meteorological stations, communication facilities, troop quarters and supply bases, as well as missile test sites, might be found. At present, the only installations of this type which have been located on photography (1957, 1959, and 1960) are the probable supply base for Vozrozhdeniya Island on the west side of Aral'sk, previously described in detail 1/, two possible military stations, one at Zhelgy Zagem (46-50N 61-35E) and one southwest of the center of Aral'sk (Figure 3), possible police posts at Kazalinsk and Novo-Kazalinsk, and groups of buildings at suspect relay stations for the suspect microwave link between Vozrozhdeniya Island and Aral'sk. The suspect relay stations are described under the heading of Communication Facilities.

- 3 -

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TABLE 1. GEOGRAPHIC PLACE NAMES OF ARAL SEA AREA

To facilitate correlation, names of populated places and small islands along the coastal portions of the Aral Sea are listed first, in a clockwise direction from Aral'sk. The names of places in the central part of the sea are presented next, in a north-south direction from Kanderli Island. Alternate names appear in parentheses.

Aral'sk	Akpetkinskiy (Karabayly)
Sapak	Archipelago
Sary-Chaganak Bay	Kazakdar'ya
Kamyshly-Bash	Maypost
Bugun'	Kungrad
Karashalan	Muynak
Akcha-Tau	Urga
(Ashcha-Tau)	Uchsay
Shevchenko	(Tokmak)
Novo-Kazalinsk	Tokma-Aty Island*
Kazalinsk	(Takman-Amy Island)
Uzun-Kair	(Muynak Island)
Kaskakulan Island	Mys Aktumсыk (Cape)
(Kaska-Gulan Island)	Shomyshkol
Kaska-Gulan	Kazaly
(Kaskakulan)	Zhana-Zhol
Kushzhitmes Island	Sarbasat
(Kuz-Zhetpes Island)	(Sary-Basat)
Krasnyy Rybak	Tastyubek
Zhingyl'dytyubek Island	Aral'sk Airfield
Chushka-Bas Island	Kanderli Island
Dzhaman-Chabaly Island	Biyurgundy Island
Atalyk Island	Avan
(Zhalpak Island)	Kokaral
(Sorcha-Aral Island)	Kugaral Island
Uzynkair Island	Barsa-Kel'mes Island
(Altay Island)	Kordon
Malyy Uzun-Kair	Komsomol'skiy Island
Uyaly Island	Mys Kokchukat
Uyaly	Mys Tastyubek
Biiktau Island	Kantyubek
Kenderli Island	Vozrozhdeniya Island
(Menshikova Island)	Konstantin Island
Dzhigildy Island	Bellingsgauzeno Island
(Tolmacheva Island)	Lazarevo Island
Ak-Petki Island	
Obrucheva Island	
Taylyak-Dzhigen	

*Although listed here as an island, this land area is sometimes described as a peninsula; either description may be correct, depending on the tide and the shifting of channels in the Amu Dar'ya delta.

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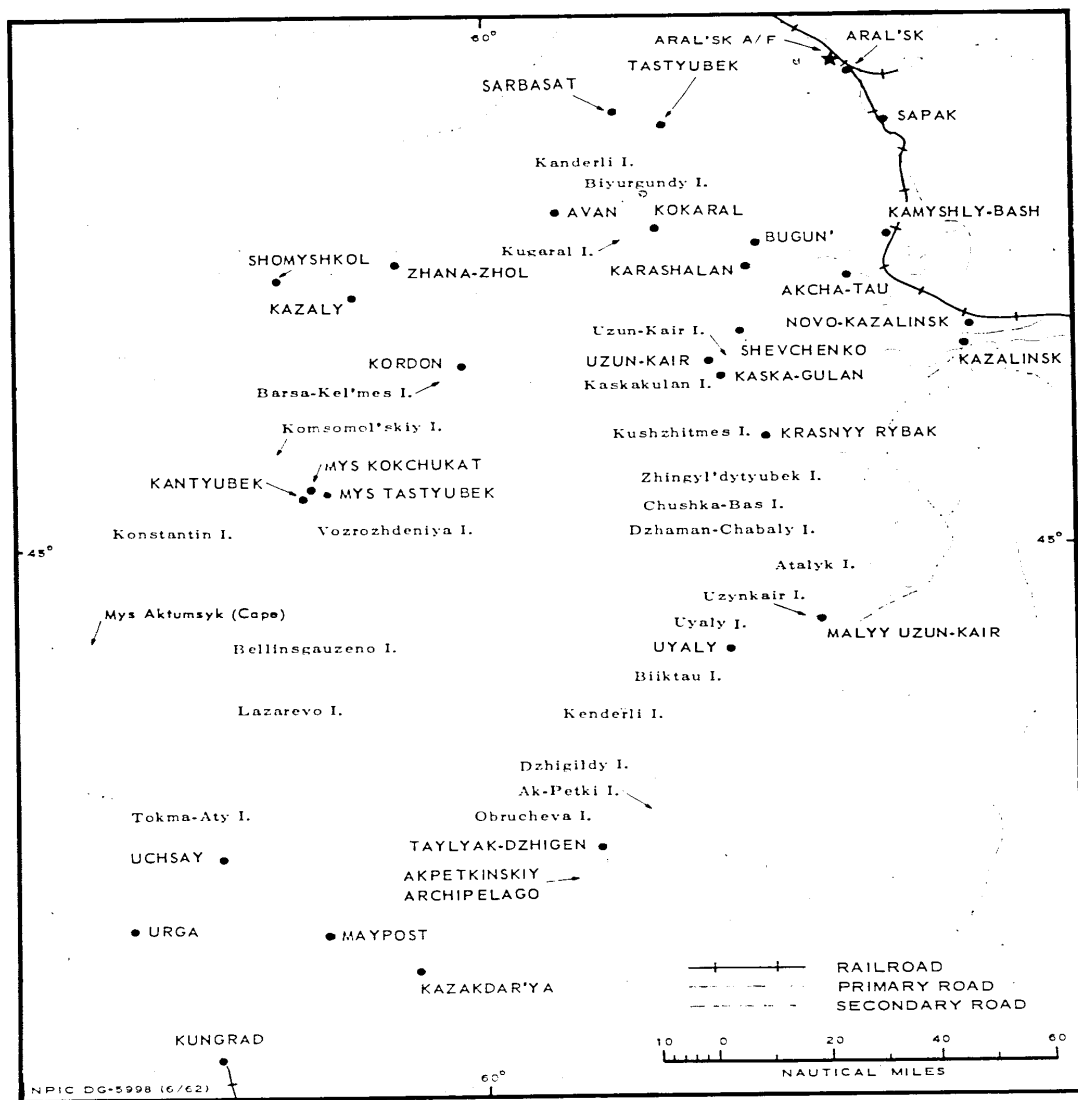


FIGURE 2. MAP OF ARAL SEA AREA. This map is based on WACs 246, 247, 326, and 327 with corrections from aerial photography.

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Possible Military Installation at Zhelgy Zagem

A small installation which is possibly a military post is located 1.25 nm north-northwest of the center of the runways at Aral'sk Airfield (Figures 3 and 4). This installation is secured by a single fence and has

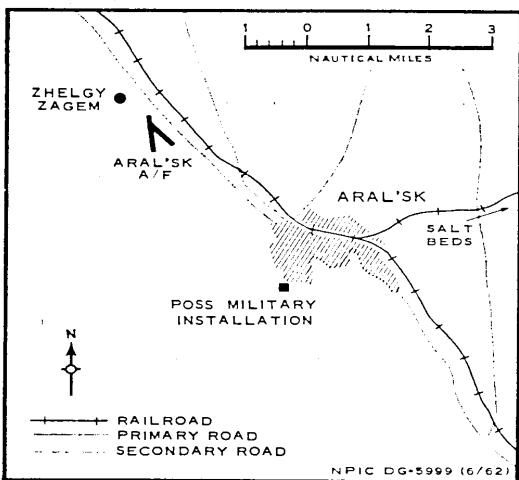


FIGURE 3. LOCATIONS OF POSSIBLE MILITARY INSTALLATIONS IN THE ARAL SEA AREA. (1957 photography)

a guard post at the entrance gate. Within the fence are two operational buildings one of which has a 40-foot tower beside it. The details of the tower cannot be discerned, but it seems to have an object at its top which could be a cab or a microwave reflector. Four barracks and several support buildings are also within the fence. Outside the fence is a possible motor pool, a possible disposal area or dump, and a group of 16 unidentified small buildings measuring approximately 30 by 25 feet and arranged in rows. The motor pool is enclosed

by a wall. A ground scar, which leads from the direction of the operational buildings, terminates at two small sheds. The sheds could house equipment and function as a meteorological station. The ground scar is possibly a cable line.

Possible Military Installation Southwest of Aral'sk

A small installation on the shore of Sary-Chaganak Bay, 1.25 nm southwest of the center of Aral'sk and just beyond the outskirts of the city, may have military significance (Figure 3). It is composed of one barracks or warehouse and seven small sheds, dispersed around a low,

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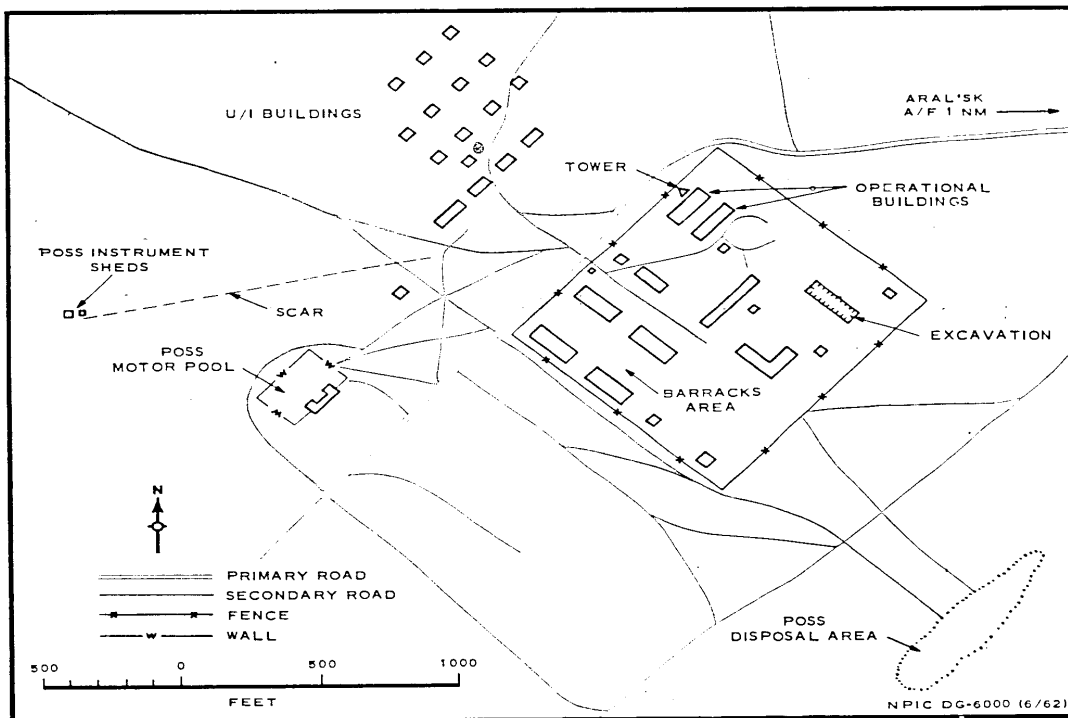


FIGURE 4. POSSIBLE MILITARY INSTALLATION AT ZHELGY ZAGEM. (1957 photography)

square-based tower which is approximately 20 feet in height. Two pits in the building area which resemble vehicle revetments, and two small-boat piers on the shore of the bay are visible. The absence of visible security measures considerably diminishes any significance which might be placed on this installation. It is possible that the tower supports a navigation signal for ships entering Aral'sk Harbor.

Possible Police Posts at Kazalinsk and Novo-Kazalinsk

Small installations in Kazalinsk and Novo-Kazalinsk could possibly be police posts. Each is composed of an administrative building and

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several barracks, secured by a fence. Kazalinsk has been a military headquarters since Tsarist days, but it is not now listed in the Soviet Order of Battle. The installations are not believed to be associated with military research programs.

TRANSPORTATION FACILITIES

Air

Airfields and Landing Grounds

As the result of a photographic study of air transport facilities within a 150-nm radius of the Aral Sea coast, 10 airfields, four landing grounds, and one possible landing ground were located and analyzed. Two of these were located to the north, three to the east, nine to the south of the Aral Sea, and one on Vozrozhdeniya Island. A small airfield is reported at Muynak 2/, but aerial photography of it is not available. Approximately 50 percent of the area under study was covered by usable photography; however, most of the area covered by photography was the populated region. A description of each air transport facility is presented in Table 2; locations of the air facilities are shown in Figure 5.

Sea

Ports and Harbors

The two principal ports on the Aral Sea which have been covered by aerial photography are those at Vozrozhdeniya Island 1/ and at Aral'sk. A third harbor, at Uchsay (43-50N 58-55E) near Muynak at the southern end of the sea, is shown on maps (Figure 2) but has not been covered by photography. Muynak was formerly the main southern port, but its harbor has filled with silt and it is now served by lighters, barges, and tugs from

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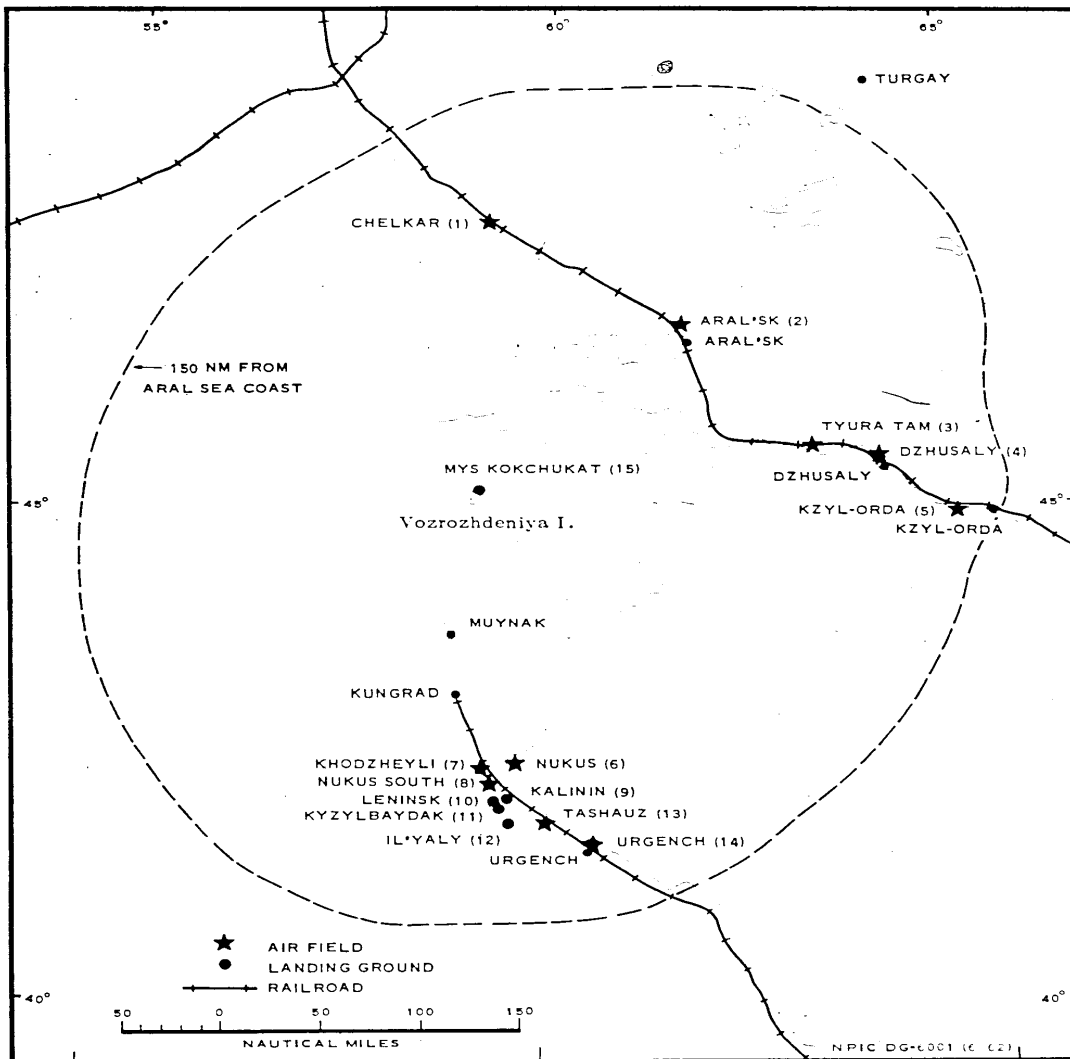


FIGURE 5. LOCATIONS OF AIR TRANSPORT FACILITIES WITHIN 150-NM RADIUS OF THE ARAL SEA COAST. This line drawing was made from 1957, 1959, and 1960 photography. Numbers in parentheses are keyed to Table 2.

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Table 2. Air Facilities Within 150-NM Radius of the Aral Sea

*Name and Location	Description of Runways	Aircraft Present	Photo Date	Supplementary Information
1. Chelkar Airfield (47-48N 59-36E) SW edge of Chelkar	One sod-surface ENE/WSW 5,100 x 230 ft	1 prob COLT/ CREEK 1 CAB		Small support area NE of runway containing five buildings.
2. Aral'sk Airfield (46-49N 61-37E)	Two hard-sand surface NNW/SSE - 5,500 ft NW/SE - 4,200 ft	6 prob CAB 4 U/I single-engine aircraft		Limited permanent facilities are present.
3. Tyura Tam Airfield (45-37N 63-16E)	One hard-surface blacktop NE/SW 3,900 x 140 ft	6 CAB 5 HOUND 3 CRATE 3 COLT 2 CREEK		A blacktop taxiway approximately 1,000 x 35 ft leads to a hard-stand approximately 1,500 x 200 ft which parallels the runway. Service apron 155 x 100 ft located adjacent to taxiway. Two hard-surface helicopter pads, approximately 75 ft in diameter, located east of aircraft dispersal area. Nine miscellaneous buildings, including two under construction, in general area.
4. Dzhusaly Airfield (45-31N 64-05E)	Two natural surface ENE/WSW (parallel) 7,600 x 200 ft	3 CREEK 2 CAB 1 COLT 1 U/I aircraft		Radar, prob TOKEN, and Commo Center located at airfield which has permanent housing and facilities; three buildings are under construction. 20 miscellaneous and 6 van-type vehicles.
5. Kzyl-Orda Airfield (44-50N 63-30E)	Two natural surface NNW/SSE and ENE/WSW crossed, each 3,300 by 150 ft	2 prob CREEK		Limited facilities. Three vehicles present on airfield.

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- 10 -

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*Numbers preceding Name and Location entries are keyed to Figure 5.

Table 2. (continue)

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*Name and Location	Description of Runways	Aircraft Present	Photo Date	Supplementary Information
6. Nukus Airfield (42-29N 59-38E) NE of Nukus East of Nukus- Chimbuy Hwy	One natural sand surface N/S (long axis) 4,500 x 3,500 ft	8 COLT 3 CAB 3 CREEK		Administration building and small support area NW of landing area. POL storage area at south end of field contains 7 horizontal storage tanks and 9 vehicles.
7. Khodzheyli Airfield (42-24N 59-26E) 1.8 nm SW of Khodzheyli South of new urban area	One natural sand surface, 4,500 feet square	1 CAB		No permanent structures visible.
8. Nukus South Airfield (42-23N 59-29E) 3 nm SSE of Khodzheyli 5 nm SW of Nukus	One NW/SE 7,300 x 160 ft	--		Taxiways and parking areas appear in advanced construction stages with grading probably completed and surfaces possibly being oiled. Support area has 4 buildings com- plete, others under construction. Approximately 30 vehicles, possibly used for construction purposes, located at airfield. Probable POL storage area located across road at SE end of field with 19 horizontal storage tanks. Across road from support area is hip-roofed building under construction as part of possible electronics site with unidentified radar, probable TOKEN or GAGE, and 6 van-type vehicles.
9. Kalinin Landing Ground (42-05N 59-38E) 3 nm SSW of Kalinin	One natural sand surface, NNE/SSW 2,500 x 1,500 ft	--		No permanent structures visible. Landing circle in center of area, serviceability undetermined.

*Numbers preceding Name and Location entries are keyed to Figure 5.

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Table 2. (continued)

Name and Location	Description of Runways	Aircraft Present	Photo Date	Supplementary Information
10. Leninsk Landing Ground (42-03N 59-25E) East of Leninsk	One natural sand surface, NW/SE, 2,500 x 1,500 ft	--		No permanent structures visible. Landing circle in center of area, and wind vane observed.
11. Kyzylbaidak Landing Ground (42-05N 59-29E) 3 nm ENE of ③ Leninsk (Ak-Tepe)	One natural sand surface, NW/SE, 4,000 x 2,500 ft	1 CREEK		No permanent structures visible.
12. Il'yaly Southwest Landing Ground (41-50N 59-36E) 2 nm SSW of Il'yaly	One natural surface	--		No permanent structures visible. Landing circle observed.
13. Tashauz Airfield (41-49N 59-58E) Southern outskirts of Tashauz	Three compact gravel surface NW/SE, NE/SW, and E/W each under 5,000 ft	5 U.I. aircraft		Limited facilities observed.
14. Urgench Airfield (41-36N 60-39E) Two nm NE of Urgench	Three natural surface NW/SE, NNE/SSW, and NE/SW each prob less than 5,000 ft	--		Interpretation limited by obliquity.
15. Mys Kokchukat Poss Landing Ground (45-13N 59-17E)	Two natural surface E/W - 1,300 x 150 ft N/S - 700 x 500 ft	--		No facilities visible. (parade ground)

*Numbers preceding Name and Location entries are keyed to Figure 5.

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Uchsay. Inasmuch as the facilities at Vozrozhdeniya Island have been described previously in PIC/JR-1031/61, Jul 61, only the port facilities at Aral'sk are described herein.

Aral'sk Harbor. Aral'sk Harbor (Figure 6) is large and well protected, the main basin being approximately 3,000 by 3,000 feet. The harbor entrance is protected by sandbars and islands and the single entrance has a channel about 250 feet wide. The harbor is divided into three parts, the main harbor and two little-used bays. Wharf facilities line three sides of the main harbor. The landing facilities and the ships found at them in [redacted] are described below. Numbers preceding descriptions are keyed to Figure 6 and all figures are overall dimensions. 25X1

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1. Finger pier, length of side, 65 feet; length of head, [redacted]. The pier extends from the water directly into the end of a building which measures 170 by 45 feet. The area around the building is enclosed by a wall; the enclosed area has the appearance of a corral. Two fishing boats, [redacted] are anchored offshore.

25X1

2. Finger pier, length of side, 65 feet; length of head, 5 feet.

3. Finger pier, length of side, 95 feet; length of head, [redacted].

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4. Finger pier, length of side, 60 feet; length of head, 15 feet.

5. T-head pier, length of head, 30 feet; width of head, 10 feet. Length and width of approach, 105 by 10 feet.

6. Finger pier, serving probable fish cannery, length of side, 160 feet; length of head, 15 feet. Pier has 13 fishing boats, measuring from [redacted] in length, tied up or anchored nearby.

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7. Quay, length of face, 320 feet; width of quay, 110 feet. Three cranes (type unidentified) stand on the quay. Two transit sheds measure 95 by 65 feet and [redacted] by 45 feet. Quay has four ships tied up alongside. One ship, measuring 155 by [redacted] with its stack aft is probably a

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25X1 cargo type; the remaining three are coasters measuring [redacted]

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8. Offshore wharf, length of face, 475 feet; width of wharf, 75 feet. Length of approach, on northeast side, 270 feet; width of approach 115 feet. Eight transit sheds on and adjacent to wharf have the following dimensions: One shed 160 by 55 with 160-foot apron, two sheds 115 by 50, two sheds 60 by 20, one shed 260 by 70 feet (flush with face of wharf), one shed 245 by 100 feet, one shed 25 by 20 feet. Eight fishing boats are tied up at this wharf and a ninth is anchored nearby. Dimensions of the boats range from [redacted] by 20 feet

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9. Finger pier, length of side, 65 feet; length of head, 10 feet.

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10. Pier, length of side, 250 feet; length of head 160 feet, with transit shed 60 by 25 feet at base. A boat [redacted] is moored alongside the wharf. A ship [redacted] freighter-transport type, with two cargo hatches fore and two aft, is anchored off this wharf.

25X1

11. Modified L-head pier, length of head, 35 feet; length of sides, 90 feet (head portion) and 125 feet (overall); width of approach, 25 feet. One 20 by 10-foot transit shed is on the pier. Three fishing boats are tied up at the pier and a fourth is anchored nearby. They range in size from [redacted]

25X1

12. Composite pier, seaward section dimensions - length of side, 120 feet, length of head, 25 feet; base section dimensions - length of side 120 feet, width 45 feet. Base section is covered by a warehouse, 100 by 45 feet. This pier is possibly used by a passenger and freight line. A cargo ship (freighter-transport type), [redacted] with hatches fore and aft and three fishing boats, ranging in size from 70 by [redacted] are tied up at the pier.

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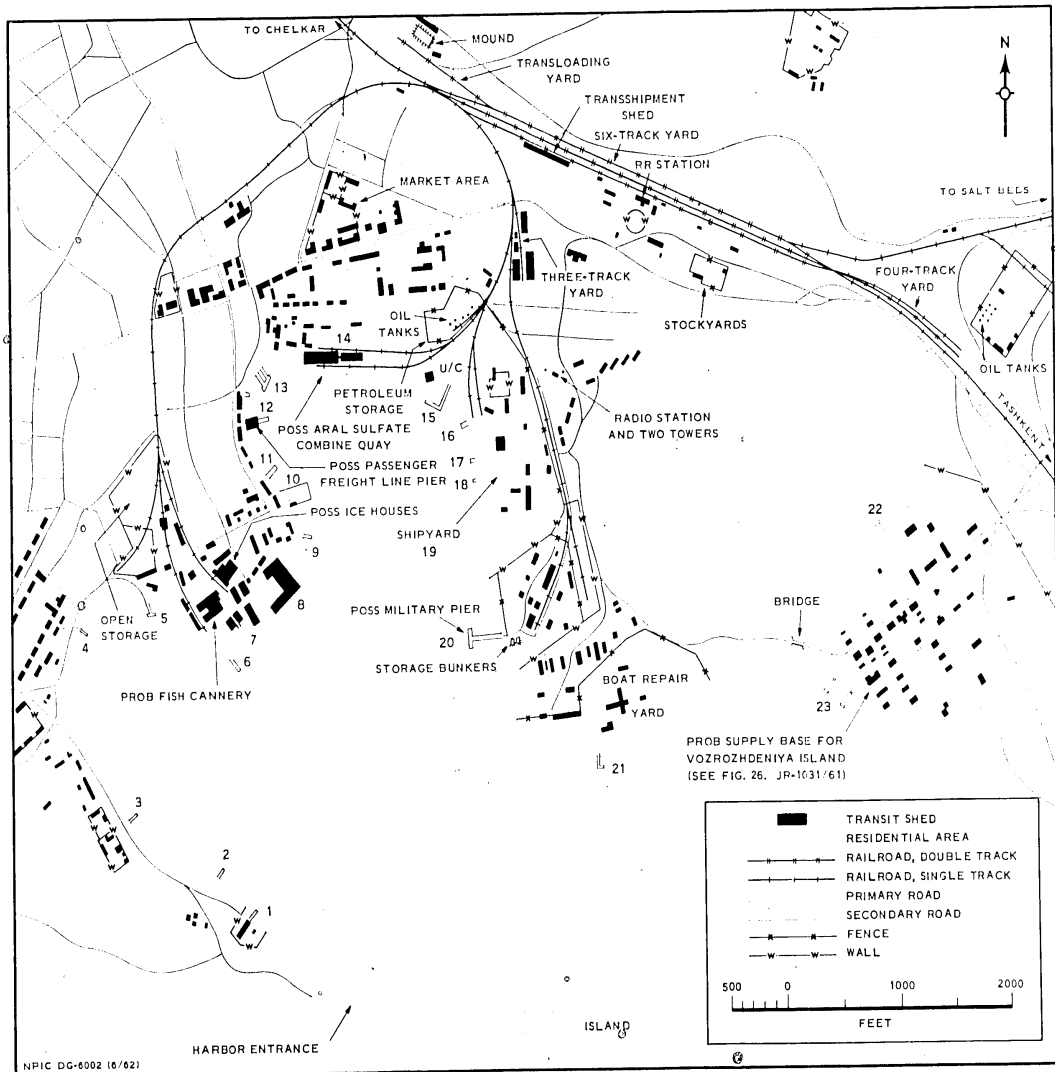


FIGURE 6. ARAL'SK HARBOR (1957 photograph). Numbered items are keyed to text.

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13. Offshore wharf with 2 approaches and a nearby pier. Pier, with a length of side 20 feet has an overall length of side of 35 feet. Dimensions of the offshore wharf are: face, 105 feet; width of wharf, 20 feet; lengths and widths of approaches, 115 by 10 feet and 80 by 10 feet. A probable patrol craft () by 15 feet) is tied up at the wharf.

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14. Quay, which probably serves the Aral Sulfate Combine, is used for loading bulk salt aboard ships. The quay is rail served. Length of face is 1,200 feet, width of quay is 95 feet. Two transit sheds on quay are 190 by 60 feet and 300 by 95 feet. Three probable loading towers are visible on quay. Six ships tied up to the quay have the following features:

25X1 () superstructure and hatches not visible, probably a barge; () superstructure aft, 2 cargo hatches amidships; hatches are open and a white material is visible in the holds; () stack aft, cargo type, 2 cargo hatches amidships; () stack aft, cargo type, no cargo hatches visible; 135 by 25 feet, stack aft, cargo type, 2 cargo hatches amidships; () by 25 feet, stack aft, cargo type, 2 cargo hatches amidships. At anchor near the quay is a ship 135 by (), stack aft, cargo type, with 2 cargo hatches amidships; the hatches are open and a white material is visible in the holds.

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15. Quay, under construction with the backfill not complete. The completed section of the face is () long and the width of the quay is 15 feet; the length of the face of the incomplete section is 150 feet and the width of the quay wall is 15 feet. One ship (or possible barge), () is tied up to the completed section. No superstructure is visible but two open hatches are visible amidships.

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16. Pier, overall length of side, 75 feet; length of head, 45 feet. Four ships tied up at this pier measure:

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() by 35 feet, stack aft, cargo type with two hatches amid-

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25X1 ships; [] by 25 feet, freighter - transport type; []
25X1 stack aft, cargo type; [] freighter - transport type.

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25X1 17. Finger pier, length of side, 35 feet; length of head, 10 feet, with
25X1 barge, [] feet, tied up.

25X1 18. Finger pier, length of side, 55 feet; length of head, 10 feet. An
25X1 icebreaker, [] and two barges, 70 by 25 feet and 50 by
25X1 25 feet, are tied up at the pier and a probable floating crane or
dredger, [] is anchored nearby.

25X1 19. Shipyard, with four side-launching sites. No rails are visible. Four
25X1 ships and four barges are under construction. The ships measure
190 by 30 feet (freighter - transport type), 210 by 30 feet (possible
lighter), and two small freighter-transport 85 by 25 feet, and 130
by 35 feet. Barges measure []
feet, and [] Five shop buildings in the shipyard measure
200 by 45 feet, 105 by 30 feet, 100 by 35 feet, 85 by 30 feet, and 85
by 60 feet. Eleven storage and utility buildings range in size from
30 by 15 feet to 70 by 15 feet.

20. T-head pier, length of head, 180 feet; width of head, 35 feet. Length
and width of approach, 290 by 25 feet. A barge (95 by []) is
anchored offshore. Pier is possibly military. It is connected by road
to the probable supply base for Vozrozhdeniya Island, and has heavy
security as well as bunker-type storage, similar to that found on
Vozrozhdeniya Island and at the supply base, located near the pier.

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21. Boat repair yard, with one L-head pier. Length of head, 85 feet;
width of head, 20 feet. Length and width of approach, 60 by 10 feet.
Three shop buildings in the yard have dimensions of 115 by 35 feet
(with a wing 35 by 35 feet); 200 by 35 feet (with a wing 160 by 15
feet); and 260 by 30 feet. The vessels in this yard are end-launched
and there is no evidence of marine railways. There are 32 small
fishing boats, each 30-40 feet in length, in the yard.

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22. T-head pier, length of head, 25 feet; width of head, Length and width of approach, 115 by 5 feet. Items 22 and 23 furnish small boat accommodations for the probable supply base for Vozrozhdeniya Island. All ship traffic for the base would have to tie up at Item 20 pier.
23. Two piers, both T-head with approximately same dimensions -- length of head, 20 feet; width of head Length and width of approach, 125 by 5 feet.

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Ships

Collateral Descriptions of Ships. A consolidated list of names and brief descriptions of ships which ply the Aral Sea is presented in Table 3. Names and descriptions of these ships have been extracted from various collateral sources which are cited in references 3 through 8. Since the ships do not sail international waters, their names do not appear on ship registry lists and information on the size and type of each ship is not available. It is known only that the ships are largely trawlers and coastal cargo ships of shallow draft but capable of withstanding the rough waters of the Aral Sea.

A fleet of river boats plies the Amu Dar'ya River under the direction of the Central Asia Steamship Line, but the names of these vessels have been omitted from the table. These ships are of very shallow draft and do not exceed 300 tons displacement. The port of Uchsay is the transshipment point between ships of the Aral Sea and river boats of the Amu Dar'ya River. 8/

Ships in Aral'sk Harbor. A description of ships over 50 feet in length visible on the 1957 photography of Aral'sk Harbor is presented in Table 4. It is not possible to identify the ships by name at Aral'sk in 1957 but if more information becomes available it may be possible to correlate the names of the ships in Table 3 below with the data obtained by photography

- 19 -

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TABLE 3. SHIPS OF THE ARAL SEA

Name of Ship	Description	References
Admiral Kornilov	Large seiner, fishing vessel of MRS*	3, 4
Admiral Lazarev	Motor fishing boat	3, 5
Admiral Makarov	Diesel ship, 400-ton freighter	3, 4, 8
Admiral Ushakov	Patrol Craft of Tuemmler class, hydrographic survey ship	5, 6, 8
Aktyubinsk	Combination passenger steamer and freighter	3, 4
Alexander Nevskiy**	Patrol craft of Tuemmler class, used as hydrographic survey ship	5, 6
Bagration	Passenger vessel (former tug)	5
Balykshlyar	Motorized seiner	5
Belinskiy	Diesel ship	3
Bukatov (Butakov)	Icebreaker	5, 8
Chapayaev	Diesel ship	3
Chayka	Fishing vessel, motor seiner	3, 5
Chernyakhovskiy	Fishing vessel, motor seiner	3, 5
Chimkent	Motorized ship	4
Chkalov	Motor ship, large seiner	3, 5
Georgiy Sedov***	Diesel ship	3, 4, 7
Karl Marx	Motor driven vessel	5
Kommuna	600-ton diesel ship	3, 4
Kotovskiy	Fishing vessel, large seiner of MRS	3, 5
Kul'turnik	Recreation and mail ship	3, 5
Kzyl Orda	Motorized ship, steam tug	4
Lev Berg	Hydrographic survey ship, Aral fish industry ship	6, 8

*Motor fishing vessel station.

**Figure 7 is a photograph of this ship.

***This name appears in international ship registers 9/ in which the ship is described as a 240 by 36-foot icebreaker with a 19-foot draft. It is probably not the Aral Sea ship.

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Table 3 (continued)

Name of Ship	Description	References
Maksim Gor'kiy	Motorized ship, steam tug	4
Marinka	Fishing vessel, diesel seiner	3, 5
Mayak	Motor fishing vessel	3, 5
Pamyat' Panfilova	Diesel ship	3, 4, 5
Papanin	Motorized ship, steam tug	4
Ryleyev	Diesel ship	3
Sel'd	Fishing vessel, diesel seiner	3, 5
Sergey Lazo*	Supply ship	3, 5
Ship**	Motor fishing vessel	3, 5
Signal	Motor fishing vessel	3, 5
Smelyy	Diesel ship	3, 5
S. M. Kirov	600-ton diesel ship, steam tug	3, 4
Som	Motorized fish vessel, large seiner of MRS	3, 5
Stalin	Diesel ship	3
T. G. Shevchenko	Recreation and mail ship	3, 5
Uran	Fishing vessel, diesel seiner	3, 5
Vatutin	Motor fishing boat	3, 5
Verna	Fishing vessel, steam tug	3, 5
Vernyy	Refrigerator ship	5
Yastreb	Large fishing motor boat	3
Yastrel	Motorized seiner	5
Yupiter	Fishing vessel, diesel seiner	3, 5
Zorkiy	Diesel tug	3, 5
20 Let VLKSM***	Steam tug	5
30 Let Oktyabrya	-----	3

- *This name appears in international ship registers 9¹ in which the ship is described as a 250 by 35-foot ship with a 14-foot draft. It is probably not the Aral Sea ship.
- **This name is a transliteration of the Russian name as it occurred in collateral.
- ***Initials of All-Union Lenin Young Communist League.

- 21 -

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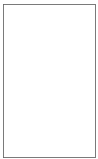



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in Table 4. Vessels identified as fishing boats or definitely identified as barges are not tabulated. Annotation Numbers on Table 4 refer to locations in Aral'sk Harbor shown in Figure 6.

TABLE 4. SHIPS IN ARAL'SK HARBOR OBSERVED ON 1957 PHOTOGRAPHY

Description (ft)	Type	Annotation No on Figure 6
210 x 30	• Possible lighter	19
25X1 	Freighter-transport	10
190 x 30	• Freighter-transport	19
25X1 	Stack aft, cargo	14
	Probable barge	14
	Possible barge	15
25X1 	Stack aft, cargo	16
	Freighter-transport	12
 25X1	Icebreaker	18
	Stack aft, probable cargo	7
	Stack aft, cargo	14
	Stack aft, cargo	14
135 x 25	Stack aft, cargo	14
25X1 	Stack aft, cargo	14
	Stack aft, cargo	14
130 x 35	• Freighter-transport	19
25X1 	Freighter-transport	16
	Probable patrol craft	13
55 x 25	• Freighter-transport	19
 25X1	Conster	7
	Conster	7
	Stack aft, cargo	16
	Freighter-transport	16

* Under construction in shipyard

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Ships at Vozrozhdeniya Island. Ships observed at Vozrozhdeniya Island on 1957 and 1959 photography have been described in an earlier publication. 1/ A description of the larger ships visible on this photography is presented here because a higher degree of accuracy has been obtained for their measurements. In August 1957

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photography, a stack aft cargo ship, 25X1

[redacted] a patrol craft, [redacted]

[redacted] with superstructure amidships, and a boat [redacted] feet were observed. In July 1959 photography, the patrol craft and the boat were the only large vessels observed.

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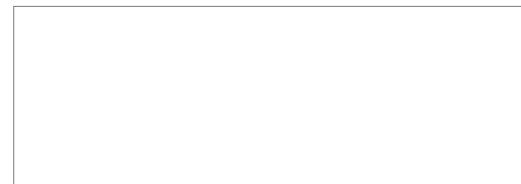


FIGURE 7. THE ALEXANDER NEVSKIY. This ship is a navy patrol craft used as a hydrographic survey ship for service on the Aral Sea. This ship, or its sister-ship, was identified at Vozrozhdeniya Island in 1957 and 1959. The photograph was taken from the Soviet publication, *Gidrokimiya Aral'skogo Morya* (Hydrochemistry of the Aral Sea), dated 1956.

The patrol craft observed on 1957 and 1959 photography of Vozrozhdeniya Island is probably the Alexander Nevskiy (Figure 7) or its sister ship, the Admiral Ushakov. These craft are described in a Soviet publication as ships engaged in hydrographic survey operations in the Aral Sea. 6/

Rail

The only rail line which serves the Aral Sea area is a single-track Aktyubinsk-Tashkent line. A short spur line leads from Aral'sk to the salt beds east of Aral'sk. Tracks of another spur line to the port facilities are shown in Figure 6. There is no rail connection between the airfield and the port of Aral'sk. A minor railroad, the Chardzhou-Kungrad line, comes within 40 nm of the Aral Sea along the southern coast.

The rail facilities at Aral'sk are on route No 360, and are listed in timetables as Aral'skoye More, 10/ stop No 265, at kilometer (km) mark No 2061. Junctions with the single-track line are 490 km to the northwest at Kandagach (49-28N 57-25E), stop No 208 at km mark No 1571 and at Arys'

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(42-26N 68-48E), 841 km to the southeast stop No 362 at km mark No 2902.

The minimum distance between stations along this line is 5 km and the maximum distance is 16 km. The minimum length of known passing tracks is 1,750 feet. The rail facilities at Aral'sk include: (a) one 6-track yard 2,400 feet long, (b) one 4-track yard 2,700 feet long, (c) one 3-track yard 1,100 feet long, (d) one transshipment shed 430 by 45 feet, (e) one track (1,200 feet long) to petroleum storage area, (f) two tracks to a rail-to-truck transloading area 1,100 feet long, and (g) one station building.

Road

Roads in the Aral Sea area are generally of a low standard. The highway connecting Aral'sk with its airfield has a rolled-stone surface, [] wide, and is straight, flat, and in good condition.

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The highway from Chelkar to Tashkent which serves the seaport of Aral'sk is Class III and of oblast importance. According to USSR highway design specifications, a Class III highway is defined as two lanes, 40 feet in width with a [] roadbed, paved with concrete, crushed stone, gravel, bitumen, or cobblestone. 11/ In the vicinity of Aral'sk the road has a rolled-stone surface, is [] wide, and in good condition. A photographic survey of this road indicates that it is well below the Class III standard in many places and frequently degenerates into a single-track rut road. The national highway nearest to Aral'sk is at Dzhusaly (45-28N 64-05E), 118 statute miles to the southeast.

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COMMUNICATIONS FACILITIES

Investigation of communications facilities on Vozrozhdeniya Island reveals that there are probably two types in use, high frequency radio for short-range communication with the proving ground and a microwave link

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with Aral'sk. 1/ The microwave link is thought to originate in a communications building with a probable microwave tower at Mys Kokchukat on Vozrozhdeniya Island.

Vozrozhdeniya Island - Aral'sk Microwave Link

It is believed that the microwave link between Vozrozhdeniya Island and Aral'sk is via relay stations on Barsa-Kel'mes Island (45-42N 59-52E), Kugaral Island (46-12N 60-30E), and a peninsula in Sary-Chaganak Bay. Examination of 1959 photography of the suspect relay stations (Figure 8) shows that there is a small group of buildings at two of these points, one on the eastern end of Barsa-Kel'mes Island and the other at Ushshokhy (46-30N 61-13E), a high point on the end of the peninsula in Sary-Chaganak Bay. The photography was too small in scale to reveal details, but there is the faint image of a group of buildings and possibly a mast at the eastern tip of Barsa-Kel'mes Island. A collateral source refers to a Ministry of Internal Affairs (MVD) station, called Kordon, in the western part of this island. 3/ A small settlement which is apparently Kordon is dimly visible in the west central part of the island. The collateral reference supports the belief that the installation is a microwave station since such a station would be under close security control.

Aktyubinsk-Tashkent Microwave Link

Probable microwave towers forming a chain from Kzyl-Orda as far as Novo-Kazalinsk have been located on 1957 photography and it is thought that the network continues through reported towers at Chokusu and Chelkar (Figure 8). 12/ and 13/ Secure military communications would be transmitted over this link. The long gap between Novo-Kazalinsk and Chokusu presupposes an intermediate relay station whose location is unknown: it is possible that the intermediate link is at Ushshokhy on the peninsula in Sary-Chaganak Bay or at the possible military station at Aral'sk Airfield.

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previously described, or both. Relay towers which could be used in the Kzyl-Orda -- Chelkar portion of the Aktyubinsk-Tashkent microwave link are described below. Numbers preceding descriptions correspond to numbers in Figure 8.

1. A possible guyed tower, 205 feet high, is located at 44-52N 66-17E, 2 nm northeast of Kzyl-Orda. No equipment or associated building can be identified.
2. A probable communications station, consisting of a fenced area with nine guyed masts, a transmitter building, and three other unidentified buildings, is located at Dzhusaly. Although no equipment can be identified, one of the masts could be used to support microwave antennas.
3. A self-supporting lattice tower, 80 feet high, is located at 45-40N 63-43E, 18 nm east of Tyura Tam and just south of the Syr-Dar'ya River. No equipment can be identified and no buildings are within the immediate area.
4. An 80-foot-high self-supporting lattice tower identical to tower No 3 is located at 45-42N 63-02E, 10 nm west-northwest of Tyura Tam and one nm north of the Aral'sk-Tashkent rail line. No equipment or buildings can be identified.
5. A 75-foot-high self-supporting lattice tower similar in structure to towers No 3 and 4, is located at 45-45N 62-56E, 8,600 feet west of Bay-Kozha (45-45N 62-58E), between the Aral'sk-Tashkent rail line and the Syr-Dar'ya River. No equipment or buildings are noted.
6. A self-supporting lattice tower, 65 feet high, is located at 45-48N 62-08E, on the northeast edge of Kazalinsk, 4 nm south of Novo-Kazalinsk. This tower appears to be set or anchored in a concrete base. No buildings are associated with the tower, and resolution of the photography precludes any possible identification of equipment on the tower.

- 26 -

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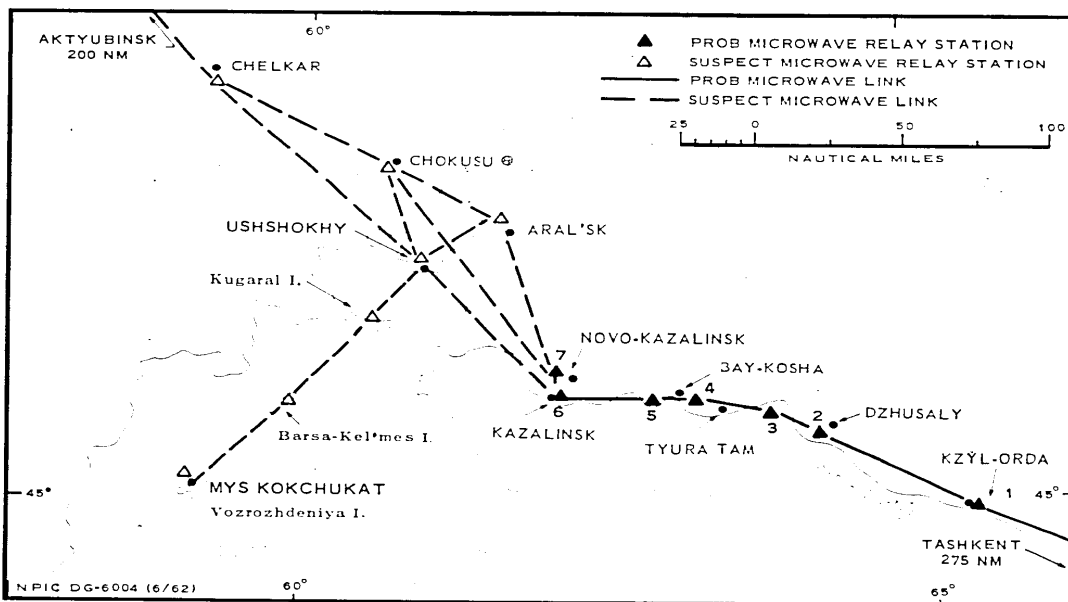


FIGURE 8. LOCATIONS OF PROBABLE AND SUSPECT MICROWAVE STATIONS IN THE ARAL SEA AREA. Probable microwave stations were observed on 1957 photography; suspect stations, on 1959 photography.

- 7. A self-supporting lattice tower 70 feet high, is located at 45-56N 62-04E, 6 nm northwest of Novo-Kazalinsk and 5,500 feet northeast of the Aral'sk-Tashkent rail line. This tower is located on top of a small knoll. No buildings or equipment are noted.

Radio Communications at Aral'sk

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A ground photograph taken [redacted] and a confirming report by a [redacted], have revealed the location of two radio masts on the north side of the Aral'sk shipyard and their location has been confirmed by aerial photography (Figure 6). This station would probably serve low-frequency civil radio traffic, such as traffic to ships on the Aral Sea. The

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masts are positioned on an east/west line so that transmission lobes of radiobroadcasts would extend north and south and enable navigators to take direction bearings on Aral'sk from the sea.

FISHERIES

A significant fishing industry has been developed along much of the Aral Sea coast. The lack of sheltered harbors along the western and northern coasts and the reluctance of fishermen to venture into deep waters of this rough sea, has led to the concentration of fishing activity in the relatively shallow eastern and southern waters. Catches of less desirable fish are salted or dried in several small fishing villages along the eastern and southern coastlines; the more desirable fish are taken to Aral'sk or Muynak where freezing and canning facilities are available.

Photographic examination of several fishing villages along the coast of the Aral Sea and of some aspects of the fishing industry at Aral'sk reveals the presence of certain features which are described below. These features are absent in the photography of Vozrozhdeniya Island.

Fishing Villages

Characteristics of Fishing Villages

Photography of several fishing villages or kolkhozes (collectives) along the shores of the Aral Sea reveals certain common features:

1. Each village has a small pier extending into deep water.
2. At the shore end of most piers are two small gable or hip-roofed buildings probably used as packing sheds. In several instances one of these buildings was roofed with a dark material and the other was roofed with a light-reflective material.

- 28 -

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3. Fishing boats, 20-40 feet in length, with pointed bow and stern, were drawn up on the beach.
4. Housing facilities of the village are usually some distance from the dock area. Small, individual houses and a few barracks are spaced at random with no regular street pattern discernible. Only a few dozen families can be accommodated at most villages.
5. Only very primitive roads connect the villages with interior settlements.

Identified Fishing Villages

Inadequate photographic coverage prevented a comparable examination of known larger fishing kolkhozes around the Aral Sea, with the exception of Aral'sk, where fish processing activities differ considerably from those of the smaller fishing collectives. The only fishing installations, other than Aral'sk, which could be identified on photography were Bugun', Uzun-Kair (possible), Kazaly, Shomyshkol, and Zhana-Zhol (Figure 2). Bugun' appears on small scale photography as a small port town on a protected bay with approximately 50-60 houses and a small pier. The quality of the photography does not permit identification of the cannery and the Severo-Aral'skaya MRS (motorized fishing vessel station) reported to be at Bugun'. 3/, 8/ A port town on a narrow reef, which is possibly Uzun-Kair, is visible (between clouds) approximately 20 miles from the mouth of the Syr-Dar'ya River. A large pier with packing sheds and a probable cannery at the land end of the pier are visible. The pier and a large marginal wharf form a protected boat basin. The boat basin is the possible location of the Kuzan-Darin'skaya MRS, which is reported to be at Uzun-Kair. 16/ Kazaly, Shomyshkol, and Zhana-Zhol, the latter two described as fishing kolkhozes 3/, appear as small fishing villages on small scale photography. Packing sheds, but no canneries, are visible at these three points.

- 29 -

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Comparison of Facilities on Vozrozhdeniya
Island with Fishing Installations

A comparison of port facilities on Vozrozhdeniya Island with those at Aral'sk and other fishing installations indicates the improbability of a fish industry existing on the island:

1. The usual gable or hip-roofed buildings visible on the piers of fishing kolkhozes are absent on Vozrozhdeniya Island.
2. According to collateral sources, fish handling at Aral'sk is mechanized, with conveyers leading from the pier to the processing buildings. 3/ and 16/ The fish are canned or frozen and then shipped by rail to inland consumers. A rail spur leads directly to the probable fish-processing buildings. (Figure 6) Conveyers and processing buildings for handling large quantities of fish are absent on Vozrozhdeniya Island.
3. Inaccessibility to railroads would probably deter the operation of a cannery on the island.
4. The main pier of Vozrozhdeniya Island is relatively small and would be incapable of handling more than just a few fishing vessels at one time. The lack of mechanized equipment would also limit the number of vessels that could be accommodated.
5. Since processed fish in excess of local requirements would have to be shipped out by boat, warehouse facilities at the main pier would be necessary. Such warehouses were lacking. It would also seem most likely that additional pier space would be necessary to separate the incoming and outgoing cargoes in a major fish-processing enterprise.
6. Housing facilities in the harbor area of Vozrozhdeniya Island appear to be far in excess of that required to support a fish-processing enterprise. The obviously planned rectangular pattern of housing and the comparatively large proportion of barrack-type buildings are in direct

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contrast to the random arrangement of housing found in fishing villages around the Aral Sea. Rather, the design of this installation definitely marks it as a military post. A photographic comparison of the operational headquarters at Mys Kokchukat on Vozrozhdeniya Island (Figure 9) with a typical Caspian fishing kolkhoz on the Ural River near Gur'yev (Figure 10) shows the differences in settlement types. Fishing kolkhozes on the Aral Sea are similar to the one near Gur'yev but adequate photographs of them are not available.

In addition to photographic comparison, collateral sources seem to negate the presence of a fishing industry on Vozrozhdeniya Island. The rather extensive literature which describes fishing on the Aral Sea since 1935 consistently avoids any association of fishing with the installations on Vozrozhdeniya Island, nor does any reference to a settlement on the island appear (except on maps) after 1935. 3/, 8/, and 16/ It is concluded, therefore, that, although fishing may be done around the island, the installations on the island are not associated with the fishing industry.

Ice Storage

Natural ice is cut from the sea and is used by inhabitants of the region not only for preserving fish en route to the processing plants, but also as a source of drinking water which is scarce or not readily available along the shore.^{16/} The ice is stored in special structures on shore; these structures are usually rectangular, walled, roofless bunkers in which the blocks of ice are stacked and then temporarily covered with an insulating material (straw, earth, sawdust, etc.). An antiquated example of this kind of structure is found at the harbor on Vozrozhdeniya Island (Figure 9). Two more icehouses are possibly present at the probable fish cannery at Aral'sk (Figure 6). Similar structures were found near Gur'yev (Figure 10) on the Caspian Sea and at Balkhash on Lake Balkhash, both important fishing ports. The fishing kolkhoz shown in Figure 10 is located on the Ural River

- 31 -

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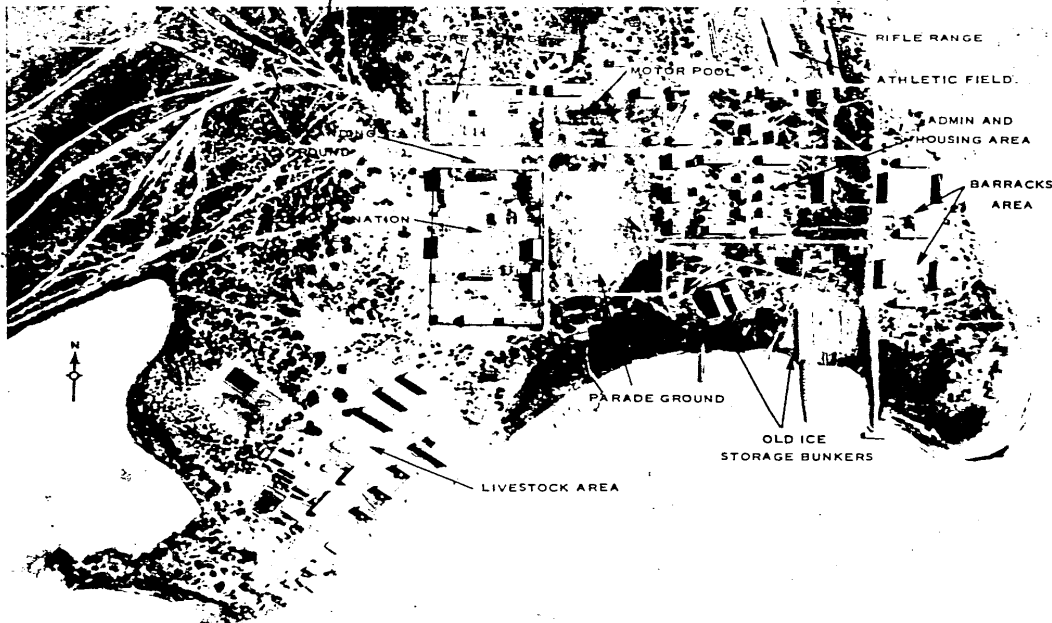
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FIGURE 9. MYS KOKCHUKAT OPERATIONAL HEADQUARTERS ON VOZROZHDENIYA ISLAND. (Terrain model from 1959 photography)

and the ice which is stored here is probably used by the Caspian Sea fishing fleet. Inadequate photography of other known fishing villages located on or near these three inland bodies of water prevented a more detailed investigation of additional examples of ice storage bunkers.

Fishing Installations on the Aral Sea

A list of fishing installations, compiled largely from reports of fishing activities in Soviet publications, is presented in Table 5. 3/ and 8/ Locations of many of the fishing enterprises in the table are shown in Figure 2.

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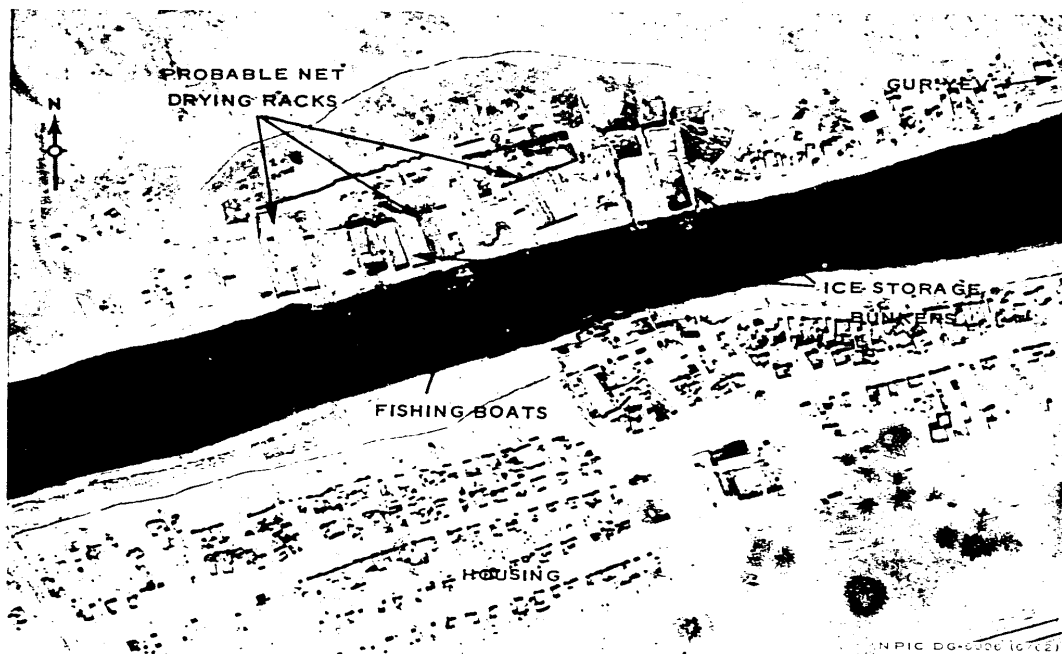


FIGURE 10. TYPICAL FISHING KOLKHOZ. This kolkhoz is located on the Ural River near Gur'yev. (1957 photography)

TABLE 5. FISHING INSTALLATIONS ON THE ARAL SEA
(COMPILED FROM SOVIET LITERATURE)

Place Name	Location	Installation
Akcha-Tau	Delta of Syr-Dar'ya River	Kolkhoz
Aral'sk	Northern end of Aral Sea	Processing plant
Avan	West end of Kugaral Island	Kolkhoz, Processing plant
Balykshlyar	Uyaly Island	Kolkhoz
Bugun'	Delta of Syr-Dar'ya River	Processing plant, MRS, Probable hatchery
Irzhan Island	Location unknown	Kolkhoz
Karashalan	Delta of Syr-Dar'ya River	Kolkhoz
Kaskakulan	Kaskakulan Island	Kolkhoz

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Table 5. (Continued)

Place Name	Location	Installation
Kazakdar'ya	Delta of Amu Dar'ya River	Processing plant
Krasnyy Rybak	Kushzhitmes Island	Kolkhoz
Kungrad	Delta of Amu Dar'ya River	Processing plant
Maypost	Delta of Amu Dar'ya southeast of Muynak	Processing plant
Mergen-atau	Atpetkinskiy Archipelago, exact location unknown	Kolkhoz
Muynak	Southern coast of Aral sea	Several kolhozes, MRS, processing plant, & probable hatchery
Porlatau	Near Muynak, exact location unknown	Processing plant
Sarbasat (Sary Basat)	Northern coast of Aral Sea	Processing plant
Shevchenko	Delta of Syr-Dar'ya River	Kolkhoz
Shomyshkol	Northwestern coast of Aral Sea	Kolkhoz
Tasty Island	Near Uyaly Island, exact location unknown	Kolkhoz
Taylyak-Dzhigen	Atpetkinskiy Archipelago	Kolkhoz
Uch-Murza	Atpetkinskiy Archipelago, exact location unknown	Kolkhoz
Uchsay	Southern coast of Aral Sea	Kolkhoz & processing plant
Urga	Southwestern coast of Aral Sea	Processing plant
Uta-Chiglau	Southern coast of Aral Sea, exact location unknown	Kolkhoz
Uyaly	Uyaly Island	Kolkhoz
Uyaly Island	Southeastern coast of Aral Sea	Processing plant
Uzun-Kair	Kaskakulan Island	Kolkhoz, MRS, fish hatchery
Zhalpak Island	Eastern coast of Aral Sea	Kolkhoz
Zhana-Zhol	Northern coast of Aral Sea	Kolkhoz

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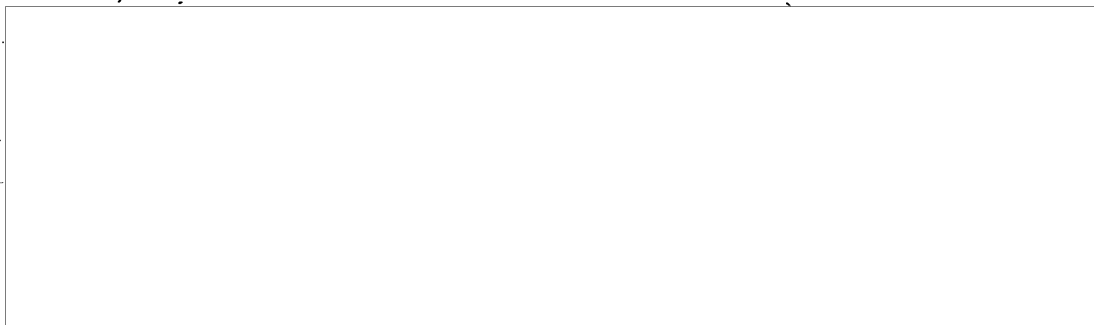
INSECTICIDE TESTS AT TUP-BUGUTSKIY

A Soviet military journal reported that in 1956 the Leningrad Anti-plague Station and the Dzhusalinskiy Antiplague Division of the Aral-omorskaya Antiplague Station conducted field experiments on insecticides to kill fleas. 17/ The tests were conducted at Tup-Bugutskiy (Tup-Bogut) (45°10'N 63-57'E) 20 nm south-southwest of Dzhusaly. The article described the use of an elaborate grid for the tests.

It was thought that these tests may have been associated with biological warfare activity because military personnel were involved. Photography of August 1957, which covered this area, revealed only an irrigated farming area, much of it in process of reclamation from the desert, with several farm villages. The grid could not be located on photography. These tests may not have involved permanent grids and may have been conducted as an expedition only during the summer season of 1956.

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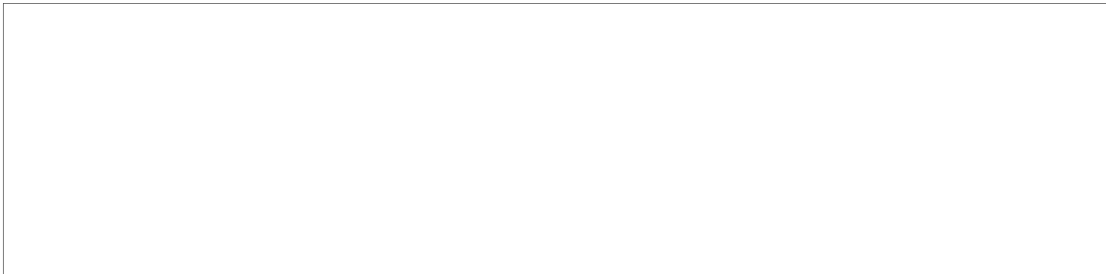
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