

# 4211

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Diag. Ch. No. 850Z-1

# 4211

Form 504	
DEPARTMENT OF COMMERCE	
U. S. COAST AND GEODETIC SURVEY	
State: <u>Alaska.</u>	
11-2813	
DESCRIPTIVE REPORT.	
Hyd.	Sheet No. <u>4211</u>
LOCALITY:	
<u>Cook Inlet, Knik Arm</u>	
<u>Fire Island To</u>	
<u>Anchorage</u>	
19 <u>22</u>	
CHIEF OF PARTY:	
<u>L.C. Dyke</u>	

DIRECTOR  
HYDROGRAPHY  
SALES  
GEODESY

Anchorage, Alaska, May 17th 1922.

JUN 14 1922  
DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SHEET (SECTION OF CHART #8557) SHOWING HYDROGRAPHIC EXAMINATION AND LOCATION OF REPORTED SHOAL NORTH OF FIRE ISLAND, COOK INLET, ALASKA.

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MAGNETIC The hydrography shown on this sheet (a Section of Chart #8557) consists of the examination and location of the shoal north of Fire Island reported by the Captain of the Steamer ADMIRAL WATSON.

Sounding was done on two days, May 12th and May 15th, using launches hired for the purpose. Much difficulty was experienced in procuring launch for this work. On my arrival at Anchorage I found that there were but two launches hauled out, and as these were on regular runs it was impossible to hire them. On May 11th, however, a small launch came to Anchorage from Kenai, on the Kenai-Peninsula, and this launch was used the first day sounding. The launch was very much under-powered and very little headway could be made with it against the strong tidal currents in Knik Arm and Cook Inlet. Sufficient work was done with this launch, however, to make further investigation desirable, and on the return of the party from the first day of sounding it was observed that a large launch was being hauled out. Arrangements were then made with the owner of this launch for use of the launch on Monday, May 15th. The launch had two 35 H.P. Engines which made the launch quite capable of bucking the strong tides. Very few launches were being hauled out at the time of this survey, on account of the danger from the still existing drifting ice. Very little trouble was had on that score, however.

The Scale of this sheet is 1 : 40,000. Positions were obtained by the usual three point fix using Wireless Poles and Tangents to the different points. Positions were obtained quite accurately by this method as the points in this vicinity are sharp and well defined. Tangents were taken in each case to the top of the bluffs, which stood out quite sharply. The position of the launch was never in doubt for a moment and changing the fix did not produce enough shifting or jumping of position to materially affect or vitiate the results, or to leave the true position in doubt. Tangents used are indicated in red ink, both by name and by lines of tangency.

All soundings recorded have been reduced to Mean Lower Low Water, the Chart datum, by recording the stage of the tide at fifteen minute intervals on a Tide Staff which had previously been set with its zero at Mean Lower Low Water, determined by precise levels from Bench Marks established in 1918. This Tide Staff, whose position is shown on the Sheet, is the one established for use in connection with the Automatic Tide Gauge installed at this time. The reduced soundings have been inked on the sheet with red ink, to distinguish them from the regular Chart soundings.

The shoal found is quite extensive, being three miles long, East and West (true) and one half mile wide, with a least water of four

feet near the eastern end of the shoal in Latitude  $61^{\circ} 12.4'$  North and Longitude  $150^{\circ} 09.2'$  West. The shoal is probably part of the delta of the Little Susitna River as shoal water of from five to fifteen feet occurs to the westward of this four foot spot, and slopes very gradually. A third days sounding was scheduled to fully develop the area, as indicated by pencil lines on the sheet, but the launch used the second day, and which was the only one available, developed several bad leaks having only been launched two days preceding, and so was put out of commission. Sufficient sounding had been done however, (a total of sixty miles of sounding line and nearly eight hundred soundings) to show the extent of this shoal and to indicate that great changes have occurred since the original survey was made. In fact, the possibility of the launch developing leaks had been figured on, and accordingly the second days work was so planned that the investigation could be considered complete in the event that a third days work could not be done. This is indicated by the fact that on the second day ten hours sounding was done over thirty nine miles of sounding line.

The Records for this Sheet consist of one volume of Sounding Record, which also contains the Tidal Observations for the two Sounding days, May 12th and May 15th, fifteen-minute readings having been recorded on each day of sounding.

The Statistics for this Sheet follows: Number of Miles of Sounding Line is Sixty and four-tenths. Number of soundings is 777, with 353 Angles observed.

The party was organized from the Precise Leveling Party of Mr F. W. Hough, Jr Hyd. & Geod. Engr., as instructed. Mr Hough took left angle; Mr Manchester, Aid, recorded, and the Chief of Party took right angle, plotted, and directed operations. Two leadsmen were employed, watch and watch, and two others to haul in the leadline. The leadline used on this work had been obtained from the Steamer SURVEYOR, which happened to be at Ketchikan when the Chief of Party passed through on the S.S. ALAMEDA, on his way to Anchorage. Two sextants and a three-arm celluloid protractor was obtained from the Inspector at Seattle.

*Leo C. Dyke.*

Leo C. Dyke,  
Hyd. & Geod. Engr.  
Hydrographer.

July 7, 1922.

Division of Hydrography and Topography:

Division of Charts:

Tide reducers are approved in  
One volume of sounding records for

HYDROGRAPHIC SHEET 4211

Locality: Knik Arm, Cook Inlet, Alaska.

Chief of Party: L. C. Dyke in 1922.

Plane of reference is mean lower low water, reading  
\*0.0 ft. on tide staff at Ocean Wharf, Anchorage.

For reduction of soundings.

Condition of records satisfactory except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of each day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.

\* Allowance made for difference in  
tide at place of soundings.

*E. F. Rode*

Chief, Division of Tides and Currents.

Report on Verification and Inking of Hypt. Sheet 4211.

The smooth sheet is a tracing of a section of Chart No. 8557. The parts traced are the intersections of the meridional and parallel lines, and topographic features used as objects and shoreline.

The smooth sheet drafting and records were excellent.

There are numerous cases of soundings not checking well against cross-lines and adjacent lines.

The examination discloses the location of the shoal but a complete hydrographic survey will be required to adequately show the changes in the locality.

Frank M. Albert  
Draftsman, Section of Field Records.

July 26, 1922.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
WASHINGTON

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4211.

Surveyed in 1922.

Instructions dated April 19, 1922.

Chief of Party: L. O. Dyke.

Surveyed by L. O. Dyke.

Protracted and soundings plotted by A. Baer.

Verified and inked by F. M. Albert.

1. The records conform to the requirements of the General Instructions except that the leadline was tested on but one day.
2. The character and extent of development satisfy the specific instructions.
3. The sounding line crossings are not adequate, the differences being so excessive as to indicate that this examination is below the standard of accuracy required in a finished survey, and the sheet therefore has been rejected. Although it cannot be used for correcting the charts, it nevertheless gives positive information of the existence of a dangerous shoal and of the shifting of the channel.
4. The deficiencies in this work were due primarily to adverse conditions beyond the control of the party. The control, although in accordance with the specific instructions is below the usual standard, the only launches available were defective, the currents were excessive and the tidal fluctuations were so rapid and erratic that correct allowances for differences in times of tides could not be made.
5. It is evident from the experience of this party together with that of Capt. Hand in the same locality in 1918 (see H. 4035) that special methods must be followed in surveying Knik Arm in order to obtain results up to standard.

6. It is suggested that the instructions for further surveying in Knik Arm provide for several auxiliary tide gauges in addition to a centrally located automatic gauge; during the two days of this survey an inspection of the tide records shows that the tide fell at a fairly uniform rate but on the flood it fluctuated considerably, the maximum rise being shortly after low water and the rate of rise reaching 14 feet per hour.

Sheet 4035 has numerous discrepancies in excess of any possible errors of tide reducers, the indications being that strong currents were largely responsible. It is suggested that lines normal to the current be restricted to 4 or 5 fathoms in depth. In greater depths the lines should follow the axis of the current.

7. Reviewed by E. P. Ellis, January, 1923.