

# 5109

U. S. COAST & GEODETIC SURVEY  
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(This report includes SPECIAL REPORT on TEST SHEET.)

Form 504 Ed. June, 1928	
DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY R. S. Patton, Director	
New York and State: New Jersey	
DESCRIPTIVE REPORT Photo Topographic } Sheet No. T5109 <del>Hydrographic</del>	
LOCALITY Raritan Bay and Arthur Kill Mouth of Arthur Kill <del>Perth Amboy, South Amboy, New Jersey</del> <del>Potterville, Staten Island, N. Y.</del>	
1934	
CHIEF OF PARTY R. C. Bolstad, Jr. H. & G. Engr.	

U. S. GOVERNMENT PRINTING OFFICE: 1922

# 5109

SUPPLEMENTAL T

-1-  
DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

REG. NO.

TOPOGRAPHIC TITLE SHEET

The Topographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 59

REGISTER NO. T5109

State New Jersey and New York

General locality Raritan Bay and Arthur Kill

Locality Perth Amboy, South Amboy, N. J.; Tottenville, Staten Id., N.Y.

Scale 1:5,000 photographs Date of survey July 30 & 31, 1932

Date of Compilation Oct. 2, 1934

~~Wessel~~ Air Photo Compilation Party No. 12, New York City

Chief of party Roswell C. Bolstad

Surveyed by See data sheet in the Descriptive Report for this sheet.

Inked by W. E. Hackett

Heights in feet above ---- to ground to tops of trees

Contour, Approximate contour, Form line interval ---- feet

Instructions dated November 15, 1932

Remarks: Compiled on scale of 1:5,000 and printed by Photo

Lithography.

- STATISTICS -

on

SHEET, FIELD NO. 59, REG. NO. T5109

PHOTOS, NO. 66-53-11 TO NO. 66-53-12

PHOTOS, NO. 66-52-35 TO NO. 66-52-38

DATE OF PHOTOGRAPHS 66-53- 11 & 12 July 31, 1932

DATE OF PHOTOGRAPHS 66-52- 35 to 38 July 30, 1932

TIME No Record

	BY	DATE From To
The Scale Factor of this sheet is 1.000		
TEMPLATE PLOT	<u>W.E. Hackett</u>	<u>3/20 - 3/22/34</u>
TEMPLATE PLOT CHECKED	<u>R.A. Philleo</u>	<u>3/23 - 3/23/34</u>
PROJECTION	<u>R.A. Philleo</u>	<u>4/6 - 4/6/34</u>
PROJECTION CHECKED	<u>G.C. McGlosson</u>	<u>4/6 - 4/6/34</u>
CONTROL PLOTTED	<u>R.A. Philleo</u>	<u>4/21 - 4/21/34</u>
CONTROL CHECKED	<u>J.G. Albert</u>	<u>5/1 - 5/1/34</u>
TEMPLATE POINTS TRANSFERRED	<u>J.G. Albert</u>	<u>5/2 - 5/2/34</u>
TEMPLATE POINTS CHECKED	<u>R.A. Philleo</u>	<u>5/3 - 5/3/34</u>
SMOOTH RADIAL LINE PLOT	<u>W.E. Hackett</u>	<u>5/8 - 5/11/34</u>
RADIAL LINE PLOT CHECKED	<u>G. Crowther</u>	<u>5/13 - 5/13/34</u>
DETAIL INKED	<u>W.E. Hackett</u>	<u>7/13 - 10/2/34</u>
PRELIMINARY REVIEW	<u>J.G. Albert</u>	<u>10/6 - 10/10/34</u>

AREA OF DETAIL INKED 4.0 sq. Statute Miles (Land Area)

AREA OF DETAIL INKED 0.1 sq. Statute Miles (Shoals in water area)

LENGTH OF SHORELINE (more than 200 m. from nearest opposite shore)  
22.4 Statute Miles

LENGTH OF SHORELINE (rivers and sloughs less than 200 m. wide)  
2.7 Statute Miles

LENGTH OF ROADS, STREETS, TRAILS, RAILROADS 100.6 Statute Miles

GENERAL LOCATION Raritan Bay and Arthur Kill

LOCATION Perth Amboy, South Amboy, N.J.; Tottenville, Staten Id., N.Y.

DATUM North American 1927

Latitude 40°- 31'- 50.94" (1571.3 m.)

STATION Stocky Chy. (National Longitude 74 - 15'- 38.15" (898.0 m.)

Lead Co.)

(unadjusted)

COMPILER'S REPORT

for

AIR PHOTO TOPOGRAPHIC SHEET FIELD NO. 59

*See T 5107 for Field Inspection report  
Field Inspection made March 1934*

GENERAL INFORMATION

This sheet has been compiled as a special test sheet on a scale of 1:5,000. It was therefore necessary to perform several steps in its compilation before the usual procedure could be followed.

The compilation of this sheet was made from single lens photos, 66-53-11 & 12 and 66-52-35 to 38, taken on July 30 and 31, 1932 by the Aero Service Corporation of America located at Philadelphia, Pa.

The control points of the entire flight, that includes the photos used on this sheet, were first plotted on the 1:10,000 scale. Definite points were picked on the photos and transferred to the photos used in the above plot. The radial points that were recorded on the 1:10,000 scale celluloid sheet Field No. 55 were transferred by proportional method to this sheet Field No. 59.

The original negatives of these photos were taken at approximately 21,850 feet and were then projected onto a movable object board. The template, scale 1:10,000, was placed on the object board and tilted until the template points, ~~on 1:5,000 scale~~, corresponded with the object points of the negatives on the 1:21,850 scale. The usual method of photographic development was then followed.

The necessary field data for the compilation of this sheet was furnished by E.W. Fickenscher and J. Rippstein, members of this party. Additional information was obtained from the field prints and, in questionable areas, from E.W. Fickenscher and W.E. Hackett, who are familiar with the topography of this area.

The accompanying STATISTICS SHEET details all data in connection with the compilation of this sheet.

The tide for this sheet could not be determined since the Aero Service Corporation has no record of the time of day at which these photographs were taken.

Because of the large size of the 1:5,000 scale photographs (32"x 40") it was necessary to devise a method for carrying these photos into the field for use in field inspection. A special removable frame was constructed for this purpose.

CONTROL

(A) Sources

The following sources of control were used in the compilation of this sheet.

(a) Triangulation by Lieut. R.W. Woodworth in 1930-33.

All control was placed on the North American 1927 Datum before beginning the compilation. The adjustment was approximate, ~~however any final office adjustments would be unplotable at this scale.~~

(B) Errors

There were no topo stations used as supplementary control on this sheet.

(C) Discrepancies

No control stations established by other organizations were used in the compilation of this sheet.

COMPILATION

(A) Method

The usual radial line method of plotting was used in the compilation of this sheet. (*See below*)

(B) Adjustments of Plot

The photographs used in the compilation of this sheet appear to be free of excessive tilt and the scale fluctuation not noticeable as the radial plot required no unusual adjustments.

Radial points south of lat.  $40^{\circ}$ - 29.3' and north of lat.  $40^{\circ}$ - 31.5' had but two radial line cuts, those south of lat.  $40^{\circ}$ - 30.5' and east of long.  $74^{\circ}$ - 15.5' have only one radial line cut. The above mentioned two radial line cuts were checked by proportioning while the single line cuts were picked entirely by proportioning and checked for position from over lapping five lens photographs, scale 1:10,000. There was no appreciable error due to the expansion and contraction of the photographs.

(C) Interpretation

Only the usual graphic symbols were used as approved by the Board of Surveys and Maps (1932), except those not available from that source. Because of the scale of this compilation special symbols, listed below, were used to explain more fully the detail.

The usual symbol for a wreck was not used, the outline of each being traced directly due to the size of the detail. Each wreck is labeled.

Each of the following symbols is adequately labeled ✓ on this sheet.

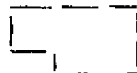
— denotes old iron in water near U.S.E. Sta. Moran

IIII denotes transformers' superstructure near triangulation station Tank (J.C. Power Plant)

--- dashed lines along shore line indicate destroyed bulkhead and piers.

:::: dots in water denote piling (not awash)

++ ++ ++ denotes abandoned tracks near triangulation station Public Service.

 area enclosed by dashed lines in Kill denotes limits of ship grave yard.

c- c- denotes cinder fill near triangulation station  
c- c- Square Chy.

The double full line was used to indicate first order roads and the double broken line for private driveways and roads of lesser importance. An exceedingly poor road or trail was shown as a single dashed line. In most cases (unless labeled on the field inspection prints) the classification had to be determined by the appearance under the stereoscope of the 1:10,000 prints and transferred to the prints for this sheet.

Although a strong endeavor has been made to show all houses on this sheet (except in thickly populated areas which have been labeled numerous houses) the photographs are not clear and trees, in some cases, obscure the buildings so that some of them may have been omitted in compiling this sheet.

Broken lines between limits on Outerbridge indicate piers and abutments along approach to the bridge in order to show that it is elevated.

All elevated ramps, elevators and conveyors have been labeled on the cover sheet.

At several places in the vicinity of South Amboy marsh has been shown in the water. This was done to approximate the actual condition as it appears in the field. The marsh shown in the water near triangulation station Tank (J.C. Power Co.) is thickly filled with coal dust. Also just south of U.S.E. station Moran, marsh has been shown and is to approximate the actual condition.

All railroad tracks to private industry have been shown to indicate their approximate location relative to buildings, but not carried out in entirety; also limits of railroad yards have been shown and labeled as such on the cover sheet. All main line tracks have been shown.

At lat.  $40^{\circ}$ -  $31.0'$ , long.  $74^{\circ}$ -  $15.3'$  hatchers have been used to indicate the limits of alclayipât - rolling ground.

At lat.  $40^{\circ}$ -  $30.0'$ , long  $74^{\circ}$ -  $16.3'$  a dashed building and circles indicate the approximate location of a new sewage disposal plant now under construction which should be completed in the summer of 1935.

All shoal areas that are clearly visible have been indicated by dashed lines and labeled on the cover sheet.

Some of the features (docks, bulkheads, jetties and shoreline) have been changed on the sheet so as to represent the present condition, since an inspection was made in the field of the entire shoreline shown on this sheet.

At lat.  $40^{\circ}$ -  $31.1'$ , long.  $74^{\circ}$ -  $15.6'$  there are three tracks on trestles which have been labeled on the cover sheet, but the symbols have been omitted in order to avoid complicating the detail in this area.

The symbol at the shoreline of the dock at U.S.E. station Guggenheim is a gantry crane and has been labeled as such.

At lat.  $40^{\circ}$ -  $30.6'$ , long.  $74^{\circ}$ -  $16.4'$  there is a three way overhead crossing - Central Railroad of N.J. track at lower level - Leigh Valley Railroad overhead and concrete

steel super-structure vehicular bridge over these railroad crossings.

The Central Railroad of N.J. passenger station is approximately fifty feet below street bridge level; the driveways are ramped to street level; an overhead covered passage across the tracks connects the two station buildings.

The station tracks (Baltimore & Ohio Railroad Sta.) to the Staten Island Rapid Transit Lines are on a timber trestle and the detail has been shown and labeled.

The areas at Ward's Point and the southern section of Tottenville do not correspond to the U.S.C. & G.S. Chart No. 286 as the creek does not exist any longer and there is no evidence of marsh; also the jetty on Ward's Point sand spit is no longer in existence.

The shoreline just east of the north end of the Central Railroad of N.J. is now filled in and a bulkhead forms the shoreline. At Ploughshare Point the marsh area shown on the Chart (No. 286) is now a mud flat.

The span and clearance of bridges is shown on the cover sheet. The information regarding the bridges was obtained from the Atlantic Coast Pilot, Section B, 1933.

Buildings along the New Jersey Railroad tracks between lat.  $40^{\circ}-30.5'$  and  $40^{\circ}-31.0'$  are in a business area and flush wall to wall. The feature would not be correct if each building were shown separately.

(D) Information from Other Sources

There was no information available from other sources for this compilation.

(E) Conflicting Names

There are no names on this sheet conflicting with those on U.S.C. & G.S. Charts.

COMPARISON WITH OTHER SURVEYS

The junctions with all adjoining sheets are satisfactory.

The bromides showing the shoreline of this area are too old, thus no practical comparison could be made.

No other survey data was available with which a comparison could be made.

LANDMARKS

The landmarks of this area were submitted by Lieut. R.W. Woodworth in his triangulation report of 1930-33. These are the only definite objects in this area that are located by geographic positions.

The triangulation station Ridge is shown by a broken triangle, lat.  $40^{\circ}-29'$ - 1823.1 m., long.  $74^{\circ}-15'$ - 382.6 m., and was used as control in making this plot, but has been destroyed by fire since the photographs were taken - approximate date of fire, May 1934 - recorded on Form 526.

U.S.E. stations that were established by <sup>U.S. Army</sup> various field parties have been plotted radially as no geographic positions are available. These radial plotted positions were used as control in detailing the shore line, ~~and were found to be within the allowable maximum error.~~ The spotting of U.S.E. station MERCANTILE on the photos may be slightly in error.

The recovered U.S.E. stations, on the accompanying list page 8, have been scaled from the celluloid sheet to within the nearest meter (the scaled distances may vary slightly due to the expansion and contraction of the sheet).

Also Class (C) Landmarks were established by the field inspection party and a list given on page 10 of this report with the positions scaled to the nearest meter. These are recoverable objects and are located within the accuracy specified under the following heading, RECOMMENDATIONS FOR FURTHER SURVEYS, and may be used to obtain hydrographic "fixes". Care should be taken in using these other objects, as buildings shown on this sheet may be slightly expanded.

#### RECOMMENDATIONS FOR FURTHER SURVEYS

The compilation of this sheet is believed to have a probable error of not over  $\frac{1}{4}$  meters in well defined detail of importance for charting and of  $\frac{3}{4}$  meters for other data. The width of roads *See Review* was not exaggerated due to the scale of the sheet. The objects, also, are detailed to size of the photographs except in a very few places, for example: the sea-wall at Lat.  $40^{\circ}-30.0'$ , Long.  $74^{\circ}-16.5'$ .

To the best of my knowledge this sheet is complete in all detail of importance for charting purposes, within the accuracy stated above, and no additional surveys are required.

Submitted by

*W. E. Hackett*  
W. E. Hackett

Draftsman

Assisted by

*J. G. Albert*  
J. G. Albert

Draftsman

*A. K. Spalding*  
A. K. Spalding

Surveyor

\* The estimate of probable error stated above is considered too low. A better estimate is: shoreline and waterfront detail (wharves, bulkheads etc),  $2\frac{1}{2}$  to 4 meters (0.5 to 0.8 m.m.), other detail,  $2\frac{1}{2}$  to  $7\frac{1}{2}$  meters (0.5 to 1.5 m.m.).

*Frank A. Eakin*

U.S.E. STATIONS - (Scaled distances to nearest meter)

*Filed on Form 524 See Review*

Name	Latitude		D.M. Meters	Longitude		D.P. Meters	Remarks
	°	'		°	'		
Sunoil	40	29	(1608) 243	74	16	(580) <del>828</del> 32	2 cut position
Sunoco	40	29	(1258) 593	74	16	(953) 460	2 cut
Penn	40	29	(1136) 715	74	16	(862) 551	2 cut
<i>Filed under T-622/a</i>							
Penn (sub)	40	29	(1137) 714	74	16	(839) 574	2 cut
<i>Filed under T-622/a</i>							
High	40	29	(87) 1764 <sup>3</sup>	74	16	(1228) 185	3 cut
New Ferry (Sub)	40	29	(46) 1805	74	15	(1171) 242	3 cut
Battery	40	29	(408) 1443	74	14	(71) 1342	1 cut
Wards Point	40	29	(322) 1529	74	15	(1301) <del>(1298)</del> 115 <sup>2</sup>	3 cuts
Mercantile	40	30	(1089) 765 <sup>92</sup> 0	74	15	(392) 1020	5 cuts
<i>Filed under T-622/a</i>							
Texaco	40	30	(1518) 333	74	15	(328) 1084	4 cuts
Perth	40	30	(1815) <del>36</del>	74	15	(49) <del>1363</del>	3 cuts
<i>See Suppl. Review</i>							
NIRA	40	30	(1023) 828	74	15	(28) <del>(930)</del> 482 <sup>4</sup>	5 cuts
<i>Filed under T-622/a</i>							
Willow	40	30	(1426) 428 <sup>5</sup> 6	74	15	(2) <del>(933)</del> 479 <sup>80</sup>	4 cuts
<i>Filed under T-622/a</i>							
Chemical	40	30	(761.9) 1088.8	74	15	(527.3) 885.3	4 cuts
Drydock	40	30	(585) 1267	74	15	(605) 807	5 cuts
Public Service	40	30	(262) 1589	74	15	(730) 682	5 cuts
Balto	40	30	(474) 1377	74	15	(1101) 311	3 cuts

U.S.E. STATIONS - (Sealed distances to nearest meter)  
(continued)

Name	Latitude			Longitude			Remarks
	°	'	D.M. Meters	°	'	D.P. Meters	
Johnson	40	30	(171) 1680	74	15	(1328) 84	2 cut position
Cossey	40	30	(22) 1829	74	15	(1384) 28	2 cuts
Rack	40	31	(1846) 4	74	15	(885) 527	5 cuts
Tracy	40	31	(1686) 165	74	14	(206) 1206	2 cuts
Moran	40	31	(1365) 488 <sup>3</sup> 8	74	14	(494) 918 <sup>5</sup> 7	2 cuts
Dock	40	31	(907) 944	74	14	(389) 1023	2 cuts
Brick	40	31	(06) 1845	74	14	(628) 784	1 cut
United Lead	40	31	(422.9) 1427.8	74	15	(1261.2) 151.0	2 cuts
Guggenheim	40	31	(220) 1631	74	15	(1221) 191	1 cut

Note: All U.S.E. stations listed on pages 8 and 9  
have been described on Form 524 by this party.

LIST OF RECOVERABLE TOPOGRAPHIC STATIONS

CLASS (C) LANDMARKS

*See Review*

(Includes all recoverable objects, sufficiently prominent for use as hydrographic "fixes", shown as topographic stations with small black circle on this sheet and described on Form 524 by this party.)

<u>Description</u>	<u>Latitude</u>			<u>Longitude</u>			<u>Height</u>	<u>Method of Determination</u>	
	<u>o</u>	<u>'</u>	<u>D.M. Meters</u>	<u>o</u>	<u>'</u>	<u>D.P. Meters</u>			
✓ Chy	40	30	(1843) 8	74	16	(942) 470	60'	A.P.T. 1934	3 cut position ✓
Flagpole (Perth Amboy)	40	30	(1437) 414	74	15	(287) 1125	60'	A.P.T. 1934	4 cuts
✓ Lattice Mast	40	30	(935) 916	74	15	(428) 984	40'	A.P.T. 1934	5 cuts ✓
✓ Switch House	40	29	(494.9) 1355.8	74	16	(150.0) 1262.9	50'	A.P.T. 1934	3 cuts ✓
<del>Car Hump</del> <i>See Suppl. Review</i>	<del>40</del>	<del>29</del>	<del>(1193) 658</del>	<del>74</del>	<del>16</del>	<del>(910) 502</del>	<del>20'</del>	<del>A.P.T. 1934</del>	<del>2 cuts</del>
Gable house	40	29	(185) 1666	74	14	(14) 1398	40'	A.P.T. 1934	3 cuts ✓
✓ Oil Tank	40	30	(123) 1728	74	14	(193) 1219	55'	A.P.T. 1934	2 cuts ✓
Balto, also U.S.E.	40	30	(474) 1377	74	15	(1101) 311	50'	A.P.T. 1934	3 cuts
Flagpole (Tottenville)	40	30	(1517) 334	74	15	(1091) 321	75'	A.P.T. 1934	3 cuts
✓ Derrick Mast	40	<del>30</del> 29	(298) 1553	74	14	(830) 582	45'	A.P.T. 1934	1 cut ✓
✓ Coping	40	29	<sup>4.8</sup> (50) <sub>03</sub> 1891	74	16	<sup>2</sup> (1268) <sub>150</sub> 146	75'	A.P.T. 1934	3 cuts

Note: A.P.T. denotes air photo topography.  
For classification of Class (C) landmarks  
see Descriptive Report for Topographic  
Sheet Reg. No. T5059, paragraphs LANDMARKS  
and REPORT ON REVIEW OF SHEET.

SPECIAL REPORT

on

TEST SHEET



AIR PHOTO TOPOGRAPHIC TEST SHEET

o Name - Signals located by radial line plot.

(3) - Number of radial lines determining its position.

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## SPECIAL REPORT

to accompany

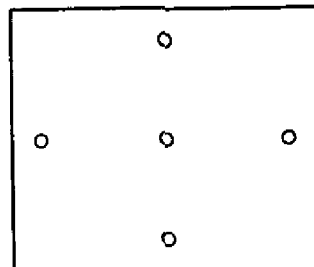
### AIR PHOTO TOPOGRAPHIC SHEET, FIELD NO. 59, REG. NO. T 5109

In March 1934 the suggestion was advanced that a test sheet be compiled to determine the feasibility of executing a hydrographic survey directly on the air photo topographic sheet. The original intention was that this sheet be compiled to the scale of the photographs on hand (1:10,000), in order to provide an index as to the accuracy of present and future compilations. However, at a request from the Washington Office, a 1:5,000 scale sheet was started of the southern portion of Arthur Kill, New Jersey.

#### PROCEDURE

##### (a) Enlargements

In order to secure enlargements as near as possible to a 1:5,000 scale it was necessary to construct a sheet to serve as a template for the enlargements. This consisted of choosing at least five points on each of the 1:10,000 scale prints (about as shown). These points were selected on very conspicuous detail so as to be readily apparent when the enlarged image from the negative was projected against the copy board. The points were then accurately radial plotted on the 1:10,000 scale projection and transferred to the 1:5,000 scale celluloid projection sheet to serve as a template. All triangulation stations were also plotted on this sheet.

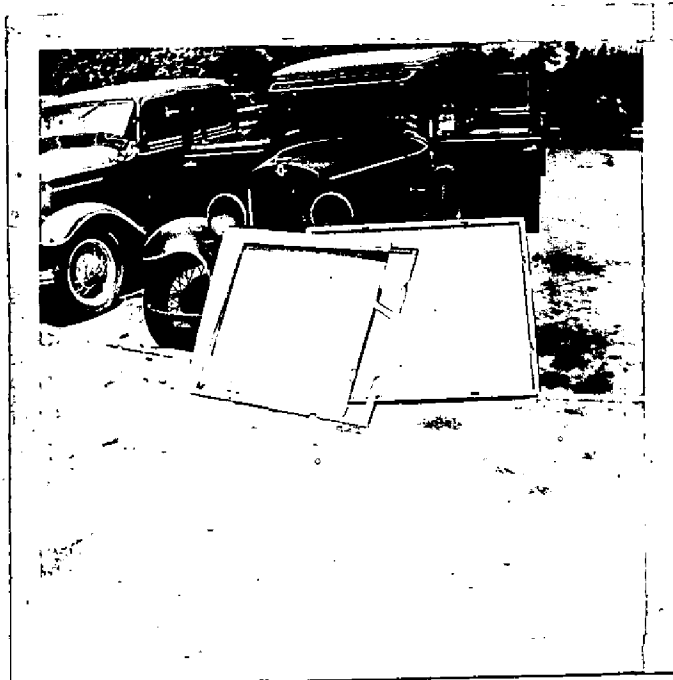


The template sheet and 1:10,000 scale photographs were then taken to the Aero Service Corporation, 1612 Chancellor St., Philadelphia, Pa., owners of the negatives; the template sheet was secured on the copy board, and the negative image was enlarged to coincide with the respective template points. When necessary a slight tilt was given the copy board in order to counter-act any tilt in the negative. As it was not possible to mark any of the negatives the 1:10,000 scale photographs served to identify each template point. The enlargements were made on special Eastman low-shrinkage paper by replacing for the template on the copy board.

##### (b) Field Inspection

Due to the large size of the 1:5,000 scale prints (32"x 40") it was necessary to construct a special container to protect them while being used in the field.

A special field inspection of these photographs was made. The entire waterfront was covered; U.S.E.D. stations and conspicuous objects were spotted at intervals to serve as hydrographic signals.



Container for large 1:5,000 scale photos

(c) Radial Line Plot

The usual method of radial line plotting was adhered to. The template points which were used in the enlargement process were disregarded as control for the plot; they were accurately radial plotted in and used by the detailer the same as ordinary radial points.

Because of insufficient overlap of photographs strong radial line intersections could not always be obtained (See Compiler's Report, page 4, paragraph (B) Adjustments of Plot).

COMPARISON WITH OTHER SURVEYS

After the completion of this sheet Lieut. E.R. McCarthy conducted a plane table survey of the area and relocated each signal on the 1:5,000 scale aluminum control sheet.

(A) Discrepancies

The following tabulation lists the positions of each common station with the resultant differences.

Name (USE)	Aluminum Control Sheet		A.P.T. D.M. meters	Diff. meters	Aluminum Control Sheet		A.P.T. D.P. meters	Diff. meters	No. Rad. Est. APT. Pos.
	Latitude o ' "	D.M. meters			Longitude o ' "	D.P. meters			
Sunoil	40 29 00	243 ✓	243 ✓	0	74 16 30	126 ✓	122 ✓	-4 ✓	2
Sunoco	40 29 00	595 ✓	593 ✓	-2	74 16 00	460	460 ✓	0	2
Penn.	40 29 00	717 ✓	715 ✓	-2	74 16 00	549 ✓	551 ✓	+2	2
Penn. (sub)	40 29 00	714 ✓	714 ✓	0	74 16 00	572 ✓	574 ✓	+2	2

## Continuation of table

Name (USE)	Aluminum Control Sheet		A.P.T. D.M. meters	Diff. meters	Aluminum Control Sheet		A.P.T. D.P. meters	Diff. meters	No. Rad. Estb. APT Pos.
	Latitude o ' "	D.M. meters			Longitude o ' "	D.P. meters			
High	40 29 30	838 ✓	838 ✓	0	74 16 00	183 ×	185 ✓	+2	3
New Ferry (sub)	40 29 30	(46)	(46)	0	74 15 00	237	242	+5	3
Mercantile	40 30 00	760 ✓	763 ×	+3	74 15 30	314 ✓	314 ✓	0	5
Texaco	40 30 00	332 ×	333 ✓	+1	74 15 30	378 ✓	378 ✓	0	4
Perth	40 30 00	36	36	0	74 15 30	655	657	+2	3
N.I.R.A.	40 30 00	828 ✓	828 ✓	0	74 15 30	(222) ✓	(224) ×	+2	5
Mon Willow	40 30 00	426 ✓	425 ×	-1	74 15 30	(226) ✓	(226) ✓	0	4
Chemical	40 30 30	165 ×	163 ✓	-2	74 15 30	181 ×	179 ✓	+2	4
Dry dock	40 30 30	340 ×	341 ✓	+1	74 15 30	98 ×	101 ✓	+3	5
Public Service	40 30 30	664 ✓	664 ✓	0	74 15 00	(26) ✓	(24) ✓	-2	5
Rock	40 31 00	(prob. 34)	4 ✓	+1	74 15 00	527	527 ✓	0	3
Average				0.61	Average				1.6

$$\text{Average Discrepancy in Distance} = \sqrt{(0.61)^2 + (1.6)^2} = \sqrt{2.93} = 1.71 \text{ meters}$$

(for 1-5,000 A.C.S.)

The two signals listed below were located on Lieut. McCarthy's 1-10,000 scale aluminum control sheet.

Name (U.S.E.)	Aluminum Control Sheet		A.P.T. D.M. meters	Diff. meters	Aluminum Control Sheet		A.P.T. D.P. meters	Diff. meters	No. Rad. Estb. APT Pos.
	Latitude o ' "	D.M. meters			Longitude o ' "	D.P. meters			
Battery ✓	40 29	(411) ×	(408) ✓	-3	74 14	(75) ×	(71) ✓	-4	1
Wards Pt.	40 29 30	605 ×	604 ✓	-1	74 15 00	111 ×	115 ✓	+4	3
Average				2	Average				4

$$\text{Average Discrepancy in Distance} = \sqrt{(2)^2 + (4)^2} = 4.5 \text{ meters (for 1-10,000 scale A.C.S.)}$$

The last column of the preceeding tabulations has been added to show that no distinct relationship exists between the number of radial line cuts determining the A.P.T. position and the amount of discrepancy. There is, however, a relationship between the A.C.S scale and the discrepancy; the 1-10,000 scale A.C.S. produced more than twice the discrepancy of the 1-5,000 A.C.S. It therefore appears that some basis may be had for suspecting errors in the aluminum control sheets.

Accordingly, a study was made to determine the items which contribute to produce differences between the Air Photo Topographic and the Aluminum Control Sheet positions.

(B) Analysis of Discrepancies.

There are four major items which are accountable for these differences. A brief discussion of each follows.

(1) Aluminum Control Sheet Errors.

The contention that sizeable errors may be expected in the aluminum control sheets is supported by the following specific proofs.

CASE I.

Signal	Aluminum Scale	Control Sheet Position		Triangulation Position. (Estb. after A.C.S.)	Diff. meters	Distance Error. meters
		0	meters			
A	1-10,000	40 35	1342.3	1347.5	5.2	6.3
		73 43	692.5	689.0	3.5	
B	1-10,000	40 35	1214.3	1216.9	2.6	4.4
		73 43	264.5	261.0	3.5	
					Average	5.3

Although Case I is outside the area of this sheet, it does, however, show that sizeable errors have been found to exist on the A.C.Sheets.

CASE II.

Signal	Aluminum Control Sheet Scale	Position		Traverse Position (Estb. after A.C.S.)	Diff. in meters	Distance Error. meters
		o	' meters			
Chemical. (U.S.E)	1-5,000	40 30	1090.4	1088.2	2.2	2.8
		74 15	887.3	885.2	1.8	

In the above case a traverse from triangulation station "Chy.(R.&H.Co.) 1915" established an accurate (within 0.1 meter) position of U.S.E. station "Chemical". The distance was measured forward and back within one-tenth foot, and a sextant angle read (nearest minute) to  $\Delta$  School 1 which is practically in line with the signal. Due to the closeness of the signal (171.39 m.) considerable angular error would be required in order to seriously effect the computed position. Lieut. McCarthy's position for this signal on his 1-5,000 scale aluminum control sheet falls 2.8 meters in error.

CASE III.

The U.S.E. station "New Ferry (Sub)" has been listed by Lieut. McCarthy as being 5 meters in error in longitude and no error in latitude (See page 3, this report.).

Prior to May 1934,  $\Delta$  Ridge 1930 (Boat House Gable) was still existent (See page 6, Landmarks, Compiler's Report for Sheet T 5109) and shows clearly on the photographs which were taken in July 1932. Adequate field

measurements were taken to accurately locate the U.S.E. station on the photos and its spotting should be unquestionable. Since the triangulation station lies only a short distance from this station and verifies the A.P.T. position the error must be on the A.C.S. and not on the compilation sheet. It is to be recalled that at the time the U.S.E. station was located on the A.C.S., triangulation station "Ridge" was no longer available, having burned down in May 1934.

#### CASE IV.

U.S.E. station "Sunoil" has been listed (on page 2) as being 4 meters in error in longitude and no error in latitude.

This station was spotted on the photos by field measurements and therefore its spotting should be unquestionable. Both radial lines used in the photo plot of this station deviate only slightly from a north-south direction so that this station is really located in longitude by the radials and in latitude by proportionment. There are three triangulation stations in this nearby locality (namely:- RnR-2, Tank (J.C. Power & Lt.), and Chy (Seaboard Coal) ) which strongly controls the azimuths of all radial lines in this direction and, therefore, no explanation of the longitude discrepancy can be made other than it being an error on the aluminum control sheet.

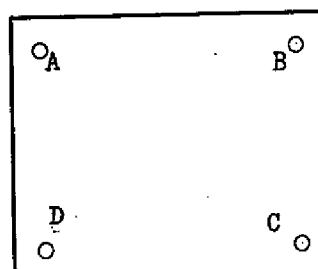
Citation of the foregoing cases has been made, not as reflection on the accuracy of these A.C.S. topographers, but solely as evidence that errors can and do exist on the aluminum control sheets, even though extra precautions are exercised as in the case of the 1-5,000 scale A.C.S.

Many other cases of errors found on aluminum control sheets have been included in the Descriptive Reports for each Air Photo Topographic Sheet, and are not mentioned here.

#### (2) Errors From Distortion of Prints.

Measurements on one of the enlarged prints (photo no. 66-52-37) made on three successive days gave the following results:

Date	Time	Temp	Rel.	Readings in Meters (on 1:10,000 scale)					
1934			Hum.	AB	BC	CD	DA	AC	DB
5-7	1:20	81	42	8842.0	6328.3	8851.2	6778.5	11006.5	11007.1
5-8	9:25	93	10	8830.5	6326.1	8841.5	6773.0	10994.5	10993.0
5-9	9:07	78	45	8833.5	6325.0	8842.5	6775.0	10998.5	10998.0
Maximum % Change				0.13	0.04	0.11	0.08	0.11	0.13



From these results it can be seen that distortion of the prints occurs from day to day. What effect this will have on the accuracy of locating signals from the photo plot cannot be definitely determined as it is dependent upon many variable conditions (proximity of control to signals, arrangement of control stations on print, angle of intersecting radials, etc.)

(3) Errors From Enlargement.

The original negatives, from which the 1-5,000 scale prints were made, are on an approximate scale of 1-22,000. To conduct a 4.4 enlargement may be considered a strain on any enlarging lens. Also such an enlargement magnifies minute distortions of the negative (since negative is of celluloid it may be slightly distorted by climatic conditions; distortion of negative image may also occur as a result of small imperfections in the aerial camera lense) which may become of objectionable proportions.

(4) Errors in Compilation.

Two A.P.T. signals, listed below, were traversed in the field (See Case II, page 4, for method of traverse) as a check on the accuracy of the compilation sheet.

Signal	Air Photo Topo.		Trav. Position (Estb. after A.P.T.)	Diff. meters	Distance Error. meters
	Position. o ' meters				
Switch	40 29	1355.8	1355.3	+0.5	0.6
House	74 16	1262.9	1263.3	-0.4	
Chemical	40 30	1088.8	1088.2	+0.6	0.6
(U.S.E.)	74 15	885.3	885.5	-0.2	

In the case of "Switch House" the final A.P.T. position was verified by the proportional method between triangulation stations RnR-1 and RnR-2. Signal "Chemical" was similarly verified by holding  $\Delta$  Chy (R. & H. Co.) on and orienting to  $\Delta$  School 1.

Although both stations gave an exceptionally close check the deduction is not made that all other A.P.T. stations must therefore be located as accurately.

Inasmuch as U.S.E. station "Chemical" had been located 2.8 meters in error on the aluminum control sheet, whereas the A.P.T. position falls only 0.6 meters in error ( or 78% nearer to the correct position) it does not always appear justifiable that the A.C.S. positions be accepted as correct and the A.P.T. positions be considered in error.

CONCLUSIONS.

In spite of the handicap imposed, the results obtained by this sheet are believed to be just as accurate as those obtained with the aluminum control sheet (of the same scale), and therefore the Air Photo Topographic Sheet could be used directly for the hydrographic survey without sacrifice of accuracy. This is not true, however, of all compilation sheets (where control and photo-overlap are inadequate, or laxity of compilation methods exists).

Nov. 5, 1934.

*Roswell C. Bolstad*  
Roswell C. Bolstad, Jr. H. & G.E.  
Chief of Party No. 12.

Date. August 19, 1934 **GEOGRAPHIC NAMES**

Survey No. T-5109

Chart No. 286 & 375


**Texas**

Diagram No. \_\_\_\_\_

Approved by the Division of Geographic Names, Department of Interior. \*

Referred to the Division of Geographic Names, Department of Interior. R

Under investigation. Q

Status	Name on Survey	Name on Chart	New Names in local use	Names assigned by Field	Location
✓	<u>Maurer</u>	Same			
✓	<u>Kreischerville</u>	"			
✓	<u>Ploughshare Point</u>	"			
✓	<u>Staten Island</u>	"			
✓	<u>Tottenville</u>	"			
✓	<u>Perth Amboy</u>	"			
✓	<u>Raritan River</u>	"			
✓	<u>Ferry Point</u>	"			
✓	<u>Arthur Kill</u>	"			
✓	<u>Raritan Bay</u>	"			
✓	<u>South Amboy</u>	"			
✓	<u>Ward Point</u>	"			
✓	<u>Mill Creek Kill Creek</u>	"			
Names underlined in red are approved.					
 W. J. Woods.					

## REVIEW OF AIR PHOTO COMPILATION T 5109

Scale 1:5,000

This compilation as submitted by the field party had not been completely compared with the graphic control surveys. An extensive and detailed review was necessary in this office. Of the 84 described topographic station cards covering this area 64 were submitted with the graphic control surveys and there were numerous discrepancies when compared with the compilation detail.

The following paragraphs state the disposition of all conflicting information but do not discuss in detail the office investigation. The office review has included a careful comparison of all available information and check of the photographs in regard to all discrepancies.

A description of this area is contained in descriptive reports T 6218 b and T 6221 a.

The street names on this compilation are from the Sanborn Maps.

Comparison with graphic control surveys

(a) T 6218 b (1934), 1:10,000

T 6218 b covers Arthur Kill from its mouth northward beyond the limit of the compilation. No shoreline.

At Lat. 40° 31' 30", Long. 74° 14' 30 1/3" there is a disagreement in the wrecks. The wreck as shown on the compilation is correct.

Described stations:

- (1) Battery and New Ferry Sub. The compilation position accepted. Cards filed under T 5109.
- (2) The following stations appearing on T 6218 b are not shown on T 5109: Yellow Stack, N. E. Chimney (Lehigh Valley), Short Tank (Dupont), Red Stack (Nat. Lead), Brack Stack (Nat. Lead), Tallest Stack (Amer. S. & R. Co.). The stations do not check the compilation. Although these stations are probably within the limit of accuracy required of a 1:10,000 scale, when transferred, they naturally fall beyond the limits required of a 1:5,000 scale sheet.

(b) T 6221 a (1934), 1:5,000.

T 6221 a covers the southern half of T 5109.

About 200 meters of shoreline is shown on T 6221a. This shoreline disagreed with the compilation. After examining the photographs the shoreline was changed to agree with T 6221<sup>a</sup> except where the change

caused the shoreline to run through trees.

Signal Fla (Flagpole) (not described on T 6221 a) was rejected on T 6221 a. It is correctly shown on T 5109 and is described.

The clearance of the Pennsylvania Railroad Bridge differs on the two sheets. The U. S. E. Bridge Book, 1927, checks the compilation value of 8.6 feet.

Described stations:

- (1) Stations Chemical, Dry Dock, Texaco, High, Sumoil, Rack, Public Service, Sunoco, and Switch House are filed under T 5109.
- (2) Perth was rejected on both surveys.

All detail on T 6218 b and T 6221 a (within the limits of the compilation) is shown on T 5109 except the magnetic meridians, temporary stations, buoys, and as mentioned above.

Comparison with previous topographic surveys

(a and b) T 1712 (1886), 1:10,000, T 3544 (1915), 1:10,000.

T 5109 is adequate to supersede T 1712 and T 3544 within the limits of the compilation except for the bluffs and contours.

Comparison with contemporary hydrographic surveys

There are no recent hydrographic surveys in this area, except in the SW corner of T 5109.  
(a) H-5647 (1934) 1:10,000 (Raritan River)

There are no conflicts with the hydrography.

Comparison with charts

(a) Chart No. 286, 1:15,000

In general very few changes have taken place in this area; however there have been many detailed changes.

- (1) Many of the piers shown on the chart are now in ruins or have been changed. Several new piers have been built.
- (2) Changes have been made in the various buildings and many new buildings are shown on T 5109.
- (3) Many of the wrecks shown on the chart have been removed. T 5109 shows all wrecks <sup>now</sup> ~~not~~ in existence as verified by the photographs and T 6218 b, ~~and~~ T 6221 a, and H-5647.
- (4) The marsh area at the southwestern part of Staten Island has been filled. There is very little evidence now of the stream shown on the chart in this area.

*{ One pile shown on Bp 18348 - none shown on Bp 27112  
Piles omitted from new compilation of chart 375 - J.T.W. 9/1/36*

- (5) The piles at lat.  $40^{\circ} 31'$ , long.  $74^{\circ} 15'$  on the chart do not appear on the compilation. They are not shown on T 6218 b. The photographs are very dark in this area and it is impossible to definitely prove the non-existence of these piles.
- (6) The bluffs shown on the chart on Staten Island are apparently from T 1712 (1886). From an examination of T 1712 and the photographs it is evident that all the bluffs have not been shown on the chart. The crest of the bluffs can be determined in a few places from the photographs but this location does not agree with T 1712. Since there is not enough overlap on the photographs to examine the entire area stereoscopically none of the bluffs are shown on the compilation (T 5109). For an accurate determination of these bluffs either a ground survey or additional photographs ~~is~~ necessary.

#### Landmarks and Aids to Navigation

Siren, on the outer bridge is not shown on the compilation. It is not shown on either T 6218 b or T 6221 a. *and does not show on the photographs.*

Light Beacon No. 2 off the Pennsylvania Railroad docks at South Amboy is not shown on the compilation. There is no accurate position for this light at this time. It has recently replaced a lighted buoy which is shown on T 6221 a (Oct. 1934).

The landmark Standpipe ( $40^{\circ} 30 \frac{3}{4}'$ ,  $74^{\circ} 14 \frac{1}{2}'$ ) should be deleted from the chart (Chart letter No. 208 - 1935).

The landmark Wooden Tower ( $40^{\circ} 31 \frac{3}{4}'$ ,  $74^{\circ} 15 \frac{1}{2}'$ ) is triangulation station Square Chimney 1931. The description of the triangulation station states that it is " - - atop the prominent tall, square, wooden chimney-like structure." The description also states that "Its position is not permanent enough for any future usage."

For landmarks and beacons in this area see Chart letters 858 (1932), 202 (1935), and 208 (1935). All landmarks and beacons from these letters (within the limits of T 5109) are shown.

June 28, 1935

*F. G. Erskine*  
F. G. Erskine *W B G Jones*

## REVIEW OF AIR PHOTO COMPILATION NO. T5109

Chief of Party: Roswell C. Bolstad

Compiled by: (see page 2,  
Des. Report)Project: New York Air Photo Compilation Instructions dated: Nov. 15, 1932  
Party No. 12

1. The charts of this area have been examined and topographic information necessary to bring the charts up to date is shown on this compilation. (Par. 16a, b,c,d,e,g and i; 26; and 64)
2. Change in position, or non-existence of wharfs, lights, and other topographic detail of particular importance to navigation which affect the chart, is discussed in the descriptive report. (Par. 26; and 66 g,n)  
See paragraph (C) Interpretation, page 4.
3. Ground surveys by plane table, sextant, or theodolite have been used to supplement the photographic plot where necessary to obtain complete information, and all such surveys are discussed in the descriptive report. (Par. 65; and 66 d,e)  
See paragraph CONTROL (A), page 3.
4. Blue-prints and maps from other sources which were transmitted by the field party contain sufficient control for their application to the charts. (Par. 28)  
See paragraph CONTROL (A), page 3.
5. Differences between this compilation and contemporary plane table and hydrographic surveys have been examined and rectified in the field before forwarding the compilations to the office and are discussed in the descriptive report.  
There were no topo stations used as supplementary control on this sheet.
6. The control and adjustment of the photo plot are discussed in the descriptive report. Unusual or large adjustments are discussed in detail and limits of the area affected are stated. (Par. 12b; 44; and 66 c,h,i)  
See paragraph CONTROL (A), page 3 and paragraph COMPILATION (B), page 4.
7. High water line on marshy ~~and mangrove~~ coast is clear and adequate for chart compilation. (Par. 16a, 43, and 44)

NOTE: Strike out paragraphs, words or phrases not applicable and modify those requiring it. Paragraph numbers refer to those in the Topographic Manual. Refer also to the pamphlet "Notes on the Compilation of Planimetric Line Maps from Five Lens Air Photographs."

8. The representation of low water lines, ~~water, water, water~~, and legends pertaining to them is satisfactory. (Par. 36, 37, 38, 39, 40, 41)  
See paragraph COMPILATION (C), page 4.
9. Recoverable objects have been located and described on Form 524 in accordance with circular 30, 1933, circular letter of March 3, 1933, and circular 31, 1934. (Par. 29, 30, and 57)  
See reports of Lieut. E.R. McCarthy, 1934. All recoverable topo stations shown on this compilation sheet by small black circle have been described on Form 524 by compilation party.
10. A list of landmarks was furnished on Form 567 and instructions in the Director's letter of July 16, 1934, Landmarks for Charts, complied with. (Par. 16d, e; and 60)  
Previously submitted in the triangulation report, 1930-33 by Lieut. R.W. Woodworth, also reports of Lieut. E.R. McCarthy, 1934.  
*Chart letters 858 (1932), 202 (1935), 208 (1935)*
11. All bridges shown on the compilation are accompanied by a note stating whether fixed or draw, clearance, and width of draw if a draw bridge. Additional information of importance to navigation is given in the descriptive report. (Par. 16c)  
All information regarding bridges shown on this sheet was obtained from the Atlantic Coast Pilot, Section B, 1933.
12. Geographic names are shown on the overlay tracing. The accepted local usage of new names has been determined and they are listed in the report, together with a general statement as to source of information and a specific statement when advisable. Complete discussion of place names differing from the charts and from the U. S. G. S. Quadrangles is given in the descriptive report, together with reasons for recommendations made. (Par. 64, and 66k)  
There are no names on this sheet conflicting with those on U.S.C. & G.S. Charts.
13. The geographic datum of the compilation is North American and the reference station is correctly noted. <sup>1927</sup>  
See page 2. *unadjusted*
14. Junctions with adjoining compilations have been examined and are in agreement. (Par. 66j)
15. The drafting is satisfactory and particular attention has been given the following:
  1. Standard symbols authorized by the Board of Surveys and Maps have been used throughout except as noted in the report.
  2. The degrees and minutes of Latitude and Longitude are correctly marked.

3. All station points are exactly marked by fine black dots.
4. Closely spaced lines are drawn sharp and clear for printing.
5. Topographic symbols for similar features are of uniform weight.
6. All drawing has been retouched where partially rubbed off.
7. Buildings are drawn with clear straight lines and square corners where such is the case on the ground.

(Par. 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48)

16. No additional surveying is recommended at this time.

*See page 22 - (Companion with Chart, sec. 6)*

17. Remarks: Any additional notes and requirements affecting this area are referred to the 1934 reports of Lieut. E.R. McCarthy, who carried on the field operations in this vicinity.

18. Examined and approved;  
Preliminary Review:

*J. G. Albert*  
J. G. Albert

Draftsman

*Roswell C. Bolstad*  
Roswell C. Bolstad  
Chief of Party

19. Remarks after review in office:

Reviewed in office by:

*Frank Perkins* *B. G. Jones*

Examined and approved:

*C. H. Green*

Chief, Section of Field Records

*L. O. Platt*

Chief, Division of Charts

*J. B. Dorden*

Chief, Section of Field Work

*G. H. Hinde*

Chief, Division of Hydrography and Topography.

# Descriptive Report of T5109 Supplemental

Supplemental filed 4/4/35

1. Corrections in red include only  
corrections to geographic names as applied 4/4/35

2. Areas noted in blue corrected Nov. 24  
1940 from nine lens photographs taken  
7/5/40 without field inspection

B. J. Jones

## NAUTICAL CHARTS BRANCH

SURVEY NO. 75109

### Record of Application to Charts

[illegible]

M-2168-1

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

Applied to new compilation of Chart 375 - July 3, 1936 - J.F.W.

Applied to Chart 286 March 7-1938 Char. R. Bush Jr.

Applied to Chart 369 May 29, 1939 Com. 37

Supplemental Info. applied to Chart 286 - 2/26/41, J.F.W.