

3214

012
1

Book "A"
4-679

BOOK 3214

FIELD NOTES

OF THE SURVEY OF THAT

Part of the

West boundary of the Navajo Indian Reservation, from the SW. corner thereof, north to intersection with the Little Colorado River, thru.

TOWNSHIPS, 21, 22, 23 AND 24 NORTH, IN RANGE

11 EAST,

Of the Gila and Salt River Base and Meridian,

In the State of Arizona.

EXECUTED BY

Thomas B. Matthews,

In the capacity of U. S. Surveyor..., under Special Instructions dated Dec. 17, 1915, issued by the United States Surveyor General to govern surveys included in Group No. 68, which were approved by the Commissioner of the General Land Office, Jan. 7, 1916, and Assignment Instructions dated Feb. 3, 1916

Survey commenced February 15, 1916

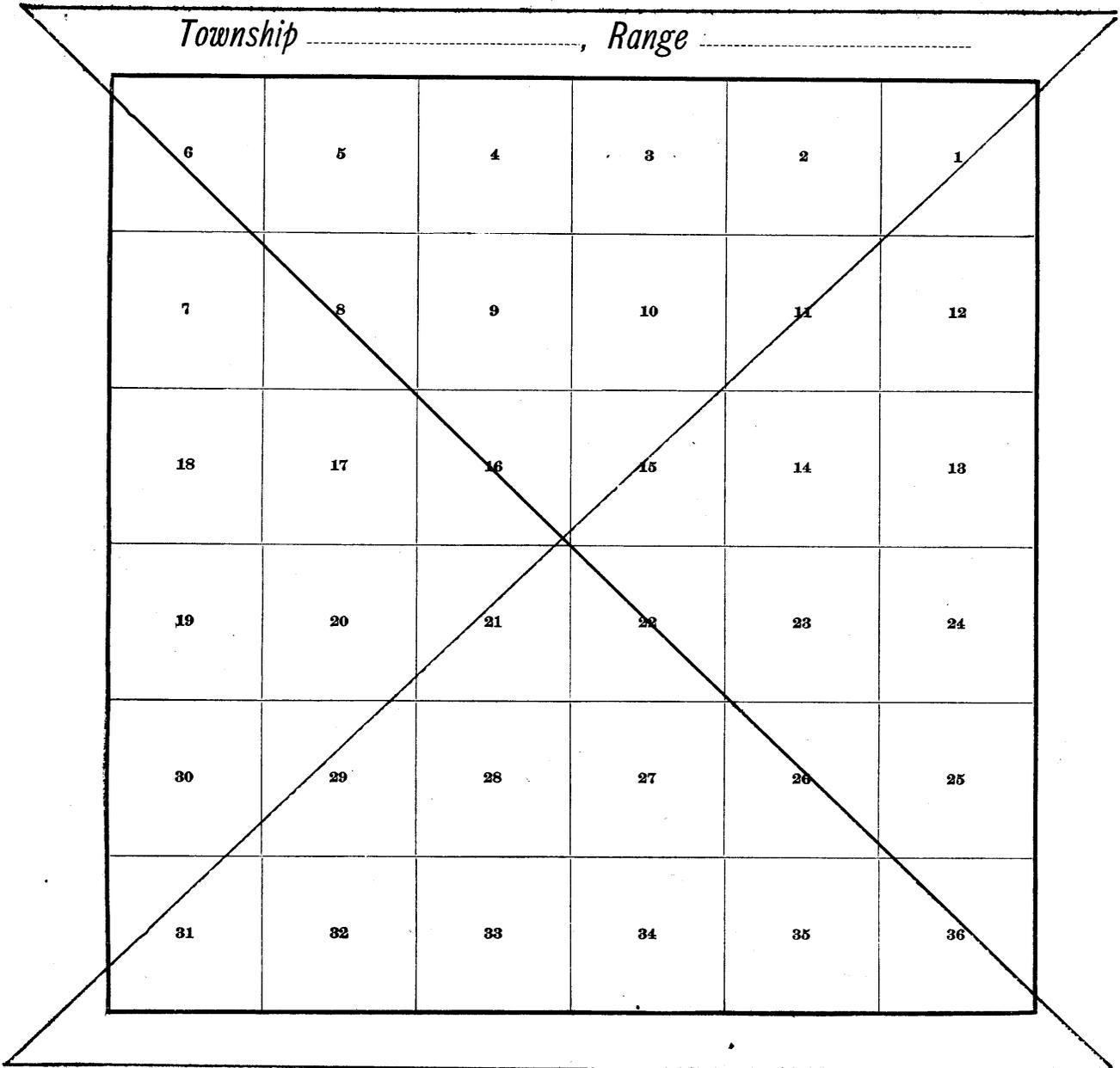
Survey completed March 13, 1916,

3214

3214

SEE SPECIAL INDEX DIAGRAM.

~~INDEX-DIAGRAM:~~



3214
 Book-A-
 GROUP 68
 ARIZONA
 INDEX-DIAGRAM.

6th	Std.	Par. N.
6	5	A.P.No.1
7	8	0
		22 M.
18	17	5
		21 M.
19	20	T24N,R11E.5
		20 M.
30	29	5
		19 M.
31	32	4
		18 M. --- 352500
6	5	3
		17 M.
7	8	3
		16 M.
18	17	T23N,R11E.2
		15 M.
19	20	2
		14 M.
30	29	1
		13 M.
31	32	1
		12 M. ---
6	5	0
		11 M.
7	8	0
		10 M.
18	17	T22N,R11E.9
		9 M.
19	20	9
		8 M.
30	29	8
		7 M.
31	32	8
		6 M. --- 3215
6	5	7
		5 M.
7	8	7
		4 M.
18	17	T21N,R11E.5
		3 M.
19	20	5
		2 M.
30	29	5
		1 M.
31	32	4
		0 M.

RESERVATION

INDIAN

NAVAJO

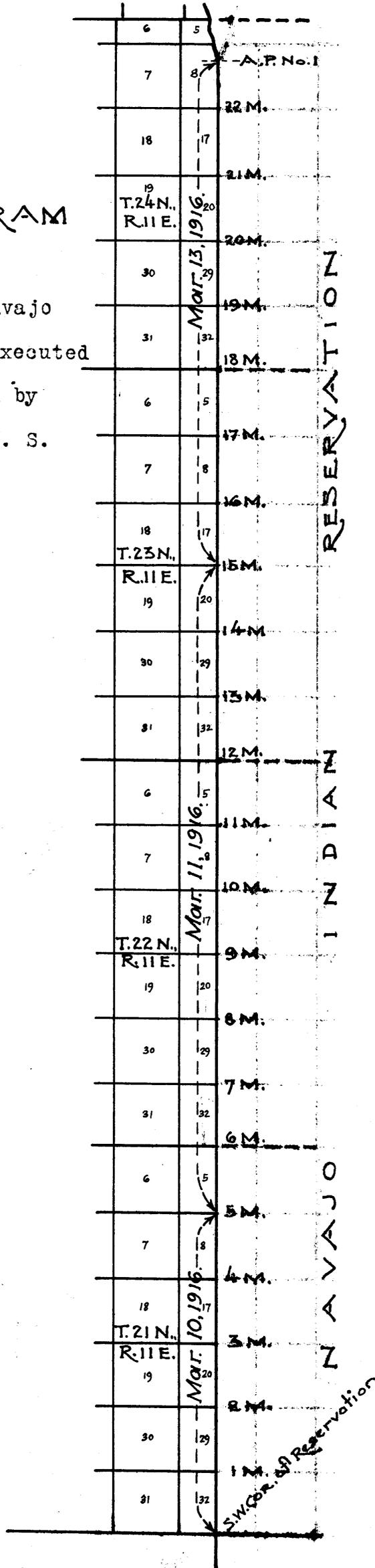
- W. bdy. of Navajo Indian Reservation indexed hereon. ³²¹⁴
- Notes in Book "B." 3215
- Notes in Book "C." 3216
- Notes in Book "D." 3217
- Notes in Book "E." 3219
- Unsurveyed.

S.W. Cor. of Reservation

BOOK 3214

Book-A-
Group 68
ARIZONA
DATE DIAGRAM

Survey of W.bdy. of Navajo
Indian Reservation, executed
on dates shown hereon by
Thomas B. Matthews, U. S.
Surveyor.



Survey of West Bdy. of Navajo Indian Reservation Through Ts. 21, 22, 23, 24 N., in R. 11 E. 3

Survey executed by Thos. B. Matthews, U. S. Surveyor, on dates shown on the diagram on page 2 of this book, using W. and L. E. Gurley engineer's transit No. and a Buff and Buff light mountain transit No. 10124.

The W. and L. E. Gurley engineer's transit is equipped with a horizontal limb having two double verniers, placed opposite to each other, reading to thirty seconds of arc, which is also the least count of the vernier of the vertical circle.

Examine the adjustments of this transit and find them to be correct.

The Buff and Buff light mountain transit is equipped with a horizontal limb, having two double verniers, reading to single minutes of arc, which is also the least count of the verniers of the latitude and declination arcs.

Examine the adjustments of the transit and correct the level and collimation errors; then to test the solar apparatus by comparing its indications resulting from observations made during a. m. and p. m. hours, on a meridian established by observations on Polaris, proceed as follows:

Feb. 15, 1916, at a point on the left bank of the Little Colorado River, in sec. 8, T. 24 N., R. 11 E., lat. 35° 30' N., long, 111° 14' 28" W., at 9h., 47 m. 11. m. t., observe Polaris at western elongation in accordance with The Manual of Surveying Instructions, and turn off the azimuth of Polaris, 1° 23 1/2' toward the E., marking a point on the meridian thus determined by a tack driven in a wooden peg, set firmly in the ground, 5 chs. N. of station.

Feb. 16, 1916, at 9h., a. m., 1. m. t., I set off 35° 30' N. on the lat. arc; 12° 36' S. on the decl. arc; and determine a meridian with the solar. The meridian thus determined intersects the tack set 5 chs. N. of station.

At 4h., p. m., 1. m. t., I set off 35° 30' N. on the lat. arc; 12° 29' S. on the decl. arc; and determine a meridian with the solar. The meridian thus determined falls less than 1' to the W. of the tack set 5 chs. N. of station, therefore conclude that the adjustments of the transit and solar attachment are satisfactory.

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Feb. 15, 17 and 18, 1916, at a point on the left bank of the Little Colorado River, about 5 miles below the Grand Falls on said river, make two Polaris and three direct altitude observations of the sun for latitude, which give a mean latitude for station, of 35° 29' 42.96" N., which correct to 35° 30' N. lat. by chaining 26.10 chs. north, a distance equivalent to a length of 17.04" on the meridian at 35° 30' N. latitude.

Feb. 18, 1916, turn off an angle of 90° from the meridian and project the line by back and fore sights, to an intersection with the Little Colorado River, setting points on both left and right banks.

From the point on the left bank, measure off a base, S. 12° E., 5 chs. dist., from the S. end of which, the point on the right bank brs. N. 18° 58' E.

Dist. across river = 5.00

sin 30° 58' sin 71° 2' X

Log 5.00 = .698970

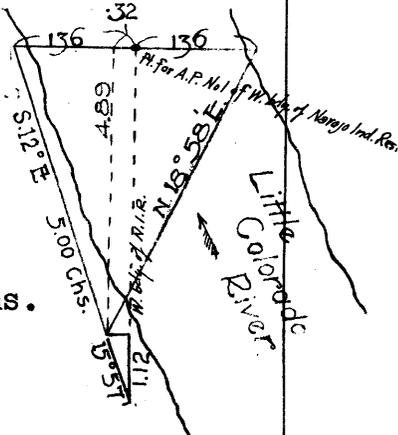
Log sin 30° 58' = .711419

.410389

Log sin 71° 02' = .975757

.434632 = log 2.72 chs.

dist. bet. points on left and right banks of river, and the dist. to the



Survey of West Bdy. of Navajo Indian Reservation Through Ts. 21, 22, 23, 24 N., in R. 11 E.

Chains

center of stream is 1.36 chs. 1.36 chs. - easting of base, (5.00 chs. S. 12° E.) 1.04 chs. = 32 lks., therefore chain S. 15° 27' E., 1.16 chs. dist. to a point on the left bank of the Little Colorado River, which is 6.01 chs. S. of the intersection of the center of the river with the 35° 30' N. parallel of latitude.

6.01 The bank at this point being loose sand makes it impractical to set meander cor., therefore continue South on a blank line along W. bdy. of Navajo Indian Reservation. Asc. 150 ft. out of canyon, to

8.39 At which point set temp. witness cor. to meander cor. of frac. sec. 8 and to A.P. No. 1 of W. bdy. of Navajo Indian Reservation. Thence, South on a blank line, along W. bdy. of Navajo Indian Reservation, setting temp. cor. at intervals of 40 chs.

320.00 Feb. 18, 1916, at 9h. 36m., p. m., 1. m. t., observe Polaris at western elongation in accordance with the Manual of Surveying Instructions, and mark a point in the line thus determined by driving a tack in a wooden stake set in the ground 5 chs. N. of station. Feb. 19, at 8h. 30m., a. m. 1. m. t., turn off the azimuth of Polaris, 1° 23' toward the east and check back on the line flags left Feb. 18, and find them to be correct.

1828.53 Intersect 5th Standard Parallel N., 15.01 chs. E. of the reestablished standard $\frac{1}{4}$ sec. cor. of sec. 32 as described in book "B".

At the point of intersection
Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for SW. cor. of Navajo Indian Reservation, mkd. on brass cap

T21N
R11E NIR
S32

1916

and raise a mound of stone, 4 ft. base, 3 ft. high, NE. of cor.

--oOo--

From the SW. cor. N. I. R., North on 1st mile along W. bdy. of the Navajo Indian Reservation, through sec. 32, T. 21 N., R. 11 E. Over rolling prairie land, through scattering undergrowth.

40.00 Set an iron post, 3 ft. long, 1 in. diam., 22 ins. in the ground, in a mound of stone, for $\frac{1}{4}$ sec. cor. of frac. sec. 32.

$\frac{1}{4}$
S32 NIR
1916

and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor.

80.00 Set an iron post 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of frac. secs. 29 and 32 and the 1st mile post of W. bdy. of N. I. R., mkd. on brass cap

T21N
R11E
S29 NIR
S32 AMP
1916

and raise a mound of stone, 3 ft. base, 3 ft. high,

Survey of West Bdy. of Navajo Indian Reservation Through Ts. 21, 22, 23, 24 N. in R. 11 E

Chains	<p>west of post. Land, rolling. Soil, thin and rocky; limestone bedrock, 3 to 6 ins. below surface. No timber. Undergrowth, scattering rabbit and yellow top brush. Short grass.</p>
	<p>North on 2nd mile of W. bdy. of Navajo Indian Reservation, over level prairie land, through scattering undergrowth.</p>
18.51	Old Indian ruins bear E. 105 lks. dist.
33.51	Edge of Padre canyon brs. E. and W. Desc. steep rocky slope, 125 ft. to
38.90	Padra creek, 20 lks. wide, clear cold water 2 ft. deep, course E. Asc. 60 ft. to
40.00	Set an iron post, 3 ft. long, 1 in. diam., on surface rock, in a mound of stone, for $\frac{1}{4}$ sec. cor. of fracl. sec. 29, mkd. on brass cap
	$\frac{1}{4}$ S29 NIR 1916
	<p>and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor. Asc. 70 ft. to</p>
41.45	N. edge of Padre canyon, brs. E. and W. Thence over level land.
80.00	Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 20 and 29, and 2nd mile post of W. bdy. of N. I. R., mkd. on brass cap
	T21N R11E S20 NIR S29 ZMP 1916
	<p>and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor. Land, level except for Padre canyon. Soil, rocky and thin; limestone subsoil, 3 to 6 ins. below surface. Timber, scattering scrub cedar and juniper along Padre canyon. Undergrowth, scattering rabbit brush 1 to 2 ft. high. Short grass.</p>
	<p>North on 3rd mile of W. bdy. of Navajo Indian Reservation, over gently rolling prairie land, through scattering scrub timber and short undergrowth.</p>
9.47	Mutual telephone line brs. S. $76\frac{1}{2}^\circ$ E. and N. $76\frac{1}{2}^\circ$ W.
32.95	Postal telegraph line brs. S. 87° E. and N. 87° W.
33.68	Old R. R. water tank brs. S. $86\frac{1}{2}^\circ$ E.
33.75	W. bound A. T. and S. F., R. R. track brs. N. 87° W. and S. 87° E.
33.96	E. bound A. T. and S. F., R. R. track brs. N. 87° W. and S. 87° E.
34.41	Western Union telegraph line brs. N. 87° W. and S. 87° E.
40.00	Set an iron post, 3 ft. long, 1 in. diam., 24 ins. in the ground, for $\frac{1}{4}$ sec. cor. of fracl. sec. 20, mkd. on brass cap
	$\frac{1}{4}$ S20 NIR 1916

6 Survey of West Bdy. of Navajo Indian Reservation Through Tns. 21, 22, 23, 24 N. in R. 11 E.

Chains

and raise a mound of stone, 3 ft. base, 3 ft. high,
W. of cor.
60.51 Santa Fe R. R. water tank brs. S. $44\frac{1}{2}^{\circ}$ E.
80.00 Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the
ground, for cor. of fracl. secs. 17 and 20, and the
3rd mile post of W. bdy. of N. I. R., mkd. on brass
cap

T21N
R11E
S17 | NIR
S20 | 3MP
1916

and raise a mound of stone, 3 ft. base, 3 ft. high,
W. of cor.
Land, level.
Soil, thin and rocky on limestone bed rock, 6 to 8 ins.
deep.
Timber, scattering cedar and juniper trees at N. end of
mile.
Undergrowth, scattering rabbit brush, 1 to 2 ft. high.
Short grass.

40.00 North on 4th mile of W. bdy. of Navajo Indian Reservation,
over level prairie land, through scattering timber and
short undergrowth.
Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the
ground, for $\frac{1}{4}$ sec. cor. of fracl. sec. 17, mkd. on
brass cap

$\frac{1}{4}$ |
S17 | NIR
1916

53.21 and raise a mound of stone, 3 ft. base, 3 ft. high,
W. of cor.
SBank of Young's creek brs. NE. and SW.

54.76 Young's creek, 10 lks. wide, clear cold water, 1 ft. deep,
course NE. Asc. 35 ft. to

55.81 N. bank Young's creek brs. NE. and SW. Thence asc. gentle
SE. slope to

70.51 Edge of mesa bears NE. and SW. Thence across mesa.

80.00 Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the
ground, for cor. of fracl. secs. 8 and 17, and the 4th
mile post of W. bdy. of Navajo Indian Reservation, mkd.
on brass cap

T21N
R11E
S 8 | NIR
S17 | 4MP
1916

and raise a mound of stone, 2 ft. base, 2 ft. high,
W. of cor.
Land, level, and rolling.
Soil, thin and rocky on limestone bed rock, 6 to 8 ins.
below surface.
Timber, scattering juniper.
Undergrowth, scattering rabbit brush, 1 to 2 ft. high.
Short grass.

Survey of West Bdy. of Navajo Indian Reservation Through Ts. 21, 22, 23, 24 N., in R. 11 E

Chains

North on the 5th mile of W. bdy. of Navajo Indian Reservation, through scattering timber and undergrowth. Over nearly level land.

20.00 Leave mesa brs. E. and W. Desc. gentle N. slope, 40 ft.

37.51 Foot of slope. Thence over level land.

40.00 Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for $\frac{1}{4}$ sec. cor. of fracl. sec. 8, mkd. on brass cap

$\frac{1}{4}$ |
S 8 | NIR
1916

and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor.

80.00 Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 5 and 8 and 5th mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T21N
R11E
S 5 | NIR
S 8 | 5MP
1916

dig pits, 24 X 24 X 12 ins., NW and SW of post, 6 ft. dist.; and raise a mound of earth, 4 ft. base, 2 ft. high, W. of cor.

Land, nearly level.

Soil, thin and rocky, 6 ins. deep to limestone subsoil.

Timber, scattering juniper.

Undergrowth, rabbit brush, 1 to 2 ft. high.

Short grass.

North on 6th mile of W. bdy. of Navajo Indian Reservation, over gently rolling prairie land, through scattering short undergrowth.

40.00 Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for $\frac{1}{4}$ sec. cor. of fracl. sec. 5, mkd. on brass cap

$\frac{1}{4}$ |
S 5 | NIR
1916

and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor.

49.50 Foot of SE. slope brs. NE. and SW. Thence over rolling prairie land.

80.00 Set an iron post, 3 ft long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 5 and 32, Ts. 21 and 22 N., R. 11 E., and 6th. Mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T22N
R11E
S 32 | NIR
S 5 | 6MP
T21N
1916

and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor.

Land, gently rolling.

Soil, volcanic ash, coarse texture.

No timber.

Undergrowth, scattering rabbit brush.

Short grass.

78 Survey of the West bdy. of the Navajo Indian Reservation Through Ts. 21, 22, 23, 24 N., in R. 11 E.

Chains

T. 22 N., R. 11 E.

North on 7th mile of W. bdy. of Navajo Indian Reservation, over gently rolling land, through scattering short undergrowth.
 40.00 Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for $\frac{1}{4}$ sec. cor. of fracl. sec. 32, mkd. on brass cap

$\frac{1}{4}$ |
 S32 | NIR
 1916

and raise a mound of stone, 3 ft. base, 2 ft. high, W. of cor.
 80.00 Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 29 and 32 and 7th mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T22N
 R11E
 S29 | NIR
 S32 | 7MP
 1916

and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor.
 Land, gently rolling.
 Soil, volcanic ash, coarse texture.
 No timber.
 Undergrowth, scattering rabbit brush, 1 to 2 ft. high.
 Short grass.

North on 8th mile of W. bdy. of Navajo Indian Reservation, over gentle N. slope, through scattering short undergrowth.
 20.11 S. bank of San Francisco wash brs. E. and W. Desc. 20 ft.
 21.15 San Francisco wash, containing stream 30 lks. wide, 4 ft. deep, muddy water, swift current, course E. Asc. S. slope, 30 ft. to
 23.00 N. bank of San Francisco wash, brs. E. and W.
 40.00 Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for $\frac{1}{4}$ sec. cor. of fracl. sec. 29, mkd. on brass cap

$\frac{1}{4}$ |
 S29 | NIR
 1916

and raise a mound of stone, 3 ft. base, 2 ft. high, W. of cor.
 80.00 Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 20 and 29 and 8th mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T22N
 R11E
 S20 | NIR
 S29 | 8MP
 1916

and raise a mound of stone, 3 ft. base, 2 $\frac{1}{2}$ ft. high, W. of cor.
 Land, rolling.
 Soil, volcanic ash, coarse texture, rocky.
 No timber.
 Undergrowth, rabbit brush and sagebrush, 1 to 2 ft. high.
 Short grass.

Survey of West Bdy. of Navajo Indian Reservation Through Ts. 21 22 23 24 N. in R. 11 E.

Chains

North on the 9th mile of W. bdy. of Navajo Indian Reservation, over gently rolling land, through scattering short undergrowth.
Over gentle S. slope.
40.00 Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for $\frac{1}{4}$ sec. cor. of fracl. sec. 20, mkd. on brass cap

$\frac{1}{4}$ |
S20 | NIR
1916

and raise a mound of stone, 3 ft. base, 2 $\frac{1}{2}$ ft. high, W. of cor.
60.00 Foot of bluff brs. NE. and SW. Asc. 150 ft. to
67.30 Top of rocky bluff brs. E. and W. Thence over rolling mesa. From this point Leupp water tank brs. S. 88 $\frac{1}{2}$ ° E.
80.00 Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 17 and 20, and 9th mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T22N
R11E
S17 | NIR
S20 | 9MP
1916

dig pits, 24 X 24 X 12 ins. NW & SW of post, 6 ft. dist.; and raise a mound of earth, 4 ft. base, 2 ft. high, W. of cor.
Land, rolling.
Soil, volcanic ash, coarse texture, rocky.
No timber.
Undergrowth, scattering rabbit brush and sagebrush, 1 to 2 ft. high.
Short grass.

North on 10th mile of W. bdy. of Navajo Indian Reservation, over rolling prairie land, thru scattering undergrowth.
40.00 Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for $\frac{1}{4}$ sec. cor. of fracl. sec. 17, marked on brass cap,

$\frac{1}{4}$ |
S17 | NIR
1916

dig pits, 18 X 18 X 12 ins., N. and S. of post, 3 ft. dist.; and raise a mound of earth, 3 $\frac{1}{2}$ ft. base, 1 $\frac{1}{2}$ ft. high, W. of cor.
80.00 Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 8 and 17, and 10th mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T22N
R11E
S 8 | NIR
S17 | 10MP
1916

dig pits, 24 X 24 X 12 ins., NW & SW of post, 6 ft. dist.; and raise a mound of earth, 4 ft. base, 2 ft. high, W. of cor.
Land, rolling.
Soil, volcanic ash, coarse texture.
No timber.

10 Survey of West Bdy. of Navajo Indian Reservation Through T's. 21, 22, 23, 24 N., in R. 11 E.

Chains

Undergrowth, mountain-rush.
Short grass.

North on the 11th mile of W. bdy. of Navajo Indian Reservation, over rolling prairie land, through short mountain-rush.

10.51
40.00

Old road brs. E. and W.
Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for 1/4 sec. cor. of fracl. sec. 8, mkd. on brass cap

1/4 |
S 8 | NIR
1916

dig pits, 18 X 18 X 12 ins., N. and S. of post, 3 ft. dist.; and raise a mound of earth, 3 1/2 ft. base, 1 1/2 ft. high, W. of cor.

56.50
80.00

Old indian ruins bear E. 250 lks. dist.
Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 5 and 8, and 11th mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T22N
R11E
S 5 | NIR
S 8 | 11MP
1916

dig pits, 24 X 24 X 12 ins. NW & SW of post, 6 ft. dist.; and raise a mound of earth, 4 ft. base, 2 ft. high, W. of cor.

Land, rolling.
Soil, volcanic ash, coarse texture.
No timber.
Undergrowth, mountain-rush.
Good grass.

North on 12th mile of W. bdy. of Navajo Indian Reservation, over gently rolling prairie land, through scattering short undergrowth.

40.00

Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for 1/4 sec. cor. of fracl. sec. 5, mkd. on brass cap

1/4 |
S 5 | NIR
1916

dig pits, 18 X 18 X 12 ins., N. and S; of post, 3 ft. dist.; and raise a mound of earth, 3 1/2 ft. base, 1 1/2 ft. high, W. of cor.

80.00

Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 5 and 32, T's. 22 and 23 N., R. 11 E. and 12 mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T23N
R11E
S 32 | NIR
S 5 | M2MP
T22N
1916

dig pits, 24 X 24 X 12 ins., NW and SW.

Survey of West Bdy. of Navajo Indian Reservation Through Ts. 21, 22, 23, 24 N., in R. 11 E. 11.

Chains

of post, 6 ft. dist.; and raise a mound of earth, 4 ft. base, 2 ft. high, W. of cor.
 Land, rolling.
 Soil, volcanic ash, coarse texture.
 No timber.
 Undergrowth, mountain-rush, 1 ft. high.
 Good grass.

T. 23 N., R. 11 E.

North on 13th mile of W. bdy. of Navajo Indian Reservation, over level prairie land, through scattering short undergrowth.

- 5.50 Edge of mesa brs. NE. and SW. Desc. gentle N. slope, 50 ft. to
- 35.50 Bottom of slope brs. E. and W. Thence over level land.
- 40.00 Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for $\frac{1}{4}$ sec. cor. of frac. sec. 32, mkd. on brass cap

$\frac{1}{4}$ |
 S32 | NIR
 1916

dig pits, 18 X 18 X 12 ins., N. and S. of post, 3 ft. dist.; and raise a mound of earth, $3\frac{1}{2}$ ft. base, $1\frac{1}{2}$ ft. high, W. of cor.

- 51.00 Wagon road, Flagstaff to Grand Falls brs. NE. and SW. Asc. gentle S. slope.
- 67.00 Edge of lava flow brs. NE. and SW. Thence over lava bed.
- 80.00 Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of frac. secs. 29 and 32 and 13th mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T23N
 R11E
 S29 | NIR
 S32 | 13MP
 1916

and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor.

Land, rolling.
 Soil, volcanic ash, coarse texture, rocky at N. end of mile.
 No timber.
 Undergrowth, scattering rabbit and schadscale brush 1 to 3 ft. high.
 Good grass.

North on 14th mile of W. bdy. of Navajo Indian Reservation, over lava bed.

- 20.50 N. edge of lava bed brs. NE. and SW. Desc. gentle NW. slope.
- 40.00 Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for $\frac{1}{4}$ sec. cor. of frac. sec. 29, mkd. on brass cap

$\frac{1}{4}$ |
 S29 | NIR
 1916

dig pits, 18 X 18 X 12 ins., N. and S. of post, 3 ft. dist.; and raise a mound of earth, $3\frac{1}{2}$ ft. base, $1\frac{1}{2}$ ft. high, W. of cor.

12 Survey of West Bay of Navajo Indian Reservation Through Ts. 21, 22, 23, 24 N., in R. 11 E.

Chains

48.50 S. edge of lava bed brs. NE. and SW. Thence over lava bed.
80.00 Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 20 and 29, and 14th mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T23N
R11E
S20 | NIR
S29 | 14MP
1916

and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor.

Land, gently rolling.

Soil, coarse, volcanic ash.

No timber.

Undergrowth, scattering rabbit brush and mountain-rush, Good grass.

40.00 North on 15th mile of W. bdy. of Navajo Indian Reservation, over rolling lava bed.
Set an iron post, 3 ft. long, 1 in. diam., 22 ins. in the ground, in a mound of stone, for $\frac{1}{4}$ sec. cor. of fracl. sec. 20, mkd. on brass cap

$\frac{1}{4}$ |
S20 | NIR
1916

and raise a mound of stone, 2 ft. base, 2 ft. high, W. of cor.

53.91 Leave lava bed, brs. NE. and SW. Desc. gentle NW. slope.
80.00 Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 17 and 20, and 15th mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T23N
R11E
S17 | NIR
S20 | 15MP
1916

dig pits, 24 X 24 X 12 ins., in each sec., NW. and SW. of post, 6 ft. dist.; and raise a mound of earth, 4 ft. base, 2 ft. high, W. of cor.

Land, rolling.

Soil, volcanic ash, coarse texture, rocky.

No timber.

Undergrowth, scattering rabbit brush.

Short grass.

40.00 North on 16th mile of W. bdy. of Navajo Indian Reservation, over rolling prairie land, through scattering short undergrowth.

Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for $\frac{1}{4}$ sec. cor. of fracl. sec. 17, mkd. on brass cap

$\frac{1}{4}$ |
S17 | NIR
1916

and raise a mound of stone, 2 ft. base, 2 ft. high, W. of cor.

Survey of West Bdy. of Navajo Indian Reservation Through Tls. 21, 22, 23 and 24 N., in R. 11E.

Chains
80.00 Set an iron post, 3 ft. long, 3 ins. diam., 22 ins. in the ground, in a mound of stone, for cor. of fracl. secs. 8 and 17, and 16th mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T23N
R11E
S 8 | NIR
S 17 | 16MP
1916

and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor.
Land, rolling.
Soil, volcanic ash, coarse texture, rocky.
No timber.
Undergrowth, scattering rabbit brush 1 to 2 ft. high.
Short grass.

North on 17th mile of W. bdy. of Navajo Indian Reservation, over rolling prairie land, through scattering short undergrowth.

35.50 Shallow draw, course NE.
40.00 Set an iron post, 3 ft. long, 1 in. diam., 20 ins. in the ground, for $\frac{1}{4}$ sec. cor. of fracl. sec. 8, mkd. on brass cap

$\frac{1}{4}$
S 8 | NIR
1916

and raise a mound of stone, 3 ft. base, 2 ft. high, W. of cor.

Asc. gradual slope.
70.00 Top of ascent. Desc. gradual slope.
80.00 Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 5 and 8, and 17th mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T23N
R11E
S 5 | NIR
S 8 | 17MP
1916

and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor.
Land, rolling.
Soil, volcanic ash, coarse texture.
No timber.
Undergrowth, schadscale brush, 1 ft. high.
Good grass.

North on 18th mile of W. bdy. of Navajo Indian Reservation, over rolling prairie land, through scattering short undergrowth.

40.00 Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for $\frac{1}{4}$ sec. cor. of fracl. sec. 5, mkd. on brass cap

$\frac{1}{4}$
S 5 | NIR
1916

14 Survey of West Bdy. of Navajo Indian Reservation Through Ts. 21, 22, 23, 24 N. in R. 11 E.

Chains
 70.00 Shallow wash, 20 lks. wide, 1 ft. deep, course NE.
 79.90 Old road brs. NE. and SW.
 80.00 Set an iron post, 3 ft. long, 3 ins. diam., 20 ins. in the ground, in a mound of stone, for cor. of fracl. secs. 5 and 32, Ts. 23 and 24 N., R. 11 E., and the 18th mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap.

T24N
 R11E
 S32 | NIR
 S 5 | 18MP
 T23N
 1916

dig pits, 24 X 24 X 18 ins., in each cor., NW. and SW. of post, 6 ft. dist.; and raise a mound of earth, 4 ft. base, 2 ft. high, W. of cor.
 Land, rolling prairie.
 Soil, red sandy loam on rock subsoil.
 No timber.
 Undergrowth, schadscale and mountain-rush, 1 to 2 ft. high.
 Short grass.

T. 24 N., R. 11 E.

North on 19th mile of W. bdy. of Navajo Indian Reservation, over rolling prairie land, through scattering short undergrowth.
 5.00 Shallow draw, course NE. Asc. gentle S. slope 34 ft. to
 35.00 Edge of mesa brs. E. and W.
 40.00 Set an iron post, 3 ft. long, 1 in. diam., 24 ins. in the ground, for $\frac{1}{4}$ sec. cor. of fracl. sec. 32, mkd. on brass cap

$\frac{1}{4}$ |
 S32 | NIR
 1916

and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor.
 55.00 Line passes 350 lks. W. of old indian ruins. Asc. to
 57.00 Summit of low ridge brs. E. and W. Desc. gradual N. slope.
 70.00 Edge of mesa brs. E. and W. Desc. gentle N. slope.
 79.50 Foot of descent, thence over level land.
 80.00 Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 29 and 32, and 19th mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap.

T24N
 R11E
 S29 | NIR
 S32 | 19MP
 1916

and raise a mound of stone, 3 ft. base, 2 ft. high, W. of cor.
 Land, gently rolling.
 Soil, thin and rocky.
 No timber.
 Undergrowth, scattering schadscale and mountain-rush, 1 to 2 ft. high.
 Short grass.

Survey of West Bdy. of Navajo Indian Reservation Through Ts. 21 22 23 and 24 N. in R. 11 E.

Chains

North on 20th mile of W. bdy. of Navajo Indian Reservation, over gently rolling land, through scattering short undergrowth.

40.00 Set an iron post, 3 ft. long, 1 in. diam., on surface rock, in a mound of stone, for 1/4 sec. cor. of fracl. sec. 29, mkd. on brass cap

1/4 |
S29 | NIR
1916

and raise a mound of stone, 2 ft. base, 2 ft. high, W. of cor.

76.50 Rim rock brs. E. and W. Desc. 40 ft. in draw.

80.00 Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 20 and 29, and 20th mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T24N
R11E
S20 | NIR
S29 | 20MP
1916

dig pits, 24 X 24 X 12 ins., NW. and SW. of post, 6 ft. dist.; and raise a mound of earth, 4 ft. base, 2 ft. high, W. of cor.

Land, rolling.

Soil, thin and rocky.

Timber, none.

Undergrowth, scattering schadscale and mountain-rush, 1 to 2 ft. high.

Short grass.

North on 21st mile of W. bdy. of Navajo Indian Reservation, over level land in bottom of draw.

15.00 Rim-rock brs. E. and W. Asc. 20 ft. to mesa.

26.50 Rim-rock, 20 ft. high, brs. NE. and SW. Thence across draw.

37.50 Rim-rock, 20 ft. high, brs. NE. and SW. Asc. to mesa.

40.00 Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for 1/4 sec. cor. of fracl. sec. 20, mkd. on brass cap

1/4 |
S20 | NIR
1916

and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor.

55.00 Shallow draw, 1 ch. wide, course NE.

74.30 Rim-rock, 10 ft. high brs. NE. and SW. Desc. to

80.00 Set an iron post, 3 ft. long, 3 ins. diam., 24 ins. in the ground, for cor. of fracl. secs. 17 and 20, and 21st mile post of Navajo Indian Reservation, mkd. on brass cap

T24N
R11E
S 17 | NIR
S 20 | 21MP
1916

and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor.

Land, rolling and broken.

Soil, thin and rocky.

Survey of West Bdy. of Navajo Indian Reservation Through Ts. 21, 22, 23, 24 N., in R. 11 E.

Chains

No timber.
Undergrowth, schadscale brush, 1 to 2 ft. high.
Scattering short grass.

40.00 North on 22nd mile of W. bdy. of Navajo Indian Reservation, over rolling land, through scattering short undergrowth. Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for $\frac{1}{4}$ sec. cor., of fracl. sec. 17, mkd. on brass cap

$\frac{1}{4}$ |
S17 | NIR
1916

45.00 and raise a mound of stone, 2 ft. base, 2 ft. high, W. of cor.
80.00 Wash, 20 lks. wide, 1 ft. deep, course NE. Set an iron post, 3 ft. long, 3 ins. diam., 22 ins. in the ground in a mound of stone, for cor. of fracl. secs. 8 and 17 and 22nd mile post of W. bdy. of Navajo Indian Reservation, marked on brass cap,

T24N
R11E
S 8 | NIR
S17 | 22MP
1916

and raise a mound of stone, 3 ft. base, 3 ft. high, W. of cor.
Land, rolling.
Soil, thin and rocky.
No timber.
Undergrowth, low schadscale brush.
Short grass.

10.00 North on 23rd mile of W. bdy. of Navajo Indian Reservation, over rolling land, through scattering undergrowth.
40.00 Dim wagon road brs. NW. and SE. Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for $\frac{1}{4}$ sec. cor., of fracl. sec. 8, mkd. on brass cap

$\frac{1}{4}$ |
S 8 | NIR
1916

60.14 and raise a mound of stone, 3 ft. base, 2 $\frac{1}{2}$ ft. high, W. of cor.
62,52 Top of bluff. Desc. 150 ft. into box canyon. True point for meander cor. on left bank of Little Colorado river. Impractical to set cor. at this point on account of loose, sandy bank; therefore, at
60.14 Set an iron post, 3 ft. long, 3 ins. diam., 18 ins. in crevice in rocks, in a mound of stone, for witness cor. to meander cor. of fracl. sec. 8 and Angle Point No. 1 of W. bdy. of Navajo Indian Reservation, marked on brass cap,

M
WC | C
T24N |
R11E |
S 8 | NIR
1916

and raise a mound of stone, 3 ft. base, 3 ft. high, S. of cor.

Survey of West Bdy. of Navajo Indian Reservation Through Ts. 21. 22. 23. 24 N. in R. 11 E. 17

Chains
68.53

True point for angle point No. 1, of Navajo Indian Reservation, at intersection of 35° 30' parallel of lat. with middle line of Little Colorado River, hereinbefore described, (witnessed 8.39 chs. south).

Land, rolling and broken.

Soil, thin and rocky.

No timber.

Undergrowth, scattering schadscale brush.

Short grass.

BOOK 3214

APR 25 1918

CERTIFICATE OF UNITED STATES SURVEYOR.

Thomas B. Matthews, U. S. Surveyor, hereby certify upon honor that, in pursuance

of special instructions received from the U. S. Surveyor General for Group 68, Arizona,

bearing date of the 17th day of December, 1915, I have well, faithfully, and truly

in my own proper person, and in strict conformity with said instructions, the Manual of Surveying Instruc-

tions, and the laws of the United States, surveyed all those parts or portions of the

West boundary of the Navajo Indian Reservation from the southwest cor-

ner thereof, north to intersection with the Little Colorado River, thru

TOWNSHIPS 21, 22, 23 AND 24 NORTH, in RANGE 11 EAST,

of the Gila and Salt River

Base and Meridian, in the State of Arizona,

and by the diagram on page 2 hereof

the foregoing field notes, as having been executed by me, and under my direction; and that all the corners of

said survey have been established and perpetuated in strict accordance with the Manual of Surveying Instruc-

tions, and the special written instructions of the U. S. Surveyor General for Group 68, Arizona,

and in the specific manner described in the field notes, and that the foregoing are the original field notes of

such survey.

Thomas B. Matthews, U. S. Surveyor.

APPROVAL.

OFFICE OF THE UNITED STATES SURVEYOR GENERAL,

Phoenix, Arizona, January 15, 1919

The foregoing field notes of the survey of that part of the

West boundary of the Navajo Indian Reservation from the Southwest

corner thereof to the intersection with the Little Colorado River,

thru. Townships 21, 22, 23 and 24 North, in Range 11 East,

of the Gila and Salt River Base and Meridian, in the State of Arizona,

executed by Thomas B. Matthews, U.S. Surveyor,

under his special instructions dated Dec. 17, 1915, for Group 68, Arizona, having been critically examined, and the necessary corrections and explanations made, the said field notes, and the surveys they describe, are hereby approved.

Francis De Troit, U. S. Surveyor General.

I certify that the foregoing transcript of the field notes of the above described surveys in

has been correctly copied from the original notes on file in this office.