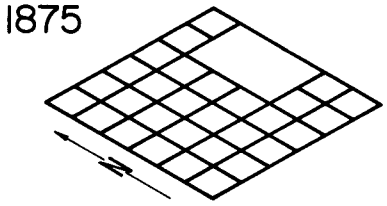
Chapter B

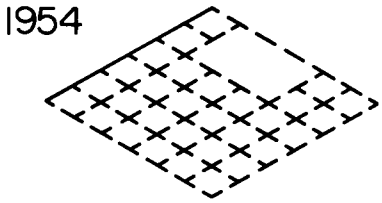
Completions With Defective Boundaries

B3



History of Surveys

1875 - T.F. White surveyed all four boundaries and most of the subdivisional lines" The original plat is shown in figure 1.



1954 - D.E. Harding resurveyed the north boundary and established new corners referring to the township to the north, T. 3 S., R. 23 E., Gila and Salt River Meridian.

Reasons for Request of this Survey

This survey was routinely requested for the administration of the public lands.

Special Instructions

On February 24, 1958 Special Instructions were written and approved, providing for the dependent resurvey of a portion of the subdivisional lines and completion of the subdivisional lines of the township. The completion was to be executed in the normal manner unless errors of closure indicated other procedures were required.

Conditions Found on the Ground

All of sections 11 through 14, 23 and 24 were vacant public lands. Four quarter sections were protracted on the 1876 plat, see figure 1.

The surveyor retraced the exterior lines of sections 11-14, 23 and 24, including 3 miles of the east boundary. Most of the corners on the subdivisional lines were missing and the retracements were extended to the lines of sections 2, 3, 10, 15 and 22, in search for control points to govern reestablishment of the missing corners. Figure 2 indicates those corners which were recovered and those which were lost.

Preliminary Statement

It is required to complete the survey of the township subdivisional lines with as many normal sections and aliquot parts as possible. The lost corners of the 1875 survey had to be restored before the completion plan could.be determined.

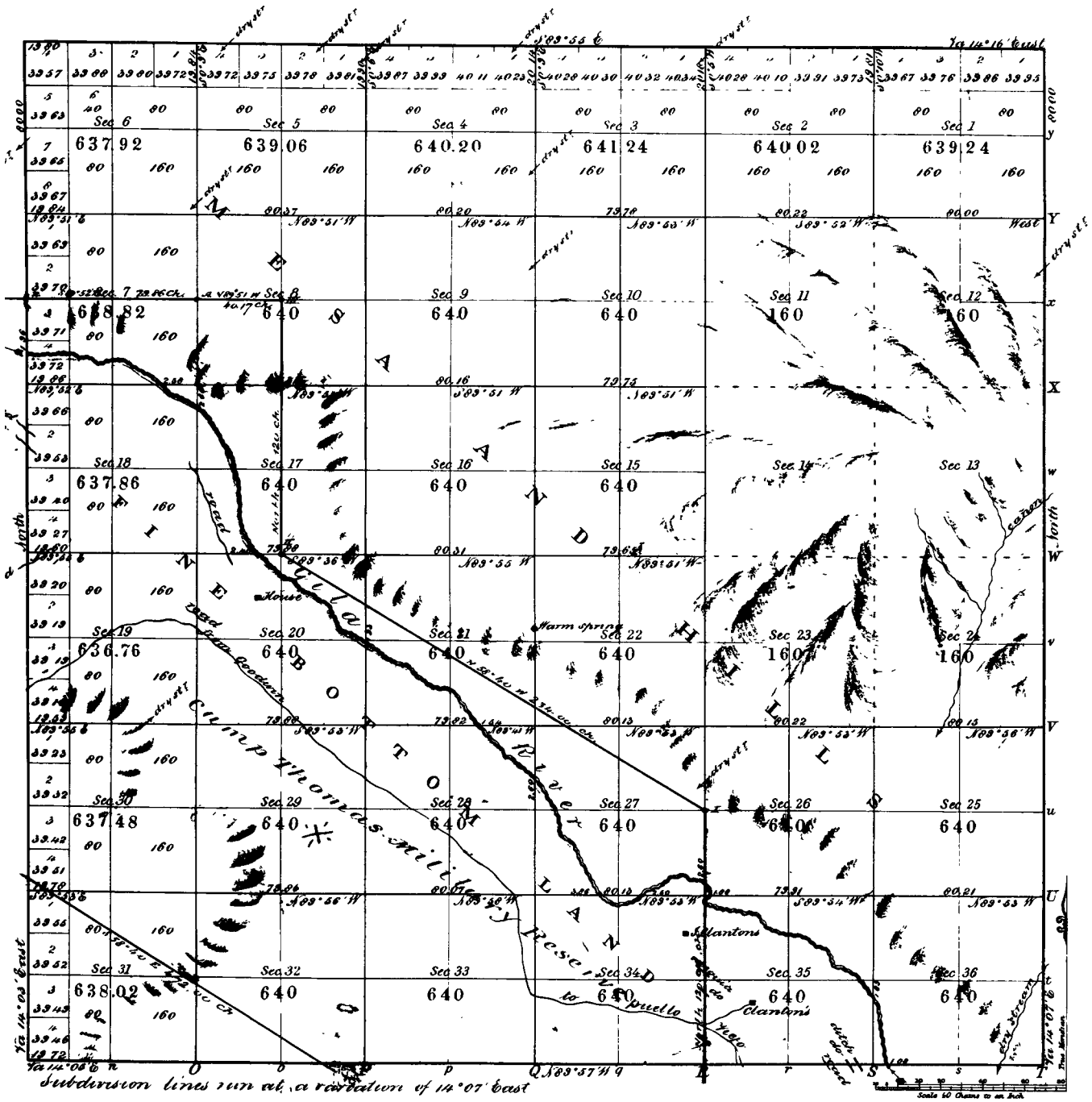


Figure 1 - Original Plat

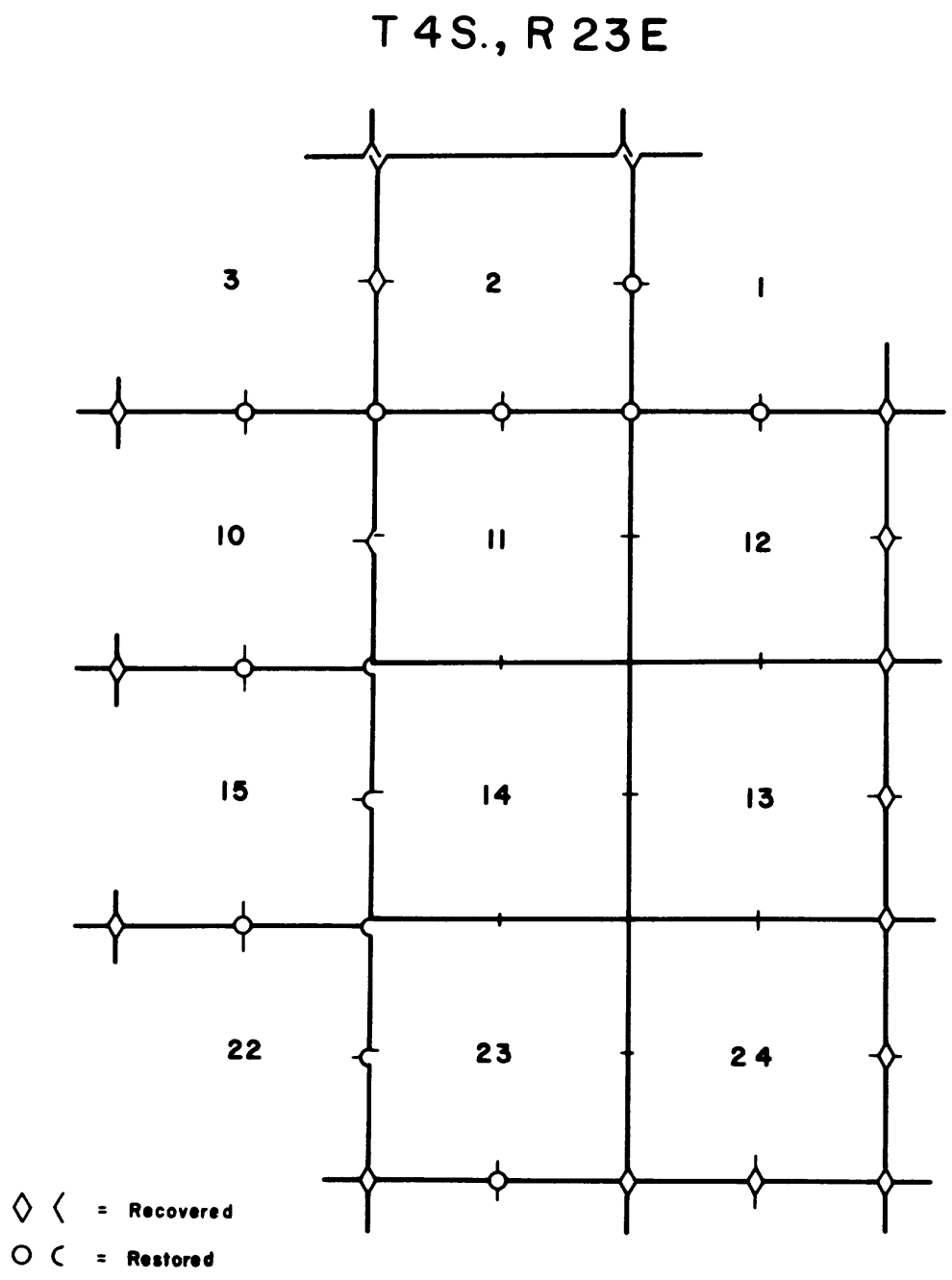


Figure 2 - Corner Recovery

Regulations

This survey illustrates the application of the following sections of the Manual of Instructions for Survey of the Public Lands, 1973:

5-25 to 5-28	Double Proportionate measurement
5-29	Three point" control (combined single proportionate and record measure in opposite direction)
3-100 to 3-102	Extension and Completion Surveys
3-103 to 3-111	Completion of partially surveyed sections

Auxiliary Topic No.1, Three Point Control

This survey illustrates the "three point control" method of restoring a lost corner. The double proportionate method can be applied only when the lines surveyed have been extended in all four directions from the lost corner. When surveyed lines have been extended only three directions from a lost corner there is no basis for a double proportion. This is the situation at the lost corners of sections 1, 2, 11 and 12; 10, 11, 14 and 15; and 14, 15, 22 and 23, as established in 1875. To reestablish the lost corner, the record distance of the line is used in one direction to control either the latitudinal or longitudinal position and single proportion is used to establish the opposite latitudinal or longitudinal position.

The corner of sections 1, 2, 11 and 12 was restored at record distance southerly in latitude from the corner of sections 1 and 2 on the north boundary and in departure by single proportionment between the corners of sections 1, 6, 7 and 12 and 3, 4, 9 and 10.

The corners of sections 10, 11, 14 and 15, and 14, 15, 22 and 23 were also restored by three point control at single proportion in latitude between the ¼ corner of sections 10 and 11, and the corner of sections 22, 23, 26 and 27; and at record distance in departure easterly from the corners of sections 9, 10, 15 and 16, and 15, 16, 21 and 22.

Auxiliary Topic No.2. Protracted Areas

The original survey plat showed protractions of the areas of NW ¼ section 11, NE ¼ section 12, SW ¼ section 23, and SE ¼ section, 24.

The accepted plat of this survey shows the protracted SE ¼ of section 24 and SW ¼ of section 23 but not the protracted NE ¼ of section 12 and NW ¼ of section 11.

The protraction of the SW ¼ of section 23 is technically incorrect, and should not have been shown in this manner. The original protraction was from the original (1875) ¼ corner of sections 22 and 23. If any portion of section 23 had been patented the survey of the section would be based on the original corner and not the newly established ¼ corner of section 23 only. Since the section is all public land no actual problem exists and the section could be subdivided as the plat is drawn.

The areas of lots 1 thru 4 of section 24 on the accepted plat are in error and could be misleading because of the protracted SE ¼ of section 24. As drawn, the plat implies that the protracted ¼ section is based on lines parallel to the south half of the east boundary and east half of the south boundary of section 24, creating a "broken" centerline situation. There would be no good reason for this because the centerlines of the section, if surveyed normally would properly protect the protracted SE ¼ of section 24 if it had been patented. The line between sections 13 and 24 is well within limits for "midpointing" that ¼ section corner. The ¼ corner of sections 23 and 24 is 40 chains north, protecting the protraction in latitude also.

Figure 4 is a diagram of section 24, with the error of closure adjusted by the broken boundary method. The diagram shows the section boundaries and center lines, based on an adjusted, flat, closure. The 1/16 section corners are placed at midpoint between ¼ corners and the center lines of the SW ¼ are normal. The areas of Lots 1 thru 4 are recomputed, based on the described method of subdivision. A comparison of the areas tends to prove that this is the method of subdivision intended on the new plat.

The protractions on the 1876 plat, of the NE ¼ of sections 12 and NW ¼ of section 11, were cancelled and the sections lotted as shown with as many aliquot parts as possible. When an entire section is vacant this is proper and is required. If either of these ¼ sections had been patented the procedure of completion would be quite different, in order to protect the patented lands.

Auxiliary Topic No.3, Distortion

Sections 5-29 and 5-45 of the Manual of Surveying Instructions, 1973, outline an exception of using the record distance when control in one direction is lacking. Any "average difference" must be conclusive and though there is a shortage in the original survey measurements in this case it is not conclusive. Using an average of all the retracement distances between recovered corners would distort some of the lines being restored.

An average of all the shortages is 20 links per half mile, with a range of from 2 links up to 40 links. This range could not be construed as a a definite deficiency under the circumstances.

Solution

The missing corners of the 1875 survey had to be restored before the completion plan could be determined. See Auxiliary Topic No. 1 for restorations performed first.

The corner of sections 2, 3, 10 and 11 was restored by double proportionate measurement between the corner of sections 1, 6, 7 and 12 and sections 3, 4, 9 and 10; and between the ¼ section corners of sections 2 and 3 and sections 10 and 11.

The missing ¼ section corners were restored by single proportionate measurement between the recovered or restored section corners.

The west boundaries of sections 11, 14 and 23 were defective in measurement. The west boundary of section 11 and west half of the south boundary of section 24 were defective in alinement. The east boundary of sections 12, 13 and 24 was irregular but not defective, and by computation the line between sections 11 and 12 would not exceed 21' of arc.

The completion survey proceeds along the basic principle that the completion pattern should provide as many normal sections as possible with as few "double" corners and closing corners and as little lotting as possible.

New corners were established along the west boundary of sections 11, 14 and 23 at 40 and 80 chain intervals in latitude, counting from the corner of sections 22, 23, 26 and 27, with the deficiency in the north half of the west boundary of section 11. The original, or restored, corners along this line were changed to refer to sections 10, 15 and 22 only. This creates what is called a "double set" of corners, with the 1875 survey controlling for alinement. The 1875 survey is the "senior" line controlling any future restorations.

The first meridional line was surveyed north from the corner of sections 23, 24, 25 and 26 with corners established at 40 and 80 chain intervals. The line between sections 11 and 12 was surveyed "random and true," with the deficiency in the north half mile.

The east-west section lines were completed by surveying them random and true. All fell within limits for both alinement and measurement. The ¼ section corners were therefore established at mid-point on those lines.

TOWNSHIP 4 SOUTH, RANGE 23 EAST, GILA AND SALT RIVER MERIDIAN, ARIZONA.

COMPLETION SURVEY

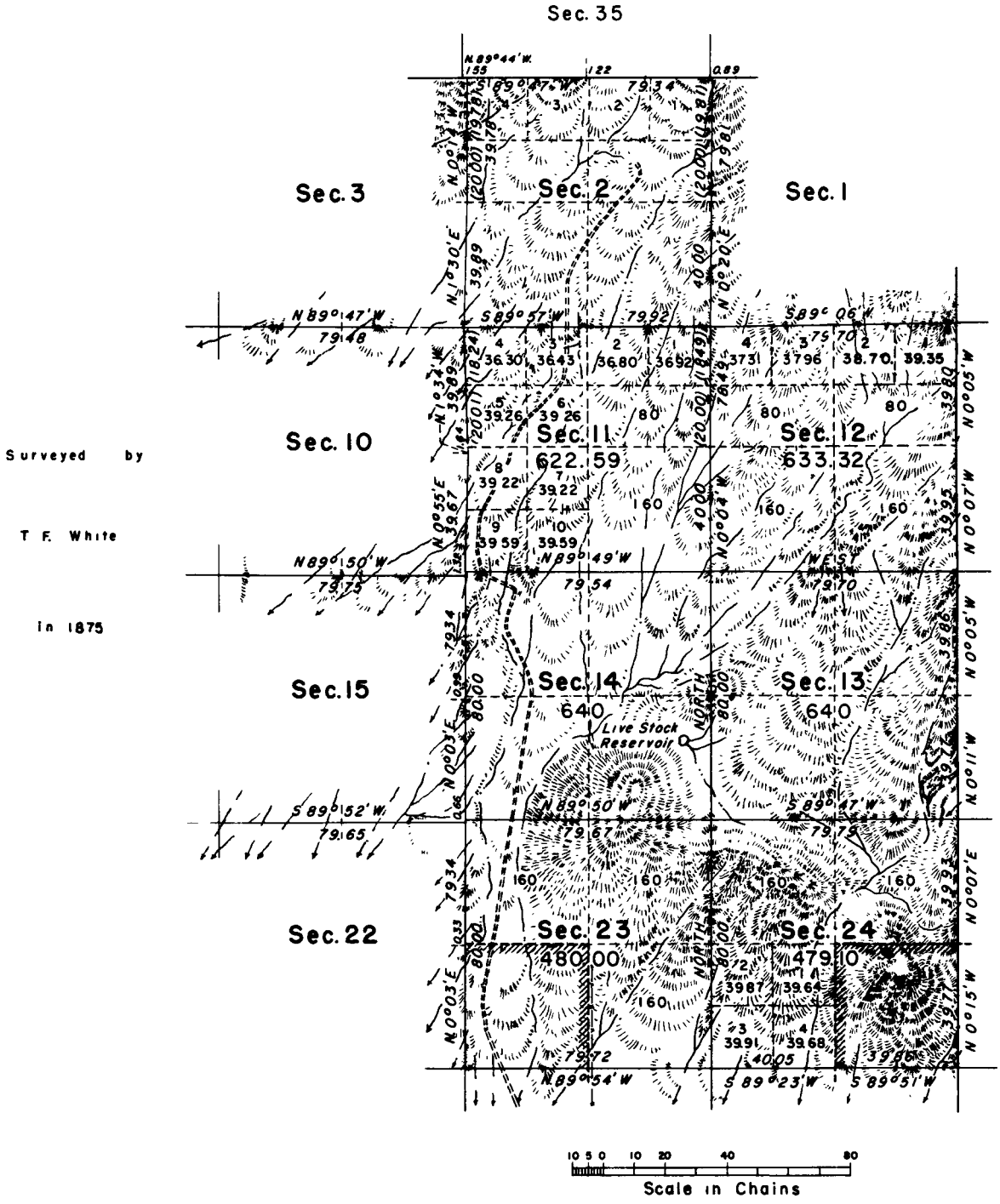


Figure 3 - Accpeted Plat

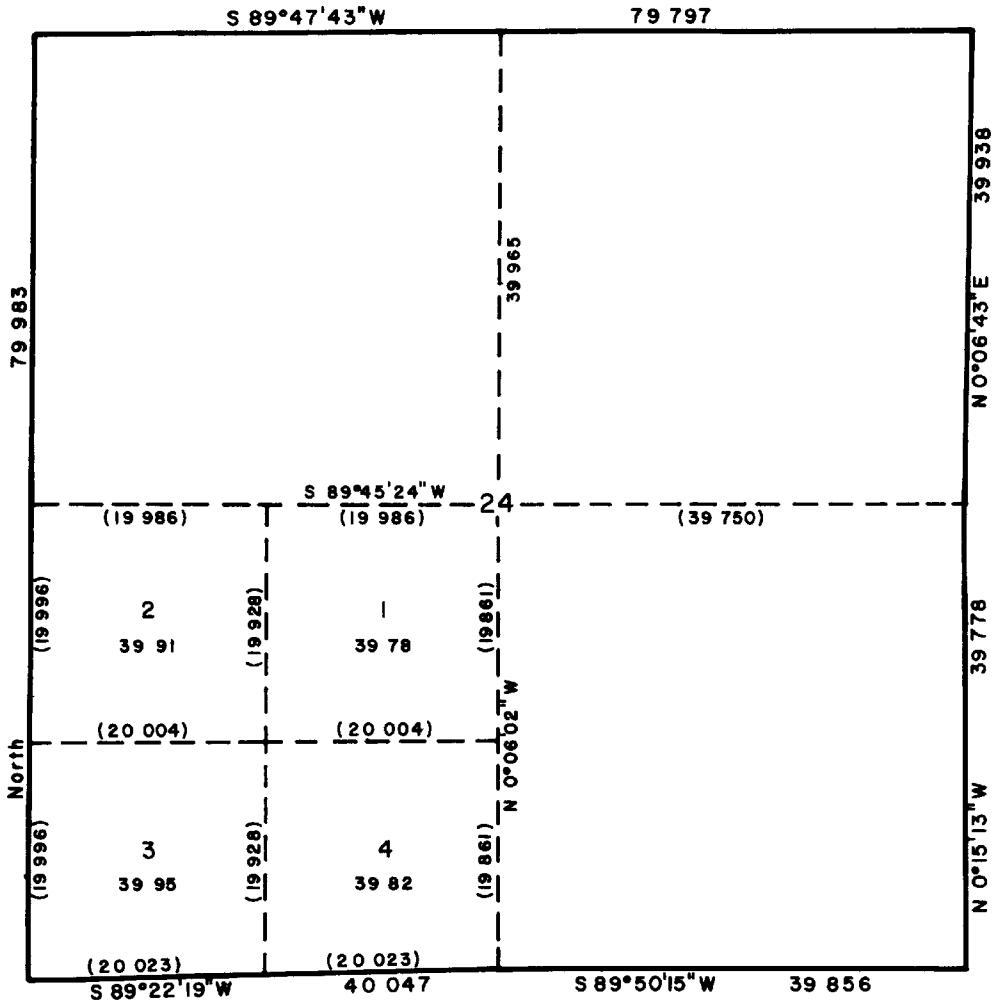


Figure 4 - Areas in Section 24