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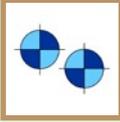
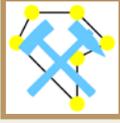
Changes to the 2009 *Manual of Surveying Instructions*

In a previous article, published online in June 2011, I discussed why the 2009 update to the *Manual of Surveying Instructions* was needed and how the BLM implemented it. The article is available in the Amerisurv Exclusive Online section of *The American Surveyor* website at www.amerisurv.com/content/view/8774/. What follows here are highlights of some of those changes in the 2009 edition of the *Manual* as compared to the 1973 edition.

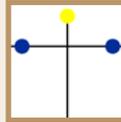
Four areas of significant change include water boundaries, standard of evidence, coordinates as evidence, and mineral survey resurveys. There is also a policy clarification related to closing corners, Alaska-specific material, and information on Historical Land Surveying Methods that was removed from Chapter 2.

Four Areas of Significant Change

Three major changes related to water boundaries including determining the navigability of a water body, issues involving submerged lands, and ownership of unsurveyed islands. The 1973 Edition contained a small group of sections on meander lines for water bodies in Chapter 3, but little other material related to water boundaries. Now expanded, the 2009 Edition also contains a new chapter on resurveys and a comprehensive discussion of water boundaries (Chapter 8). Much

4 AREAS OF SIGNIFICANT CHANGE	
	Water Boundaries
	Corner Status Standard of Evidence
	Coordinates as Evidence
	Mineral Survey Resurveys

of this material is drawn from the book *River and Lake Boundaries* by James Simpson. Topics include: Resurvey of Meander Lines, Navigability, Source of Law Considerations (Conflict between State and Federal Law), Delimitation of Opposite Banks, Water Body Movements, Partition Lines in Accreted and Relict Areas, Islands and Sandbars, Erroneously Omitted

OTHER CHANGES	
	Alaska Specific Material
	Closing Corner Policy Clarification
	Technology

Lands, Accretion Prior to Entry, Land Outside Meanders with No Gross Error In Survey, Mineral Land Surveys and Water Boundaries, Acquired Lands and Tidal Waters, and Division of Tidewater Flats.

The standard of evidence used to determine if a PLSS corner is existent, obliterated, or lost has been clarified. The definition of these three corner categories

SUBSTANTIAL EVIDENCE STANDARD

“Relevant Evidence as a reasonable mind might accept as adequate to support the conclusion. Substantial evidence is more than a scintilla of evidence, but less than a preponderance of evidence.”

has been updated in the new edition of the manual to reflect this clarification.

The 2009 Edition explains the new standard of evidence that must be met to categorize a client as existent or obliterated. This standard has been clarified as “substantial evidence”. Section 6-11 provides a definition of this “substantial evidence” standard: “*Relevant evidence as a reasonable mind might accept as adequate to support the conclusion. Substantial evidence is more than a scintilla of evidence, but less than a preponderance of the evidence.*”

Section 6-15 clarifies that there are no set rules on corner status determination, but that good professional judgment must be used when evaluating the evidence to see if it meets the “substantial evidence” standard.

The 2009 Edition provides instructions on when *repeatable* coordinates can be used as collateral evidence of a PLSS corner location. It also provides a description of circumstances in which repeatable coordinates may be the *best* available evidence of the corner location. Section 2-33 and 2-34 provides general information on the use of the State Plane Coordinate System for PLSS surveys.

The 2009 Edition also greatly expands the instructions on mineral resurveys and mineral segregation surveys. This expanded content incorporates material from the BLM *Mineral Survey Procedures Guide*. The new material on mineral resurveys is in Chapter 10, Section 10-208 to Section 10-229.

Policy Clarification on Closing Corners

The 2009 Edition makes a policy clarification regarding closing corners. In our previous understanding, closing corners only controlled the alignment of the junior PLSS line being established. It did not control the alignment or position of the senior PLSS line being intersected. The new understanding is that closing corners set during a careful

retracement may be accepted as controlling the senior line marked. This may result in a small kink or angle point in the senior line. The distinction between whether a closing corner will control a senior line is directly related to the method used to set the closing corner. The retracing land surveyor needs to ask when the corner was set and if its position was the result of a careful retracement of the senior corners. If the closing corner was located properly after a proper retracement of the senior corners, it may control the senior PLSS line. See Section 7-24, Section 7-25, and Section 7-26 of the 2009 Edition for more information.

Alaska-Centric Survey Statutes

Scattered throughout the *Manual* is Alaska-centric material. For example, there is a discussion of the rules related to the meandering of water bodies in Alaska on page 26.

Information Removed From Chapter 2

One of the goals of the 2009 Edition was to be technology independent. As part of the effort to reach this goal, information on historical surveying methods included in the 1973 Edition was removed from the 2009 Edition. However, this material is still valuable to the land surveyor that needs to retrace historical PLSS surveys. It is essential that the retracing surveyor in this situation understand the tools and methods used by the PLSS land surveyor that preceded him. As a consequence, the material removed from Chapter 2 of the 2009 Edition is still valuable. My review of Chapter 2 in both editions revealed the sections on measurement with tapes, stadia measurements, subtense bar measurements, traversing methods, triangulation, electronic telemetry, and the use of photogrammetry in PLSS surveys have been removed from the 2009

WATER BOUNDARY ADDITIONS

- Resurvey of Meander Lines
- Navigability
- Source of Law Considerations
- Determination of Opposite Banks
- Water Body Movements
- Partition Lines in Accreted and Relicted Areas
- Islands and Sandbars
- Erroneously Omitted Lands
- Accretion Prior to Entry
- Land Outside Meanders with No Gross Error in Survey
- Mineral Land Surveys and Water Boundaries
- Acquired Lands and Tidal Waters

edition. The prohibition on using the magnetic needle to determine the direction of a line in a PLSS survey remains in Chapter 2, though it has moved from Section 2-18 to Section 2-4. Section 2-4 of the new edition also mentions other historical means of establishing direction, including the solar compass, transit with solar attachment, and direct observation of Polaris or other stars. However, this section does not contain any details on the way these historical methods were executed.

It seems prudent for land surveyors working in areas governed by the PLSS to keep or obtain a copy of the 1973 Edition in order to reference information on methods used by previous PLSS surveyors as needed during their retracement work. A PDF copy of the 1973 Edition can be downloaded from the Arizona Office of the BLM at this URL: <http://www.blm.gov/az/st/en/prog/cad/manual.html>. 