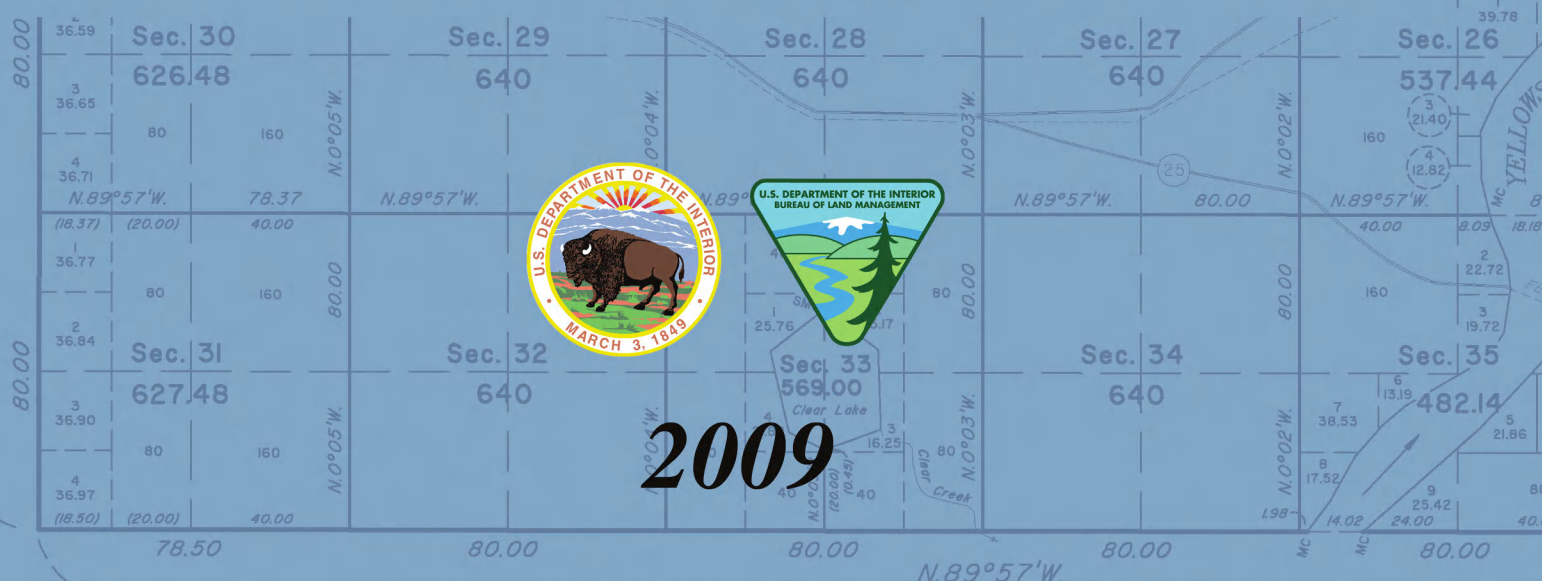


Surveyed by Thomas Acres in 2007 NORTH



# Manual of Surveying Instructions



who thereafter administered the same in association with the surveying operations in his charge and under regulations as the Secretary of the Interior provided.

The administrative plan that was set up through the Act of March 3, 1925, continued in operation until displaced by the reorganization of July 16, 1946, wherein the GLO was abolished and its functions transferred to the BLM.

The Act of July 7, 1943, as amended (57 Stat. 380; 44 U.S.C. 3301), defines Federal records (also called official records) as all papers and maps made or received by an agency of the United States in connection with the transaction of public business and preserved because of the administrative, legal, fiscal, or informational value of data in them.

The Federal Records Act of 1950, as amended (64 Stat. 586; 44 U.S.C. 3101), requires the preservation of Federal records vital to the protection of the legal and financial rights of the Government and individuals affected.

The Submerged Lands Act of 1953 (43 U.S.C. 1301 et seq. and 1311 et seq.) uses the terms “navigable” and “navigability” for the purpose of determining title to lands beneath navigable waters, as between the United States and the several States.

The Alaska Statehood Act of July 7, 1958 (72 Stat. 339, 344; 48 U.S.C. note preceding section 21), modifies public land survey law, in Alaska, by allowing selected land to be conveyed by tentative approval prior to survey. Subject to valid existing rights, the force and effect of such a tentative approval is to convey to and vest in the State exactly the same right, title, and interest in and to the selected lands the State would have received had it been issued a patent by the United States. The survey of the exteriors of the selections only, without any interior subdivision, is permissible. The boundaries of the lands as defined and conveyed by the tentative approval shall not be altered but may then be redescribed, if need be, in reference to the plat of survey. Upon survey of lands covered by the tentative approval, a confirmatory patent thereto shall be issued to the State. This Act is applicable only to land in Alaska.

The Public Land Administration Act of July 14, 1960 (section 103; 74 Stat. 506; 43 U.S.C. 1364), provides that the Secretary of the Interior may accept contributions for cadastral surveying performed on Federally controlled or intermingled lands. This Act was repealed by section 705(a) of FLPMA on October 21, 1976. Section 307(c) of FLPMA (43 U.S.C. 1737(c)) substantially reenacts 43 U.S.C. 1364.

The Alaska Native Claims Settlement Act (ANCSA) of December 18, 1971 as amended (85 Stat. 688; 43 U.S.C. 1612, 1621), provides that the Secretary, save explicit exceptions, shall survey all Native Alaska Village Corporation withdrawals, selections, and conveyances in conformance as nearly as practicable to the PLSS.

ANCSA also modifies public land survey law by allowing selected land to be conveyed by interim conveyance prior to survey. Subject to valid existing rights, the force and effect of such an interim conveyance is to convey to and vest in the recipient exactly the same right, title, and interest in and to the selected lands as the recipient would have received had they been issued a patent by the United States. In addition, the Act authorizes original surveys to monument only exterior boundaries of the areas selected or designated areas at angle points and at intervals of approximately 2 miles on straight lines. The Act states that no ground survey or monumentation will be required along meanderable water boundaries and conveyances can be based upon protraction diagrams. Upon survey of lands covered by the interim conveyance, a confirmatory patent thereto shall be issued to the Native Corporation. This Act is applicable only to land in Alaska.

The Federal Land Policy and Management Act of October 21, 1976 (90 Stat. 2743, 2747; 43 U.S.C. 1701, 1711), provides that the Secretary shall prepare and maintain, on a continuing basis, an inventory of all public lands and shall ascertain the boundaries of the public lands; provide means of public identification thereof including, where appropriate, signs and maps; and provide State and local governments with data from the inventory for the purpose of planning and regulating the uses of non-Federal lands in proximity of such public lands.

Under FLPMA, a tract of public lands<sup>10</sup> or interests therein or a tract of land or interests therein within the National Forest System may be disposed of by exchange; the costs or other responsibilities or requirements shall include costs or other requirements associated with land surveys (90 Stat. 2756; 102 Stat. 1087; 43 U.S.C. 1716).

Under FLPMA, unsurveyed islands may be surveyed and conveyed if the applicant State or its political sub-

<sup>10</sup> Under section 103 of FLPMA, the term “public lands” means any land and interest in land owned by the United States within the several States and administered by the Secretary of the Interior through the Bureau of Land Management, without regard to how the United States acquired ownership, except: (1) land located on the Outer Continental Shelf; and (2) lands held for the benefit of Indians, Aleuts, and Eskimos” (43 U.S.C. 1702(e)).

division donates money or services for such survey and such services are conducted pursuant to criteria established and survey approval by the Director (43 U.S.C. 1721).

Under FLPMA, omitted lands, other than islands, are lands determined after survey to be erroneously or fraudulently omitted from the original surveys. Conveyance of such land shall not be made without a survey. The prospective recipient may donate money or services for the survey and such services are conducted pursuant to criteria established by the Director (43 U.S.C. 1721).

Under FLPMA, the Secretary may establish reasonable charges and commissions with respect to applications and other documents relating to the public lands. Such fees collected shall be made immediately available for program operations and remain available until expended (43 U.S.C. 1734).

The Secretary is authorized to enter into contracts for the use of aircraft and for supplies and services prior to the passage of an appropriation therefore for airborne cadastral survey operations of the BLM (43 U.S.C. 1738).

FLPMA permits the Secretary to issue a document of disclaimer of interest or interests in any lands in any form suitable for recordation, where the disclaimer will help remove a cloud on the title of such lands and where he or she determines (1) a record interest of the United States in lands has terminated by operation of law or is otherwise invalid; or (2) the lands lying between the meander line shown on a plat of survey approved by the BLM or its predecessors and the actual shoreline of a body of water are not lands of the United States; or (3) accreted, relicted, or avulsed lands are not lands of the United States (90 Stat. 2743, 2770; 43 U.S.C. 1745; 43 CFR 1864).

Under FLPMA, the Secretary of the Interior, or the Secretary of Agriculture, as applicable, shall specify the boundaries of each right-of-way (defined as an easement, lease, permit, or license to occupy, use, or traverse public lands granted for the purpose listed) as precisely as is practical. Rights-of-way shall be granted, issued, or renewed subject to such terms and conditions as the Secretary concerned may prescribe regarding extent, survey, and location, including reimbursements by the applicant for all reasonable administrative and other costs incurred (43 U.S.C. 1764).

The Alaska National Interest Lands Conservation Act (ANILCA) of December 2, 1980, as amended (94 Stat.

2438; 43 U.S.C. 1635; 94 Stat. 2447; 43 U.S.C. 1637), modified public land survey law by authorizing that no ground survey or monumentation shall be required on any parcel selected by and conveyed to the State of Alaska or to a Native Corporation or Native group.

This same Act, as amended (94 Stat. 2430; 102 Stat. 979; 43 U.S.C. 1631, 1635, 1637), provides that no agency or board of the Department of the Interior other than the BLM shall have authority to determine the navigability of a lake, river, or stream within an area selected by a Native or Native Corporation pursuant to the ANCSA or the ANILCA. The Secretary may issue a patent on protraction diagrams in lieu of field surveys. Any person or corporation receiving a patent on the basis of a protraction diagram shall receive any gain or bear any loss of acreage due to errors, if any, in such protraction diagram. This Act is applicable only to land in Alaska.

The National Forest System Lands Small Tracts Act of January 12, 1983 (96 Stat. 2535; 16 U.S.C. 521c-521i), authorized the Secretary of Agriculture to sell, exchange, or interchange certain National Forest System lands to resolve trespass situations on Federal land. Many parcels and rights-of-way were surveyed by agents of the United States Forest Service without receiving instructions from the BLM. Many of these Forest Service survey records are therefore not filed in the BLM survey recordkeeping system. The parcel and right-of-way surveys under the direction and control of the BLM or surveyed in conformance to the Manual are officially approved and filed.

The Alaska Submerged Lands Act of August 16, 1988, as amended (102 Stat. 979; 43 U.S.C. 1631), restated some existing public land survey laws and modified others.

Whenever the Secretary surveys land selected by an Alaska Native, a Native Corporation, or the State of Alaska pursuant to the ANCSA, the Alaska Statehood Act, or the ANILCA, lakes, rivers, and streams shall be meandered in accordance with the principles in the 1973 edition of the Manual.

If title to lands beneath navigable waters of a lake less than 50 acres in size or a river or stream less than 3 chains in width did not vest in the State pursuant to the Submerged Lands Act (43 U.S.C. 1301 et seq.), such lake, river, or stream shall not be meandered.

The Secretary is not required to determine the navigability of a lake, river, or stream that because of its size

or width is required to be meandered; to compute the acreage of the land beneath such lake, river, or stream; or to describe such land in any conveyance document. Ground survey or monumentation of meander lines is not required.

The specific terms, conditions, procedures, covenants, reservations, and other restrictions set forth in the document entitled, "Memorandum of Agreement between the United States Department of the Interior and the State of Alaska," dated March 28, 1984, were incorporated and ratified as to the duties and obligations of the United States and the State as a matter of Federal law. For any plat of survey approved after December 5, 1983, water bodies shall be meandered and segregated from the survey, in accordance with the principles contained in the 1973 edition of the Manual, as modified by this agreement, as the basis for determining acreage chargeability.

With respect to land in Alaska, the terms "navigable" and "navigability" mean navigable for the purpose of determining title to lands beneath navigable waters, as between the United States and the several States pursuant to the Submerged Lands Act of 1953 as amended (43 U.S.C. 1301 et seq.), the Alaska Submerged Lands Act of 1988 as amended, and section 6(m) of the Alaska Statehood Act.

The Act provides that whenever, either before or after the date of enactment of this section, the Secretary conveys land to an Alaska Native, a Native Corporation, or the State of Alaska pursuant to the ANCSA, the Alaska Statehood Act, or the ANILCA, which abuts or surrounds a meanderable lake, river, or stream, all right, title, and interest of the United States, if any, in the land under such lake, river, or stream lying between the uplands and the median line or midpoint, as the case may be,

shall vest in and shall not be charged against the acreage entitlement of such Native or Native Corporation or the State. The right, title, and interest vested in a Native or Native Corporation shall be no greater an estate than the estate conveyed in the land that abuts or surrounds the lake, river, or stream.

The execution of an interim conveyance or patent, as appropriate, by the BLM, which conveys an area of land selected by a Native or Native Corporation that includes, surrounds, or abuts a lake, river, or stream, or any portion thereof, shall be the final agency action with respect to a decision of the Secretary of the Interior that such lake, river, or stream is or is not navigable, unless such decision was validly appealed to an agency or board of the Department of the Interior on or before December 2, 1980. No agency or board of the Department of the Interior other than the BLM shall have authority to determine the navigability of a lake, river, or stream within an area selected by a Native or Native Corporation pursuant to the ANCSA or this Act. This Act is applicable only to land in Alaska.

The Act of November 10, 2003 (117 Stat. 1241, 1283), provides that the Secretary of Agriculture may authorize the expenditure or transfer of such sums as necessary to the BLM for the performance of cadastral surveys to designate the boundaries of National Forest System lands.

The Act of October 18, 2004 (118 Stat. 1357; 43 U.S.C. 1617 note), provides that an Alaska Native owner of restricted land may, subject to the approval of the Secretary, subdivide the restricted land in accordance with the laws of Alaska or applicable local platting authority. The survey should be submitted for approval and filing by the BLM.

**Table 3-2.** Public Land Surveys Having No Initial Point as an Origin for Both Township and Range Numbers

Survey (and year commenced)		Townships numbered	Ranges numbered
Ohio River Survey (Ohio)	1785	North from Ohio River	West from west boundary of Pennsylvania
U.S. Military Survey (Ohio)	1797	North from south boundary of mili- tary grant.	West from west boundary of the Seven Ranges
West of the Great Miami (Ohio)	1798	North from Great Miami River	East from Ohio- Indiana boundary
Ohio River Base (Indiana)	1799	North from Ohio River	From Ohio-Indiana boundary and its projection south
Scioto River Base (Ohio)	1799	North from Scioto River	West from west boundary of Pennsylvania
Muskingum River Survey (Ohio)	1800	1 and 2	10
Between the Miamis, north of Symmes Purchase (Ohio)	1802	East from Great Miami River	North from Ohio River (continu- ing numbers from Symmes Purchases)
Twelve- Mile-Square Reserve (Ohio)	1805	1, 2, 3, and 4	None

are established alternately at intervals of 40 chains, and regular township corners at intervals of 480 chains. Corners designated as meander corners are established at the intersection of the line with meanderable bodies of water.

**3-9.** The survey of the principal meridian and other standard lines (base lines, standard parallels, and guide meridians), require independent verification of the accuracy of measurements made. Typically, verification of measurements will be done: (1) when subdivisional closings are provided in the same assignment with the establishment of the standard line, in which case the closings

furnish a verification of the length; or (2) when the measurements are verified through other independent means such as the statistical analysis of measured data.

If the measurement error of a standard line exceeds 2 links per 80 chains, new measurements are made to reduce the measurement error. If independent tests of the alinement of a standard line indicate that the line has deflected more than 0'50" from the true cardinal course, the source of error will be identified and corrected. These are the maximum discrepancies allowable in new surveys.

## Base Line

**3-10.** The base line is extended east and west from the initial point on a true parallel of latitude. Standard quarter-section and section corners are established alternately at intervals of 40 chains and standard township corners at intervals of 480 chains. Meander corners are established where the line intersects meanderable bodies of water.

**3-11.** The manner of making the measurement of the base line and the accuracy of alinement and measurement are the same as required in the survey of the principal meridian. The determination of the alinement of the true latitudinal curve process is described in the record.

## Protraction Diagrams Plan of Survey

**3-12.** Protraction diagrams have been prepared for substantially all unsurveyed areas in the public domain. Such diagrams are prepared to describe unsurveyed land areas. A protraction diagram is not, and is not intended to be, a substitute for an official survey. Protraction diagrams consist of drawn lines that follow the public land survey system but are not an actual survey. They do not involve a field survey with monumentation and hence no monuments on the ground. They represent the plan for the extension of the rectangular system over unsurveyed lands, following the general scheme as outlined earlier. They are constructed based upon the following rules as far as practicable. For discussion on preparation of protraction diagrams see sections 3-138 through 3-157.

## Standard Parallels

**3-13.** Standard parallels, which have also been called correction lines, are extended east and west from the

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Inside the back cover is a facsimile of the 2009 plat of a township in Alaska surveyed under the public land survey system. The plat represents an original survey executed in accordance with the specifications set forth in the *Manual of Surveying Instructions* and special instructions. The field notes were approved, the plat was accepted, and the survey is officially filed.

The township is designated Township 10 North, Range 80 West, Seward Meridian, counting north and west from the Initial Point of the Seward Principal Meridian and Baseline in Alaska. The basis of location for this survey is the approved Bureau of Land Management Protraction Diagram which provides the plan of survey for land described by aliquot part and referenced to the rectangular survey system. This township was surveyed to accommodate Alaska Native village and regional land selections authorized under the Alaska Native Claims Settlement Act (ANCSA) of December 18, 1971, as amended (85 Stat. 688; 43 U.S.C. 1601 et seq.).

Individual Native allotment parcels and meanderable or navigable water bodies have been segregated within surveyed sections, and lots have been created. Alaska Native allotments were surveyed prior to the township survey as United States (U.S.) Surveys, under the Alaska Native Allotment Act of May 17, 1906, as amended (34 Stat. 197; 43 U.S.C. 270-1 repealed), and are shown as hashed polygons within the township. Under ANCSA, only the exterior boundaries of the selected or designated areas at angle points and at intervals of approximately 2 miles on straight lines are surveyed and marked. Most, but not all, of the township boundary has been returned as surveyed to accommodate the future subdivision of the township, a portion of which remains unsurveyed.

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