Chapter 1

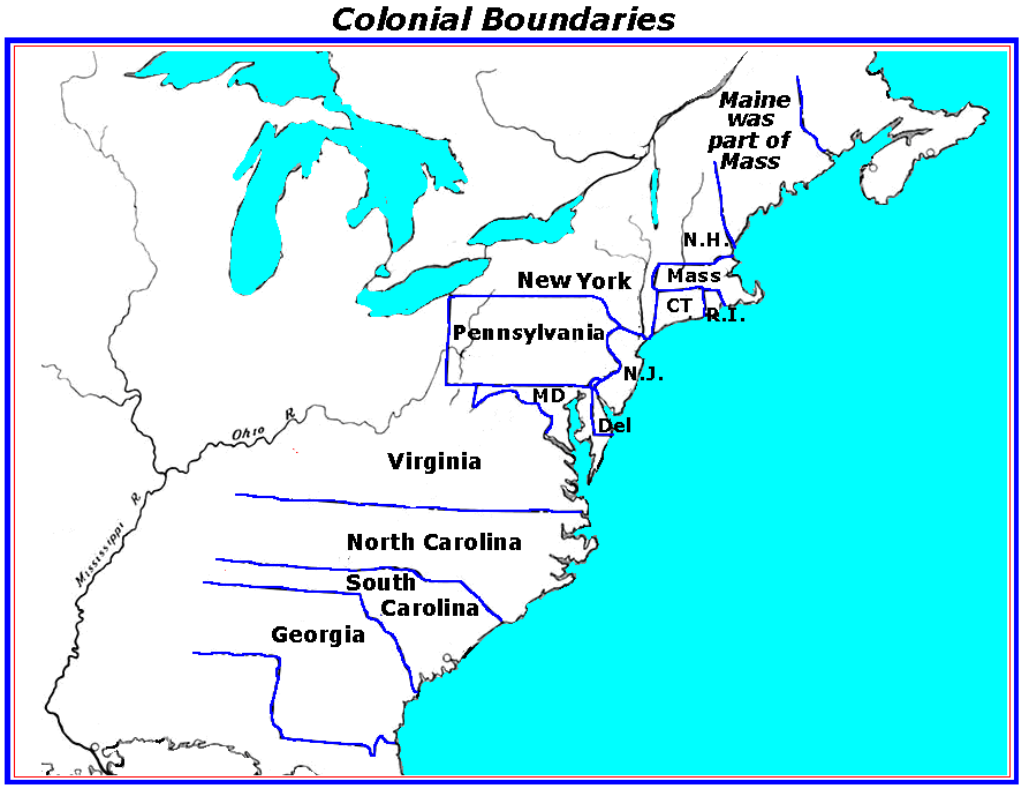
Land and Mineral Ownership in the United States

A Brief History of Land Ownership in The United States

Prior to the Revolutionary War, during what is known as the Colonial Period of our nation, Spain claimed much of the lands to the west of the Mississippi River and those lands southeast and southwest of the colonies. France claimed the lands north and south along the Mississippi up into the Ohio River Valley.

The thirteen colonies as "territories" of the British Empire eventually received land grants. In some cases, the grants extended from the Atlantic Ocean to the Pacific Ocean. Six of the colonies had defined western boundaries (New Hampshire, Rhode Island, New Jersey, Delaware, Pennsylvania and Maryland). The western boundary for the other seven colonies (Massachusetts, Connecticut, New York, Virginia, North Carolina, South Carolina and Georgia) was considered the Pacific Ocean. At that time, no one had traveled inland to the Pacific Ocean nor did anyone know how far the land extended.

As can be seen, with this vague concept of owning the lands to the Pacific Ocean and the claim of some of the same lands by the French and Spanish, there were disputed lands from the very beginning.



A hand full of the colonies had disputed boundaries between themselves, such as New Hampshire which claimed the territory to the west. New York made the same claim.

The colony of Virginia believed that her northern boundary ran northwest and continually widened as it traveled in that direction. This belief conflicted with the claim of Maryland and of Pennsylvania.

Prior to the Revolutionary War, many colonial land speculators believed that fortunes could be made from these western lands. Around 1766 there was an uncontrolled land rush whereby many powerful and wealthy families invested in the surveying and purchasing of very large tracts of land. In many cases the purchases were made from Native American Indian tribal governments. In other cases, the purchases came from the individual colonies which claimed the rights to the land. As an example, Georgia sold to three land companies over 25,000,000 acres of land for one cent per acre.

After the war, the new government proposed that a fixed western boundary be set for each of the original colonies and that the remaining western territory should be divided into additional states. The proposal was met with furious opposition from states like Virginia and Georgia. They knew that future land sales were like having a gold mine in their back yard and that such a proposal would critically limit their ability to make money from the western lands.

Those wanting to buy land were equally as conflicted because no one knew if this new government was as motivated in selling the lands and were the individual states. Therefore, land speculation increased.

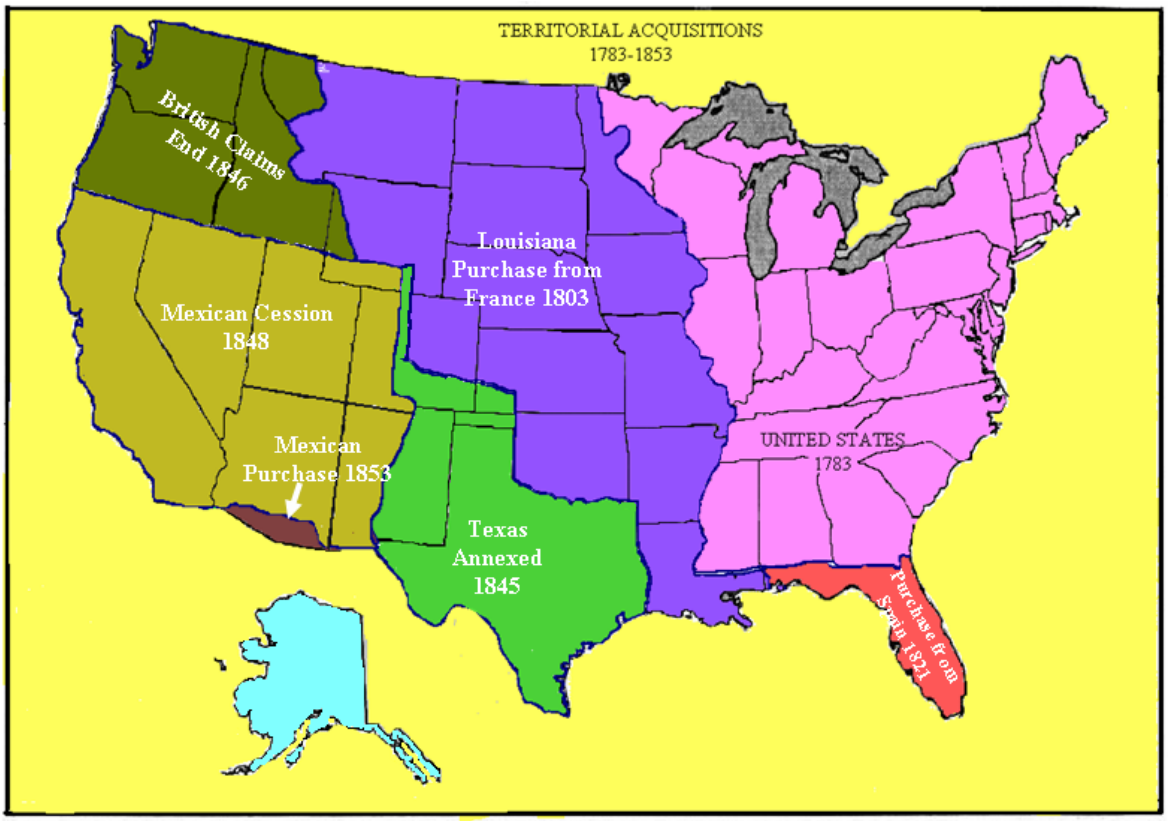
But the United States government was motivated. They desperately wanted the revenue, specifically for the purpose of paying off debt incurred from the war. In 1784, a compromise was reached whereby the thirteen states ceded their claims to the western lands and the states of Vermont, Maine, and Kentucky were formed out of lands that had been in dispute.

ACQUISITION OF LANDS BY THE UNITED STATES GOVERNMENT

Although the surrender at Yorktown in 1781 marked the end of the Revolutionary War, there were minor battles between the American colonists and the British during the next two years. It was not until February of 1783 that King George III issued his *Proclamation of Cessation of Hostilities*. And the result was The *Peace Treaty of 1783*. The agreement formally ended the United States War for Independence and transferred to the United States all lands claimed by England that were east of the Mississippi River. For the next two decades, the boundary of our new nation stayed the same.

With this cessation of hostilities the United States now encompassed the original 13 colonies, Vermont, Maine, Kentucky, West Virginia and an additional land mass that would eventually become the states of Ohio, Indiana, Illinois, Mississippi, Illinois, Michigan, Wisconsin, parts of Minnesota, Tennessee, Mississippi and Alabama.

In 1783 the shape and size of the United States was not as it is today. In order to understand some very important title issues that surround the ownership of land and/or minerals, it is important to understand how the United States acquired title to the rest of the present day United States. The acquisitions were made in several ways: through treaty, purchase, and annexation.



It was not until 1803 that the United States purchased from France, for three (3) cents an acre, some 523 million acres of land, which now comprise present-day North and South Dakota, Nebraska, Kansas, Iowa, Missouri, Arkansas, and Louisiana; most of Wyoming, Montana, Minnesota, and Oklahoma; and the northeastern portion of Colorado. This acquisition is known as *The Louisiana Purchase*. In 1821, what is now known as Florida was purchased from Spain.

The Oregon Compromise of 1846 resolved the British-American dispute over the northwest boundary and in that year the British claim of ownership was extinguished. Washington, Oregon, Idaho, and lands in northwestern Montana and west central Wyoming were then added to the rapidly growing nation.

Under *The Treaty of Guadalupe Hidalgo* (1848), Mexico agreed to sell to the United States for $15 million all of what is now California, Nevada, Utah, and Arizona north of the Gila River, New Mexico west of the Rio Grande River, and parts of Southwestern Colorado, totaling 334,479,360 acres.

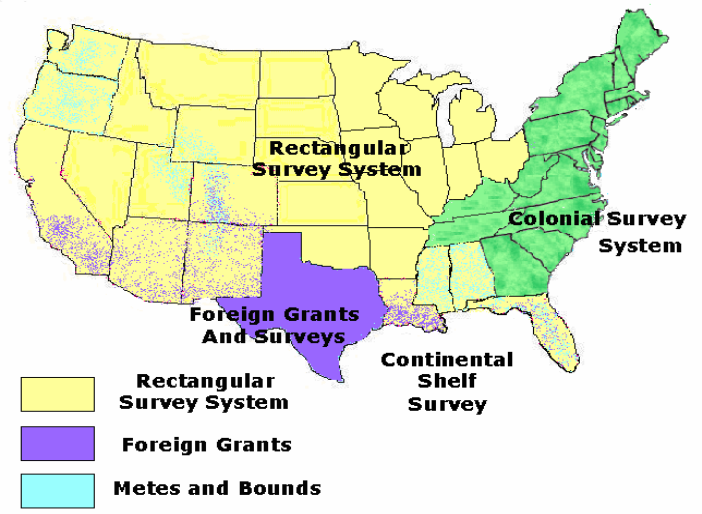
In 1845, Texas was annexed into the Union. Five years later, Texas sold to the United States 78,842,880 acres of its western lands for $10 million. The lands that were sold are now portions of present-day New Mexico, Oklahoma, Wyoming, Colorado and Kansas.

In 1853, James Gadsden negotiated with Mexico to purchase a tract south of the Gila River in Arizona for $10 million.

In 1867, Alaska was purchased from Russia by the United States, paying $7 million for these 18,961,920 acres. [1]

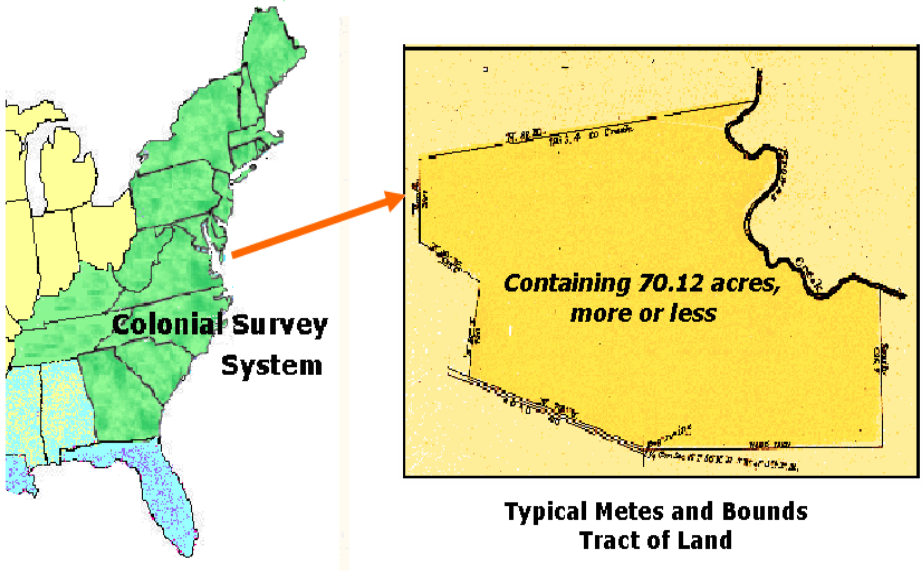
At the end of this era of expansion, the United States owned approximately 1.9 billion acres of land in the lower 48 states and an additional 365 million acres in Alaska. Of the 1.9 billion acres, 1.4 billion acres of land were considered vacant and unoccupied. Since the vast portion of these western frontier lands were unsettled, the government devised a plan to occupy this area and make it productive. That plan resulted in what is today known as “Land Grants.”

SURVEY METHODS USED WHEN GRANTING LANDS



COLONIAL SURVEY SYSTEM

Property, in the colonies, was conveyed and described through the metes and bounds survey system (also referred to as the colonial survey system). Simply put, a metes and bounds system often worked like this: the person making a claim to the land would step off the tract of land moving from one landmark to the next and then would have the land surveyed and registered in a land office.



Typical Metes and Bounds Tract of Land

This was a survey method that had been utilized for centuries throughout Europe and other parts of the world and generally, arose when parties had free choice to the land in which they wanted to settle. The colonies were a perfect example. Vast regions of land were available and a colonist could pick and choose the best locations, regardless of shape, out of immense virgin woodlands.

Usually, settlement would occur prior to the surveying of the land and, in many cases, it was incumbent upon the settler to submit his own survey, sketch or drawing of the lands.

Such a method; however had its problems. The person asked to submit their own survey might have been a great hunter and could shoot the ear off of a rabbit at a distance of 50 yards but that did not make him a great surveyor. In many cases, the last school grade attended, by these pioneers, was the 5th grade. Many could not write their own names let alone create an accurate survey. Such issues created discrepancies in the original documents plus one person's chosen tract of land might overlap that of a neighbor's.

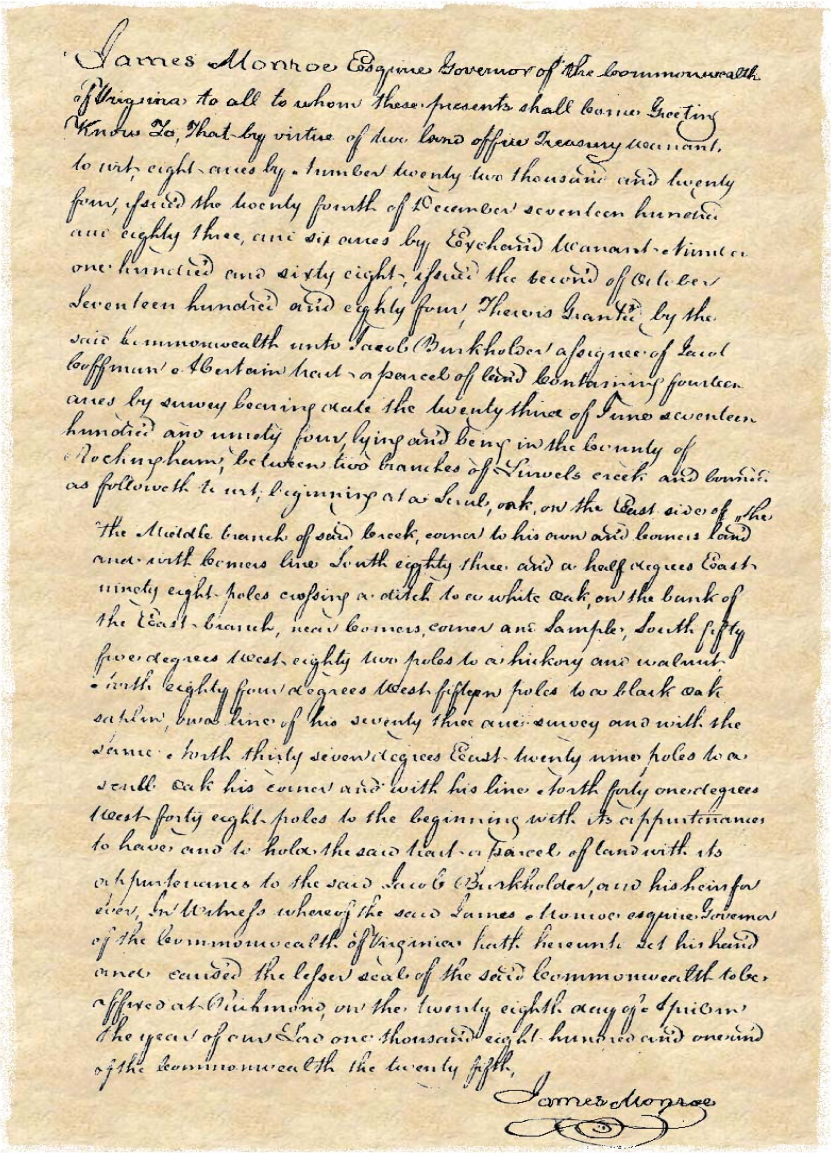
In 1785, the United States government began a new way of surveying that would revolutionize the metes and bounds approach. The method was called the rectangular survey system and would simply divide land into squares. There would be no more irregular tracks of land or describing one's property line as running from *the "old oak tree to the large mossy rock"*.

The new system was simple, methodical and did away with many of the issues created in the metes and bounds approach. However, not all parties were on board with the new survey system. Picture yourself as a pioneer in 1785 who wanted to buy a 160-acre tract of land. Would you rather pay for the irregular track of land that ran up the lush river valley with fertile meadows on either side or would you rather buy the 160-acre *square* tract of land that contained only a portion of the river valley, a portion of the fertile meadows and most of the vertical hill above the valley?

The rectangular survey method eventually caught on and it is the method still used in most of the United States today.

In the United States, metes and bounds legal descriptions can be found in any state; however they are primarily found in the thirteen original states, Hawaii, Kentucky, Maine, Tennessee, Vermont, and West Virginia. They are also found in Texas, New Mexico and parts of California that were originally settled through Spanish and Mexican land grants.

Patent from James Monroe, Governor of Virginia to Jacob Burkholder. The metes and bounds legal description is as follows:



James Monroe Esquire Governor of the Commonwealth of Virginia to all to whom these presents shall come Greeting Know Ye, That by virtue of two land office Treasury warrant, to wit, eight acres by number twenty two thousand and twenty four, dated the twenty fourth of December seventeen hundred and eighty three, one six acres by Exchange Warrant number one hundred and sixty eight, dated the second of October seventeen hundred and eighty four, There is Granted by the said Commonwealth unto Jacob Burkholder assignee of Saml Coffman a certain tract a parcel of land containing fourteen acres by survey bearing date the twenty third of June seventeen hundred and ninety four, lying and being in the County of Rockingham, between two branches of Linvels creek and Coners as followeth to wit, beginning at a small oak, on the East side of the the Middle branch of said creek, corner to his own and Coners land and with Coners line South eighty three and a half degrees East ninety eight poles crossing a ditch to a white oak, on the bank of the East branch, near Coners, corner and Sample, South fifty four degrees West eighty two poles to a hickory and walnut north eighty four degrees West fifteen poles to a black oak sapling, was line of his seventy three acre survey and with the same North thirty seven degrees East twenty nine poles to a small oak his corner and with his line North forty one degrees West forty eight poles to the beginning with its appurtenances to have and to hold the said tract a parcel of land with its appurtenances to the said Jacob Burkholder, and his heirs for ever, In Witness whereof the said James Monroe esquire Governor of the Commonwealth of Virginia hath hereunto Set his hand and caused the lesser seal of the said Commonwealth to be affixed at Richmond, on the twenty eighth day of April in the year of our Lord one thousand eight hundred and one and of the Commonwealth the twenty fifth.

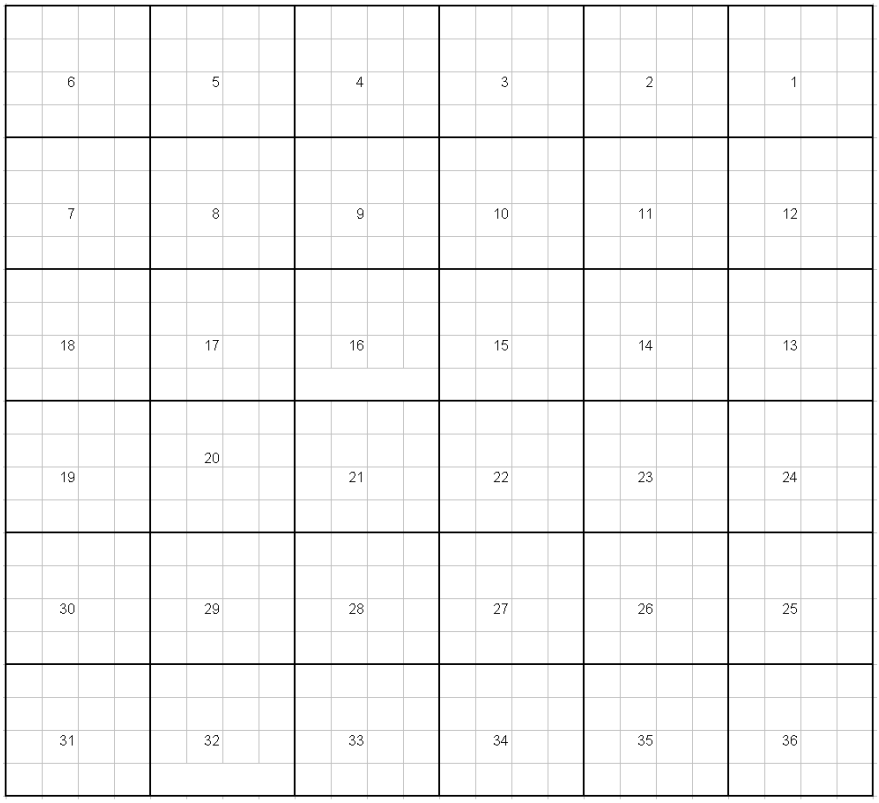
James Monroe

"A parcel of land containing fourteen acres by survey becoming date the twenty third of June seventeen hundred and ninety-four, lying East being in the County of Rockingham, between two branches of Linvels Creek and Coners, as follows to wit; beginning at a small oak, on the East side of the Middle branch of said Creek, corner of his own and Coners land and with becomes line South eighty-three and a half degrees East ninety eight poles crossing a ditch to a white oak, on the bank of the East branch, near Coners corner said Sample; South fifty four degrees West, eighty two poles to a hickory and walnut; north eighty four degrees West fifteen poles to a black oak sapling, was line of his seventy three acres survey and with the same North thirty seven degrees East twenty nine poles to a small oak his corner and with line North forty one degrees West forty eight poles to the beginning."

THE RECTANGULAR SURVEY SYSTEM

The government believed that before any land grants should be offered, they needed to institute a new methodical and simplified plan for the surveying of these new acquired lands. This new survey system established under *The General Land Ordinance of 1785* is still used today and is called *The Rectangular Survey System* or *The Jeffersonian Survey System*.

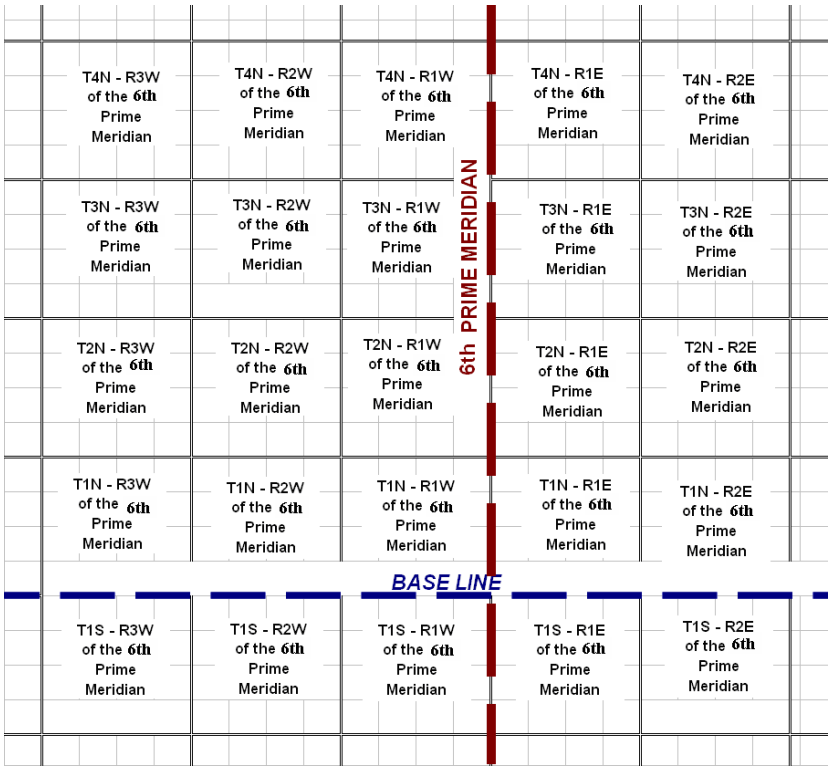
This system divided the land into squares which were one mile on each side and were called "sections." Thirty-six sections were grouped together, six sections north to south and six sections east to west. This grouping was referred to as a township and range. Each of these sections was numbered in a precise manner beginning with Section #1 and ending with Section #36.



Normal 36-Section Township and Range

Townships and ranges were also numbered in a specific manner, thus allowing anyone the ability to locate a specific tract of land within any state or territory.

For the most part, these lands, from the eastern edge of the Ohio River west to the Pacific ocean and from the southern borders of New Mexico, Arizona, and California north to the Canadian border, were placed into a grid system of sections, each one mile square. The townships and ranges (or groups of 36 sections) were lined up next to each other running in a numbered sequence north, south, east or west.



Normal Township and Range Grid

THE NAMING OF LAND UNDER THE RECTANGULAR SURVEY SYSTEM

A land description is the name given to a tract of land that, in legally acceptable terms, will determine exactly where the land is located and will determine how many acres are within a particular tract of land. The rectangular survey system simplified the naming of lands in that it divided land into equal squares and devised a simplified method for naming each of those blocks of land. The method was to use sequential numbers and the four main compass headings (north, east, south and west) in naming each tract of land.

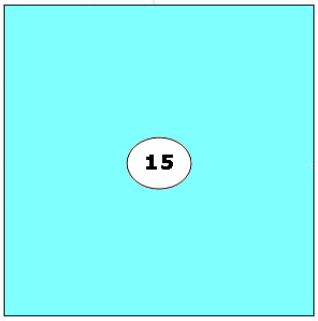
Just as every house has an address so that mail can be delivered or friends

can visit, so legal descriptions have addresses. Each will typically have a *TOWNSHIP* number, a *RANGE* number, a *SECTION* number and a description of the portion of the section in question (NE/4). An example might read:

Township 16 North, Range 90 West, Section 24: NE/4

Section of Land

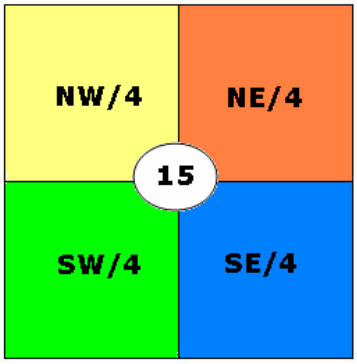
Much of the United States has been measured, surveyed and categorized into "sections" of land. Each section of land generally contains 640 acres. A section of land is usually square and is divided into quadrants such as the NE/4, NW/4, SW/4 and SE/4. A section of land is one mile in length on each of its sides or is one mile square (Illustrated as Section 15.)



1 MILE SQUARE
640 ACRES

Quarter Section

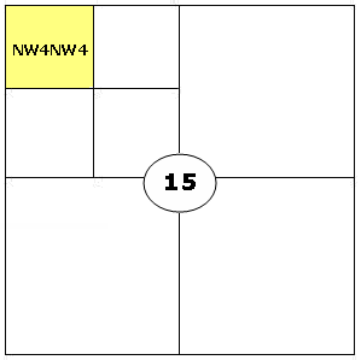
A quarter section is ¼ of a section of land. Generally, quarter sections contain 160 acres or ¼ of 640 acres. Quarter sections are named by where they lay in the section. If the quarter section lies in the North West quadrant of the section, it is referred to as the NW/4. The SW/4 lies in the South West quadrant. The NE/4 lies in the North East quadrant. The SE/4 lies in the South East quadrant.



¼ of the Section
160 ACRES

Quarter/Quarter Section

A quarter/quarter section is ¼ of a quarter section. Generally, quarter/quarter sections contain 40 acres or ¼ of ¼ of 640 acres. Quarter/quarter sections are named by where they lay in the quarter section. If the quarter/quarter section lies in the North West quadrant of the North West quadrant, it is referred to as NW/4NW/4. If the quarter/quarter section lies in the South East quadrant of the North West Quarter, it is referred to as the SE/4NW/4.



¼ of ¼ of the Section
40 ACRES

FOREIGN GRANTS AND SURVEYS

The United States government encouraged the settlement and granting of the western lands and, in doing so, was able to survey such lands through the rectangular survey method. There were; however, parts of the country that had been previously granted by foreign powers. Louisiana recognized early French and Spanish descriptions, particularly in the southern part of the state.

Much of Texas had been previously granted through the Spanish and Mexican survey method. California was similar to Texas in that the southern part of the state had been previously granted through Spanish land grants. These were called ranchos and Hawaii had long used a native survey system established years before its statehood.

TEXAS LAND GRANTS, SURVEYS AND ABSTRACTS

To understand the Texas land description system, one should first take a look at the state's history often referred to as the "Six Flags" history. Prior to 1821, this large land area was a Spanish possession. Large chunks of land were surveyed under the Spanish rule and granted to individuals and described through a metes and bounds description. The largest tract of land conveyed this way contained 939 square miles or 600,960 acres and was conveyed to San Juan de Caricitas in Cameron County.

In 1821, the Mexican government overthrew the Spanish government. This new regime recognized the previous grants and continued to survey lands under a Mexican system. The lands again were conveyed under a metes and bounds method. It is important to note that this granting of land was not done in any specific methodical order. The location of the lands had little structure in relation to a bigger picture; therefore, one grant might exist with gaps of un-granted land lying between the nearest conveyed tract of land. Since the descriptions were based on metes and bounds rather than squares, parts of Texas appear to be a patchwork of land grants.

Under the Spanish and Mexican governments, over 26 million acres were granted through this method.[2]

Prior to 1835, the Republic of Texas formed a strategy in which to overthrow the Mexican government. A part of that strategy was to offer large tracts of land to any man who wished to enlist in the Texan militia, in order to fight the Mexican government.

It is said that Davy Crockett enlisted with a promise of receiving 10,000 acres of land. Now, travel back in time to the year 1835 and try to image the difficulty in *accurately* surveying a 10,000 acre tract. Mistakes were often made and resurveying the land revealed many errors.

In 1835, the Mexican government was overthrown by the Republic of Texas and existed that way until 1846. After the war, the new Republic began selling land certificates for 50 cents an acre. Normally, those buying land could pick and choose which parcels of land they wanted. They could also choose the shape of the tract of land. Again, metes and bounds became a big part of these lands and again the individual conveyances had little structure as they related to other tracts of land.

This newly formed Republic provided in its Constitution that "all persons except Africans and Indians living in Texas on Declaration of Independence are entitled to a headright Grant…heads of families one league and one labor, single men seventeen years or older, one third league."

A League = 5000 square varas or about 4,430 acres
A Labor = 1000 square varas or about 177 acres
A vara = 2.77 feet

The vara (Spanish for yard and defined as three feet - is sometimes referred to as the *stride of a mule*) became one of the standard measurements in describing these tracts of land. The reason a vara referred to the stride of mule, rather than the stride of a man, was based on practical logic. While measuring large tracts of land a man's stride would become shorter in length as he became tired. The stride of a mule would stay consistent throughout the day. The length of a vara; however, in East Texas, differed from the length of a vara in West Texas and differed from some of the older Spanish land grants. Today, the original length of a vara is unknown and remains a measurement of some uncertainty. Because of this issue, in 1919 the Texas legislature adopted the length of 33.3333 inches per vera.[3]

Instead of using the full metes and bounds description, it became common to reference other items such as a block number, survey name, abstract number, section number the particular deed in which the land was first described or the original patentee. Texas legal descriptions might contain several of the items mentioned. The following is an example of a Texas land description:

> *The north 102.34 acres of the west 277 acres of Block A-2, Section 77, Abstract #75, Southern Union Railway Company Survey, in Van Zandt County.*

BLOCK NAME OR NUMBER

A block is the larger tract of land that consists of a group of surveyed tracts, each having a section number. Blocks were usually named after the party who surveyed the land (this was often a land agent or railroad) or were

given an identifying number. Surveys within the block were usually consecutively numbered. The block/section method was done primarily in west Texas and the panhandle and one block of land can exist in more than one county.[4]

SECTION

In Texas, the term section is often used to describe the surveys done within a particular block. A section of land does not necessarily contain 640 acres nor is it necessarily square in size. A section can be named Section 325, contain 1,000 acres and resemble an octagon.

STAND ALONE SURVEY

East Texas contains what is known as "stand alone surveys". These were surveys that were not intended to become a part of a block. These surveys are generally named after the original grantee.

ABSTRACT NUMBER

An abstract may be either all or a part of a section or may contain the entire stand alone survey. Each original land grant was assigned an abstract number, at the time of the original conveyance, in order to keep track of subsequent conveyances within the original grant. The term abstract refers to an original land survey. The number for each abstract is unique within each county.

In order to locate the tract of land in our example,

> *The north 102.34 acres of the west 277 acres of, Block A-2, Section 77, Abstract #75, Southern Union Railway Company Survey, in Van Zandt County.*

one must first locate the county, find the area surveyed by the Southern Union Railway Company, locate Block A-2, locate Section 77, locate Abstract #75, and then locate the north 102.34 acres in the west 277 acres.

Furthermore, a legal description might be shown as:

> *29.05 acres, more or less, Franklin A-181 survey, located in Johnson County, Texas. The same tract of land conveyed to Jim Johnson in a particular deed found Book 37 Page 125 in the county clerk and recorder's office in Johnson County, TX.*

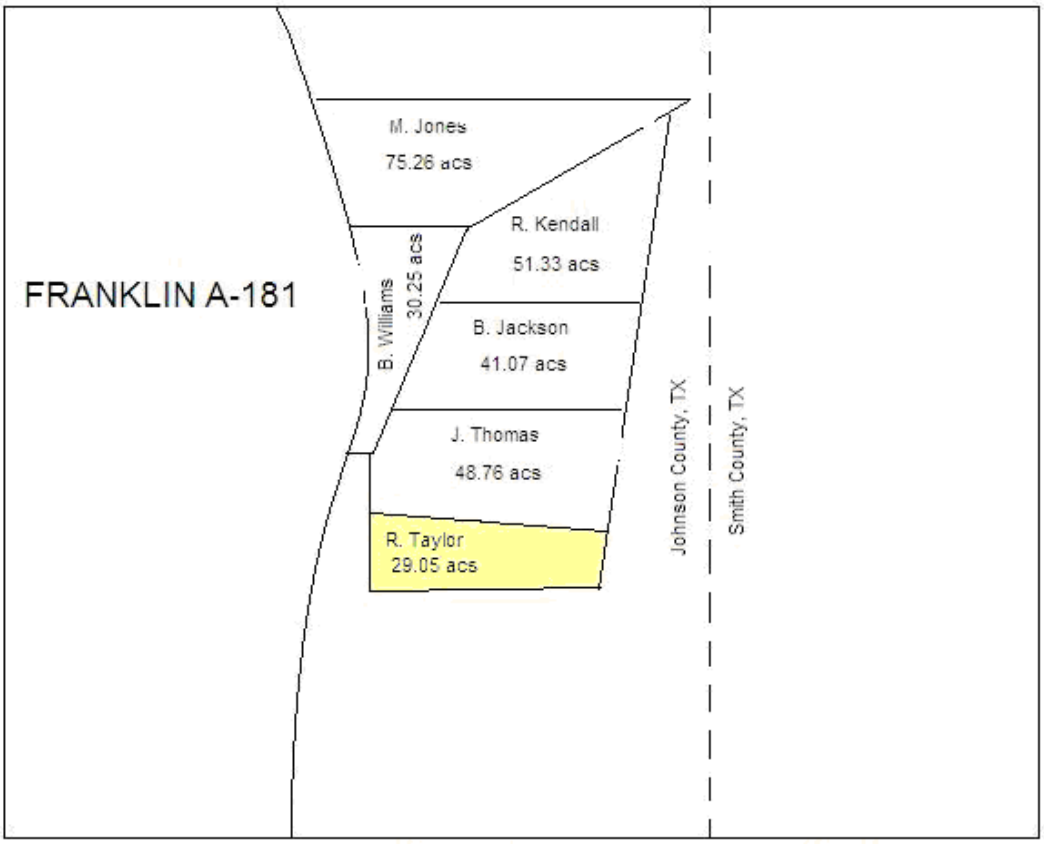
Rather than describing the tract of land in detail, the description simply refers back to the description found in a certain book and page of the county records.

When legal descriptions are referenced it is very important to pay attention to the book, page and county in which the deeds were recorded. For

example, two deeds might contain the exact amount of acreage, reference the same abstract name and number and have been recorded in the same county and yet be describing two separate tracts of land:

> *29.05 acres, more or less, Franklin A-181 survey, located in Johnson County, Texas.*

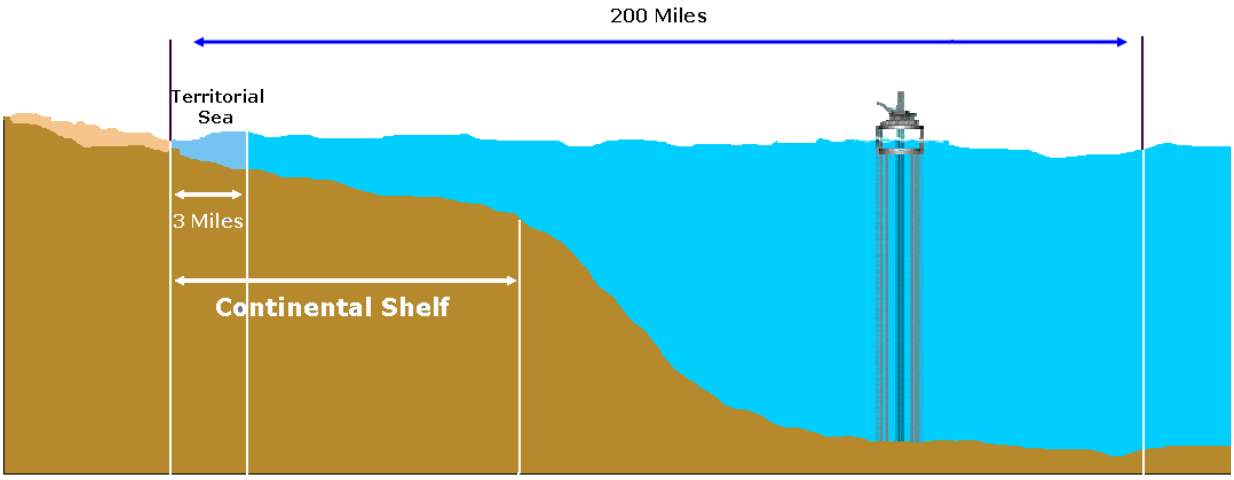
Without a book and page reference, determining if these two deeds are referencing the same tract of land or two different tracts of land can be very difficult. This is why recording information in a legal description is imperative. It allows an examiner to pinpoint a particular tract of land in a county and state.



M. Franklin Abstract Survey, Johnson County, TX. - 01/07/1994

OUTER CONTINENTAL SHELF

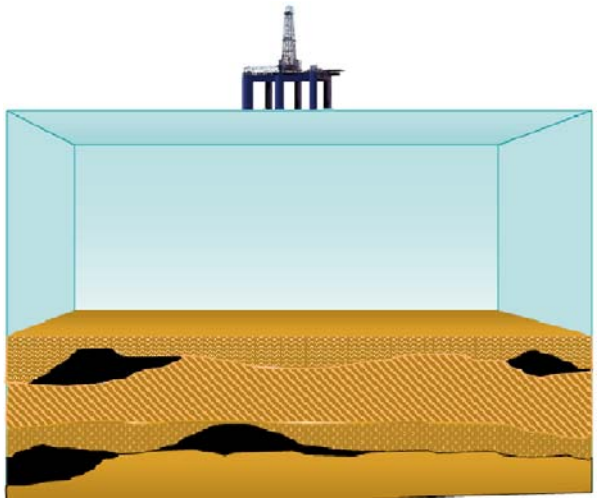
Outer continental shelf is a term that refers to "all submerged lands lying seaward and outside of the area of lands beneath navigable waters of each of the respective States subject to the jurisdiction and control of the United States." In 1958, the definition was expanded to include "areas lying seaward of the territorial sea to a depth of 200 meters (656 feet) and beyond".[5]



[6] US Department of the Interior

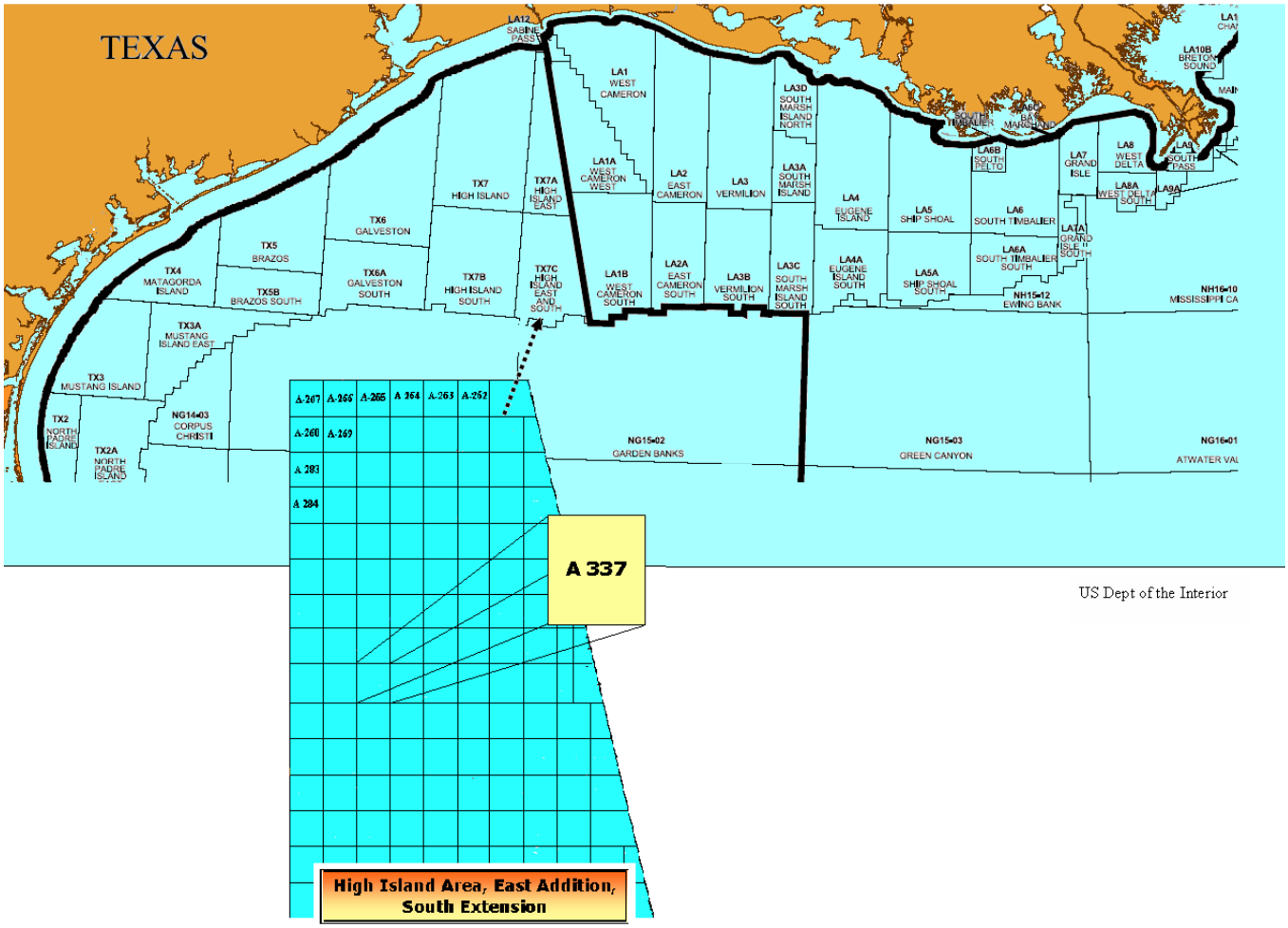
Those outer continental shelf lands leased by the Federal Government are lands, generally, 3 geographical miles from a state's coast and extend to a line approximately 200-300 miles offshore. The 3 geographical miles, owned by the individual states, were established in 1702 when it was determined that a cannon ball could travel approximately 3 miles and that the state could protect its land into the ocean as far as a cannon ball could travel. The exception to this rule is the state of Texas and the west coast of Florida whose boundaries are set at nine nautical miles from the shoreline.

Although the outer continental shelf runs along the Atlantic coast, the Pacific coast, the Gulf of Alaska and the Gulf of Mexico, most of the oil and gas leases granted by the government are located in the Gulf of Mexico. These leases account for approximately 30 percent of the oil and over 20 percent of the natural gas produced domestically. The department which oversees these 1.76 billion acres of outer continental shelf lands is Minerals Management Service (MMS).



A grid system, similar to the rectangular survey system is used to describe the areas of the OCS. These areas are identified by area names and block numbers. The area names are based on onshore landmarks or nearby cities. The blocks are identified with a distinct alphanumeric numbering system (as seen in the illustration as High Island Area, East Addition, South Extension, Block A337).

A true section of land, in the rectangular survey system, is a perfect square and contains exactly 640 acres. For OCS lands, a block may or may not be in the shape of a square and can contain approximately nine square miles (between 5,000 to 5,769 acres).



LAND GRANTS

In the late 1780's, Congress began to adopt policies that would oversee the creation of new states and set forth a course of action related to the granting of these vast lands. *The General Land Ordinance of 1785* was the first to be passed. Two years later *The Northwest Ordinance of 1787* was passed.

THE CLASSIFICATION OF LANDS

Before the United States Government began granting land claims to settlers, states, or the railroads, they first classified the lands into one of two categories: Agricultural Lands and Mineral Lands.

When the government began granting land claims, they were done under Congressional agricultural entry laws. For the most part, grants to settlers, states and railroads were made *only if* the lands were classified as non-mineral in character. For instance, *The General Land Ordinance of 1785* reserved to the United States Government one-third of all gold, silver, lead, and copper mines. [7]

In the early days of granting land, the surface owner received all right, title and interest in and to the oil and gas minerals associated with the land. It is important to realize that the United States Government did not recognize the value of oil and gas minerals at the time of the classification of lands.

THE GRANTING OF LANDS

After the expansion of the United States, the federal government held title to over 80 percent of the 1.9 billion acres comprising the lower 48 states. Today they own less than 30 percent of the same land area. In order to settle the western frontier, the vast majority of that land was granted to either states, settlers, or to railroads.

LANDS GIVEN TO STATES

As the territories and later states were being formed, education seemed to be a major issue to the founding fathers. They did not want an expanded country full of illiterates, and they did not want children to grow up without the ability to receive an education. Therefore, *the Land Ordinance of 1785* and again *The Northwest Ordinance of 1787* established guidelines for "state trust lands" or lands that would be held by the states for the purpose of

education. *The Northwest Ordinance* stated that public education was considered critical to the success of the western settlements; it further stated:"Religion, Morality, and Knowledge being necessary to good government and the happiness of mankind, Schools and the means of education shall forever be encouraged."[8]

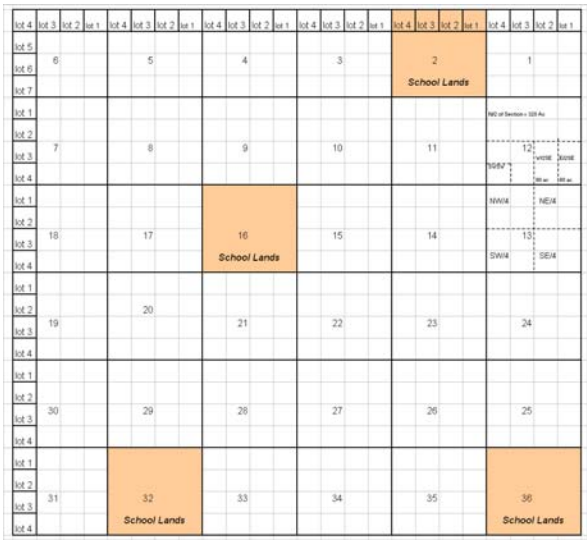
Public education was a critical issue even before the expansion of the west. Many of the original colonies required the education of all children, and some even required the education of all citizens. Thus it was no wonder that one of the first orders of business was to grant to the states or territories certain lands set aside for public education and then place the success of this institution squarely into the hands of the individual states.

The important thing to remember is that when these lands were granted to the states, oil and gas mineral reservations were seldom invoked by the federal government. Therefore, in most cases, these minerals passed to the states and are an issue today in the oil and gas industry. During this period of settlement, over eighty million acres of surface and mineral lands were granted into these state trust lands.

Between 1803 and 1858, fourteen new states were admitted to the Union. During this time, only section 16 was designated as school trust land. Beginning with the admission of Oregon to the Union in 1858, two sections (section 16 and section 36) were designated as school trust lands. Several states received these two sections. Later, as Utah, Arizona and New Mexico were admitted to the Union, four sections were granted as school trust lands (sections 2, 16, 32 and 36).

Ohio	Received Section 16
Louisiana	Received Section 16
Indiana	Received Section 16
Mississippi	Received Section 16
Illinois	Received Section 16
Alabama	Received Section 16
Missouri	Received Section 16
Arkansas	Received Section 16
Michigan	Received Section 16
Florida	Received Section 16
Iowa	Received Section 16
Wisconsin	Received Section 16
California	Received Section 16
Minnesota	Received Section 16
Oregon	Received Sections 16 & 36
Kansas	Received Sections 16 & 36
Colorado	Received Sections 16 & 36

Nebraska	Received Sections 16 & 36
Idaho	Received Sections 16 & 36
Oklahoma	Received Sections 16 & 36
Wyoming	Received Sections 16 & 36
Washington	Received Sections 16 & 36
Montana	Received Sections 16 & 36
North Dakota	Received Sections 16 & 36
South Dakota	Received Sections 16 & 36
Utah	Received Sections 2, 16, 32 & 36
Arizona	Received Sections 2, 16, 32 & 36
New Mexico	Received Sections 2, 16, 32 & 36
Nevada	Received 2,000,000 acres in lieu of specified sections



Normal Township and Range showing State Trust Lands in New Mexico

Overall, states or territories were granted lands for:

1. Public Buildings
2. Penitentiaries
3. Universities
4. School Lands (as a source of revenue for support of the common schools).

To give an example of just how much land could be granted to a state:

> "By the time New Mexico and Arizona were admitted in 1910, they received enormous grants on top of their four reserved sections for a laundry list of public purposes: 200,000 acres for university purposes; 100,000 acres for public buildings; 100,000 acres for insane asylums; 100,000 acres for schools and asylums for the deaf, dumb, and blind; 50,000 acres for disabled miners' hospitals; 200,000 acres for normal schools; 100,000 acres for penitentiaries and reform institutions; 150,000 acres for agricultural and mechanical colleges; 150,000 acres for schools of mines; 100,000 acres for military institutes; and 1,000,000 acres for the payment of county bonds (with any remainder going to the benefit of the common schools)." [9]

The term *normal school* was used at that time to denote schools that offered education for only teachers.

RIGHTS TO WATERS

Navigable waters

At statehood, states also received an implicit grant of the beds underlying inland navigable waters which were navigable at the date of statehood. The grant extended to the high-water mark of navigable streams and lakes. Navigable waters were not designated at the time of admission. As a result, a critical question of fact always arises as to whether the waters overlying lands in question were navigable at the date of statehood. *Ordinarily, the title examiner cannot determine whether or not the waters overlying lands were or were not navigable at statehood. An abstract may show a perfect chain of title from the state, but, if the navigability inquiry is answered in the negative, the state's claim to title is destroyed.* [10]

Variances

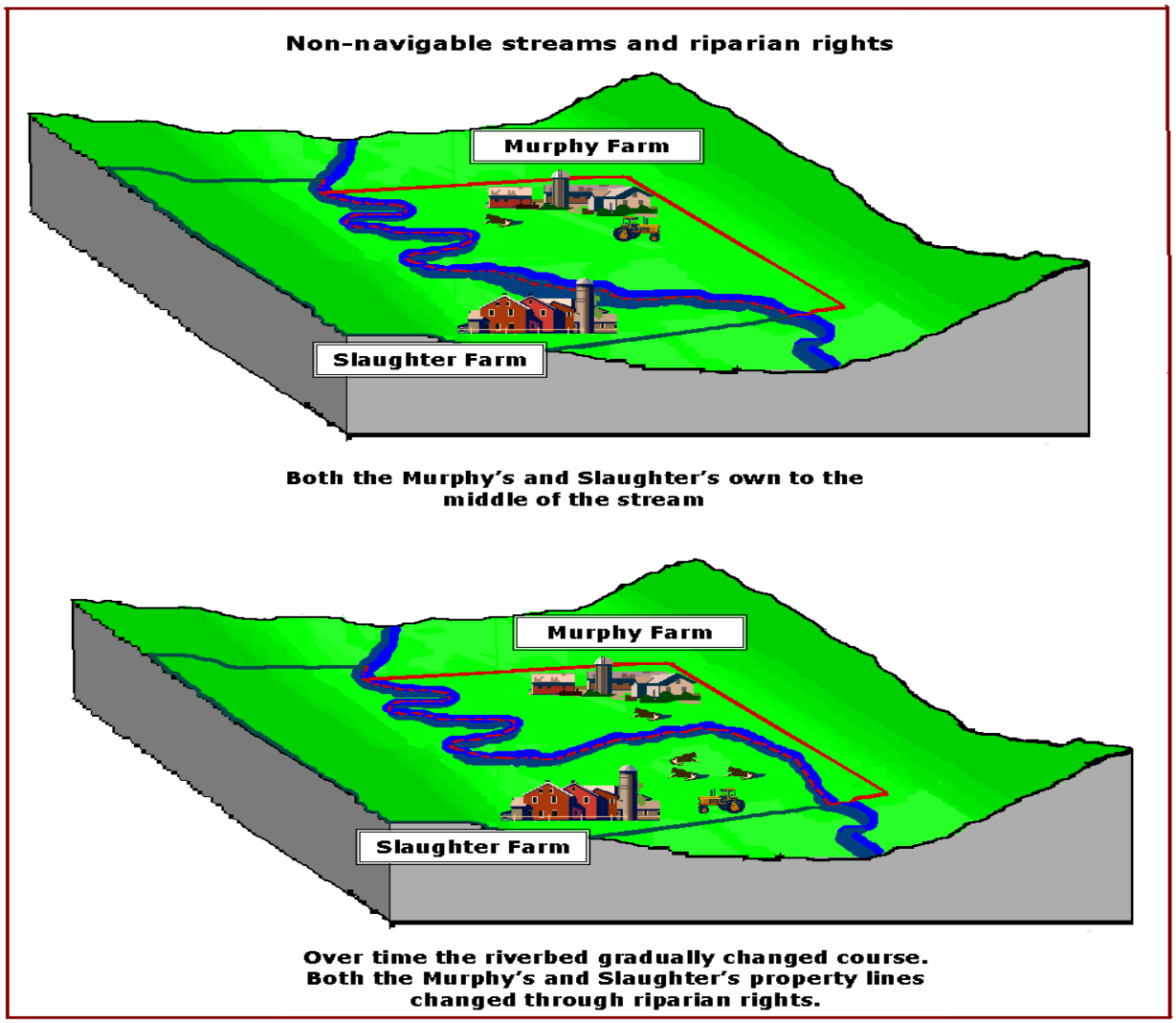
As with most every law, state laws governing ownership to rivers and streams vary from state to state. For instance:

1. Texas holds title to all of the minerals under navigable rivers or streams and has deemed all of them navigable if they can be navigated or have a width greater than 30 feet from the mouth up.
2. Except for a portion of the Arkansas River, Oklahoma has deemed all of its major rivers non-navigable.
3. Louisiana claims ownership to the "historic high water mark of a

naturally navigable lake, to the current low water mark of a naturally navigable river or stream and to all lands in the vicinity of the open gulf directly affected by the ebb and flow of the tides." [11]

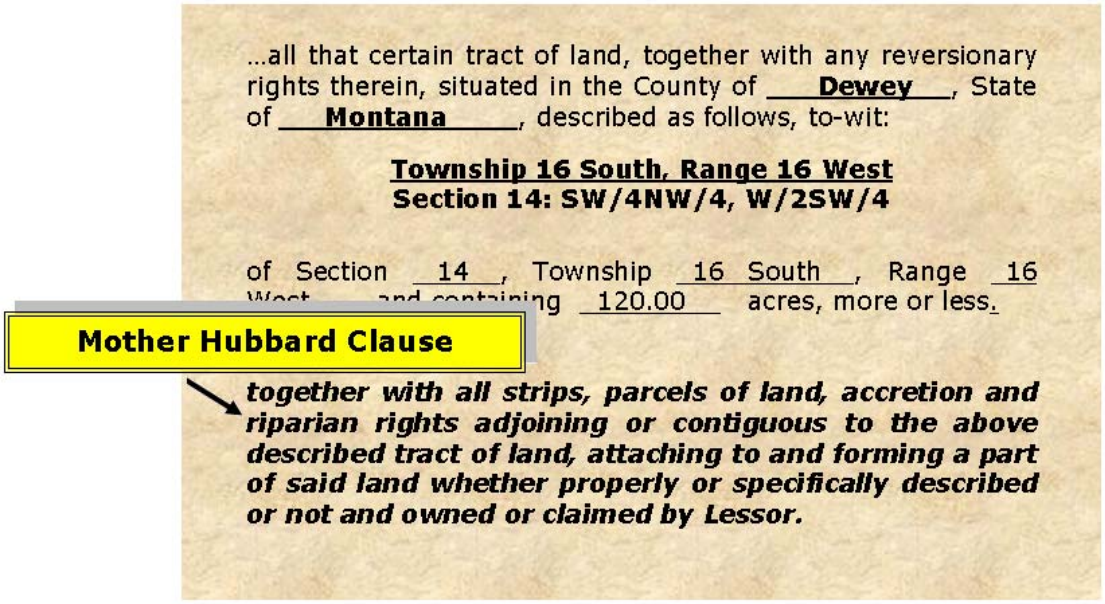
Non-Navigable Streams and Riparian Rights

Generally, non-navigable streams or rivers are owned by the adjacent property owners, with each party owning to the middle of the stream or river. Over time riverbeds gradually change as the natural flow of the water changes its course. When this happens, the property owners' rights to the river change with the natural flow of the water. This principle is called *riparian rights*.



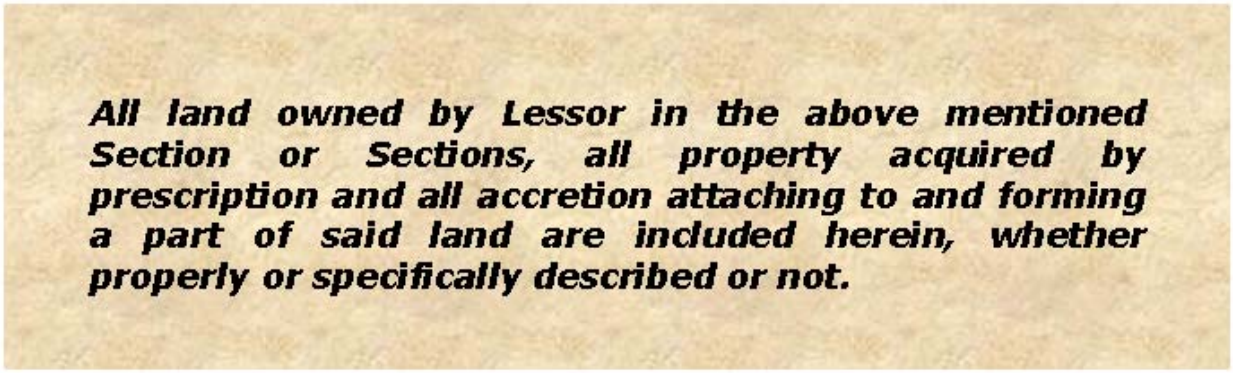
Avulsion Rights

Avulsion is the sudden change in the course of a river or stream caused by man or events such as a flood. Generally, avulsion will not change the ownership to the land, and the original boundary ownership remains the same.



Notice that the Mother Hubbard language in the above Oil and Gas Lease addresses *riparian rights*. If your company had taken a lease on the Slaughter farm lands, because of the change in the riverbed, your company's acreage position would have changed dramatically.

Not all Mother Hubbard language is the same. The following language does not mention the word riparian; however, a provision for "all accretion attaching to … said land" is specified. This language would have the same outcome as in the previous example.



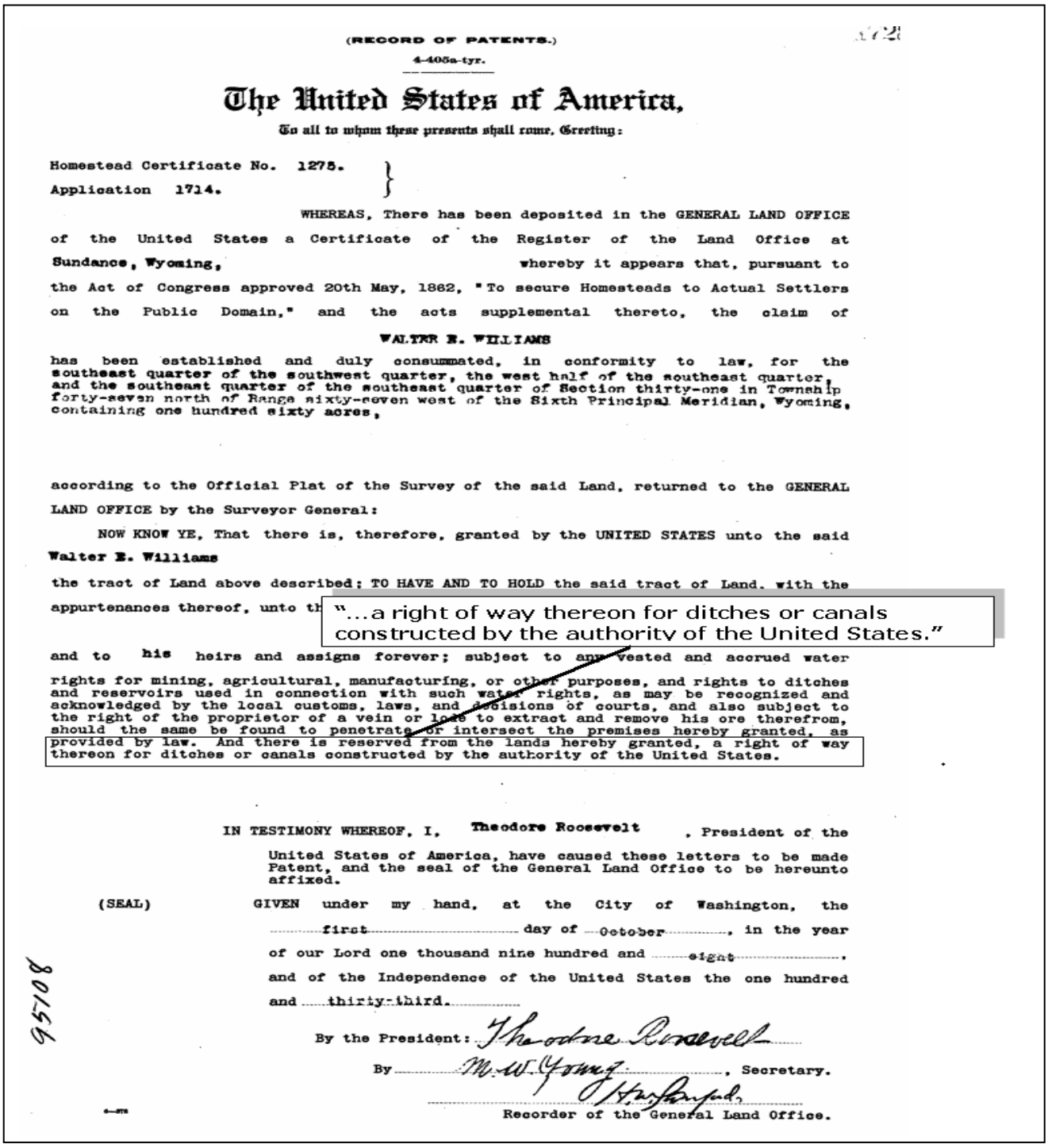
LANDS GIVEN TO SETTLERS

In 1850, 1.4 billion acres of the western frontier were primarily unoccupied. During this time, the government continued to promote the westward movement and began to grant lands through a conveyance called a *land patent.* Patents were given to those individuals who met the criteria for the following categories:

1. Residence requirements
2. Land improvement requirements
3. Requirements for actual settlement and cultivation for 5 years

The significant patenting of western lands began with *The Homestead Act of 1862*. It allowed ownership in 160-acre tracts of land. The land was free, except for filing fees, hence the origination of the term *Fee Lands*. Homesteads were available on any land where Indian title was deemed non-existent. Between 1862 and 1900, over 80 million acres of land were granted to settlers under this act.

One type of improvement requirement came with *The Timber Culture Act of 1873.* The purpose of this act was to promote the growth of forests on the western frontier and allowed settlers to claim an additional 160 acres if they were able to plant and then cultivate 25% of the land in trees. Imagine planting 40 acres of trees on a tract of land that had grown only prairie grass for the last ten thousand years! Five years later, *The Desert Land Act* was passed. This act provided for 640 acres of land if the settler could irrigate the land within 2 years. Imagine irrigating 640 acres of desert land! The land improvement requirements were often impossible.



(RECORD OF PATENTS.)

4-405a-tyr.

The United States of America,

To all to whom these presents shall come, Greeting:

Homestead Certificate No. 1275.
Application 1714.

WHEREAS, There has been deposited in the GENERAL LAND OFFICE of the United States a Certificate of the Register of the Land Office at Sundance, Wyoming, whereby it appears that, pursuant to the Act of Congress approved 20th May, 1862, "To secure Homesteads to Actual Settlers on the Public Domain," and the acts supplemental thereto, the claim of

WALTER B. WILLIAMS

has been established and duly consummated, in conformity to law, for the southeast quarter of the southwest quarter, the west half of the southeast quarter, and the southeast quarter of the southeast quarter of Section thirty-one in Township forty-seven north of Range sixty-seven west of the Sixth Principal Meridian, Wyoming, containing one hundred sixty acres,

according to the Official Plat of the Survey of the said Land, returned to the GENERAL LAND OFFICE by the Surveyor General:

NOW KNOW YE, That there is, therefore, granted by the UNITED STATES unto the said Walter B. Williams the tract of Land above described; TO HAVE AND TO HOLD the said tract of Land, with the appurtenances thereof, unto th

"...a right of way thereon for ditches or canals constructed by the authority of the United States."

and to his heirs and assigns forever; subject to any vested and accrued water rights for mining, agricultural, manufacturing, or other purposes, and rights to ditches and reservoirs used in connection with such water rights, as may be recognized and acknowledged by the local customs, laws, and decisions of courts, and also subject to the right of the proprietor of a vein or lode to extract and remove his ore therefrom, should the same be found to penetrate or intersect the premises hereby granted, as provided by law. And there is reserved from the lands hereby granted, a right of way thereon for ditches or canals constructed by the authority of the United States.

IN TESTIMONY WHEREOF, I, Theodore Roosevelt, President of the United States of America, have caused these letters to be made Patent, and the seal of the General Land Office to be hereunto affixed.

(SEAL)

GIVEN under my hand, at the City of Washington, the first day of October, in the year of our Lord one thousand nine hundred and eight, and of the Independence of the United States the one hundred and thirty-third.

By the President: Theodore Roosevelt

By M. W. Young, Secretary.

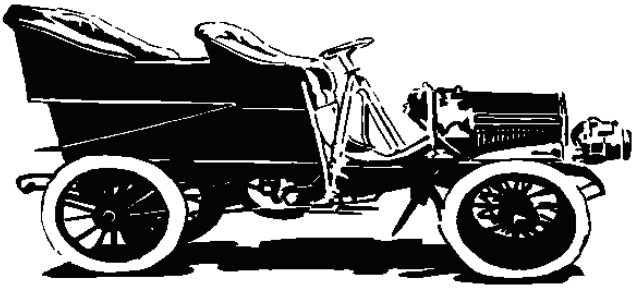
H. Stanfield, Recorder of the General Land Office.

8056

Patent from the United States to Walter B. Williams
Signed by Theodore Roosevelt, dated Oct. 1, 1908

This patent reserved to the United States only “a right of way thereon for ditches or canals constructed by the authority of the United States.” In such a patent, all mineral rights would have passed to Walter B. Williams.

A CHANGE IN THE WAY THE U.S GRANTED FEE LANDS



In 1909, the United States government changed the way it would grant fee lands to those folks moving west. This change, which would significantly impact the ownership of oil and gas minerals, came about after the automobile had shown Congress the error of their ways.

In 1889, the first automobile was built that was powered by a 1.5 hp, two-cylinder gasoline engine; it had a four-speed transmission and traveled at 10 mph. The gasoline-powered automobile remained largely a curiosity for the rest of the nineteenth century, with only a handful being manufactured in Europe and the United States.

In 1901, the first automobile to be produced in quantity was built in the United States by Ransom E. Olds. Modern automobile mass production is credited to Henry Ford, who began producing his Model T in 1908. By 1927, over *18 million* had rolled off the assembly line.

When *The General Land Ordinance of 1785* was written, few men dreamed of the wealth that would eventually come from the development of oil and gas minerals. However, in 1909, Congress, realizing that their predecessors had been short-sighted concerning the wealth of oil and gas minerals, began to develop what they called the "multiple use concept." Simply put, they began to *reserve the minerals under lands that had previously been classified as Agricultural.*

Prior to 1909, the United States usually would reserve only "ditches, canals or coal" when deeding lands. After 1909, in most cases, all coal and other minerals were reserved and may still be owned by the United States government, managed by The Bureau of Land Management.

Denver 028275 and 030626 4—1007-R.

The United States of America,

To all to whom these presents shall come, Greeting:

WHEREAS, a Certificate of the Register of the Land Office at Denver, Colorado,

has been deposited in the General Land Office, whereby it appears that, pursuant to the Act of Congress of May 20, 1862, "To Secure Homesteads to Actual Settlers on the Public Domain," and the acts supplemental thereto, the claim of James J. Conklin

has been established and duly consummated, in conformity to law, for the south half of the southeast quarter, the southeast quarter of the southwest quarter, the northwest quarter of the southwest quarter, the southeast quarter of the northwest quarter, and the southwest quarter of the northeast quarter of Section eight, the southwest quarter of the southwest quarter and the northeast quarter of the northwest quarter of Section nine, the northeast quarter of Section seventeen, and the southeast quarter of Section eighteen in Township one south of Range se

taining six

according to the Offi

"Excepting and reserving, however, to the United States all the coal and other minerals in the lands so entered and patented". "

NOW KNOW YE, That there is, therefore, granted by the UNITED STATES unto the said claimant the tract of Land above described; TO HAVE AND TO HOLD the said tract of Land, with the appurtenances thereof, unto the said claimant and to the heirs and assigns of the said claimant forever; subject to any vested and accrued water rights for mining, agricultural, manufacturing, or other purposes, and rights to ditches and reservoirs used in connection with such water rights, as may be recognized and acknowledged by the local customs, laws, and decisions of courts; and there is reserved from the lands hereby granted, a right of way thereon for ditches or canals constructed by the authority of the United States. Excepting and reserving, however, to the United States all the coal and other minerals in the lands so entered and patented, together with the right to prospect for, mine, and remove the same pursuant to the provisions and limitations of the Act of December 29, 1916 (39 Stat., 862).

IN TESTIMONY WHEREOF, I, Herbert Hoover,

President of the United States of America, have caused these letters to be made Patent, and the seal of the General Land Office to be hereunto affixed.

GIVEN under my hand, at the City of Washington, the TWENTY-NINTH day of NOVEMBER in the year of our Lord one thousand nine hundred and TWENTY-NINE and of the Independence of the United States the one hundred and FIFTY-FOURTH

By the President: Herbert Hoover

By Viola B. Pugh, Secretary.

M. P. LeRoy

Recorder of the General Land Office.

1437109

(SEAL.)

RECORD OF PATENTS: Patent Number 1032465

Patent from the United States to James J. Conklin

Signed by Herbert Hoover, dated Nov 29, 1929

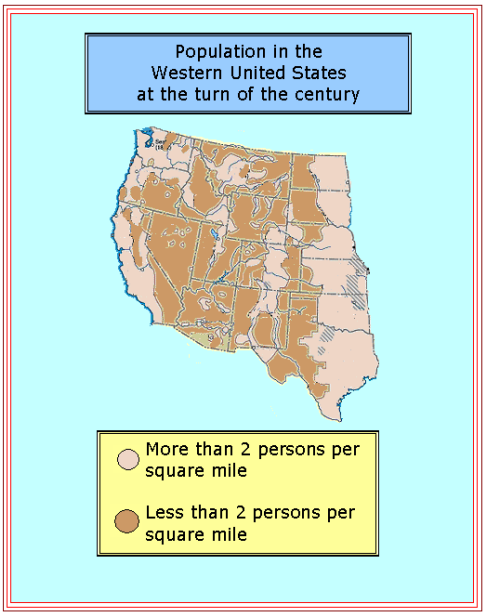
This patent is different from the one previously shown. It states, “Excepting and reserving, however, to the United States all the coal and other minerals in the lands so entered and patented.” In such a patent, James J. Conklin would have received the surface acres but no mineral rights.

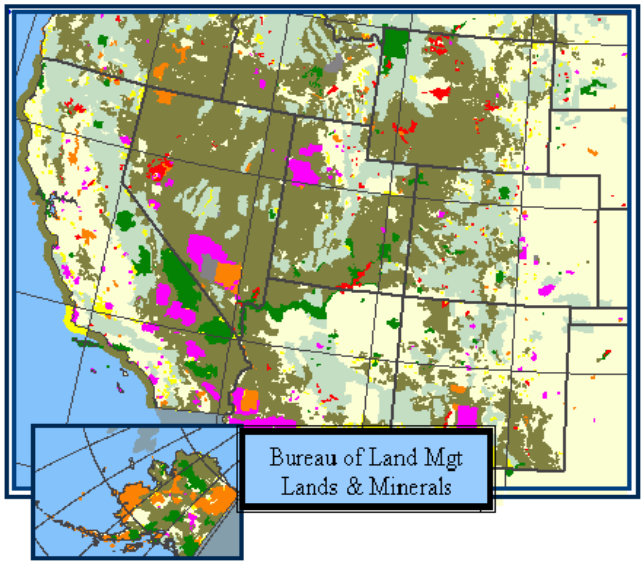
THE IMPACT OF MINERAL RESERVATIONS IN THE UNITED STATES

Below are two maps of the Western United States. The first shows the population in the year 1900 as to regions with more than 2 persons per square mile or regions with less than 2 persons per square mile. It would appear that much of the darker shaded areas were unpatented lands in 1900.

The second map is a current map of all those lands and/or minerals either owned by or managed by the Bureau of Land Management.

The first map shows that most of Nevada, Wyoming, southeastern California and western Colorado were unsettled. Today, even though much of that land is patented land, the *minerals* are still owned and are being managed by the Bureau of Land Management.





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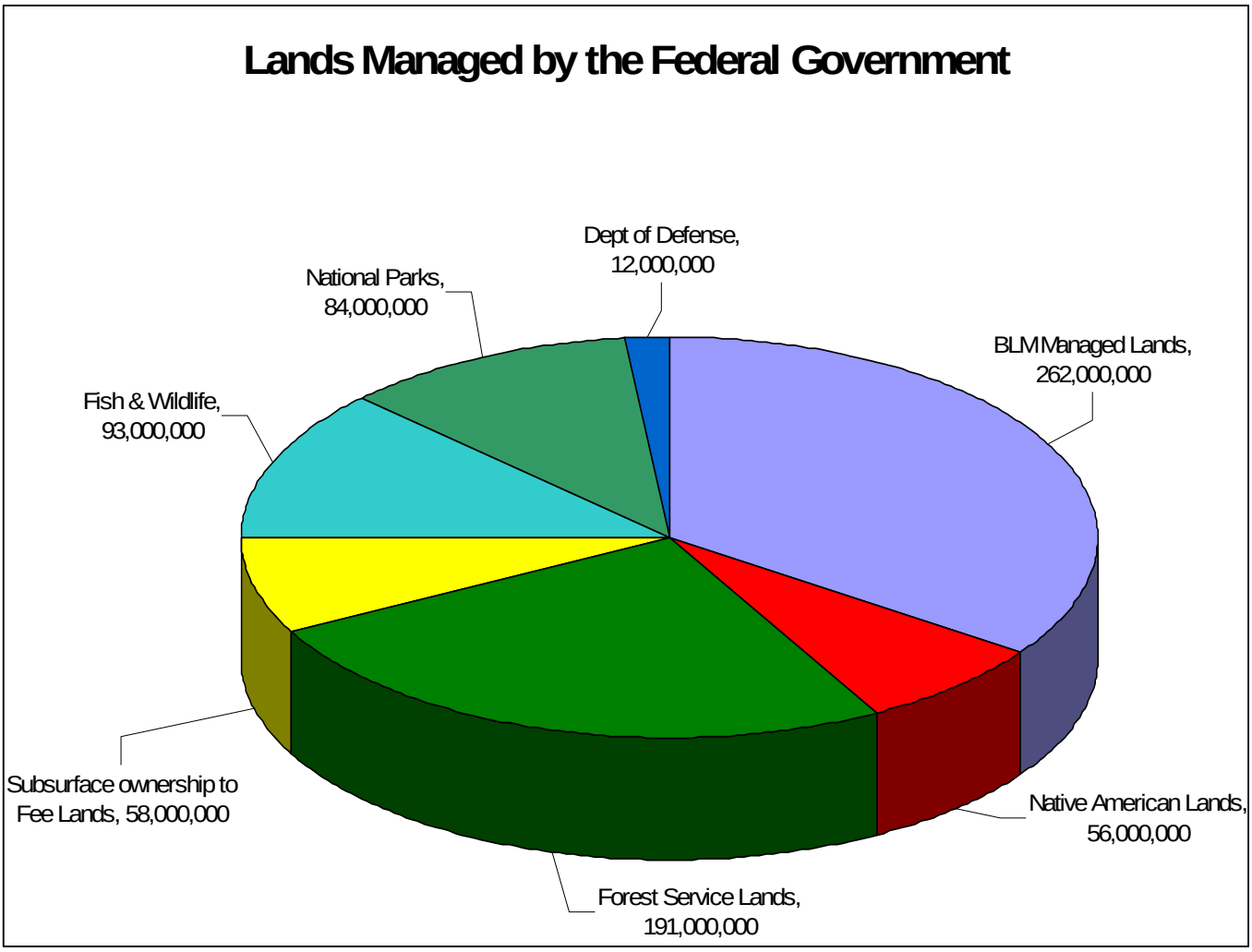
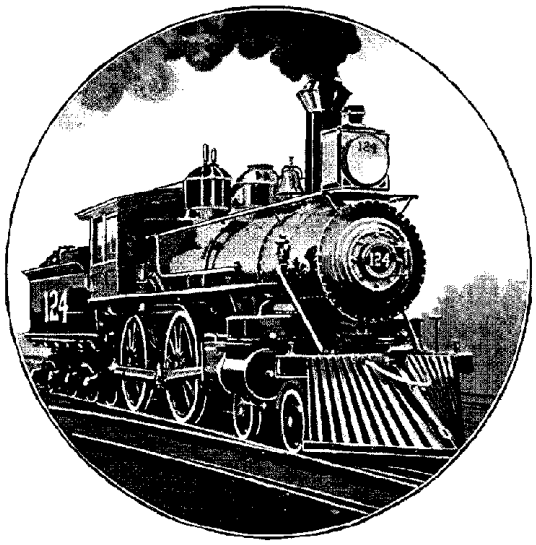
lm.gov/nhp/facts/index.htm

Today, the federal government manages 262 million acres of public lands located primarily in the western United States and Alaska. It also manages an additional 380 million subsurface mineral acres located throughout the country in national parks and forest lands, 56 million subsurface acres of Native American Indian lands, and 58 million subsurface acres of privately owned land. The government-owned mineral acres now total in excess of 756 million.[12]



LANDS GIVEN TO RAILROADS

Congress recognized that public aid for the construction of railroads across the country was necessary to make possible the settlement of its western lands. Between 1850 and 1870, they began granting large portions of the frontier lands to railroad companies in order to subsidize their construction. These land grants became known as the Federal Railroad Land Grants or also the *"Checker boarding of the western United States"* and comprised tens of millions of acres of land.



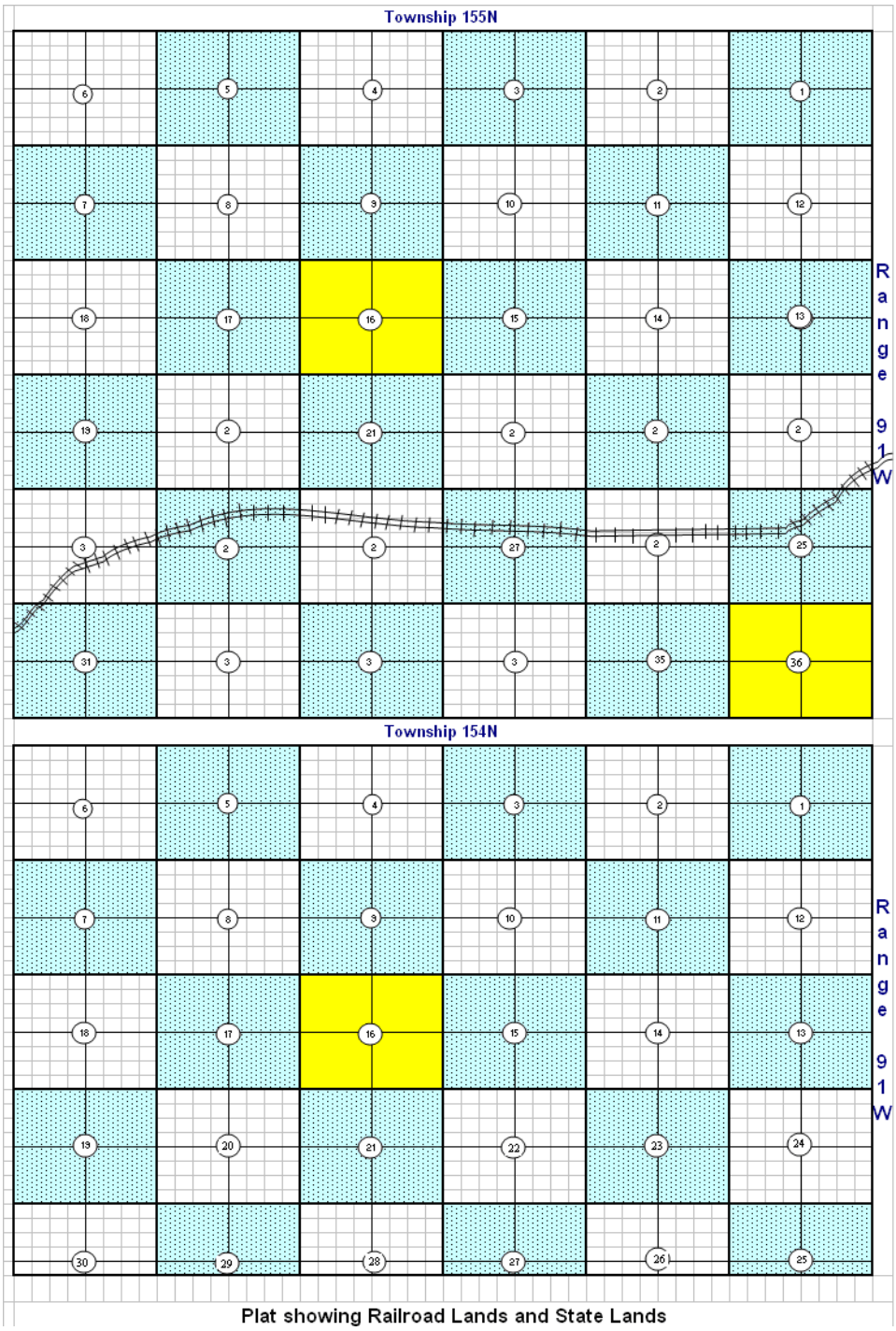
The first of several of these grants was enacted in 1862 to promote a transcontinental railroad. The Union Pacific and Central Pacific railroads were granted 400-foot right-of-ways and ten odd-numbered sections of land for every mile of track that was laid. In 1864, the land grants to these two railroads were increased to include 20 odd-numbered sections (ten sections on each side of the right-of-way) for every mile built. [13]

The Burlington Railroad was given a 200-foot right-of-way and 20 sections per mile of public lands from the Missouri River to Nebraska. [14]

From Atchison, Kansas, to the western border of the state, the Santa Fe Railroad was given lands of alternate sections for a depth of 10 miles on both sides of the tract. In all, twenty percent of the acreage in Kansas passed to railroads.[15]

In 1864, the Northern Pacific Railroad Company was given a 400-foot right-of-way and 20 sections of land on each side of the tract for each mile constructed in states and 40 sections for each mile in territories. This grant comprised 45,000,000 acres, 80 miles wide in the states and 160 miles wide in the territories. The land grant consisted of 23% of North Dakota and 15% of Montana. [16]

The Texas Pacific Railroad received a similar grant stretching from the eastern Texas border to San Diego, California. [17]



Plat showing Railroad Lands and State Lands

This plat shows the checkerboard granting of odd-numbered sections granted to the railroads (shaded sections) and the school lands granted to the states (sections 16 and 36).

Note: In many cases the railroads ended up with 20 odd-numbered sections (ten sections on each side of the right-of-way) for every mile built. This plat would need to be ten times larger than it is in order to show all of the sections granted for this stretch of track laid.

The following chart of 14 western states shows how much land the government granted to either the state or the railroads. [18]

	Grants to Railroads	Total of Grants to States and Railroads	Percent of land Granted
Arizona	7,790,128	18,333,881	25.2%
California	11,588,626	20,440,766	20.3%
Colorado	3,757,673	8,229,277	12.3%
Idaho	1,320,753	5,575,241	10.5%
Kansas	4,057,683	11,852,352	22.5%
Montana	14,739,697	20,703,035	22.1%
Nebraska	7,272,623	10,731,334	21.8%
Nevada	5,086,603	7,812,269	11.1%
New Mexico	3,355,179	16,149,838	20.7%
North Dakota	10,697,490	13,861,042	31.1%
Oregon	3,656,085	10,688,932	17.3%
Utah	2,230,085	9,737,813	18.4%
Washington	9,617,384	12,661,855	29.6%
Wyoming	5,749,051	10,092,477	17.7%
Total	94,355,739	318,233,203	

The important thing to remember is that when these lands were granted to the railroads, seldom were oil and gas mineral reservations invoked by the federal government. Therefore, these minerals passed to the railroad companies.

The main purpose of these large land grants was to help railroads subsidize the tremendous construction costs. When selling these grant lands to individuals, however, railroads frequently made a practice of reserving the minerals and ended up owning millions of mineral acres of western lands. Over the years several of these companies ventured into the oil and gas business.

According to the chart above, close to 100 million acres of land were granted to the railroads in these 14 western states.

THE NATIVE AMERICANS WERE GRANTED THE RIGHT OF OCCUPANCY

In comparison to the vast land grants given to the railroads, the individual states, and the settlers, how did the Native American Indians fare?

After the period of acquisition of the western lands from France and Britain, the United States began to settle treaties with the Native Americans. Although they recognized that these people had a right to the land they occupied, the government transferred these rights to themselves in order to hold portions of this land in trust for the native people.[19]

At times these lands were set aside in order to establish reservations. These reservation lands also were held in trust and managed by the United States government.

Courts concluded that the United States stood in the shoes of the respective discovering European nations who had asserted ultimate dominion over the lands they discovered. Furthermore, since “land ownership” was a foreign concept to most Native Americans, the courts concluded the land should be held in trust on their behalf.

Courts also concluded that since the Indians retained only a right of occupancy, they did not possess the right to transfer title to the property to others.

Based upon this underlying rationale, the power of the United States to control the disposition of Indian lands has always been recognized by the courts of the United States.

The long and short of it was that 0% of the land in these 14 states shown on the previous chart was granted to the Native American Indian. Instead lands were placed into two categories.

CATEGORIES OF INDIAN LANDS

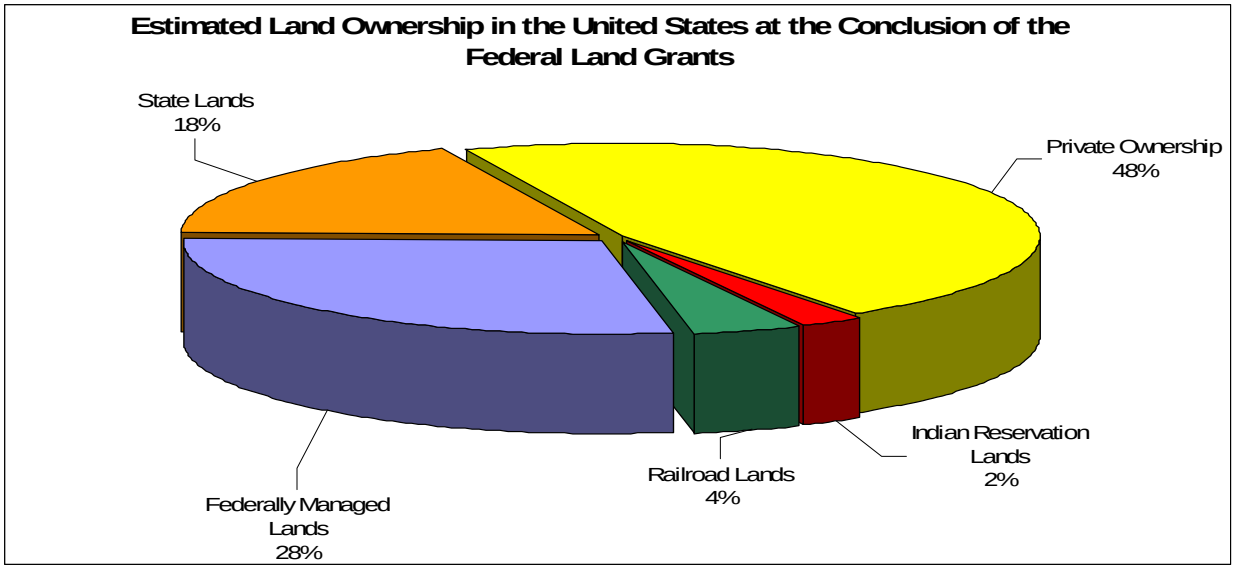
1. **Tribal Indian land** is land owned by the United States as trustee for the use and benefit of a tribe, group, or band of Indians.

2. **Allotted Indian land** is land owned by the United States as trustee for the use and benefit of individual Indians. The Indian interest in tribal or allotted land is similar to the interest of a beneficiary under a trust.

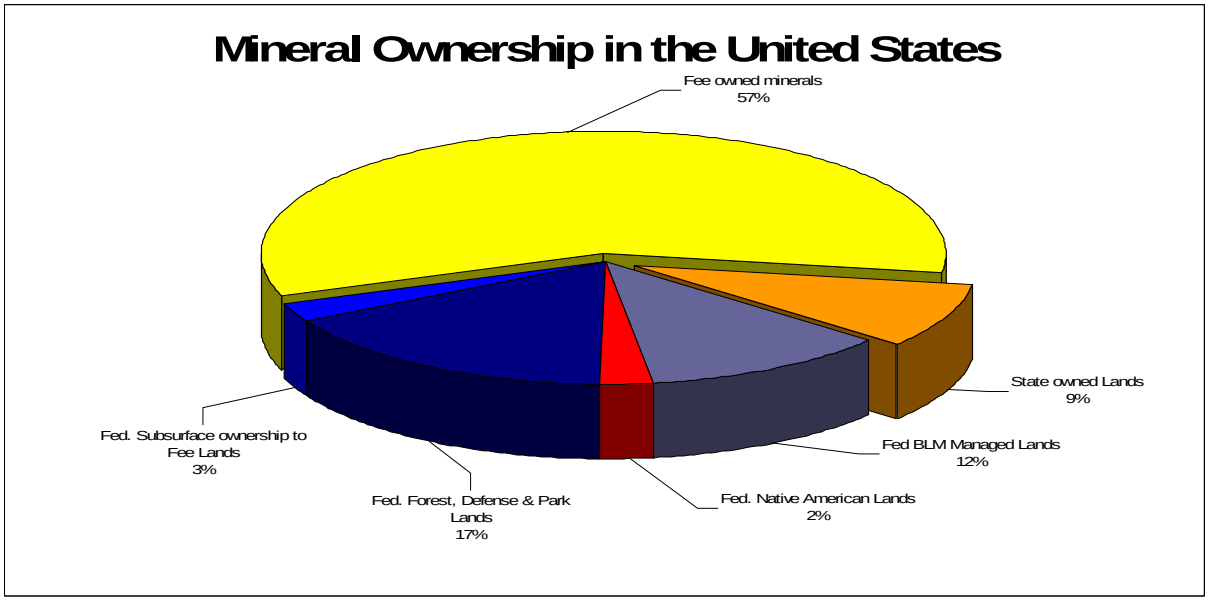
Today there are approximately 275 Native American land areas administered by the United States as Indian reservations. The Navajo Reservation in portions of Arizona, New Mexico and Utah encompasses the largest area with 16 million acres of land. The smallest reservation holds less than 100 acres. In total, over 56 million acres of land are held in trust by the United States for either tribes or individuals.[20] It is important to note that fee lands can also be located within the boundary of a reservation.

OWNERSHIP IN THE UNITED STATES

The land mass of the United States totals close to 2.3 billion acres of land. The following chart depicts how the land ownership of the United States was owned at the conclusion of the Federal Land Grants.



Mineral ownership is quite another matter. The federal government reserved 58 million acres of subsurface minerals from the fee lands. States sold nearly half of their land to settlers, and in many cases the minerals were conveyed with the surface. The railroads also sold great portions of their surface acreage keeping large portions of the minerals.



GLOSSARY OF TERMS
TYPES OF LANDS

ACQUIRED FEDERAL LANDS

Acquired Federal Lands are those lands in federal ownership which have never been "Public Domain." This category also includes those lands in federal ownership which have once been public lands but have been disposed of as such and which the United States has later re-acquired by purchase, condemnation, or donation. As a result of the dust-bowl years of the 1930's, many acres were re-acquired, with the minerals being reserved for a term of years.

PUBLIC DOMAIN

The public domain is land acquired by the Federal Government by treaty.

PUBLIC LANDS

Land owned by the Federal Government, including two classifications: the public domain and acquired lands.

FEE LANDS

The term *fee lands* refers to land that is owned by private individuals, short for "owned-in-fee," and also refers to "patented" lands.

INDIAN LANDS

Indian lands are those lands set aside by the government for Indians. Indian lands constitute a type of property ownership different from all other types in the United States. In general, there are two classes of Indian Land which are:

A) Tribal — Lands occupied by a group or tribe of Indians collectively in common, which are not transferable, inheritable or devisable. The group or tribe has a right of perpetual occupancy.

B) Allotted — Lands held by the government in trust for an individual Indian, who occupies the land with certain restrictions on alienation and with a tax exemption.

ALLOTMENT

An allotment is an allocation to a Native American of land of which he has made substantially continuous use and occupancy for a period of five years and which is then deemed the “homestead” of the allottee and his heirs in perpetuity, and shall be inalienable and nontaxable except as otherwise provided by Congress.

SCHOOL LANDS

As pioneers settled the western frontier, the federal government designated sections 16 and 36 as school lands in many parts of the country. These lands and minerals are still owned, in many cases, by the individual state.

RIPARIAN RIGHTS

Generally, non-navigable streams or rivers are owned by the adjacent property owners--each owning to the middle of the stream or river. Over time riverbeds gradually change as the natural flow of the water changes its course. When this happens, the property owners' rights to the river change with the natural flow of the water. This principle is called *riparian rights*.

AVULSION RIGHTS

Avulsion is the sudden change in the course of a river or stream caused by man or events such as a flood. Generally, avulsion will not change the ownership to the land, and the original boundary ownership remains the same.

Government Bureaus Involving Federal Ownership of Land

BLM

The United States Department of the Interior oversees The Bureau of Land Management, which, among other responsibilities, administers the statutes and regulations applicable to the leasing of land owned by the federal government for oil and gas purposes. This bureau also manages federal right-of-ways on federally owned lands.

MMS

The branch of the Federal Government that manages and oversees the payments due the Federal Government for the use of its lands is called the Minerals Management Service.

LEGAL DESCRIPTIONS

LEGAL DESCRIPTIONS IN GENERAL

Just as every house has an address so that mail can be delivered. So *sections* of land, *quarter sections* of land, and *quarter quarter* sections of land have addresses. These addresses are referred to as *legal descriptions*. Usually they will have a township number and a range number along with a section number and a description of the portion of the section in question.

SECTION OF LAND

Much of the United States has been measured, surveyed and categorized into “sections” of land. Each section of land generally contains 640 acres. A section of land is usually square and is divided into quadrants such as the NE/4, NW/4, SW/4 and SE/4. A section of land is typically one mile in length on each of its sides or is one mile square.

QUARTER SECTION

A quarter section is ¼ of a section of land. Generally, a quarter section contains 160 acres or ¼ of 640 acres. Quarter sections are named by where they are located in the section. If the quarter section lies in the northwest quadrant of the section it is refereed to as the NW/4. The SW/4 lies in the

southwest quadrant. The NE/4 lies in the northeast quadrant. The SE/4 lies in the southeast quadrant.

QUARTER QUARTER SECTION

A quarter quarter section is ¼ of a quarter section. Generally, a quarter quarter section contains 40 acres or ¼ of ¼ of 640 acres. Quarter quarter sections are named by where they are located in the quarter section. If the quarter quarter section lies in the northwest quadrant of the northwest quarter, it is referred to as the NW/4NW/4. If the quarter quarter section lies in the southeast quadrant of the northwest quarter, it is referred to as the SE/4NW/4.

TOWNSHIP

Township lines run north and south from the base line and are usually placed every six miles, separating one township from the next.

RANGE

Range lines run east and west from a meridian and are usually placed every six miles, separating one range from the next. The use of the township and range method in the “Rectangular Survey System” can be used to designate tracts of land. Each township and range is approximately 6 miles square. Therefore, a township and range contains 6 sections of land in each direction or 36 sections of land in all.

LOTS

Due to the curvature of the earth, state and national boundaries and human error, not all townships contain 36 sections and not all 36 sections within a township and range contain 640 acres. Because of this, irregular lots were created to run along the north and west edge of each township and range.

METES AND BOUNDS DESCRIPTION

In many parts of the country, the rectangular survey system was not implemented. In those areas, metes and bounds descriptions are often used. A metes and bounds will describe a tract of land using landmarks, ditches, rivers, rocks, wagon wheels, trees, rods, degrees, links, chains, feet, and yards, as well as many other terms that have been used.

UNITS OF MEASURE

- Acre - a unit of area equal to 43,560 square feet, or 10 square chains,

or 160 square poles. It derives from a plowing area that is 4 poles wide and a furlong (40 poles) long. A square mile is 640 acres.

- Arpent - a unit of length used in Louisiana and Canada, measuring approximately 191.8 feet.
- Chain - equal to 66 feet, or 4 poles. The name comes from the heavy metal chain of 100 links.
- Furlong - equal to 40 poles (220 yards). Its name derives from "furrow long," the length of a furrow that oxen can plow before they are rested and turned.
- Labor - a term used in Texas which equals 177.14 acres (or 1 million square varas).
- Link - equal to 1/100 chain (7.92 inches).
- Out - equal to ten chains.
- Pole - also known as a *perch* or *rod,* equal to 16.5 feet.
- Pueblo - a Spanish grant of less than 1,000 acres.
- Rancho - a Spanish grant of more than 1,000 acres.
- Vara - (the *"Spanish yard" or "the stride of a mule"*) used in the southwestern area of the U.S. The vara has values around 33 inches, depending on locale. The legal value in Texas was set to 33 1/3 inches early in the 1900's.

FOOTNOTES

[1] Mineral Title Examination II. Genesis and Evolution of Land and Mineral Ownership in the Western United States. April, 1982, Roscoe Walker, Jr., and Janet Harris, Rocky Mountain Mineral Law Foundation.

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[3] The Evolution of Texas Land Surveys, TOBIN International. Ltd, AM/FM/GIS Conference, Dallas, Texas, Pauline Jacobson, Oct. 1992.

[4] Definition of Terms Pertaining to the TOBIN Original Texas land Survey Data, www.tobin.com/documents/TechWhitePaper1., Oct, 1996.

[5] Leasing Oil and Gas Natural Resources, Outer Continental Shelf, U.S. Department of the Interior, Minerals Management Service, www.mms.gov/ld/PDFs/GreenBook-LeasingDocument.

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[7] Mineral Title Examination II. Genesis and Evolution of Land and Mineral Ownership in the Western United States. April, 1982, Roscoe Walker, Jr., and Janet Harris, Rocky Mountain Mineral Law Foundation.

[8] Harold M. Hyman, American Singularity: The 1787 Northwest Ordinance, The 1862 Homestead and Morrill Acts, and the 1044 GI Bill 10-25 (1986).

[9] Trust Lands in the American West, Lincoln Institute of Land Policy/Sonoran Institute, www.trustland.org.

[10] Mineral Title Examination II. Genesis and Evolution of Land and Mineral Ownership in the Western United States. April, 1982, Roscoe Walker, Jr., and Janet Harris, Rocky Mountain Mineral Law Foundation.

[11] A Comparative Review of Oil and Gas law in Texas, Oklahoma, Arkansas, New Mexico, Mississippi & Louisiana. December, 2002, George Snell, Timothy Dowd, Tom Daily, Gregory Nibert, John McDavid and Richard Revels, Landman Oil & Gas Law Special Section.

[12] blm.gov/nhp/facts/acres.

[13] Mineral Title Examination II. Genesis and Evolution of Land and Mineral Ownership in the Western United States. April, 1982, Roscoe Walker, Jr., and Janet Harris, Rocky Mountain Mineral Law Foundation.

[14] Ibid.

[15] Ibid.

[16] Ibid.

[17] Ibid.

[18] Ibid.

[19] Land Ordinance of May 20, 1785, Documents of American History, pp. 123-24.

[20] answers.com/topic/indian-reservation-2.