Introduction
The shale revolution in the United States has attracted a plethora of Japanese companies and investors to the U.S. oil and gas market over the last several years. While independent U.S. oil and gas companies were at the forefront of the early stages of the U.S. shale oil and gas boom, international energy companies and investors soon joined the race. Many shale transactions in the U.S. have taken the form of a partial or full acquisition of a company’s U.S. oil and gas interests coupled with, in the case of a partial acquisition, a development agreement to govern the ongoing development and operation of the oil and gas interests. Recent examples of these types of transactions include: SM Energy sale of 12.5% interest in the Eagle Ford shale to Mitsui; Atlas sale of 40% interest in the Marcellus shale to Reliance; Chesapeake sale of 20% interest in the Haynesville shale to Plains; Chesapeake sale of a 25% interest in Utica to Total; Chesapeake sale of a 32.5% interest in the Marcellus shale to Statoil; Chesapeake sale of a 33.3% interest in the Eagle Ford shale to CNOOC; Devon sale of a 30% interest in the Wolfcamp shale to Sumitomo; Pioneer sale of 41% interest in the Eagle Ford shale to Reliance; Hilcorp sale of interest in the Eagle Ford shale to Marathon; SM Energy sale of interest in the Eagle Ford shale to Statoil/Talisman; CONSOL sale of 50% interest in the Marcellus shale to Noble; CONSOL sale of 50% interest in the Utica shale to Hess; Anadarko sale of 32.5% interest in the Marcellus shale to Mitsui; Denbury sale of interest in the Bakken shale to ExxonMobil; Talon sale of interest in the Barnett shale to Enervest; Encana sale of interest in the Barnett shale to Enervest; Rex sale of interest in the Marcellus shale to Sumitomo; and Hunt sale of 35% interest in the Eagle Ford shale to Marubeni. As evidenced by the list above, a significant portion of these transactions consist of Japanese companies acquiring U.S. oil and gas interests from U.S. companies.

Alternatively, some transactions have been structured as acquisitions of equity in companies holding U.S. oil and gas interests. Some well-known examples of these types of acquisitions include: ExxonMobil’s acquisition of XTO; Chevron’s acquisition of Atlas Energy; BHP Billiton’s acquisition of Petrohawk; Shell’s acquisition of East Resources; Statoil’s acquisition of Brigham; and Apollo’s acquisition of El Paso Oil & Gas.
Given the significant number of U.S. oil and gas transactions involving non-U.S. companies, it is important for non-U.S. companies to understand the fundamentals of U.S. oil and gas law and the assets that are being acquired in these transactions. This article will discuss the fundamentals of U.S. oil and gas ownership, key provisions of U.S. oil and gas leases, and changes to U.S. oil and gas leases precipitated by the huge investment that has been made in U.S. shale oil and gas interests.

Oil and Gas Ownership in the United States

Ownership of oil and gas in the United States is unique compared to the rest of the world in that private individuals can own oil and gas. This fundamental characteristic of U.S. oil and gas ownership has a number of legal implications as it relates to the acquisition and development of U.S. oil and gas interests. Oil and gas ownership in the United States can take on a variety of forms, the most common of which are addressed below.

A. Landowner’s Interest

In general, the owner of a particular parcel of land in fee simple absolute owns everything under the surface of the land, including oil and gas, and has the following rights: he may drill a well to explore for oil and gas beneath the land, produce oil and gas, and dispose of oil and gas for his own benefit.1 However, state law governs oil and gas rights, including the rights of the landowner to the oil and gas underlying his land, and different theories exist as to the precise nature of the landowner’s rights. Most states prescribe to the ownership in place theory, which holds that oil and gas lying beneath or within land constitute a part of such land and therefore belong to the owner of the surface until it is conveyed.2 Furthermore, ownership of such oil and gas constitutes ownership of a real property interest, as “[i]t is well settled in every jurisdiction that oil and gas in place are minerals, and as such they are part of the realty.”3

Once oil and gas is produced, its legal character changes from real property to personal property. Extracted oil and gas retains its character as personal property even if it is subsequently re-injected into storage under the ground.

The rule of capture is a key concept in U.S. oil and gas law and generally applies in all states regardless of the landowner’s interest theory adopted by the state.4 Under the rule of capture, a landowner owns all of the oil and gas produced by a well bottomed on his land even if such well drains oil and gas from beneath land adjoining his land.5 Texas courts have described the rule of capture as “a well established doctrine in Texas which holds that a landowner is entitled to produce the oil and gas in place beneath his land, as well as the oil and gas which flows to the land as the result of physical conditions and natural laws relating to the migratory nature of oil and gas.”6

A landowner’s rights in oil and gas underlying his land may be separated from the fee simple absolute ownership interest of the surface of the land in a variety of ways, including by grant or reservation.7 The deed by which such rights may be granted or reserved must comply with the local rules applicable to real estate because it involves the creation of an interest in land. For example, the conveyance of an interest in oil and gas must be in writing, signed, and acknowledged in order to be filed of record. While the sale of all or part of the oil and gas fee estate must comply with the statute of frauds of the applicable state and other doctrines applicable to the conveyance of real property, the sale of oil and gas after it has been produced is governed by the Uniform Commercial Code of the applicable state. The types of interest in the oil and gas underlying land that a landowner may create by grant or reservation generally fall into three categories: (i) leasehold interests; (ii) mineral interests; and (iii) royalty interests.8

B. Leasehold Interest

A landowner may execute an agreement known as an oil and gas lease under which the landowner is known as the lessor and the counterparty is known as the lessee. Under an oil and gas lease, the lessee is granted the exclusive right to go upon the land to explore for, produce, sever, and remove oil and gas at its sole expense.9 An oil and gas lease typically has a primary term that consists of a stated number of years and has a secondary term that lasts for so long after the primary term as minerals are produced in paying quantities. In some oil and gas leases, the term may be extended under circumstances other than production in paying quantities, such as certain types of operations, which may include drilling operations or preparations for drilling operations. Although an oil and gas lease is treated in the State of Louisiana as an ordinary lease,10 most states recognize the generally accepted rule that an oil and gas lease does not truly give rise to a landlord-tenant relationship, but rather constitutes a transfer of an ownership interest in oil and gas as
A mineral interest may be created by a landowner in several ways. A mineral interest is created through a grant when a landowner conveys the mineral interest to another person through an instrument often referred to as a mineral deed. A landowner can create a mineral interest by conveying his land, but reserving or excepting from such conveyance the oil, gas, and other minerals beneath the land. A mineral interest may consist of the entirety of the interest in the oil, gas, and other minerals, or it may only consist of an undivided smaller interest in the oil, gas, and other minerals.

The mineral interest owner generally has the right to go upon the land to explore for, produce, sever, and remove oil and gas. The mineral interest, sometimes referred to as the mineral estate, is generally regarded as the dominant estate (as compared to the ownership interest in the surface in the land) because the owner thereof has the right to use the surface of the land as necessary to explore for, produce, sever, and remove oil and gas. A mineral interest that has been severed from the surface interest usually also includes executive rights, which consists of the right to execute an oil and gas lease. In the U.S., it is common for the mineral interest to be severed from the surface interest in the land and for the owner of the mineral interest to execute oil and gas leases with parties that desire to go on the land to explore for and produce oil and gas.

D. Royalty Interest
A royalty interest is a non-possessory real property interest in oil and gas production free of production and operating expenses, which may be created by grant or by reservation or exception. A royalty interest owner is entitled to share in the oil and gas that may be removed from the land or the proceeds thereof; however, unlike a mineral interest owner, a royalty interest owner is not entitled to go upon the land to explore for and produce oil and gas and has no executive rights (that is, no right to execute oil and gas leases). A royalty interest is often created under an oil and gas lease by the lessor reserving a certain percentage interest in the oil and gas that may be produced by the lessee, but a royalty interest may be created in other ways using a variety of different instruments. For example, it is common for a lessee under an oil and gas lease to create what is known as an overriding royalty interest by assigning its interest in an oil and gas lease, but reserving from such assignment a royalty interest.

E. Net Revenue Interest
A net revenue interest is not a real property interest, but rather a measurement of a lessee’s or other oil and gas interest owner’s share of oil and gas production after satisfaction of all royalties and other burdens.

The U.S. Oil and Gas Lease
A fundamental document of the U.S. oil and gas industry is the oil and gas lease, which grants the lessee the exclusive right to go upon the land to explore for, produce, sever, and remove oil and gas. While there is no standard U.S. oil and gas lease form, most traditional U.S. oil and gas leases contain similar provisions. Although there is no standard form, the “Producer’s 88” refers to a form of U.S. oil and gas lease that has been widely used over the years in the U.S. Over the last few years, oil and gas leases have further evolved in connection with the U.S. shale boom. As mineral interest owners have realized the vast amount of value associated with their oil and gas rights, it has become more common for them to negotiate, often successfully, for additional provisions to be added to traditional lease forms, many of which tend to be lessor-friendly and protect the interests of the lessor. Some of these provisions are discussed in Section IV. A brief overview of some of the basic provisions in a standard U.S. oil and gas lease follows.

A. Habendum Clause
The habendum clause usually provides that the leasehold estate lasts for a stated number of years and so long thereafter as oil and gas are produced in paying quantities. In many modern oil and gas leases the term may be extended under circumstances other than production in paying quantities, such as certain types of operations. This may include commencement of or preparation for drilling operations, commencement of additional drilling operations within a certain period of time after a dry hole is drilled and production ceases, or a shut-in royalty clause. Commencement of drilling operations is commonly viewed to have occurred when some activity on the land directly relating to or preparing for drilling has occurred. A shut-in royalty clause provides that if a well is
completed but production therefrom is not being sold, the lease may be kept alive by the payment of shut-in royalties.\footnote{20}

\section*{B. Paid-up Lease vs. Delay Rentals}
Traditionally, U.S. oil and gas leases contained delay rental clause, which require the payment of annual delay rentals to maintain a lease during the primary term if the lessee has not commenced drilling of a well. Delay rentals are no longer commonly used in oil and gas leases. Instead, most modern leases are known as “paid-up leases.” Under a paid-up lease, the lessee typically makes an upfront bonus payment to the lessor and is not required to commence drilling operations or pay any rentals in order to maintain the lease in effect for the duration of the primary term. In Texas, a paid-up lease may be created, even if the lease contains a delay rental clause, by simply adding such language as “this is a paid up lease and all references to delay rentals shall be disregarded.”\footnote{21}

\section*{C. Pooling}
Most modern leases contain pooling clauses, which authorize the lessee to combine one lessor’s acreage with other acreage and form a pooled unit.\footnote{22} Although pooling clauses take a number of different forms, such clauses generally provide that production on any of the pooled acreage will maintain the leases as to all of the leased acreage (including acreage not contained within the pooled unit). However, in order to prevent a lessee from maintaining a lease as to all of the acreage covered by the lease (including acreage not contained within the pooled unit) by production on only a small portion of leased acreage through pooling, many leases contain Pugh clauses. Pugh clauses provide that only the pooled acreage will be maintained by production from the pooled unit, and any acreage covered by the lease that is not contained in the pooled unit will not be held by production in the pooled unit. Additionally, in Texas, if a lessee pools acreage it must do so in good faith and the inclusion of non-productive acreage could be considered pooling in bad faith.\footnote{23} Another technique that lessors use to protect themselves from abuse of pooling is the inclusion of a

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Shale gas extraction has become profitable due to recent advances in: 1. drilling techniques of horizontal drilling which opens up more of the deposits to be accessible with the need for only one drilling pad, therefore reducing cost and land impacts; and 2. hydraulic fracturing which cracks the rock formation to allow the oil or gas to flow to the well Chart 1 and 2 demonstrate the horizontal drilling and the hydraulic fracturing process.

Wells in most basins are drilled vertically to 4,000-8,000 feet to access the shale, below the water table by 2,000-7,000 feet. Steel casing and cement surround the well to protect aquifers and prevent gas and fluids from escaping. At the desired depth, the drilling turns horizontally into the shale. The horizontal pipe is perforated by explosives to allow gas to flow in. Fracking fluid is forced into the pipe to crack the surrounding shale rocks, freeing gas trapped in the formation to flow into the pipes.
requirement that a minimum portion of a lease be included in a pooled unit or that the portion of a pooled unit that includes acreage from a lease constitute a minimum percentage of the acreage in the pooled unit. There are several ways to allocate production for the purposes of royalty payments among the acreage included in a pooled unit, but the most common method is to base such allocation on the proportion that a lessor’s acreage included in a unit bears to the total acreage included in the unit. 

D. Royalty Clause

A royalty is a non-operating interest in oil and gas production free of production and operating expenses and is a key economic feature of a U.S. oil and gas lease as it entitles the lessor to a certain percentage of oil and gas production. The percentage of production to which the royalty interest entitles the lessor under an oil and gas lease varies widely, but on standard forms the royalty is often 1/8th of production; however, this amount is often revised upward in negotiations between the lessor and the lessee. Most leases provide that the lessor has the option to receive his share of oil production in kind or to sell his share of oil at a price, such as the prevailing market price, the value of the oil, or the proceeds received by the lessee for the sale of the oil.  

The amount of royalty to which a landowner is entitled for gas production is often calculated based on the market value of gas for gas sold or used off the premises, or, for gas sold at the well, based on net proceeds realized by the lessee under the sale.  

Gas royalties are most commonly calculated based on the fair market value of the gas at the well. Whether or not the costs of transporting and treating gas to make it marketable are included in the calculation of fair market value is often a highly negotiated point, and even efforts to explicitly state so have been ineffective. For example, in a Texas case the lessor’s royalty was subject to its pro-rata share of marketing, processing, and transportation costs despite the inclusion of a clear statement that the lessor’s royalty would be calculated free and clear of such costs because the royalty was based on the market price at the well.

Pillsbury has made numerous presentations on the acquisition and development of shale oil and gas in the U.S. such as to the Japan Institute for Overseas Investment Seminar (JOI) in Tokyo in June of 2012, to the Japan Society in New York in January of 2013; to the Global LNG seminar in London in March 2013, and to the Tokyo Energy Summit in Tokyo in April, 2013. Pillsbury is also an active presenter to the Association of International Petroleum Negotiators and other oil and gas trade organizations.

Chart 2: Horizontal Drilling

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Developments in U.S. Oil and Gas Leases as a Result of the Boom in Shale and Other Unconventional Oil and Gas Exploration and Development

The shale revolution in the United States has yielded a substantial number of changes in the ways that oil and gas leases are negotiated and the provisions contained in oil and gas leases. The proliferation of horizontal drilling and hydraulic fracturing has resulted in the need to modify some oil and gas lease provisions in order to more appropriately govern the subject oil and gas development. Mineral interest owners have also become increasingly savvy and oftentimes successfully negotiate addendums to standard oil and gas lease forms that contain a significant number of additional provisions. Finally, the nature of shale and other unconventional oil and gas interests have demanded modifications to standard oil and gas lease provisions that are more tailored to the particular oil and gas development.

Set forth below are examples of the changes in oil and gas leases brought about by the U.S. shale revolution.

A. Pooling

Pooling under oil and gas leases is one of the most significant areas impacted by horizontal drilling and shale development. The reach of the drainage of a horizontal well will likely only be 200-300 feet, but it may traverse numerous tracts of land covering substantial acreage. Lessors have increasingly scrutinized whether it is fair for a well bore that traverses a small portion of its land to hold the entirety of a large lease by production. As discussed above, the traditional techniques employed by lessors to protect themselves from abuse of pooling may limit a lessee’s ability to hold potentially productive acreage through horizontal drilling.

The commonly used method of allocating production amongst pooled acreage based on the proportion that a lessor’s acreage included in a unit bears to the total acreage included in the unit has come under scrutiny with the advent of horizontal drilling. This method sometimes leads to unfair sharing in the horizontal well context. For example, assume that three tracts, Tract A, Tract B, and Tract C, are included in pooled unit. Tract A contains 120 acres, Tract B contains 60 acres, and Tract C contains 20 acres. Production from a horizontal well that traverses equal portions of each such tract should arguably be allocated based on the wellbore length within each tract. But, if the traditional allocation method is used, Tract A will be allocated 60 percent of the oil and gas while Tract C will only be allocated ten percent. Some horizontal well leases have attempted to address this issue by modifying that allocation method based on wellbore length or the number of points along the well contained in each tract from which oil and gas is obtained. The allocation issue can be exacerbated if the leases subject to a pooled unit contain different allocation formulas. Because of problems like this, many in the industry have determined that the traditional acreage allocation method remains the best method.

Finally, sometimes a horizontal lateral may traverse the subsurface of a tract of land not included in the subject pooled unit. In this situation, the mineral interest owner’s consent is necessary in order to drill the well.

B. Horizontal Pugh Clause

The horizontal Pugh clause is an additional provision commonly found in modern shale leases that provides that a lease will terminate as to non-producing depths after the primary term. Sophisticated lessors have become increasingly interested in regaining non-producing and potentially future productive horizontal formations. A potential pitfall in these types of provisions is a lack of precision. Because of the variable thickness of many shale formations, simply stating that a lease terminates at a certain depth below the deepest point of production could terminate the lease as to potentially productive depths.

C. Force Majeure

Force majeure clauses have taken on unprecedented significance in oil and gas leases due to the horizontal drilling moratoria imposed by some U.S. states and local governments and other regulatory restrictions inspired by the increased public sensitivity to hydraulic fracturing in some areas. Prior to the proliferation of hydraulic fracturing, parties to a lease usually relied upon the standard force majeure provision contained in the lease form they were using. Today, force majeure clauses are more heavily negotiated, with lessees often insisting that drilling bans or moratoria be specified as force majeure events, the occurrence of which will sustain the lease in full force and effect notwithstanding any other provision in the lease.

D. Primary Term Extension

In building up acreage positions in major shale plays in the U.S., many oil and gas company lessees now insist upon having the ability to extend the
primary term of a lease for a certain number of years (often two to three) by the payment of a certain sum of money. This provision has provided oil and gas companies with additional flexibility to plan its development of a shale oil and gas play that best fits its overall strategy. Oil and gas companies’ drilling plans often span a number of years, so the ability to extend the primary term of its oil and gas leases through the payment of money and not through operations or other traditional methods is a significant development tool.

### E. Royalty

The amount of the lessor’s royalty has generally increased across the board over the last several years. Although traditional lease forms contain a 1/8th royalty, depending on the shale play and geographic location of the subject oil and gas interests, it is more common to see royalties in the range of 20-25 percent in today’s U.S. oil and gas industry.

### F. Lessor Protection Clauses

Traditional lease forms contain few provisions specifically protecting lessors from liability for environmental damage, violations of law, surface damage and restoration, and other damages caused by drilling operations. Sophisticated lessors in major U.S. shale plays often successfully negotiate a number of provisions addressing these issues in an addendum to the standard lease form. Additional lessor-friendly clauses that are often found in today’s shale play leases include requirements to obtain the lessor’s consent prior to certain assignments and provisions requiring the lessee to deliver certain drilling data and reports to the lessor.

### Conclusion

The U.S. oil and gas industry has undergone a major transformation over the last five years thanks to the development of shale plays, with vast amounts of international capital flowing into the U.S. to develop these shale plays. It is important for international investors to understand the basics of ownership of U.S. oil and gas interests and U.S. oil and gas leases. Although many aspects of the U.S. oil and gas industry have changed, basic U.S. oil and gas legal principles remain the same.

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Endnotes

7. WILLIAMS & MEYERS, supra note 1, § 201, at 18.
8. Id. at § 202, at 20.
9. Id. at § 202.1, at 21.
10. Id.
14. Id.
17. Id. at § 202.3, at 24.
18. Id. at § 303.3, at 458.
19. Id. at § 601, at 1.
20. Id. at § 631, at 399.
22. WILLIAMS & MEYERS, supra note 1, § 668, at 1.
24. WILLIAMS & MEYERS, supra note 1, § 642.2, at 502.5.
25. Id. at § 642.2, at 504-05.