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Underground Storage of Natural Gas in the Appalachian Area

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Reasons for Gas Storage

It is recognized that one of the more pressing problems facing gas distributors in the Appalachian area in the past several decades has been the gas industry’s inability to deliver sufficient quantities of gas to meet winter day consumer “peak demands.” Until some twenty-five years or so ago, the native gas production from the Appalachian area was sufficient to supply, not only local needs, but consumers in neighboring states with natural gas to meet most of their demand requirements. In recent years this has not been the case. Following World War II, the demand for natural gas for heating and cooling soared. When the public saw the advantages of using natural gas, its popularity and the run-away growth in demand for this favorite fuel for space-heating increased to the extent that the gas industry was faced with a very serious problem of seasonal ups and downs.

At first the utilities appealed to the regulatory authorities for authority to curtail gas deliveries, first to industrial, wholesale and finally to domestic consumers during periods of severe winter consumption. It was finally realized that if the gas industry was to expand, the answer lay not in curtailment, but rather with an all out effort to meet the peaking requirements; otherwise, customers would look elsewhere for a stable fuel.

About twenty years or so ago, distributors in the Appalachian area began to supplement their native production by a contractural arrangement with larger southwest pipeline companies bringing gas east from the Southwest.

The average person does not realize that the facilities for gas utilities such as wells, pipelines and compressor stations must be designed to meet the demand for gas on the coldest hour of the
The coldest day of the year. This means that increased distribution facilities to handle new peak demands must remain idle to a large degree during the summer months resulting in a loss of return upon capital investments. It was also apparent from the outset that the distributors could not avoid high mcf demand charge costs in purchasing southwest gas unless these large, long-distance pipelines, costing millions of dollars, could be utilized to maximum capacity 365 days out of each year. It was also readily ascertainable that if the distributors could purchase gas from the long-distance pipelines on a firm-load basis taking large deliveries the year around, the price of the gas could be substantially reduced. The problem was, what to do with the summer gas deliveries from the Southwest? In order to effect savings, the gas industry fell upon the idea of underground storage of natural gas.

The history of underground storage dates back to 1915 when it was first used in Ontario, Canada, and to the years from 1915 to 1919, when gas was stored in the state of New York. In 1919, some gas was stored in Menifee County, Kentucky by the Central Kentucky Natural Gas Company.

It was early determined that gas storage accomplished two important missions: namely, large quantities of gas during summer months would not have to be sold at bargain prices to industrial customers as boiler fuel; and, gas stored near urban markets could be used for winter peak day requirements. It was also conceded that summer storage of gas helped to keep the gas cost lower for the consumer. Admittedly there were added costs to the gas by virtue of its being stored. However, this cost was much lower than the costs resulting by over-sizing and looping pipeline facilities from the Southwest to meet demands arising during peak requirement periods. Furthermore, having storage pools located near its eastern markets, a distributor could sell more gas during high consumer demand winter periods without periodic curtailments and possible loss of existing and new markets.

Activation of Storage Pool

The ideal situation was to activate a storage pool or pools near a large urban market area, with lines carrying high-pressure gas to the pool and a low pressure transmission line from the pool for local distribution. In this manner local pumping of southwest gas
for injection and withdrawal could be eliminated. The storage pool must be a “closed” reservoir having the desired volume and deliverability rate compatible with peak market requirements. In this connection, a small volume-high deliverability reservoir or large volume-sustained deliverability reservoir may be needed to meet the projected market requirements for the particular area to be served.

In order to store gas underground, reservoirs must be carefully selected. They must be completely sealed by nature to prevent the migration or escape of injected gas. Of course, the storage area must include not only the pool but a “protection area” around the storage pool as an added safeguard against drainage. The reservoir chosen for storage must be high in porosity and permeability and must be sealed by impervious surrounding rocks or some other agent such as water. Depth of the storage horizon should be sufficient to guarantee safety when the desired maximum of gas has been stored. The operator should maintain maximum storage pressures below the original rock pressure on practically all pools. A thick reservoir formation covering a relatively small area, rather than a thin formation covering a large area, is highly desirable.

The storage strata are mostly carbonate or sandstone formations originally filled with natural gas or some fluid that to a large extent has been exhausted.

Choosing a depleted or partially depleted gas field for storage necessitates careful geological investigation. The geologist should analyze all available data on any well previously drilled into the formation that is to be used for storage, as to lithology, initial open flow, rock pressure, deliverability at various stages of depletion of the gas reserves, the presence or absence of water in the formation and the areal extent of the pool. Care should be taken to insure that it is a closed reservoir. The limits of a closed reservoir are usually defined by drilling.

The storage area consists for the most part of a gas pool that is essentially or partially depleted. Many times, non-productive wells in the pool area were plugged years ago. If there is any doubt that a particular well is not completely sealed, the operator should drill the plug out and properly replace the plug or convert the abandoned
well to a storage well. Before a well informed operator invests large sums of money injecting gas into an underground pool, all possible precautionary steps are taken to insure that the gas will not leak therefrom.

In most cases, heavier casing and much more cement are used in the completing of a storage well than in an original gas well. It is generally the practice to run an additional string of casing or tubing inside the existing production string and cement it from bottom of the casing to the surface. The procedure of casing both new and old wells for storage in West Virginia is to run at least two strings of casing through coal beds and to cement at least one string through the coal. This practice eliminates any possibility of vertical migration of gas into a coal seam.

Some storage pools have been operated by storing gas in a highly porous water-bearing formation on an anticlinal structure that had not previously held natural deposits of gas. The Doe Run storage field of the Louisville Gas and Electric Company near Louisville, Kentucky, is a field of this type. Another is located in Montana, and the largest field of this type is the Herscher field in Illinois where the Peoples Gas Company of Chicago estimates an ultimate capacity of ninety billion cubic feet of gas. In these pools, the water acts as the trapping mechanism. The size and shape of the storage area can be controlled by injecting or withdrawing water.

The installation of equipment and facilities such as compressor stations and pipelines must always be considered in storage pool planning. The size of this equipment depends upon the volume of gas to be handled. Additional wells are often drilled into the pool to increase injection and withdrawal rates.

In many large volume-sustained deliverability pools, it requires several years to fill the storage reservoir to its ultimate capacity, as gas is being removed from it during the winter. However, there is always more gas placed in storage each year than is taken out, until the storage field reaches its maximum capacity. As can readily be seen, the cost of facilities is expensive and so, too, is the cost of several billion cubic feet of stored gas acting as a "cushion" and as "working" gas to operate the pool in a utility manner.
Relative Rights as to Gas Injected into Subterranean Stratum

Since the active commencement of the storage of gas in underground depleted reservoirs, counselling lawyers have been faced with numerous unanswered legal problems dealing with gas storage. For the most part, the lawyer in the past has had to "go-it-alone," as there were no established guide lines. Because of lack of legal precedents the practitioner was forced to proceed with extreme caution; otherwise, unnecessary expenditures for activating storage pools would result, or through lack of precautionary steps the storage pool would be placed in jeopardy. Not only would the storage pool be jeopardized by the failure to include a sufficient "protective area" around the pool so as to prevent an outsider from drilling a well and draining the pool, but the lawyer was faced with the necessity of assuring his client that none of the "unaccounted for" holders of surface or sub-surface rights in the pool area could lawfully penetrate or block operations of the storage pool area.

In the beginning of storage activities, many soul-searching hours were devoted to the basic inquiry: From whom should the storage operator acquire storage rights? The problems were never simple. Where the landowner was vested with the "fee title" in its broadest sense, the problem was one of careful draftsmenship. However, where severence deeds had been made separating the surface from the minerals or dividing the minerals into one or more estates or encumbering the oil and gas estates by royalty and/or production rights, the practitioner found himself in a quandary in advising his client as to the proper procedures to follow, because of the necessity of pre-judging the courts with few if any indications as to how they might ultimately rule. Furthermore, in order to limit the cost of the pool to a reasonable price, it was necessary to take certain calculated risks. A few of the more important legal problems which confronted the practitioner were:

1. Was it safer to deal with the owner of the "interstices" (referred to by the industry as the depleted storage vessel), or the owner of the oil and gas in the storage stratum?

2. If the oil and gas owners were dealt with alone, was the owner of the depleted stratum or storage vessel legally authorized to penetrate the stratum by the drill or other exploratory means?
3. If the stratum owner was dealt with alone, could the owner of the oil and gas invade the pool by the production drill?

4. Did the owners of the other minerals, as distinguished from the owner of oil and gas, have any rights in the storage stratum?

5. What were the rights of the owner of coal seams?

6. What were the rights of the surface owner upon whose land gas injection and withdrawals were to be made?

**Ownership of Injected Gas**

Brushing aside the analytical questions raised above, the Kentucky Court of Appeals first considered the over-all issue as to who held title to the gas once it had been reinjected into the storage reservoir.

In *Central Ky. Natural Gas Co. v. Smallwood*, the heirs of A had in 1944 conveyed to the plaintiff Smallwood all of the surface and one-half of the minerals under approximately 500 acres of land in McDowell County, Kentucky. In 1950, Smallwood executed a combination production and storage lease to the defendant gas company, covering his interest in the 500 acre tract. The lease conferred upon the lessee the right of drilling and operating for and marketing oil and gas, and storing gas regardless of the source, including the right of injecting gas into the oil and gas stratum and removing the same. Consideration for the lease was one-eighth of the oil produced and saved from the leased premises and an annual rental of $100.00 for each gas well from which gas was produced and marketed or a minimum annual rental of $1.00 per acre. The rental and royalty payments were qualified by the provision that if the lessor did not have title to all of the oil and gas under the premises, the payments were to be decreased proportionally. No oil or gas was produced from wells located on the leased premises. The only use to which the property was put by the lessee was the storing of gas which was removed through wells located on adjacent lands. In payment of the minimum land rental the gas company paid only one-half of the accrued rentals to Smallwood, because that was his proportionate share of the mineral interest.

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1 252 S.W.2d 866 (Ky. 1952).
Contending that the gas storage rentals were payable to the surface owner rather than the mineral owner, Smallwood filed a declaratory judgment suit against the gas company and A's heirs. The trial court concluded that the rentals under the lease were payable to the surface owner and entered judgment against the company for the unpaid balance. Reversing the lower court, the court of appeals held:

When the gas was reinjected, the rights thereto were exactly the same as they would be as to gas originally in the sub-surface stratum. Furthermore, the mineral owners and not the surface owners had the right to grant storage privileges.

The appellate court took notice of the fact that the acreage was located in the Menifee Gas Storage Field from which the native gas had been exhausted for commercial purposes many years prior to 1944, and since that time, appellant had been storing gas in the field by injecting gas piped from distant sources into the old native gas-bearing stratum known as the "Corniferous Lime" formation. The old production field covered some 18,000 acres but increased rock pressure of the gas, due to large injections, caused the field to expand. The gas company then held some 41,000 acres under lease in order to protect the stored gas.

The Kentucky court, admitting that it had not previously decided the issue involved in the Smallwood case, proceeded to review the "Theory of Storage Gas Ownership" as determined by the Kentucky court in the earlier case of Hammonds v. Central Ky. Natural Gas Co.²

There Hammonds, as owner of a fifty-four acre tract of land within the same Menifee Storage Field, brought a suit to recover damages for trespass against the gas company for the unauthorized storage of gas under his land. The Kentucky court held that the gas company ceased to be the exclusive owner of the gas after its injection into the ground, and as it was not the owner of the gas, it was not responsible for trespass of released gas migrating under the Hammonds property. The ownership of gas that had been captured and then released by injection in the ground was held to be analogous to wild animals or animals "ferae naturae." The Hammonds case said:

² 255 Ky. 685, 75 S.W.2d 204 (1934).
If one captures a fox in a forest and turns it loose in another, or if he catches a fish and puts it back in a stream at another point, has he not done with that migratory, common property just what the Appellee has done in this case? Did the Company not lose its exclusive property in the gas when it restored the substance to its natural habitat?

The Kentucky court in the Smallwood opinion further reasoned that title to the gas in place whether a severed or a non-severed estate is a qualified one. Because of the fugitive characteristics of gas, one does not own the gas in the sense that one owns the surface or the solid minerals. Such ownership is limited to the exclusive legal right to explore and if gas should be found reduce the same to possession. Furthermore, the mineral owner has the right to exclude all others from attempting to exercise the rights off the premises.

By way of passing comment for those interested in drafting gas storage leases, from the storage pool operator's point of view, it is important to note that the Kentucky court indicated that the way to circumvent the "wild animal" concept was for the mineral owner to contractually forgo his right of recapture.

The court in the Smallwood opinion concluded by saying:

In arriving at the conclusion which we reach, it is not necessary to determine whether the cavern or strata from which the mineral has been removed becomes the property of the mineral or surface owner. The rule in England is that in case of a grant of the minerals under land the grantee has the exclusive right of possession of the whole space occupied by the layer containing the minerals, and after the minerals are taken out is entitled to the entire and exclusive use of the space for all purposes . . . . The general rule in the United States seems to be otherwise . . . .

As we have heretofore indicated, there is a clear distinction between the ownership of the solid minerals and those of a fugitive nature, such as oil, gas or water. Coal and other stationary minerals remain in one place until removed. After removal the cavern in which such minerals were originally located is generally of no benefit to the person originally owning the minerals. However, in the case of fugitive minerals,
the mineral owner does not own a specific cubic foot of water, oil or gas under the earth until he reduces it to possession. The reason is, these substances may be under his land today and somewhere else tomorrow. His ownership involves merely the right to explore and reduce the minerals to possession. Therefore, the geological formations or strata common to this class of minerals may be exhausted a thousand times and the mineral owner still retain the exclusive right to take all of the minerals which find their way into the formation, whether through injection or in any other way. This view is supported by *Gray-Melon Oil Company v. Fairchild*, 219 Ky. 143, 292 S.W. 743, 745, in which it was said: "While the oil is fugitive, the oil bearing sand is as stationary as a bank of coal. The only practical use to which the oil-bearing sand can be put is to get the oil out of it. The exclusive, permanent right to get the oil from the sand is necessarily a right to a part of the land, for to use the sand in any other way would be to destroy the right to extract the oil from it, as the sand must be allowed to remain as it is for the oil to flow through it. We conclude that the mineral rather than the surface owner is entitled to the rental or royalty accruing under a gas storage lease. The Gas Company properly paid to appellee only that portion of the rental which represents appellee's proportionate ownership of the minerals. Appellee insists that the surface of the land may be utilized under the lease in the production of the stored gas and that such use amounts to a taking of the surface without compensation to the owner. Of course, the production of minerals involves some use of the surface, but the right to a reasonable and necessary use of the surface for exploration and production is always implied in a grant or reservation of minerals . . . ."

The *Hammonds* case has been criticized in several law review articles. The *Oil & Gas Reporter*\(^3\) points out that the effect of the conclusion reached is to render condemnation essential if underground storage by injection is to be feasible; otherwise, the owner of any tract in the reservoir, not controlled by the operator, could drill a well or wells and appropriate to himself the gas produced. It is also agreed that regardless of how essential condemnation may be, it is not available unless made so by statute.

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\(^3\) *Oil & Gas Reporter* 1171.
At first reading it appeared that condemnation as proposed by the Oil & Gas Reporter, to circumvent the Hammonds case, if constitutional, clearly would not be the answer to the problem. That is, under the “capture approach” the owner of the condemned gas well would be entitled to compensation based on the “reserves” in the well at the time of the “taking.” This alone could and would place the parties exactly where they stood, “from a dollar standpoint,” before condemnation. However, the Kentucky Court of Appeals worked around this problem with the greatest of ease.

In the case of Cornwell v. Central Ky. Natural Gas Co.,⁴ the gas company brought a suit to condemn the right to store gas in the “Corniferous Lime” stratum under Cornwell’s 119 acre tract, located in the Menifee Storage Field. The jury returned a $1,000.00 verdict for Cornwell. Cornwell, while conceding the Kentucky statute had been declared constitutional in Calor Oil & Gas Co. v. Franzell⁵ and Kentucky Heating Co. v. Calor Oil & Gas Co.,⁶ sought reversal on the ground that he was being deprived of his property without just compensation in violation of section 13 of the Kentucky Constitution, because the condemnation statute did not compensate him for any natural gas which might be under his land. The court said:

We cannot agree with the appellants in this contention. The record shows that the Company has no right to drill or produce gas from the appellants’ land and the sole right it gets through condemnation is to store gas which it pumps into the corniferous lime stratum in appellants’ land. Appellants will not be deprived of their right to drill and produce oil or gas from their land, except they cannot produce either mineral from the “Corniferous Lime” stratum, which they must case off should they drill. [Emphasis added.]

Clearly, the court has placed the landowner in the position of having the right to explore and produce the stored gas from the storage stratum extending under his land under the authority of the Hammonds case; yet if he does, the Cornwell decision permits the storage operator to resort to condemnation to acquire the storage stratum, as such, without paying the landowner for his “own” gas reserves.

⁴ 249 S.W.2d 531 (Ky. 1952).
⁵ 128 Ky. 715, 109 S.W. 328 (1903).
⁶ 146 Ky. 414, 142 S.W. 728 (1912).
The Oil & Gas Reporter alluded to another somewhat analogous problem where gas was produced and the gasoline content removed, and the dry gas was then reinjected into the original reservoir from whence the gas was later withdrawn. In that case, Corzelius v. Harrell, a person so reinjecting dry gas complained to the Railroad Commission that the order adjusting the allowables between the person and another who had drilled into the reservoir did not reasonably adjust correlative rights. Apparently both parties assumed that when the substances were reinjected, the rules which were applicable before the original capture again became applicable on gas reinjection into the reservoir.

A case abstract in the Texas Law Review is also critical of the Hammonds decision, stating:

Some courts have drawn a fanciful analogy between oil and gas and animals ferae naturae in dealing with the acquisition of title to these substances . . . but it is believed that the principal case stands alone in adopting this analogy for the purpose of establishing a divestiture of title.

It has been held that if oil actually brought to the surface thereafter escapes along the surface from the wells of its origin onto the land of another, the original producers may pursue and appropriate it . . . . This is inconsistent with the rule as to wild animals, title to which is lost upon escape, in the absence of an animus revertendi . . . .

The law of oil and gas has no pertinent analogy to that of wild animals. But even if the rules as to escaped wild animals were properly applicable in oil and gas cases, it was grossly misapplied in the principal case. The defendant company had not lost possession of the gas; it was enclosed as completely in the underground reservoir as if it had been placed in a tank on the surface. The result reached makes it extremely hazardous for oil and gas companies to utilize depleted fields for cheap storage. If they should by mistake fail to secure the agreement of all landowners over the reservoir, or if the title to some tracts should be found to be in some one other than the person from whom they received consent, they might lose

7 143 Tex. 509, 186 S.W.2d 1961 (1945).
their title to the stored oil or gas by productive operations conducted upon such lands. A fanciful analogy to wild animals will bring about absurd results in oil and gas cases. It is believed that the court erred seriously in departing from the ordinary rules of personal property.

RIGHTS OF GAS PRODUCTION OWNER

In White v. New York State Natural Gas Corp., the court was faced with the question as to whether or not title to gas is lost when the gas is reinjected into a known storage pool. In the White case, the plaintiff owned a partial interest in the proceeds from the sale of gas produced from a certain production well known as the O'Donnell well and drilled to the Oriskany Sand Formation in the so-called Ellisburg Pool. The production records showed that the amount of gas produced from the O'Donnell well dropped rapidly from the time of its completion in 1935, and in 1942 produced less than 2,000 mcf. The pressure had decreased from the initial pressure of 2,019 pounds p.s.i. to 21 pounds p.s.i. by 1949.

Commencing in October, 1953, one of the defendants, Tennessee Gas Transmission Corporation (hereafter referred to as "Tennessee"), began to store southwest gas in the adjoining Hebron pool. In July, 1955, another defendant, United Natural Gas Company, likewise began to store southwest gas in the Hebron pool.

In July, 1955, the production from the O'Donnell well suddenly jumped from 541 mcf for the previous month to 1,904 mcf. This increase in production continually rose until December, 1956, when it reached a level of 41,020 mcf per month.

Furthermore, an analysis of the chemical content and physical properties of the gas produced from the O'Donnell well since 1956 showed unquestionably that the gas being produced was southwest gas. This conclusion was clearly established by a chemical analysis of the produced gas as compared with native production from the same sand horizon. It was thereupon determined that the Ellisburg and Hebron pools were physically connected.

Realizing this situation, defendant New York Natural Gas Company, the lessee operator of the O'Donnell well, acted in good faith and starting in January, 1956, reduced its production from the

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*190 F. Supp. 342 (W.D. Pa. 1960).*
O'Donnell well to the approximate level that the well had produced prior to the injection of gas by United and Tennessee.

The federal district court, applying the Pennsylvania law, refused to agree that the gas released in the storage pool legally could be recaptured by plaintiff under the "capture theory." The court did, however, recognize and affirm that the capture rule was still the law in Pennsylvania as to "native" oil and gas production.

The court in the White case cited the early Pennsylvania case of Brown v. Vandergrift,10 which acknowledged that oil and gas belongs to the owner of the land so long as it is located underneath, but recognized that oil and gas have migratory characteristics and when gas escaped and went into the lands of another, the title to the former owner was gone. It further recognized that if an adjoining owner, or even a distant owner, drills his own land and taps another's gas so that it comes into his well and under his control, he becomes the owner of the gas that is tapped. The White opinion also cited two other Pennsylvania cases which had applied the rule of minerals ferae naturae. In Jones v. Forest Oil Co.,11 the court refused to enjoin the use of a mechanical pump by defendant to obtain oil and gas. The court in Barnard v. Monongahela Natural Gas Co.,12 refused to enjoin a defendant's location of wells near his property line resulting in the admitted withdrawal of gas from adjoining tracts.

The court in White then proceeded to lay down a limitation upon the "capture rule," stating that the doctrine should apply only to the "original capture" of native oil and gas, and once initial capture was over, the rules governing ownership of personal property should prevail. The court said:

Notwithstanding serious doubts as to the existence of any evidence concerning wilfulness on the part of United and defendant, Tennessee, [in confusing their stored gas with plaintiff's "native gas"] the court is of the opinion that this plaintiff is in no position to invoke the benefit of the harsh 'confusion of goods' doctrine. The native reserve of gas in the drainage area of the O'Donnell Well had already reached a

10 80 Pa. 147 (1875).
11 194 Pa. 379, 44 Atl. 1024 (1900).
12 216 Pa. 362, 65 Atl. 801 (1907).
level where production was uneconomical some time before the influx of stored gas from the Hebron part of the Hebron-Ellisburg Pool.

The court pointed out that the stored gas was not in the strict sense of the word being permitted to escape from its owners.

On the contrary, it is very much in the possession of the storage companies, being within a well defined storage field, the Hebron-Ellisburg Field, and being subject to the control of the storage companies through the same wells by which the gas originally had been injected into the storage pool. Moreover, there had been no return of the storage gas to its "natural habitat", because southwest gas, differing materially in chemical and physical properties from native Oriskany Gas, is not native to the Oriskany Sand, underlying the Hebron-Ellisburg field.

The court noted that also important as a guide toward the decision of the novel issue presented were certain recent enactments of the Pennsylvania legislature, which manifested a strong public interest in the Commonwealth in promoting the development and use of underground storage facilities. Having previously deemed the transportation and supply of natural gas to be of sufficiently great public concern to declare it a public use and subject it to public utility regulations, the legislature had conferred upon the gas company the power of eminent domain for the condemnation of depleted structures for storage purposes. The court concluded:

In view of the foregoing, the court is of the opinion that the Supreme Court of Pennsylvania would hold that title to natural gas once having been reduced to possession is not lost by the injection of such gas into a natural underground reservoir for storage purposes. Moreover, in view of the fact that the native reserve of gas in the drainage areas of both wells has long since been depleted, plaintiff is not entitled to compel production at any capacity.

Rights of Stratum Owner

Of particular interest to the West Virginia Bar is the case of *Tate v. United Fuel Gas Co.* In that case Tate, as plaintiff,

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brought suit to enjoin United Fuel, one of the defendants, from using his land and the strata underlying it for the purpose of storing gas. He also asked for cancellation, as a cloud on his title, of the gas storage agreement under which gas storage operations had been conducted, and for damages for the value of the previous use of his land for unauthorized purposes.

The plaintiff was the fee owner of 244 acres, subject to a prior deed in his chain of title which provided:

The oil, gas and brine and all minerals, except coal, underlying the surface of the land hereby conveyed are expressly excepted and reserved from the operation of this deed . . . it being understood that the term "mineral" as used herein does not include clay, sand, stone or surface minerals except such as may be necessary for the operation for oil and gas and other minerals reserved and excepted herein.

The owners of the above quoted mineral exception had previously executed a production lease to United Fuel, under which lease a well had been successfully completed to the Big Lime formation. After the production well had ceased to produce gas in paying quantities, the mineral owners executed a storage agreement with United Fuel, which purported to give United Fuel the right to use and to occupy the Big Lime stratum for purposes of injecting, storing and removing gas.

United Fuel then drilled and completed a storage well to the Big Lime stratum for the purpose of injecting and storing gas.

Several questions were certified to the West Virginia Supreme Court, one of which asked: "Does the . . . [exception hereinabove quoted] contained in the deed to . . . plaintiff's predecessor in title, create title to the Big Lime stratum in plaintiff or defendant?"

The court said this was the controlling issue in the case.

The court said that a disposition of this question rested almost entirely upon the proposition whether the plaintiff was the owner of the Big Lime stratum: "If he is not the owner of that portion of the tract of land, then there are no grounds for equitable relief."

Ruling that the reservation and exception contained in the Workman deed was not ambiguous, the court said:
The language in the deed from Workman [owner of the mineral exception] to Tinney [plaintiff's predecessor in title] in the absence of a limitation of the word 'mineral,' makes it clear that the oil, gas, brine and all other minerals except coal were not granted to Tinney and hence are not owned by the plaintiff, Tate. But language in the latter part of the exception limits the meaning of the word "mineral" so as not to include clay, sand, stone or surface minerals. The limitation is also qualified in that clay, sand, stone or surface minerals necessary for the mining and drilling operation were excepted by Workman . . . . Summarizing the exception: Oil, gas and brine were excepted by Workman. Minerals were excepted by him as well as sufficient clay, sand, stone and surface minerals necessary for mining and drilling operations, but Workman did not except other clay, sand, stone or surface minerals. An unqualified exception of the right to all minerals, in and under the land would include solid minerals as well as oil and natural gas . . . . [Emphasis added.]

Considering the entire deed with special attention to the language of the exception and giving such language its plain meaning, we are of the opinion that Workman did not retain title to the Big Lime stratum.

Much weight was given to the exact wording of the deed, the court saying:

In considering the over all implication of the questions presented on this certificate, it is a fair assumption that the exception made by Workman in the deed to Tinney was for the purpose of mining and operating the land for the production of minerals. Now, defendants are seeking to utilize their ownership rights and privileges provided for in that exception for a different purpose, i.e., the storage of gas produced elsewhere . . . . [Emphasis added.]

Unquestionably Tate held such a title to the minerals, after production of the oil and gas, that there was no question to the court's thinking that Tate was vested with the depleted Big Lime storage stratum. The court clearly pointed out that once the oil and gas had been produced, Tate held title to the "clay, sand, stone and surface minerals," i.e., the depleted Big Lime reservoir.
The *Tate* case does not purport to answer the question as to who owns the stratum as between the owner of the oil and gas in place and the owner of the other mineral estates embracing the storage stratum.

Further understanding of what the West Virginia court defines as “storage stratum” may be clarified by a study of the case of *United Fuel Gas Co. v. Allen*. In that case, United Fuel sought to acquire through condemnation the subterranean natural gas stratum in the Big Lime formation underlying Allen's 175 acre farm in Putnam County, West Virginia.

The trial court permitted testimony showing the diminution in value of the farm by showing the market price immediately before and after the storage stratum taking. Witnesses for Allen did not testify as to the fair market value of the storage stratum as such.

The appellate court reversed a $6,000 jury verdict in favor of Allen because of his failure to offer testimony going directly to the question of the market value of the storage stratum itself. Although the court in *Allen* case once again failed to define “storage stratum,” one is inevitably led to the conclusion that the storage stratum includes the “walls” surrounding the interstices in which the original native gas was stored; otherwise the court would have permitted testimony to go to diminution in the market value of the farm.

It is interesting to note that some six months after the *Tate* decision, the court in *Fisher v. West Virginia Coal & Transportation Co.* held that the lessee from the owner of the “coal only” underlying a sixteen acre tract of land was permitted to use subterranean passageways underlying the tract for the purpose of hauling coal from adjacent tracts of land notwithstanding the fact that the lessee had stopped mining upon the sixteen acre tract of land. The coal lessee stated that it intended to later recover the remaining minable coal ribs and pillars in the sixteen acre tract in the overall planned abandonment of its mine workings. Judge Given filed a dissenting opinion, agreeing with the Virginia case of *Clayborn v. Camilla Red Ash Coal Co.*, that the coal owner does not own the vacated space and that coal is personal property when severed from the realty and the right to mine and to remove is an incorporeal hereditament in

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14 137 W. Va. 897, 75 S.E.2d 88 (1953).
15 137 W. Va. 613, 73 S.E.2d 633 (1952).
16 128 Va. 383, 105 S.E. 117 (1921).
the nature of an easement expressed in or incident to the grant of
the fee in the coal. Furthermore, the grantee in the exercise of this
easement has no more right to put an additional burden upon the
servient estate than he would have to haul timber from an adjoining
tract over a tract on which he had bought the timber with the right
of removal.

It is noted in passing that there is a difference between the exhauster of a seam of coal and the production of the commercially
productive gas from a producing horizon.

The fugacious minerals such as oil and gas do not necessarily
remain under the same surface, but may, when subject to pressure,
be driven into the stratum underlying another tract. Because of
this fact there is no ownership of them in place in the sense that
there is ownership of the solid minerals in the earth. Also, under
presently known recovery methods, oil and gas bearing strata are
never completely depleted. Therefore, it cannot be said that the
depleted stratum, not a great empty cavern but one of porous rock,
cannot be of benefit to the mineral owner. New methods such as
fracturing, water, steam or gas pressure recovery methods and new
production methods yet to be introduced, may in the near future
produce more native gas and oil which are not presently producible
in paying quantities. In keeping abreast of industrial improvement
the law should not ignore the estates and rights of such owners.
Accordingly, courts will no doubt be called upon to determine the
question as to who has the right to the interstices as between the
oil and gas owner in place, who has not exhausted all the native
production, and the owner of the remaining clay, sand and stone
above and below the storage stratum.

**Surface Owner’s Rights**

Of course, where there is no physical disturbance of the surface,
the surface owner could not complain of the use of underground
storage strata *United Fuel Gas Co. v. Allen*, 17 unless the rule of
*Ramage v. South Penn Oil Co.* 18 were invoked. In the *Ramage* case
the court held, in effect, that the grantee of the “surface” was not
confined to the plough-depth where the habendum clause in the
deed of conveyance limited the class of minerals reserved. The
court said:

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17 Supra note 14.
18 94 W. Va. 81, 118 S.E. 162 (1923).
It may be that if the word 'Surface' is used as the subject of conveyance, 'without more', that is without any express reservation, then the word 'Surface' would carry all the solum, or soil, except the minerals. As that is not this case, we do not decide that question, but reserve it for decision as the occasion may arise; but where the conveyance of the 'Surface' is followed by an express reservation, we think the effect of the reservation is to limit it to those things which are so expressed. [Emphasis added.]

In other words, a conveyance of the "surface" reserving only the right to produce the oil and gas, would no doubt also convey the clay, sand, stone and inert matters forming the storage vessel, and the surface owner would be the owner of the storage vessel.

Of course it is clear that where the surface of the tract of land is being used for actual injection and withdrawal of the stored gas, care must then be taken to secure the right to inject, store and withdraw gas from the surface owner.

It will be recalled that in the Kentucky Hammonds case, the surface owner argued that if the surface is appropriated for storage purposes, the surface owner is entitled to just compensation for use of the same.

The Kentucky court admitted that production withdrawal of the injected gas involved some use of the surface but insisted that "the right to reasonable and necessary use of the surface for exploration and production is always implied in a grant or reservation of the minerals." The court's conclusion was predicated upon the theory that once the gas is re-injected under a tract of land, it thereupon becomes for all intention and purposes native gas, and the landowner has the right to produce the same. Even if this conclusion were sound, no consideration was given to compensating the surface owner for the added surface burden resulting from injecting gas into the pool.

In arriving at the correlative rights between surface and storage stratum owners, it is thought that the analogy drawn between the different owners of partitioned surface tracts would be of some assistance in determining all relative rights of the horizontal owners, resulting from a division of the same tract into several separate mineral estates. As Judge Given argued in his dissent in the Fisher
case, it is basic that the owner of one surface partition tract can stop the haulage of mineral products across his surface partition tract from adjacent tracts as an unauthorized burden thereon, and by way of analogy, it would appear that the owner of the surface should not suffer additional gas injection and withdrawal burdens without just compensation, where the native gas was depleted from the storage stratum. Therefore, it would appear that the necessity for obtaining such injection and withdrawal rights from the surface owner is abundantly clear where the parties in interest have established or agreed that the stratum has been depleted of the native gas production. It would also appear that if the owner of the production rights has lost his right to the stratum, the surface owner should be compensated for the added burden of transporting foreign gas upon his land and injecting and removing the same through a well or wells located on the surface thereof, where admittedly the surface is being used beyond the productive gas life of the property.

COAL SEAMS

It is not the purpose of this paper to discuss the correlative rights between the storage operator and the coal operator other than to say that where the operated pool underlies or is within 10,000 feet of a coal mine, the storage pool operator must comply with the statutory requirements of the West Virginia Code. This article imposes certain duties upon both storage pool operators and coal mine operators. Its purpose is to guard against the danger of storage gas escaping into mines. Compliance is required not only for new storage wells but also in reconditioning old wells to be used in operating the storage pool.

CONCLUSION

Disregarding the engineering and geological steps necessary to select a storage pool, the practical legal steps in activating a storage pool might be summarized as follows:

1. As a first step, it appears essential and appropriate to establish from a factual standpoint that the proposed storage stratum in which one is seeking to store "foreign" gas has been "depleted"

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19 Supra note 15.
20 W. VA. Code ch. 22, art. 7 (Michie 1981).

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of the native production to the extent that it is non-productive in substantial quantities. As the legal proof of this factual issue would be expensive and difficult, it would appear wise, at the outset, to have an "agreed" settlement with the owners of the oil and gas in place by calculating and paying for the "gas reserves" in the depleted stratum.

Furthermore, the showing of substantial depletion of the stratum is absolutely essential where the storage operator is forced to condemn. Under the West Virginia condemnation statute one must be able to demonstrate that: "... [B]y previous exploration of the stratum sought to be condemned [it] ... has ceased to produce or has proven to be non-productive of oil and/or gas in substantial quantities ...." 21

2. The storage agreement should provide that thereafter the operator shall enjoy the exclusive right and privilege of utilizing the designated formation for the purpose of injecting, storing and removing gas and that the title to all gas so injected and removed, from time-to-time, would be and remain the exclusive property of the storage operator. The background for such an agreement is ideal when the storage lessor is the owner of the fee to the entire tract of land. However, as illustrated by the Tate case, 22 many other types of ownership are encountered, and these frequently require the operator to make certain difficult decisions.

3. Where the native gas has been depleted, one must analyze each given title situation to ascertain whether the oil and gas mineral owner is vested not only with the oil and gas production rights, but also with title to the storage vessel, the interstices. This is particularly true in West Virginia, where the law on the question of storage vessel ownership is still unsettled. The only West Virginia case of any assistance is the Tate case, 23 and there it was not necessary for the court to decide whether the owner of the gas and oil in place was the owner of the interstices. In Tate the gas company's lessor held only the oil and gas production rights, which the court said were not tantamount to "storage rights."

4. If a West Virginia storage pool operator found itself confronted with a leak in its storage pool, and gas was being produced

22 Supra note 13.
23 Supra note 13.
therefrom by a well drilled on neighboring lands, the legal questions presented would be of first impression in West Virginia. Notwithstanding the criticism of the Kentucky Hammonds case, it must be kept in mind that only in the White case has the universally recognized rule of "capture" been qualified so as to make it inapplicable to reinjected gas. Even in White it is questionable whether the rule of capture was rejected as to stored native gas. Therefore, the storage operator in West Virginia cannot wisely assume that the rule of capture does not apply to stored gas. It should always take the precautionary step of contractually agreeing with the landowners involved that the native gas has been depleted and/or reserves paid for and that title to the stored gas is and will remain in the storage operator during the life of the pool. These agreements should be made not only with all those owning land directly over the proposed storage pool, but also with those owning any land within a reasonable distance beyond the pool area. See Amherst Land Co. v. United Fuel Gas Co. Furthermore it is recommended that "pool pressure" should not exceed the original rock pressure; otherwise the court could say with clear conscience that the operator drove his "geese" to his neighbor's pond, thus losing title thereto.

5. The storage operator's use of the surface to inject and withdraw storage gas clearly appears to be an added burden upon the servient surface estate. Of course it may be argued that so long as the storage operator is using only the old production well and its related facilities, no additional surface burdens have been imposed by the storage operations and their continued use should be permitted. However, in view of the unsettled state of the law, it is suggested that the prudent storage operator should acquire express easements from the surface owner of every tract on which it is contemplated that surface operations might be necessary.

24 Supra note 2.
25 Supra note 9.