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THE ASSESSMENT OF MINERAL LANDS

IN PENNSYLVANIA

Mineral Economics Monograph

By

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FOREWORD

In the fall of 1968 the Mineral Conservation Section of the College of Earth and Mineral Sciences of The Pennsylvania State University initiated a research project to determine the methods used in appraising mineral reserves within Pennsylvania. Most of the county assessing offices were contacted and information obtained on the procedures used to determine value and hence the assessment of mineral lands, both active and inactive, i.e. producing and non-producing.

Research also involved a survey of the literature for theoretical aspects of taxation of mineral lands and for methods of appraising mineral lands used in other states. Although the literature concerning assessment of real estate, both from a theoretical and an applied viewpoint, is voluminous, literature specifically concerned with mineral lands is sparse; and with few exceptions what does exist is applicable only to producing or active mineral lands.

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THE ASSESSMENT OF MINERAL LANDS IN PENNSYLVANIA

Much of Pennsylvania is underlain by known yet undeveloped reserves of minerals which are held by owners for use at some undetermined future time. These lands are subject to property taxation (the most important type of tax for financing local governments and school districts). For most counties, the value of the minerals is relatively insignificant compared to that of other forms of taxable property, but for some counties and for some school districts, the mineral wealth is, or could be, an important part of the tax base. Also, it is well recognized by political economists and others that tax policy can be used to accomplish other purposes than provision of revenue.

The purpose of this study is to survey and critically analyze property tax and assessment policies relating to nonproductive mineral lands in all 67 counties. The objective is to ascertain what policies promote or hinder mineral development and to disseminate the results to the relevant local, county and state taxing authorities for their use.

In addition to the direct impact on the tax payer and the taxing unit, the assessment on minerals can have an effect on the development of the mineral resources. An unduly low assessment on reserves may retard the development of the mineral industry. If a company holds two deposits equally good in all respects except that they have different assessments, the rational company would mine the higher-taxed property and keep the lower-taxed property for reserve. Where assessments and taxes on good mineral reserves are extremely low, it may encourage companies to buy up the best mineral land, far in excess of their foreseeable needs, in order to limit competition by limiting production of mineral raw materials. An engineer familiar with the western Pennsylvania coal fields has expressed the opinion that a few large companies own the majority of marketable coal, or have it under lease. This has hindered the development of the coal industry by limiting the coal produced from these properties solely to the production requirements of the owners. Assessing according to use, rather than according to highest potential use, leads to speculation and inequities in certain urban areas, and the same general results might occur in areas containing valuable mineral reserves.

SUMMARY AND CONCLUSIONS

Although each Pennsylvania county uses its own method of appraising mineral lands, these apparently diverse methods can be classified into a limited number of approaches for each group of mineral commodities: (1) coal, (2) oil and gas, and (3) stone, clay, sand, and gravel.

Most counties that contain large reserves of coal have technical staffs familiar with the coal-mining industry and are very knowledgeable about conditions in their county. The appraisal of coal in and
near active mines presents no unusual difficulties in determining a satisfactory appraisal, but even with a competent technical staff, the assessor has difficulty in determining true value and may be forced to use a somewhat arbitrary or rule-of-thumb method for appraising inactive and remote reserves. It is unlikely that there have been enough recent sales to determine a competitive market price for such coal lands; and if the present value approach to appraisal is used, some rather arbitrary assumptions must be made as to when the coal will be mined. The usual method is to set some range of values per acre of coal land with adjustments for the thickness, depth, and other geologic and engineering characteristics.

Counties that are not coal-focused but do have some coal land use less technical methods of appraising. In most cases they assess coal in or around an active mine at a higher value than inactive or remote reserves. Some counties may have only one value for each type of coal reserve, other counties may have a specific value per acre for each coal seam or make allowances for such attributes as quality and thickness. It may seem discriminatory to assess each acre of inactive coal land the same amount, but it is a simple and practical method since neither the assessor nor the owner knows all of the characteristics of the coal in that particular acre.

If there is only one potentially commercial coal seam in the county, and that seam is rather uniform, such a method will not be discriminatory. Unless some of the coal is considerably closer to navigable water (i.e. cheap transportation to consumers), it would be unrealistic to make major adjustments in the appraised value of inactive and remote coal for transportation facilities because by the time the coal will be mined (maybe twenty years) the transportation network and markets, such as power plants, probably will not be located as are today's facilities. In a few counties in which coal is unimportant, land containing coal is appraised as farm land with no consideration given to the possible value of the coal unless the coal rights are separated from the surface rights.

The tax on producing oil land is determined by output. Many producing gas fields are owned by public utilities and are exempt from taxation. Non-producing or potential oil and gas lands are not appraised and taxed for their value as mineral land unless the mineral rights have been severed or leased. In some counties the land is appraised only as farm or forest land even though the oil and gas rights have been leased. When nonproducing oil and gas lands are taxed, they are assessed at a uniform rate per acre. The assessing method in general use for producing oil land is non-discriminatory only if all the fields have the same cost of production, and this may be approximately true in Pennsylvania where most of the fields are small and are now using secondary recovery methods. Assessing for oil and gas only if the mineral rights have been separated or leased has some justification since only a small percentage of land in an oil and gas province contains commercial oil and gas. It is more difficult to predict the occurrence of oil and gas than it is coal, which is more uniformly
distributed. The implicit assumptions made with this method of assessing are that most land does not contain commercial deposits of oil and gas; but if someone buys or leases the oil and gas rights, that tract is considered a good prospect for valuable minerals and the rights to such minerals, if they exist, are worth something.

Deposits of clay, stone, and sand and gravel that are being mined or quarried are appraised, the appraisal being based largely upon the profitability of the operation or upon the physical conditions around the mine or quarry. Except for limestone, reserves are not assessed. Many, but not all, counties place an assessment on some of the limestone reserves on a property containing an active quarry. The acreage to be assessed for mineral land, rather than as lower valued farm land, is determined by the average production of the quarry. Several years reserve are assessed as mineral land.

While no data are available as to the actual market value of mineral lands in Pennsylvania, the appraised values listed herein indicate that, in general, the mineral lands of Pennsylvania have been underappraised. If these lands were placed on the market, their selling price would be considerably higher than their appraised value. Even if true, it does not necessarily mean that the owners of mineral lands are alone in "getting a free ride." It may be that much farm, forest, and brush land are appraised far below the market price. Such land commonly is appraised according to its present use instead of its highest potential use, and in many cases the market value of such land is much higher than the appraised value, but it would be a rare case in which the market value is lower than the appraised value.
RECOMMENDATIONS

There are several ways in which agencies of the Commonwealth of Pennsylvania could assist the counties in setting equitable assessments on mineral lands and in obtaining for the counties a share of taxes that could be properly allocated to such lands. There may be political and legal difficulties in changing current practices and that for some suggestions, the benefits might be worth the cost. Nevertheless, the following suggestions should be given serious consideration.

The comparable sales method is rarely used in appraising mineral land in Pennsylvania because there are few such sales in any one county, and the sales may not be bona fide. The State Tax Equilization Board evidently keeps no special record of sales of mineral lands and may in fact "throw out" many sales of mineral lands because they are not bona fide. For a few counties the assessed value of coal is nearly fifty per cent of the total assessed value in the county, and it is difficult to see how the Board can rationally compare such a county's assessment with the assessment of a non-coal county without special consideration of the assessed and market values of the coal. Even a mere state-wide listing of sales of separated coal land would be of value to the assessors. The sales prices might or might not reflect market value, but the aggregation of sales prices are likely to indicate the trend of prices. The number of sales and the number of acres of coal land transferred certainly should be of interest to the assessor. If the number of sales markedly increased in his county and nearby counties having the same type of coal, even if nothing is known about sales price, the assessor would be alerted to the increased demand for coal rights, and he might logically conclude that the value of coal land is increasing and reappraise all coal land in his county.

Of even more benefit to the assessor would be a knowledge of all coal land sales (whether separated or owned in fee) in surrounding counties. The State Tax Equilization Board is a logical agency to keep track of all sales of separated minerals, but the Equilization Board may not be in a position to know whether the sale of a particular tract contains potentially commercial coal, but they might be able to get this information from agencies of the State Department of Environmental Resources or from reports published by the Federal government.

A knowledge of the amount of leasing activity in the various coal and oil and gas fields would be of value to the county assessors as would an estimate of the most recent royalty agreements. Such information might be obtained by a state agency, but it is impractical for a single county to obtain such information for areas outside his county.
Some counties appraise sand and gravel pits and rock quarries only as to the surface character of the land and do not consider the value of the minerals. A large deposit of sand and gravel with cheap transport costs to a metropolitan center can be very valuable. Only Class "A" aggregates can be used in pavements for state highway construction, and deposits that meet the rather strict specifications are relatively scarce and have a significant value higher than the usual alternative use such as farming. The Pennsylvania State Highway Department has a list of approved quarries that meet their specifications, and the list should be an aid to the assessors.

It is difficult to determine the value of limestone used for cement or of clay used for brick or tile because such minerals, with rare exceptions, are not sold on a competitive market, but are used as a raw material in the manufacturing process by the same company that mines them. Federal laws permit such companies to claim a deduction against their federal income tax for each ton of rock or clay mined. The amount of deduction is a percentage of the gross income from the mining of the mineral, which includes extraction from the ground and ordinary treatment processes. The local assessor might be justified in using the value per ton claimed by the mineral producer for federal income tax depletion. For deposits being worked, the present value of the clay, limestone, or sand and gravel reserves could be calculated, and even with a high discount rate and a conservative estimation of reserves, the appraised value of the property calculated in this manner might be considerably higher than if the land were appraised just as farm or brush land.

Most assessors place no assessment on good deposits of limestone and sand and gravel if the deposit is not being mined even though the deposit has considerable value, because any specific value is somewhat arbitrary and controversial. There is a method by which the county can recover some of their revenues lost by inability to determine true market value and failure to appraise future mineral reserves. A similar method, used in some states to compensate for underappraisal of real estate is to reappraise the land for several previous years after the land has been converted to a new and higher use.

As an hypothetical example, suppose 200 acres of farm land is assessed at $50 per acre as farm land, and no assessment is added for thick beds of high purity limestone that underlie the farm. A few years later the land is sold, and large-scale quarrying operations begin. Now the land is assessed at $200 per acre. The assessor then recalculates the assessed value of the land for the last several years. The fifth year back might retain the old $50 per acre assessment; the fourth year would be slightly higher, and last year's recalculated assessment would be slightly less than the present $200 per acre assessment. The former landowner, having sold his land for its valuable limestone, certainly would be in a position to pay the back taxes. If the farm had previously been held for its reserves of limestone by the same company that opened the quarry, the company would be prepared to
pay back taxes at the time they opened their quarry. One assessor's opinion of this suggestion is that such a method of taxation would not be legal under the present assessing laws of Pennsylvania.

There is a summary, pages 42 - 44, reviewing how the state governments of Minnesota and Arizona assist the counties in appraising mineral laws. In Arizona the State Tax Commission determines the assessment of the large copper mines, but local assessors appraise mining equipment, mine buildings, and prospects. Thus, all mines are assessed by the same method and there is less disparity between the assessed and true value between mines. In Minnesota the Ore Estimation Division of the School of Mines has the responsibility of determining the quantity and classification of iron ore, and their estimations are sent to the State Tax Commission, which determines the actual value of the properties.

The Commonwealth of Pennsylvania could give very valuable assistance to those counties containing valuable deposits such as coal, limestone, oil and gas, by adopting and modifying the system used in Minnesota. The system has been used successfully for sixty years in that State, and there are similarities between the problems of appraising coal lands and iron lands. In both cases there are vast reserves that will not be mined in the immediate future, large tracts are held for reserves by large corporations, the value per ton is relatively low, changes in demand and in technology greatly affect the value, it is easier to obtain a reliable estimate of the quantity of mineral available than for less uniformly distributed minerals, and in those counties where the value of the mineral lands is a large percentage of total value of real estate, there is a large potential source for conflict and inequity. Anyone seriously interested in the problem, should read the articles by Weaton (1968, 1969).

In general the appraisals of large operating mines in Pennsylvania are made by qualified technicians employed by county assessor offices, and they are quite familiar with local mining conditions. Such assessments are not as controversial or arbitrary as assessments on mineral reserves, the subject of this report. If Pennsylvania decides to establish a system to appraise mineral lands, the State would do well to leave the appraisal of large coal mines with the county offices and to concentrate on the appraisal of mineral reserves. The appraisal of mines and quarries, exclusive of coal, could be done by either the county or the State at the option of the county. For the State to appraise coal and other minerals, the State would need (1) to determine what lands contain valuable minerals and (2) the value of the minerals. The appraisal of the surface could be left to the county. In Minnesota the first function is performed by the Ore Estimation Division of the School of Mines, and the second function is performed by the State Tax Commission. In Pennsylvania the first function might be performed by a division of the State Department of Environmental Resources or by the College of Earth and Mineral Science of The Pennsylvania State University. The second function of actually appraising the mineral lands might be performed by the State Tax Commission or the College of Earth and Mineral Sciences. Minerals that the State should be especially concerned with are coal, high-grade limestone, oil and gas, and possibly sand and gravel.
Two immediate advantages in having the State take an active role in appraising mineral lands is that appraisals would be more uniform between mineral properties and that conflict between the local assessor's office and the owner of mineral land would be greatly reduced, thus freeing the local assessing staff from a difficult task and allowing them to devote more time to general property appraisal. Furthermore, the possibility of one county "bidding" against another county by offering unreasonably low assessments to attract a new quarry or mine is eliminated, and the mining company cannot play one county against another to avoid paying the fair share of taxes.

Possibly the greatest advantage of the proposal for centralizing the appraisal of mineral reserves would be the benefits derived from providing a full-time workload for a specialist in mineral appraisal. For example, most oil-producing counties put only a nominal assessment on oil fields. It is not worthwhile for a single county to hire a petroleum engineer who could determine a less arbitrary method of appraising and to consider each oil field in the county. It might be worthwhile for some state agency to hire the necessary man power to appraise the wells in all of the counties. The State could set up a few classes of wells depending upon such items as type of secondary recovery and annual production. For coal reserves the state would need several classes depending upon such characteristics as quality, depth, and location. In determining the actual value, the State would be in a better position than any single county to estimate future market conditions and hence future worth and value.
PROPERTY TAXATION AND THE MINING FIRM

Taxes are levied by governmental agencies for a variety of reasons, the most important being to raise revenue, but redistribution of income is an important goal for some taxes. Taxes also may levied to encourage or to discourage a particular activity or industry; and even if the primary purpose of the tax is to raise revenue, it is unlikely that the tax will be neutral for all industries. Many tax laws contain special clauses affecting the mineral industries. Examples are the depletion allowances which reduce taxable income for producers of various minerals and the different assessment ratios applied to various types of property. Arizona assesses mining property and railroads at 60 per cent, manufacturing property at 25 per cent, and agriculture and residential property at 18 per cent of "full cash value" (Hansen, 1969, p.1)

Income tax usually is the most important tax to the mining firm. The percentage depletion aspect of the income tax serves as an incentive for exploration and development of the mineral industries, and this provision has its greatest impact on the petroleum industry. Some states have franchise and sales taxes, but their effects on the mining industry are small.

The ad valorem or property tax is a principal source of revenue for small political units such as cities, counties, school districts, and in some instances for state funds. The ad valorem tax must be uniform within any class of property but can be used to discriminate for or against various classes of property as is done in Arizona and certain other states. In some states parts of the property tax laws may favor industry as a whole as in Pennsylvania where machinery and movable equipment is exempt from ad valorem taxes. No state appears, as a matter of policy, to give a tax advantage to mining firms. On the contrary, some states, such as Arizona and Minnesota, discriminate against mining firms by requiring them to pay a higher rate on the market value of their property.

Several states require the company to pay a certain amount for each unit of mineral produced. The payment may be a flat rate or may be based upon the value of the output. Such taxes are called severance taxes, but other names are used. For example, in Arizona it is called a privilege sales tax and is 2 per cent of the value of the mineral output (Hazelett, 1969, p.2). Minnesota has an occupation tax that is based upon a percentage of value of iron ore produced; this tax is in lieu of a state income tax (Weaton, 1968, p. 31-32). Credits for labor are allowed against the occupation tax, but credits are not allowed for certain other costs so that the occupation tax cannot be considered an income tax. Thus, the occupation tax allows the state to change the effective tax rate of the iron-mining companies without changing the tax rate of other industries.

The separation tax is anti-conservation in that marginal ore will be left in the mine as waste. For example, if a ton of mineral could be recovered from several tons of low-grade ore at a profit of $2 a ton
of recovered mineral, the ore would be mined. If on the other hand there were a $3 per ton severance tax on the sale of that ore, the low-grade ore would then be left in the ground since mining it would cause a loss of profit. The severance tax can be considered discriminatory in that the same tax is paid whether the mineral came from a low-grade deposit or from a high-grade and easily-mined deposit.

In general, property taxes are less important to the mining firm than are other types of levies (such as income and severance taxes). However, because the orientation of this study is the assessment of mineral lands the remainder of this report will primarily deal with the property tax as it applies to mineral lands.

**Historical Basis**

The property tax is an ad valorem tax because the amount of tax is proportional to the (appraised) value of the property. The origin of the property tax can be traced back to seventeenth century England where there was a levy on real property based upon its "annual value" or "what it is worth to let" plus taxes on the "inventories" of merchants (Commonwealth of Pennsylvania, 1969, p. 2-1). In America the property tax was first introduced in New England. The English colonists originally had a head or poll tax and a tax on the gross output on land, which developed into a general property tax. The southern colonies, whose economy was based upon large plantations producing for export, favored taxes on imports (Dewey, 1903, p. 10-11), but idea of the property tax eventually spread from New England to the entire United States.

When the property tax was first introduced, America was predominately an agricultural nation and most wealth was in the form of land. The tax was considered equitable or "fair". Wealth in the form of land could not be hidden to evade taxes. The largest and wealthiest landowners paid the most tax, but they presumably had the ability to pay for and to receive benefits from public expenditures in proportion to the amount of property they owned.

**Inequities**

Today America is no longer primarily an agricultural country, and land is only one of many forms of wealth; and certain forms of wealth or property can be concealed for avoidance of taxes. Many tax experts say that the property tax is not based upon ability to pay. For example a small farmer with $50,000 worth of land makes a greater sacrifice in paying his property taxes than does a surgeon living in a $50,000 home. Although both pay taxes on the same valuation, the benefits received may be quite different.

An additional cause of inequity is that the property tax is used both as a means of wealth redistribution or subsidy to supposedly deserving groups or an an incentive to certain favored uses. This is done by exempting various special groups from all or part of their tax
obligations. If some groups are excused from paying property taxes, the remaining property owners must pay an additional amount to cover the exceptions. Thus, the burden of subsidizing the special groups falls entirely upon the property owners, rather than the community as a whole.

In some areas, relief from property taxes for five or ten years has been used as an incentive to attract new industry. This has been used in Louisiana, Puerto Rico, certain Canadian provinces, and elsewhere. Such an incentive might be used to encourage mining, but Stoker and Falk (1967, p. 394) say that such an incentive is inefficient and costly because firms use a much higher discount rate or interest than local governments and because the foregone local taxes serve to increase the firm's income and half of such an increase is therefore paid out as part of the firm's federal income tax.

Kinds of Property

Some kinds of property are tax-exempt and even within the taxed property various kinds or classes can be taxed at different rates. The two major divisions of property are real (real estate) and personal. Real property is subdivided into land and improvements. Land can be classified according to its uses such as residential, commercial, farm, mineral, forest, grazing, or waste lands. Improvements are anything that are attached to the land and include not only residential, farm, industrial, and commercial buildings, but items such as fences, driveways, and drainage ditches. The two major classifications of personal property are tangible and intangible. Tangible personal property includes such diverse items as manufacturing raw materials, merchandise, furniture, jewelry and livestock. Excluding trucks, trailers, and mobile homes, Pennsylvania does not tax personal tangible property and most other states have a similar policy (Commonwealth of Pennsylvania, 1969, p. 2-2). Intangible property includes such items as securities, cash, savings and checking accounts, mortgages, and promissory notes.

It can be very important to the property owner as to how his property is classified. For example, real property normally includes land and anything attached to the land. In 1911 the City of Pittsburgh exempted all machinery and equipment attached to the land. Formerly such machinery was considered as part of real estate and taxed as such rather than as tax-exempt personal tangible property (Williams, 1963, p. 158).

Administration

The tax assessor has the duty to maintain a list of all taxable property in his jurisdiction and to appraise the property at true market value. Determining the value is most difficult and is discussed in more detail in the following section. Depending upon the locality, the property is assessed at the appraised value or some fraction thereof. Property owners may derive some psychological satisfaction and be less likely to object to their assessment if their assessment on, for example, a $30,000 home (the appraised value) is only $10,000 even though their
tax bill will be the same if all property in the community is assessed at one-third of the appraised value.

Although all property of the same class must be assessed at the same ratio to the appraised value, many states permit a different assessment ratio (assessed value to appraised value) for different classes of property; and as previously stated, certain classes of property can be exempt entirely from property taxes. Arizona has a much higher assessment ratio on mining land and equipment than on land and equipment used in other industries (Hansen, 1969, p. 1). After the property has been appraised and assessed, the tax rate is determined by dividing the amount of money to be raised by the taxing unit by the total assessed value of all property in the community.

In Pennsylvania all county assessors are appointed by special boards concerned with assessment and taxation. The size of the board and the qualifications, term of office, and salary of the board members depend upon the classification of the county. In most cases, the boards are appointed by county commissioners, but in the smaller (fourth to eighth class) counties, the three county commissioners have the option of constituting themselves as the board. In addition to the chief assessor, boards may hire assistant assessors as well as a legal, engineering, and clerical staff. For most counties the townships, cities, towns, and boroughs have the option of electing their own tax assessor or of having their assessments made by the county. Elected tax assessors within the Fourth to Eighth class counties are subject to the jurisdiction of the chief assessor of the county, who is an appointed official (Commonwealth of Pennsylvania, 1969, p. 1-12).

Although for certain classes of counties there are technical qualifications for the board members that appoint the chief assessor, there are no legal technical qualifications for the assessors. Nevertheless, assessing is a real profession and requires a broad knowledge of economics, law, business, and finance as well as intimate knowledge of construction and real estate, and, depending upon the county of familiarity with farming, forestry, mining, and manufacturing. Some jurisdictions rely heavily upon private consulting firms to make the assessments, but none of these firms specialize in the assessment of mineral properties. It is only by special effort that an assessor's office will have available the skills required to appraise mineral reserves.

The Assessor's Association of Pennsylvania was founded in 1949 to increase the professional skills of the members. This organization publishes articles of professional interest and sponsors state-wide

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1 The tax rate is expressed in mills per dollar of assessed value and each property owner is billed accordingly. The property owner has the right to appeal if he thinks that his property has been overassessed or that he has been discriminated against in comparison with other property of the same class. After the tax bill has been determined, the owner is obligated to pay the tax and if he does not the tax-levying unit has the right, in the case of real property, to take possession of the tax-delinquent property, which can be sold at public auction.
meetings and seminars.

**Approaches to Appraisal**

In Pennsylvania, as in other states, real estate is supposed to be appraised upon actual or market value; i.e. the price that a purchaser is willing but not obligated to pay an owner who is willing but not obligated to sell, taking into consideration all uses to which the property is adapted (Commonwealth of Pennsylvania 1969, p. 3-6, 7). The law states that the price at which a property has been sold must be considered but is not controlling.¹

"The willing seller and willing buyer not under obligation" concept precludes any sale where either party has an urgent need for the transaction. For example, a farmer who had a poor harvest would be tempted to sell his mineral rights at less than true value. The manager of a brick or cement plant, if running out of reserves of a particular kind of rock needed for his product, is under pressure to acquire an additional source of that rock and could be forced to pay more than true market value. True market value implies a competitive market; if there are few sellers (monopoly) the selling price may be more than the true market value, and if there are few buyers (monopsony) the sale price may be lower than true market value.

The Pennsylvania State Tax Equalization Board rejects the selling price for the following classes of transactions as representing true market value: sales between relatives; between corporations and affiliates; sales involving special reservations or agreements; transfers motivated by special need or speculation; transfers with personal property involved in the consideration; sales involving charitable, religious, or governmental organizations; and forced sales (Commonwealth of Pennsylvania, 1968, p. 14).

According to Child (1951, p. 443), value is an estimation of present worth of future benefits derived from ownership and can be approached in three ways: (1) cost, (2) comparison, and (3) income. Market value, however, depends upon expected future demands and psychological factors as well as present worth of future benefits.

**Cost Basis**

According to White (1950, p. 243), there are several types of cost: original, reproduction, replacement, and acquisition costs. For mineral properties, the purchase price or acquisition cost is by far

¹ An example of an unwilling purchaser would be of a family, newly arrived in a community, buying a home. If there were only a few or no suitable houses for rent, the family is forced to buy, and is under pressure to buy immediately in order to save on motel bills. Even if houses are available for rent, the family may want to buy and would pay more than true market value for immediate occupancy. The sale price might be below true market value in the case of a family leaving the community and needing money to buy a house in another area.
the most important; but for an active mine or quarry, the original or the replacement cost of sinking a shaft or stripping the overburden might have some bearing on the true market value of the property. It previously has been pointed out that acquisition cost does not always reflect the market value, and it is not always possible for the assessor to determine the sale price.

A common method is to rely upon the value of the federal revenue stamps documents. According to Zangerle (1927, p. 94-95), this method is unreliable as some buyers deliberately put excess revenue stamps on the documents so that they can sell to another at a fat profit, and Rhode Island has ruled that revenue stamps are not admissible as evidence of certain sale prices.

Comparison Basis

Properties do not have to be identical, a "replica", to be comparable. Comparison can be made on the basis of use or functional utility, location, physical characteristics, and time or date of sale (Hollebaugh, 1952, p. 74 - 79). The comparison principle is used extensively for appraising urban real estate, but it is more difficult to apply to mineral lands where the quantity and quality of the minerals are not known with a high degree of certainty since they lie hidden underground.

Income Basis

The income principle of appraising is the method of determining the present market value of the property based upon capitalizing on some suitable discount basis the future flow of income expected from exploitation of the property. True market value, however, depends indirectly upon expected future demands for the goods being sold.

The present or capitalized value of future earnings can be determined by the following formula:

\[ V = \frac{E_1}{1+r} + \frac{E_2}{(1+r)^2} + \frac{E_3}{(1+r)^3} + \ldots + \frac{E_n}{(1+r)^n} \]

"V" is present value; "r" is a rate of interest for that year; "E_1" is earnings or profit for year "1"; "E_2" is earnings for year "2", and so on. This method is used extensively for appraising commercial and industrial property, some farm land, and some active mineral lands. Future earnings are not known, but for established businesses, the usual method is to use the average earnings for the past few years.
This method gives a specific and unique value and is less likely to create conflict than if the assessor predicted future earnings based upon his forecast of supply, demand, and prices. The question of how many years in the future to project earnings is not too important for most businesses because the present value of earnings 20 years in the future generally becomes negligible.

The discount rate greatly affects the present value, and there are a number of interest rates in the country. The assessor can arbitrarily select a reasonable rate or he can negotiate a rate with the taxpayer. Since the discount rate used for determination of present value includes a risk factor, it would be reasonable to use different discount rates for different industries. As in the case of future earnings, the same discount rate is used for all future years even though the assessor might forecast that the present high interest (discount) rate will decrease within a few years.

Methods Used for Minerals

No one of the three major methods of determining the market value of real estate is completely reliable so good assessors consider all appropriate methods in arriving at an appraisal value. The three major methods of appraisal, cost, comparison, and income, are applied to the appraisal of mineral lands. Appraisal of mineral lands present unusual difficulties to all three methods. These difficulties will be discussed later.

Formerly in Australia, according to Zangerle (1927, p. 221), the land owners themselves set the value of raw land; but if in the opinion of the Governor General, the land was undervalued by 25 per cent or more the state could acquire the land at the price set by the owner. It is most unlikely that such a system would ever be accepted in the United States, but is interesting to speculate what value would be set by owners of large reserves of coal under such a system.

Incidence of the Property Tax

The property tax is a well-established and accepted part of American political tradition and as its main function today is to raise revenue for local governmental units. The tax accomplishes its purpose. For example in 1965, of total tax revenues in Pennsylvania the following amounts were raised by real estate taxes: 51 per cent for cities, 68 per cent for boroughs, 73 per cent for townships, 79 per cent for school districts, and 86 per cent for counties (Commonwealth of Pennsylvania, 1969, p. 2-4).

The tax on real property is difficult to avoid since such property cannot be hidden and once it is listed on the assessor's role, the tax has to be paid or the owner's title is in jeopardy. For efficiency, as measured by the cost of administrating, the ad valorem or property tax might receive a mark of "fair". The administration cost includes all

1 A more theoretical question that can be ignored for practical purposes is how much of a firm's earnings should be allocated to the land or mineral reserve, how much to the buildings, how much to machinery, (tax exempt in Pennsylvania), how much to management, etc.
expenditures required to assess the property, and levy and collect the tax. The cost of administrating the tax should be no more than 1.5 per cent of tax collections for a large city, compared with direct administrative costs of 1 to 1.5 per cent for collecting state sales tax and 0.6 per cent for collecting federal income taxes (Commonwealth of Pennsylvania, 1968, p.2-12).

The relative cost of administrating the property tax for a large city is less than the cost for a less densely populated political unit where the wealth is less concentrated. A study in Montana showed that the administrative cost of collecting the tax on real property was 1.4 per cent, but that the average cost was more than twice as high in the 28 counties with the least amount of taxable property as in the five counties with the largest amount of property (Wicks and Killworth, 1967, p. 311).

The mining industry is particularly vulnerable to inequities. As pointed out by Roberts (1944, p. 5), the value of mines is not easily determined so they have little protection against arbitrary assessments. In a community dominated by an agricultural population, and in which the value of mines is relatively high, the mines are unlikely to be appraised conservatively. A study of 1961 assessments in Colorado concluded that the local tax system was full of inequities and inefficiencies and that agricultural land gets better treatment than mining land (Lentz and Rusk, 1963, p. 230-232). To support the conclusion, the average assessed value per acre was given for different classes of land: producing coal, $272; developed and non-producing coal, $26-15; quarry, $81; meadow, hay, and irrigated pasture, $21; dry farm, $11; and grazing, $3.

One of the advantages of the property tax is that it is a stabilizer and a dependable source of income. In times of recession, property values drop some, but not as much as income, sales, and profit. Homeowners will continue to pay their tax, rather than risk losing their property, even if they must use savings. Businesses will also pay their property tax, even though the business currently is operating at a loss. For example, an engineer with the Arizona Department of Mineral Resources remarked that during the Depression the railroads and the copper mines kept Arizona going. That may well be true, and the property tax does have a stabilizing effect for the short run. In the long run the homeowner will use up his savings and may leave the community, the landlord will not be able to collect rent and may not be able to pay either his mortgage or taxes, and the business may close. In such cases the revenues to the community will be decreased drastically.

Even if the community takes over the property for non-payment of taxes, it is unlikely that a buyer can be found so the community still has not obtained the needed revenue. The end result is that it has unwanted property on its hands that may have to be maintained in order to prevent rapid deterioration. According to Jenkin (1959, p. 238), a tax can never be raised on land which pays no rent, for the owner would rather abandon the land than pay the tax. That may not be true in the short run, but it certainly is in the long run. For proof one need but go only as far as the anthracite region of Pennsylvania where lands containing coal have
been taken by the local government for non-payment of taxes.

If a community depends too heavily on the property taxes collected from mineral reserves, that community can be in for serious trouble, because the mines eventually will decline, and that is the very time that the community will be in need of funds. This decline can occur slowly if new deposits are not discovered quite as fast as the ore is being mined; the decline can occur very rapidly if richer deposits discovered elsewhere or technological advances reduce the value of the ore. At one time these communities may have been living high off the taxes from minerals and have a difficult time living without this wealth. The Minnesota iron range is a prime example, (Weaton, 1968, p. 35-39) but other examples can be found in certain counties of the West or in some Pennsylvania coal regions.

Various incentives, including relief from taxes, have been used by localities in an attempt to attract new industry. Louisiana, Puerto Rico, certain Canadian provinces, and other regions have offered relief from property taxes for five to ten years as an incentive. Such an incentive might be used to encourage mining, but Stoker and Falk (1967, p. 394) say that such an incentive is inefficient and costly because firms use a much higher discount rate of interest than governments. This certainly is true for any of the states that can issue and sell tax-exempt bonds, but there might be very poverty-stricken local taxing units that set a high discount rate but could not find a market for their securities.

If relief from property taxes is an ineffective method of attracting new industry, it is unlikely that even a relatively high property tax will cause an industry to leave or to discourage a new industry from entering the region if other factors are favorable. A recent state development agency advertisement stated that property taxes there were not the lowest because they thought that amenities such as good schools, roads, and recreational area were more important than low taxes.

Certainly, for the mineral industry, the property tax is a very minor factor in considering where to locate. For example, in Arizona mining properties now are assessed at a higher rate than most other industries, and mining managers probably believe that Arizona unfairly discriminates against mining. Nevertheless, there is a lot of exploration taking place in Arizona, and there is no indication that any firms have decided to cancel a proposed exploration project in Arizona because of the recent change in assessing mining properties.

Despite such evidence to the contrary many feel that if assessments are raised, the mining industry will leave. During an interview, one county official said that he could not raise the assessment of quarries because the operation would go somewhere else. This would be a most unusual circumstance. Admittedly, it is easier to locate a potential quarry site than a copper mine, but not all rock or all gravel is saleable, and the location site has to result in low cost transportation to the market. The theory has been advanced that a high tax will create
physical waste because the mine owner will quickly mine out the best ore, rob the pillars, and get out, thereby leaving a lot of low grade ore. This could happen, but it is most unlikely because the cost of property tax is so overshadowed by other costs of the firm.

**Effect of Increasing Assessments**

Increasing assessments on mineral lands will have the effect of increasing the property taxes paid by owners. Higher property taxes on mineral reserves might have an undesirable and economically wasteful effect on the operation of mines, and especially on certain types of metal mines. For planning the most efficient operations, the mine should have considerable reserves blocked out well in advance, but if these reserves are taxed too heavily, e.g. not discounting the value of the ore reserve, the mining firm might reduce their tax bill by not drilling ahead to block out sufficient reserves.

Two closely related concepts of property taxation are: (1) Henry George's proposal to tax land only, and not to tax buildings or improvements on the land, and (2) the concept of appraising land according to its best use. A tax on land, theoretically, cannot be shifted in a competitive market because the land owner will continue to produce, even though his return has been reduced by the land tax. The output from the land will not be reduced, and the price of the land's output will be unchanged as shown below. The land tax captures some of the "unearned" returns to land.

If land is taxed at a fixed rate according to its market value, in theory increasing the tax (by increasing the assessment) will have no effect on output, as long as the tax is not so high that the property is abandoned. Figure 1 shows the total cost of production and the total revenue or sales from coal produced from a profitable mine or region. Production is between Q₁ and Q₂ tons of coal. The shaded area represents profit since it is revenue minus cost. The profitable output per year will be at Q₂ tons because at that rate of production, the profit, \( a_1 - a_2 \), is greatest.

If the property tax were raised by X dollars, this sum would be an additional fixed cost or production and would shift the total cost curve upward by an equal amount. The profit would be decreased by X dollars, but the outputs would not change because Q₂ still is the most profitable rate of production.

In practice an increased property tax probably would not change output in the short run. In the long run a possible effect would be to decrease future investment in coal mining within that area\(^1\), thereby causing a long term decrease in production. As previously pointed out, however, the property tax is generally overshadowed by other considerations.

\(^1\) If other areas did not also increase their taxes.
Owners of coal land will complain that such a tax increase is unfair because the incidence of a tax increase would reduce the market value of their land. At the time of purchase the present owner might have figured on ten per cent return which was competitive with other investment opportunities. With increased land taxes and decreased returns, his investment now yields less than ten per cent, and if the current interest rate remains unchanged, the value of the land has been reduced by the tax increase.

An engineer familiar with the western Pennsylvanian coal fields expressed the opinion that a few large companies own or control the majority of marketable coal and have hindered the development of the coal industry by limiting production to their own needs, and an official from one of the anthracite-producing counties expressed a similar opinion regarding coal in his area. If these opinions are correct, and a few companies are exerting some degree of monopoly control, it is doubtful that any reasonable tax increase would force them to sell some of their coal reserves. However, the tax would make it more costly for them to hold such reserves idle and would thereby serve as an incentive to opening them to mining.
Since 1913 the city of Pittsburgh has used the graded tax plan which is based on George's idea regarding land taxation (Williams, 1963, p. 149). Under Pittsburgh's system, buildings are taxed at one-half the rate of land, and throughout Pennsylvania machinery is exempt from the property tax. Both of these policies shift an additional tax burden to the land. But where some land is significantly underappraised, as minerals are in some counties, their use remains unaffected.

Land is supposed to be appraised at its actual or market value; there are several methods, previously described to estimate market value. Opinion is divided upon whether valuation should be made on present use or highest and best use. This problem arises because the market for land is not perfectly competitive, and knowledge of the market is imperfect. Those using the present use of land to base their appraisal justify their methods on equity. In addition it creates less controversy. Even if the assessor knew that the best use of a particular piece of farmland was for a quarry site or for suburban development, he might have a difficult time justifying his assessment before a court of appeals, whereas the value of the land under the present conditions of farming is more easily determined.

A question of equity arises when land is valued on the basis of best use. For example, consider the case of an old farmer making a bare living on a marginal farm. His land may be quite valuable for a shopping or housing development, or for a sand and gravel quarry. If his property is appraised at its best use, the farmer may be forced to sell because his taxes are more than he can pay. Although the hypothetical farmer would reap a profit by selling his land, he would have difficulty adjusting to a life elsewhere and would much prefer to spend the remainder of his life on his farm. Should he be forced off his homestead just because the community grows and now wants his land? The other side of the coin is should the farmer stand in the way of development and deny the community the additional tax revenues it would collect if the land were put to its best use.

According to Dr. H. B. Gamble (oral communication), Maryland and a few other states have a system that applies to farmland that goes into suburban development. In general, land that is being farmed is appraised as farmland, but if it is sold for suburban development, the value being much greater in the new use, the appraised value for several years previous to the sale are recalculated, based upon the increased value of the land. Some of the windfall gains are thus taxed away from the land owner, but he certainly has the ability to pay the additional taxes, and he has not been forced off his land. This type of backward adjustment of taxes could be used for sales of land for mineral production in states where the law allows it.

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APPRAISAL OF MINERAL LANDS IN PENNSYLVANIA

In 1970 the value of Pennsylvania's mineral production was estimated as about one billion dollars, ranking the State apparently the sixth largest mineral producer. Pennsylvania is one of the few states where the value of the primary mineral production exceeds the value of farm product (Schanz, 1967, p. 7 – 8). Coal, particularly bituminous, is predominant, but limestone, building stone, sand and gravel, clay, and oil and gas are also important. Of the metallics only iron and zinc are of any significance to the state.

The importance of the ad valorem tax to counties and smaller political units within Pennsylvania already has been discussed. Since mineral land is a form of real property and is subject to the ad valorem tax, counties and other political units are concerned with the valuation of mineral land. For counties where the value of mineral land is relatively small, the concern for properly evaluating mineral land is small.

In certain coal-producing counties, however, the value of mineral land to total real estate is large, and those counties are vitally concerned with the problem of determining an equitable appraisal value for such land. For example, in Greene County approximately one-half of the assessed value of property is on coal lands, and the percentage of assessments on mineral lands to total assessments for some smaller political units could be even higher. A study by Schanz and Schenck (1968, p. 3) showed that in 1963 wages and salaries from the coal industry exceeded ten per cent of the total payroll for Clearfield, Greene, Indiana, Schuylkill, Somerset, and Washington counties.

The State should be concerned with the appraisal and assessment of mineral lands to insure uniformity and equity among classes of property and for equity among school districts. The amount of State subsidy given to school districts is largely determined by the district's assessed valuation of taxable property (Commonwealth of Pennsylvania, 1968, p. 9); therefore, it is essential that the county's evaluation of taxable real property be adjusted for the purpose of uniformity for and equitable distribution of funds to school districts. The State Tax Equilization Board was established specifically for this purpose.

The Board's responsibility is to determine the aggregate or total value of taxable real estate in each district, not to determine the value of a particular property. To calculate an aggregate value, the sales ratio is used to arrive at an average assessment ratio (Commonwealth of Pennsylvania, 1968, p. 11). To get this ratio, the Board compares recent bona fide sales with the appraised value of that piece of property. The sales price is considered to be the actual or market price, but field checks are made on some properties. Since there may be few or no bona fide sales of mineral lands within some school districts, the sales ratio method may distort the average assessment of a large amount of mineral land. The Board apparently keeps no separate record of mineral lands nor does it make any special adjustments for mineral-rich districts.

During the Depression the State government was concerned with the assessment of mineral and forest lands because the system was considered
inequitable. Therefore, in 1931 a commission was established to consider a system of taxation based upon production from such lands in lieu of the ad valorem tax (Commonwealth of Pennsylvania, 1933, p.1-33). The coal business was depressed, and companies had excess reserves. Farmers with coal on their land were in danger of losing their property. Although the price and demand for coal were greatly depressed, the assessments had not been reduced very much.

The Commission reported that the value of oil land was based upon production and concluded that although the system might not be constitutional, the system was good, but that taxes should be reduced since the price of oil was low. The Commission found that most natural gas land was tax exempt since it was owned by public utilities, but taxable gas land was not taxed on the basis of production as was oil. Since it is difficult to evaluate gas land, they recommended that gas be taxed on the basis of production like oil. The Commission recommended that the present system of property taxation be retained for anthracite land, and that the proposal of the mine operators to tax bituminous coal land on the basis of production be given more study. This proposal apparently never was acted upon.

Special Problems for Minerals

In principle, the appraising of mineral land should be no different than the appraising of any other type of real estate and is based upon actual or market value. Appraising mineral lands has two problems not usually encountered in appraising other types of real estate. First, no one knows exactly what minerals are in an area. Near an operating mine or quarry the quantity of the minerals may be fairly well known, but elsewhere considerable uncertainty exists. Nevertheless, some information can be obtained from the projection of mine workings, surface exposures, drill hole information, and from published geologic maps and reports.

In many cases it can be stated with a high degree of certainty that a coal seam or an especially desirable limestone or sandstone bed underlies a property, even though there is no mine, quarry, or drill hole on the property. The problem of the assessor is not to determine what actual minerals underlie a particular property but what is the market value, which will be determined largely by what prospective buyers think is or might be in the ground, and their optimism regarding future price and demand.

For mineral lands the cost is the purchase price, and when there has been a bona fide sale, the assessor has a good clue to the recent market value. When a historical cost or sale price goes back in time (10 to 20 years), the purchase cost may be of little help to the assessor. At the least, a correction would have to be made for inflation and also for the profitability and demand for whatever minerals are on the property. Usually, however, the industry product prices will have changed so that such old sales mean little.

In some counties there have been few if any recent sales so it is difficult to determine market value by the comparative sales approach.
However, by comparing recent and near-recent sales in his and neighboring counties the assessor might have a basis for approximating market value. Adjustments could then be made for each block of mineral land for the known geologic factors and for distance from market and transportation facilities.

If the land owner sells the mineral rights but retains title to the surface, the assessor may have a good clue as to the market value of the minerals, but if the landowner sells his property but retains the mineral rights, the assessor's task is more difficult.

For coal and certain other minerals the assessor sometimes can get an idea of the value from royalty payments paid to owners of the mineral rights. For example, if the XYZ Mining Company has agreed to pay a landowner a certain amount per ton of coal mined from the property, the coal in the ground should be worth at least the amount of the future royalty payment, discounted to the present value. If the property is being mined, there is no particular problem in estimating when the coal will be mined, but if the coal land is being held for reserve, the present value depends very largely upon the time when the owner will receive his royalty. Even if a valuation is obtained from royalty payments, this valuation might be too low, but it would set a minimum value on the coal land. In many agreements concerning royalty payments the landowner receives a lump sum at the time of the signing of the contract. Therefore, in such cases the royalty payments may not reflect the full value of the coal.

The assessor cannot set a uniform evaluation on mineral land of the same type if the value is known to vary between different tracts, even if the appraised valuation is equal to or less than the true market value for the least valuable tract. In the year 1928 the Commissioners of Green County, Pennsylvania, set a uniform assessment, based upon 50 per cent of market value, for virgin coal (coal that has not been opened for mining, i.e. inactive or remote) of the Pittsburgh seam for each township. The assessments varied between each township because it was recognized that the value of the coal depended upon the accessibility to market, which in this case meant proximity to the Monongahela River, but assessments were uniform within each township.

The Cumberland Coal Co., et al. appealed their assessments, claiming that their coal lands had no more than one-half the value of coal in Cumberland Township that fronted the river. All inactive coal in the township, regardless or proximity to the river, was assessed at $260 an acre, which at the 50 per cent assessment ratio meant an appraised or market value of $520. At that time the real value of coal along the river was about $1000 and acre. The appellants did not claim that their coal was over-assessed, but that they were being discriminated against by an intentional and systematic undervaluation of other coal land. The case went before the United Supreme Court which upheld the appellants and ruled that the method of assessment was in violation of the equal protection clause of the Fourteenth Amendment (Lawyers Co-Operative Publishing Co., 1932, p. 146-151).
The difficulty of determining the true market value of mineral lands frequently leads to court action if the amount in dispute is large. An example is the current dispute between a large corporation and the Board of Assessment and Revision of Taxes, Greene County, Pennsylvania. The 1967 assessment for the "Cumberland Reserve" is being contested. This tract of 29,255 acres of the Pittsburgh coal seam was assessed at $2,191,060 or $74 per acre. At the present ratio of assessed to market value of 35 per cent for Greene County the implied market value is $214 per acre. The taxpayer's appeal is based upon the testimony of an expert coal appraiser who calculated that the present market value was $116 an acre so that the assessed value should be $39.60, not $74 an acre.

The principal evidence supporting the Greene County valuation is the sale price in 1959 of two large tracts of Pittsburgh coal land situated within reasonable proximity to the Cumberland Reserve Tract. One of these tracts consisted of 7,863 acres and sold for $609 per acre; the other had 10,749 acres and sold for $677 per acre. A court held that the Cumberland Reserve Tract was similarly located and of like equity compared to the other two tracts. The Cumberland Reserve Tract at its closest proximity is about eleven miles from the Monongahela River, and the tract is not traversed by a railroad. No part of the Cumberland Reserve Tract is in an active mining area, but the court noted that the demand for coal from the Pittsburgh seam had increased within the last two years. The court further noted that most of the holdings of Pittsburgh coal is in large corporate blocks and that in recent years sales of such coal land have been infrequent.

The expert witness for the appealing corporation determined the present value of the Cumberland Reserve Tract to be $116 per acre primarily from forecasts of future demand for steam and metallurgical coal in conjunction with sources of supply, using river and rail transportation. The witness cited a sale in April, 1968, of 28,479 acres of Pittsburgh seam coal at $37.07 an acre, the coal being in the adjoining county of Wetzel, West Virginia. The appealing corporation questions whether the two sales of coal land reported to be $609 and $677 per acre should be considered recent and whether the reported price truly is the sale price. These two sales were made by Emerald Land Company and by Youghiogheny and Ohio Coal Company to Buckeye Coal Company, the deeds for both sales dated April 14, and recorded April 15, 1959. Records of conveyance of the two properties to Buckeye Coal have a notation showing a consideration of $1 for each property, but the reported sale price was determined by the value of revenue stamps attached to documents. The appellant maintains that the stamps do not necessarily reflect the sale price. The appealing corporation maintains that its own Cumberland Reserve Tract which adjoins the Buckeye Coal land, is not comparable because the Cumberland Reserve is not serviced by a railroad, and the Buckeye Coal land is traversed by a railroad. The Buckeye Coal land is assessed at $59.30 per acre. The appellant contends that the assessed value of the Cumberland Coal Reserve is excessive, unrealistic and discriminatory when compared with the assessed value per acre of adjoining
coal land.\textsuperscript{1}

The contention is not so much about the quantity and quality of the coal in the ground but is about how to calculate value, what are comparable sales, and how to determine the market value of coal land in the absence of recent bona fide sales.

\textbf{Classes of Mineral Reserves}

From the assessor's viewpoint the most important distinction between classes of reserves is that between active and inactive properties. Assessment of a third class, called remote properties, is often even more controversial and about which this study revealed nothing.

Many of the mineral-producing counties make a distinction between active and inactive reserves for coal lands. Active reserves are defined as so many acres of mineral lands or so many years' supply at current rate of production. The rest of the mineral land on the property is classified as inactive reserve and assessed at a lower rate. Some of the counties have a third category at a still lower rate of assessment for separated or remote deposits, i.e., not near an operating mine; such reserves are sometimes referred to as future reserves.\textsuperscript{2} These three classes of reserves are rational and simple, and by setting a higher appraised value on active reserves than on inactive reserves, the assessor implicitly recognizes the present value concept of discounting future earnings.

\textbf{Assessment Practices of the Counties}

County assessing offices in Pennsylvania were contacted by telephone and inquiries were made as to how the market value of mineral lands was determined. When mineral rights are not separated from surface ownership, no separate assessment is made on the mineral rights.

\textsuperscript{1}From "Appeal of United States Steel Corporation from Decision of the Board of Assessment and Revision of Taxes in Greene County, Pennsylvania. Brief of Appellant in Support of Exceptions to Adjudication of the Court of November 27, 1968." This unpublished document was prepared by Sayers, King, and Keener, Attorneys at Law, Waynesburg, Pennsylvania and dated January 21, 1969.

\textsuperscript{2}An additional concept is that of a potential resource which is mineral raw materials that may become economically mineable because of economic or technical changes. Examples of potential resources are iron deposits that are too low grade or too small, or of coal beds that are too thin or too deep to be economic under present conditions. Potential resources may in time become a valuable reserve, and what is now considered a potential or an inactive reserve become practically worthless if technology changes or if additional and better sources of that reserve are discovered.
Except in the tract containing a mine or quarry, most counties put no additional value on the land because of valuable minerals in the tract, and the land is appraised according to the surface characteristics only such as, waste land, forest land, farm land. Exceptions are coal-oriented counties that do increase the appraised value of land known to contain coal even though the mineral rights have not been separated.

The problem of appraising an operating mine or quarry is not too different from appraising any other industrial property. Some of the coal-producing counties have technically-trained staff that know the industry, and appraisals are based upon actual conditions in the mine and by consultation with the mine owners.

The working area of most stone quarries is appraised at a much higher figure than the surrounding land, but in at least one county quarries are assessed at the same rate as farm land. Some counties appraise sand and gravel pits only as to the surface characteristics or type of land and apparently do not consider the value of the minerals when making an appraisal.

Producing oil and gas lands are assessed upon their production. Where oil and gas rights have been separated from the surface owner, a nominal value is placed on non-producing tracts, and the same is true for other minerals, excluding coal. When mineral rights are leased, rather than sold, normally the appraised value of the land is not increased unless production occurs.

Table I provides a summary of information contained within the following county by county review of assessing practices for mineral lands.
Table 1
County Assessing Practices for Mineral Lands

<table>
<thead>
<tr>
<th>County</th>
<th>Method</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams</td>
<td>N</td>
<td>No special treatment for mineral lands.</td>
</tr>
<tr>
<td>Allegheny</td>
<td>Sp</td>
<td>County has several classification of coal lands.</td>
</tr>
<tr>
<td>Armstrong</td>
<td>Sp</td>
<td>Coal lands are classified as active or inactive and assessed accordingly. Oil and gas rights, if separated from surface rights, are appraised at a uniform rate.</td>
</tr>
<tr>
<td>Beaver</td>
<td>Sp</td>
<td>Several minerals are assessed. Royalty payments are an important consideration.</td>
</tr>
<tr>
<td>Bedford</td>
<td>Sp</td>
<td>Coal beds assessed according to thickness and depth.</td>
</tr>
<tr>
<td>Berks</td>
<td>N</td>
<td>No special treatment for minerals.</td>
</tr>
<tr>
<td>Blair</td>
<td>Nom</td>
<td>County has a few tracts of separated coal lands. They are assessed at a uniform rate.</td>
</tr>
<tr>
<td>Bradford</td>
<td>N</td>
<td>No special treatment for mineral lands.</td>
</tr>
<tr>
<td>Bucks</td>
<td>N</td>
<td>No special treatment for mineral lands.</td>
</tr>
<tr>
<td>Butler</td>
<td>Nom</td>
<td>Assessments are placed on active coal lands, separated coal lands, and oil and gas leases.</td>
</tr>
<tr>
<td>Cambria</td>
<td>Sp</td>
<td>Industry sets value but county sometimes hires an independent appraiser, a specialist in mineral lands. Assessment is based on quantity and quality of coal.</td>
</tr>
<tr>
<td>Cameron</td>
<td>Nom</td>
<td>Oil and gas leases are assessed at uniform rate.</td>
</tr>
</tbody>
</table>

1Sp = Special techniques applied to appraising mineral land.
Nom = Nominal assessment placed on certain types of mineral lands.
N = Little or no special treatment of mineral land.
NA = County officials not available for comment.
<table>
<thead>
<tr>
<th>County</th>
<th>Method</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon</td>
<td>Sp</td>
<td>Several categories of coal lands. Operating sandstone quarries are appraised.</td>
</tr>
<tr>
<td>Centre</td>
<td>Nom</td>
<td>Separated mineral lands (limestone) are given nominal assessment.</td>
</tr>
<tr>
<td>Chester</td>
<td>NA</td>
<td>Mineral reserves are unimportant.</td>
</tr>
<tr>
<td>Clarion</td>
<td>Sp</td>
<td>County has several classifications of coal lands. Limestone, clay, and producing oil lands are assessed.</td>
</tr>
<tr>
<td>Clearfield</td>
<td>Nom</td>
<td>Separated mineral lands are appraised at a nominal value.</td>
</tr>
<tr>
<td>Clinton</td>
<td>Nom</td>
<td>Separated mineral lands are appraised at a nominal value.</td>
</tr>
<tr>
<td>Columbia</td>
<td>Nom</td>
<td>Coal land appraised at uniform rate.</td>
</tr>
<tr>
<td>Crawford</td>
<td>Nom</td>
<td>Oil is taxed on output. County is seeking method to appraise gas lands.</td>
</tr>
<tr>
<td>Cumberland</td>
<td>Nom</td>
<td>Active quarries are assessed.</td>
</tr>
<tr>
<td>Dauphin</td>
<td>Nom</td>
<td>Active quarries are assessed.</td>
</tr>
<tr>
<td>Delaware</td>
<td>NA</td>
<td>Mineral reserves are unimportant.</td>
</tr>
<tr>
<td>Elk</td>
<td>Nom</td>
<td>Separated mineral lands given nominal assessment. Oil and gas fields taxed on output.</td>
</tr>
<tr>
<td>Erie</td>
<td>N</td>
<td>No special treatment for minerals.</td>
</tr>
<tr>
<td>Fayette</td>
<td>Sp</td>
<td>Several classifications of coal lands.</td>
</tr>
<tr>
<td>Forest</td>
<td>Nom</td>
<td>Leased or separated oil and gas lands given nominal assessment.</td>
</tr>
<tr>
<td>Franklin</td>
<td>N</td>
<td>Operating quarries are assessed.</td>
</tr>
<tr>
<td>Fulton</td>
<td>N</td>
<td>No special treatment for minerals.</td>
</tr>
<tr>
<td>Greene</td>
<td>Sp</td>
<td>Assessment of coal lands is very important.</td>
</tr>
<tr>
<td>Huntingdon</td>
<td>N</td>
<td>Coal lands, unless flooded, are assessed at uniform rate. Gannister rock is assessed at nominal rate.</td>
</tr>
<tr>
<td>County</td>
<td>Method</td>
<td>Assessment</td>
</tr>
<tr>
<td>------------</td>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Indiana</td>
<td>Sp</td>
<td>Coal lands assessed according to size of tract and whether or not coal is being mined.</td>
</tr>
<tr>
<td>Jefferson</td>
<td>Nom</td>
<td>Inactive mineral lands are assessed nominally.</td>
</tr>
<tr>
<td>Juniata</td>
<td>N</td>
<td>A few small limestone quarries are assessed.</td>
</tr>
<tr>
<td>Lackawanna</td>
<td>NA</td>
<td>Uses board of assessment; important anthracite region</td>
</tr>
<tr>
<td>Lancaster</td>
<td>N</td>
<td>County has a few quarries, but no assessment on reserves.</td>
</tr>
<tr>
<td>Lawrence</td>
<td>N</td>
<td>Recorded sales price considered in mineral assessment</td>
</tr>
<tr>
<td>Lebanon</td>
<td>N</td>
<td>Reserves of Cornwall mine was estimated to last for twenty years, and assessment is reduced 5 per cent each year.</td>
</tr>
<tr>
<td>Lehigh</td>
<td>N</td>
<td>Quarries classified as active or abandoned and appraised accordingly.</td>
</tr>
<tr>
<td>Luzerne</td>
<td>Sp</td>
<td>Coal lands assessed by engineering principles and number of acre feet.</td>
</tr>
<tr>
<td>Wyoming</td>
<td>N</td>
<td>Coal around mine is assessed.</td>
</tr>
<tr>
<td>McKean</td>
<td>Nom</td>
<td>Non-producing mineral property, if separated from surface ownership, is given nominal assessment.</td>
</tr>
<tr>
<td>Mercer</td>
<td>Nom</td>
<td>Inactive coal lands assessed at uniform rate per acre.</td>
</tr>
<tr>
<td>Mifflin</td>
<td>N</td>
<td>No special treatment for minerals.</td>
</tr>
<tr>
<td>Monroe</td>
<td>N</td>
<td>Quarry sites are assessed so much per acre, but no special assessment placed on reserves.</td>
</tr>
<tr>
<td>Montgomery</td>
<td>N</td>
<td>No special treatment for minerals.</td>
</tr>
<tr>
<td>Montour</td>
<td>N</td>
<td>No special treatment for minerals or quarries.</td>
</tr>
<tr>
<td>Northampton</td>
<td>N</td>
<td>Only quarry sites are assessed. No assessment on mineral reserves.</td>
</tr>
<tr>
<td>Perry</td>
<td>NA</td>
<td>Mineral reserves are unimportant.</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>NA</td>
<td>Mineral reserves are unimportant.</td>
</tr>
<tr>
<td>Pike</td>
<td>N</td>
<td>No valuable minerals in county.</td>
</tr>
<tr>
<td>County</td>
<td>Method</td>
<td>Assessment</td>
</tr>
<tr>
<td>------------</td>
<td>--------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Potter</td>
<td>Nom</td>
<td>Areas leased for gas are given nominal assessments.</td>
</tr>
<tr>
<td>Schuylkill</td>
<td>Sp</td>
<td>Coal lands are evaluated on engineering principles.</td>
</tr>
<tr>
<td>Snyder</td>
<td>NA</td>
<td>Mineral reserves are unimportant.</td>
</tr>
<tr>
<td>Somerset</td>
<td>Nom</td>
<td>Coal lands, if separated, and oil and gas lands, if leased, are given nominal assessments.</td>
</tr>
<tr>
<td>Sullivan</td>
<td>Nom</td>
<td>Inactive coal land is given nominal assessment. A tract with a coal mine is assessed according to acreage even if entire tract not underlain with coal.</td>
</tr>
<tr>
<td>Susquehanna</td>
<td>N</td>
<td>No special treatment for minerals.</td>
</tr>
<tr>
<td>Tioga</td>
<td>Nom</td>
<td>Coal land, if separated, is given a nominal assessment.</td>
</tr>
<tr>
<td>Union</td>
<td>N</td>
<td>Quarry sites are appraised according to acreage.</td>
</tr>
<tr>
<td>Venango</td>
<td>Nom</td>
<td>Mineral rights, if separated, are given a nominal assessment.</td>
</tr>
<tr>
<td>Warren</td>
<td>Nom</td>
<td>A nominal assessment is placed on oil and gas lands.</td>
</tr>
<tr>
<td>Washington</td>
<td>Sp</td>
<td>Engineering techniques are used for appraising coal lands. Distance from river transportation and quality or kind of coal are important considerations.</td>
</tr>
<tr>
<td>Wayne</td>
<td>N</td>
<td>County has no mineral deposits of value.</td>
</tr>
<tr>
<td>Westmoreland</td>
<td>N</td>
<td>Active and inactive coal lands are assessed.</td>
</tr>
<tr>
<td>Wyoming</td>
<td>Nom</td>
<td>Nominal assessment is placed on minerals in unseated land that has potential for producing gas.</td>
</tr>
<tr>
<td>York</td>
<td>N</td>
<td>No special treatment for minerals.</td>
</tr>
</tbody>
</table>
Adams County: (40 per cent assessment ratio)

There is no place in this county where mineral rights are separated from surface rights. Mineral land is taxed as farmland, even though land is owned by a company for its limestone reserves.

Allegheny County: (Assessment ratio not published.)

The rates for coal were set up many years ago on the basis of quality, depth, and other factors. Coal is classified as active (if being mined) or inactive. If a company has 1000 acres of coal land, 100 to 200 acres will be classified as active and assessed at $400 to $500 an acre. The remainder of the tract will be classified as inactive and assessed at $100 to $200 per acre. Each year the companies report how much coal was mined out, and their inactive reserves are reduced accordingly. Figures are notorized by coal companies, and if there is any discrepancy, the county consults with the U.S. Bureau of Mines (The Bureau has an office in Pittsburgh). If inactive coal land is separated into small tracts or is remote from the transportation facilities, it is assessed at $125 per acre.

Limestone, shale, and clay are not assessed.

Armstrong County: (40 per cent assessment ratio)

A certain amount of a mining company's coal land is appraised at $300 per acre, and the remainder at a much lower amount. The companies each year report how much coal was mined and their inactive reserves are reduced accordingly.

On land where the oil or gas rights have been separated from the surface rights, an appraisal value of $10 per acre is set. If both oil and gas rights are separated, the appraised value is $20 per acre. If the land is leased, no assessment is placed on the oil and gas rights.

Beaver County: (30 per cent assessment ratio)

If the mineral rights are not separated from surface rights, a separate assessment cannot legally be made for the minerals. The county data on minerals has been computerized since 1961, and the value of coal, limestone, clay, etc. is determined on the basis of depth, thickness, etc. A check sometimes is made on their valuations by "working backwards," that is by using the current royalty payments to determine the present value of future royalty income.

Bedford County: (25 per cent assessment ratio)

There are four coal seams and in order of decreasing value are the Kelly, Little Pittsburgh, Fulton, and Barnett. The Barnett seam
is uneconomic so no value is placed on coal in that seam. Recently most of the coal in the Fulton seam (Broadtop area) was written off as valueless because it is too deep, thin, and the formation contains lots of water. Only a few small privately owned mines are now operating in this area because the coke ovens that formerly used this coal are closed, and a railroad no longer serves the area. The owners have been told that if changes in technology or demand makes the coal profitable, the land will be put back on the tax roll. Coal land that is presently taxed is assessed from $40 to $60 per acre.

The county contains uneconomic low grade iron deposits owned by a steel company. If the mineral rights are not separated, the land is classified as forest land and assessed from $4 to $12.50 per acre. If the mineral rights are separated, the low-grade iron deposits are carried on the tax rolls but valued separately at $0 per acre.

Berks County: (35 per cent assessment ratio)

This county has some limestone quarries, and the reserves are classified as farm land.

Blair County: (50 per cent assessment ratio)

The county has only three parcels of land where coal is separated from the surface rights to the land. The coal is appraised at $50 per acre.

Bradford County: (30 per cent assessment ratio)

The county has only one small area where coal is being stripped, and it is declining in importance. The county does nothing about evaluating the coal.

Bucks County: (30 per cent assessment ratio)

The county has a few quarries of limestone, trap rock, shale, and sandstone. The rock is low quality and used for fill and crushed stone. The quarries are assessed as businesses, but no value is placed upon the reserves of rock.

Butler County: (33.3 per cent assessment ratio)

No value or assessment normally is made for coal until the mineral is separated. Active coal land for stripping is assessed at $75 per acre. Inactive coal land, if separated or leased, is assessed at $10 per acre.

Oil and gas leases are assessed at $10 per acre.
Cambria County: (35 per cent assessment ratio)

Coal land is assessed according to the quantity and quality of coal, and relative to the particular beds or seams that underlie the area. No differentiation is made between the producing and non-producing properties. The value of the coal land is determined by industry, but if the values of adjacent properties differ greatly, the county hires an independent appraiser, who is a specialist in mineral lands. If coal or other mineral resources is now economic to produce, it is not taxed, but will be taxed if technological or other changes make it profitable to produce the mineral. The better coal land is assessed at $60 per acre.

The county now produces some gas but there has not yet been a determination as to a valid method for evaluating the land.

Cameron County: (50 per cent assessment ratio)

County no longer produces coal, oil, or gas. Most of the land is now leased for oil and gas. The mineral rights are assessed at $2 per acre, and the surface rights of unseated (unused) land is also $2 an acre. The state owns 51 per cent of the land and pays the county twenty cents an acre annually.

Carbon County: (40 per cent assessment ratio)

This county used to be an important coal-producer. In 1957-1958 an Illinois firm made a survey of the coal lands and set up six categories with an appraised value of from $904 per acre for active mining areas with both mineral and surface rights to $3 to $10 an acre for barren or stripped areas. In 1961 with the decline of the coal industry, appraisals for all categories were reduced as a result of appeal from mining companies. The county is now in the process of reassessing.

The actively used areas of sandstone quarries (usually 4 to 5 acres) are appraised at 2 to 5 cents per sq. foot, and the rest of the area is appraised at so much per acre as farm land.

Centre County: (33.3 per cent assessment ratio)

County has commercial limestone deposits but very little coal. County has separate evaluation only if mineral and surface rights are separated. Appraised value of separated mineral lands are $10 to $20 an acre. These values were set in 1959 when all property in the county was reassessed under a new procedure. The appraisal value of the mineral lands may be arbitrary, but there have been no complaints. The appraised value of most property may be only 75 to 80 per cent of true market value.
Chester County: (40 per cent assessment ratio)

We were unable to contact county officials.

Clarion County: (33.3 per cent assessment ratio)

Strip mining is important to the county, and records are readily available. Assessments are based upon quality and type of mineral. Examples are coal (one seam) from $20 to $150 assessment per acre, average of $25; coal (all seams) from $50 to $200 per acre, limestone and clay from $30 to $150 assessment per acre.

Oil producing land is taxed on barrels produced and upon rating of good, medium, or poor.

Clearfield County: (40 per cent assessment ratio)

Mineral lands, when separated, are assessed at $10 per acre. This value has been used since 1960 when new state rules for assessment went into effect. If just coal rights are separated, surface rights owned by farmers won't be reduced, but if all mineral rights (coal, clay, etc.) are separated, the assessment of the remaining surface rights may be reduced by $10 per acre.

Clinton County: (25 per cent assessment ratio)

The county has some coal and a few oil and gas areas. If mineral rights are not separated, no assessment is made on them. If mineral rights are separated from surface rights, both are appraised at the same amount. Most of the coal occurs in the mountain areas that are appraised at $10 per acre. Thus if the coal is separated, it is also appraised at $10 per acre. Most oil and gas areas are in farming areas which are appraised at $30 to $40 per acre.

Columbia County: (33.33 per cent assessment ratio)

The county has a lot of strip coal mines but no deep mines. The coal lands are appraised at $20 per acre for the surface rights and $50 per acre for the coal. An engineer determines whether the land is coal land or not. The county has about $750,000 worth of coal land.

Crawford County: (50 per cent assessment ratio)

The county produces a little oil and the tax is based upon barrels of production. Non-producing fields are not taxed.

In the past gas was found, but companies said they were holding it in reserve. There are recently drilled gas fields, but wells are not yet being taxed. The county plans to tax the gas fields, and is studying the matter because they don't know how to determine value. One problem is that many leases are not recorded.
Cumberland County: (33.3 per cent assessment ratio)

The county has some stone quarries, and there are large quarries in Dauphin County to the east. Whenever Cumberland County talks about raising taxes on quarries, the owners talk about closing them. Typical farmland might be appraised at $250 to $300 an acre, and a quarry site at $500 per acre, but some sites are $1000 per acre. Reserves for quarries are taxed as farm lands.

Dauphin County: (30 per cent assessment ratio)

The county has some limestone quarries. The working area of each one is appraised separately. The non-working areas or reserves are mostly cultivated and are appraised as farm land.

Delaware County: (Assessment ratio not published)

We were unable to contact county officials.

Elk County: (20 per cent assessment ratio)

The county has about $320,000 of assessed value for minerals — mostly oil and gas, but some coal. When mineral rights are separated, they are assessed at $1 per acre for one or all minerals. Coal around a mine is assessed at the usual $1 an acre, but the buildings and improvements are assessed separately.

Assessments for producing oil and gas fields are based upon average daily production.

Erie County: (40 per cent assessment ratio)

The only commercial mineral is gas, and it is not taxed. Most of the producing fields are owned by public utilities and are tax-exempt.

Fayette County: (35 per cent assessment ratio)

The county has a formula for assessing coal lands. The main coal seam (the nine-footer) is assessed at $975 per acre. Thinner seams that can be mined profitably are assessed at $250 per acre, and seams that are uneconomic to mine are assessed at $25 per acre. Coal is not assessed on lots less than five acres.

Forest County: (Assessment ratio not published)

The county has oil and gas. When oil and gas rights are leased or separated from surface owner, the mineral rights are assessed at $1.50 per acre. If oil rights and gas rights are not held by the same owner, the total assessment is $3 per acre.
Franklin County: (40 per cent assessment ratio)

The county has some limestone, but there is little or no separation of mineral rights from surface rights. Operating quarries are appraised at $2000 per acre for the quarry site. Undeveloped mineral reserves are appraised as farm land.

Fulton County: (40 per cent assessment ratio)

There are no assessments on minerals.

Green County: (35 per cent assessment ratio)

Limestone and oil are not taxed.

Coal land is appraised at market price. Coal is very important to the economy of this county, and some assessments on coal lands are under litigation.

Huntingdon County: (40 per cent assessment ratio)

Coal lands mostly are assessed at $75 per acre, but flooded coal lands are assessed at a lower value. The value of the coal lands and the amount of coal estimated to be in the ground hasn't been revised recently but there hasn't been much mining.

There are two or three operating quarries, and gannister stone on land leased or owned by the quarry operators is assessed at $1 per acre. If they own the land, one assessment for the stone and another assessment for surface is placed on the land.

The county has one large active sand plant. Many acres of their land is given a high assessment because of their operating plant.

Indiana County: (35 per cent assessment ratio)

Coal is the only mineral that is assessed. Small isolated tracts of coal are assessed at $10 per acre. Large blocks of coal land that could be mined are assessed at $35 per acre. For active mines, the company's ten-year projection of coal to be mined is assessed at $60 per acre and the rest of the reserves are assessed at $35 per acre. "Active" mined out areas (used for haulage ways, waste storage, etc.) and faulted areas of mine are assessed at $15 per acre. "Inactive" mined out areas are assessed at $5 per acre. No allowances are made for the thickness of the coal except to separate mineable from non-mineable coal.

Jefferson County: (30 per cent assessment ratio)

Inactive mineral lands are valued at $5 to $20 per acre.
Juniata County: (50 per cent assessment ratio)

The county has a few limestone quarries, but the area of limestone reserves away from the quarry site are appraised according to the surface, and no special value is assigned to the limestone.

Lackawanna County: (35 per cent assessment ratio)

We were unable to contact county officials.

Lancaster County: (25 per cent assessment ratio)

The assessing is done by a private appraisal company. The county has a couple of stone quarries that are taxed as industry. No value is placed on the reserves.

Lawrence County: (30 per cent assessment ratio)

When mineral rights are separated from the surface, the sale price is considered.

Lebanon County: (50 per cent assessment ratio)

The county formerly had some coal strip mines, but the area is now included in State Game Lands. Some assessment is placed on limestone around quarries, but some of the quarry land is assessed only for the surface.

In 1954, the mining company estimated that reserves at the Cornwall Iron Mine would be depleted in 20 years. The mine was then assessed at $10 million and depleted 1/20 every year. A more recent estimate indicated that the mine would be depleted about 1974, thus substantiating the 1954 estimate.

Lehigh County: (60 per cent assessment ratio)

The county has lots of limestone, stone, some zinc, and abandoned slate quarries. The mineral rights are rarely if ever separated from surface rights. The assessor does not attempt to examine underground operations to set value.

Good limestone land is classified as farm land until a quarry is opened, then it is evaluated on the basis of an operating quarry. When it is shut down, it is evaluated as an abandoned quarry having an average appraised value of about $500 an acre. If a quarry site is sold or put to a special use, the property is reevaluated.

Luzerne County: (35 per cent assessment ratio)

An engineering approach has been used since the 1930's to evaluate anthracite coal lands. The number of acre feet is determined for each tract and assessed a maximum of $215 per acre foot, and the surface is assessed at $100 an acre. The assessment for the anthracite is reduced to account for coal mined out and for engineering factors such as
thickness of seam, transportation and water in the mine. Even after the coal is mined out, it is still considered coal land and has a minimum assessment of $5 per acre.

**Lycoming County:** (33.3 per cent assessment ratio)

The county has little coal and only a few small mines. Only coal around the mines is assessed, and a value is determined for both surface and sub-surface rights.

**McKean County:** (25 per cent assessment ratio)

When mineral rights are separated from surface ownership, an assessed value of $1 per acre is set for each mineral separated, but the value of the farmer's rights to the surface is not reduced by a corresponding amount. If the separated mineral rights were not assessed on the county records, the mineral owner would lose his rights if the surface rights were sold for non-payment of taxes.

**Mercer County:** (33.3 per cent assessment ratio)

Inactive coal land is assessed at $15 per acre.

**Mifflin County:** (20 per cent assessment ratio)

The county has some sand and limestone deposits being worked, and they are treated just like an operating plant in any other industry. Reserves are assessed according to the value of land surface.

**Monroe County:** (35 per cent assessment ratio)

The county has deposits of sand and gravel and limestone quarries. Quarries are appraised at $500 per acre, but the reserves around the quarries are appraised as farm land. This is not realistic as there is no real farm land in the county, and the land sells on the market for more than its value as farm land. Large blocks of land containing limestone or sand and gravel are held by speculators and such land is appraised at a relatively low value.

The county has a twelve-man commission studying the problems of assessment.

**Montgomery County:** (Assessment ratio not published.)

No mineral rights have been separated from the surface so there are no assessments on mineral lands.

**Montour County:** (50 per cent assessment ratio)

The county has lots of limestone and some iron deposits that were mined before the opening of the Mesabi Range in Minnesota. Minerals aren't taxed, and even quarry sites are assessed as farm land.
Northampton County: (60 per cent assessment ratio)

The county has some slate and some limestone for cement. The value in use concept is applied to determine value, and quarries are appraised at about $4000 per acre, and the surrounding area as farm, timber or other land. Abandoned quarries normally are classified as waste land, but one abandoned quarry was used for storage by an oil company and appraised at a high value.

Northumberland County: (25 per cent assessment ratio)

We were unable to contact county officials.

Perry County: (25 per cent assessment ratio)

We were unable to contact county officials.

Philadelphia County: (Assessment ratio not published)

The county coincides with the city of Philadelphia and mineral reserves are unimportant.

Pike County: (33.3 per cent assessment ratio)

The county has no valuable minerals.

Potter County: (50 per cent assessment ratio)

The county has some gas and a little oil. Several thousand acres are leased for gas, and the assessed value is $1 per acre. It formerly separated from surface owner, the land is assessed as farm land or timber land, and the appraised value is not increased because of potential gas or oil. It is illegal to tax gas production, but a severance tax is placed on each barrel of oil produced.

Schuylkill County: (35 per cent assessment ratio)

The Engineering Department of the county (not part of the assessor's office) determines the value of coal lands, using an engineering approach, considering such factors as transportation costs, thickness of coal seams, and amount of water in the mine. The Engineering Department also determines the amount of depletion from active areas and makes adjustments. When mining stops, the owner usually requests a reduction in evaluation, and the Engineering Department reevaluates the coal property. In the western part of the county, the coal land is not so good and is appraised at about $100 an acre not including surface rights. The county owns much coal land that was taken from former owners for non-payment of taxes.
Somerset County: (20 per cent assessment ratio)

No value is put on coal if mineral rights are not separated from surface rights. When coal rights are separated, coal is appraised at $15 per acre ($3 assessment). After mining commences, the operating company furnishes information to the tax assessor, and the assessment on the coal is increased.

Oil and gas lands under lease are assessed at $0.40 per acre, but when the lease is dropped, the assessment is removed from the tax rolls. Friction may result if the assessor is not notified that the lease has been dropped. It was stated that the assessment of oil and gas leases is more trouble than it is worth so recent leases have not been put on the tax rolls.

Sullivan County: (33.3 per cent assessment ratio)

The county has a few operating strip mines but no underground mines now. In some tracts the coal rights are separated from the surface rights. Recently an appraisal company reappraised the land, but not the minerals, in the county so the value of the minerals was raised in the same proportion as the land. Coal with a producing mine on the tract is assessed at $6 per acre for the entire tract, even though the entire tract may not be underlain with coal. When coal or other minerals are separated from the surface rights but there is no producing mine or quarry, the minerals are assessed at $1 per acre, regardless of whether the mineral rights include just coal or all minerals. Most deeds day "minerals", and originated when the former land owner sold the surface rights but retained the mineral rights. Thus, there was never an actual market price set on the mineral rights.

In the past there have been times when land was leased for oil, but there is no such leasing now.

Susquehanna County: (Assessment ratio not published.)

There are no minerals separated from the surface rights and no assessment of minerals. A coal company owns some land that is assessed as town lots or according to surface usage such as farmland and forest.

Tioga County: (50 per cent assessment ratio)

The mineral rights for coal land is assessed at $2.50 per acre, and the surface rights for coal at $10 per acre. This is considerably higher than the assessed value for the surface rights to brush land which is $3 per acre. An appraisal company is changing the assessments, which will be increased.

Union County: (25 per cent assessment ratio)

The county has two limestone quarries; the actual quarry sites are appraised at $200 per acre as quarry land, and the remaining acreage, not actually now being used for quarrying operations, is classified as farm land and appraised at $130 per acre, even though
it contains good reserves of limestone.

Recently a large quarry operator purchased a farm containing the best limestone in the area, but the land is only fair for farming. The property is appraised as farm land but below the owner's purchase price.

Land is traditionally appraised according to use, and farm land traditionally is underappraised, e.g. farm land appraised for $130 an acre sells for $500 to $600 per acre.

The county has some low grade iron deposits that were worked during the Civil War. The land is classified as unseated (unused) and has a very low appraised value.

**Venango County:** (30 per cent assessment ratio)

Some oil and gas rights are separated from the surface rights, and the appraised value for oil and gas, when separated, is $5 an acre. When mineral rights are sold, the value of the surface rights remaining to the landowner is not reduced.

**Warren County:** (50 per cent assessment ratio)

The county has some oil and gas; when mineral rights are separated, they are appraised at $2 per acre.

**Washington County:** (30 per cent assessment ratio)

This county contains a lot of good coal, and except for very small tracts, all coal, even if owned in fee, is appraised. Coal land that is being mined is classified as "assigned" land, and coal land held as reserves is "unassigned" coal land. The county uses engineers to appraise the coal as to quality, thickness of seam, distance to shipping point, and other economic and technical considerations. The best assigned (active) coal lands are appraised at $1400 an acre, and the value is reduced by ten per cent for each zone away from the Monongahela River. The best assigned steam coal is appraised at $600 per acre, and the value is reduced by $70 per acre for each less desirable category.

For unassigned or non-producing coal land, the best strippable coal is appraised at $500 per acre. For non-strippable and non-assigned coal, the appraised value ranges from $250 to $30 per acre.

**Wayne County:** (Assessment ratio not published.)

No minerals are produced in the county. The county formerly produced a little coal. The abandoned coal land is now classified as waste land.

**Westmoreland County:** (Assessment ratio not published.)

The Freeport coal seam is assessed at $20 per acre for inactive (non-producing) areas. The actual selling price is $100 to $150 per acre.
Active coal land is assessed about three times the value of inactive
ccoal. The mine area is assessed at a much higher amount.

**Wyoming County:** (33.3 per cent assessment ratio)

In the past there was some exploration for gas. The county has
some unseated lands that are appraised at $6 per acre for surface rights
and $3 per acre for mineral rights. The county is in the process of
reappraising, and the appraisals will be increased.

**York County:** (20 per cent assessment ratio)

The county has one small limestone quarry. Lands containing
limestone are not appraised for the value of the mineral.
MINERAL ASSESSMENT IN OTHER STATES

The problem of assessing mineral lands is of great concern to many local mining communities and to those states where mining is an important industry. There are different philosophies on how mineral properties should be treated, and state laws and policies vary accordingly. State Taxation of Metallic Deposits by Roberts (1944, p. 400) gives a description of the policies of several states. Occasionally a journal article discusses some phase of the assessment of mineral properties. Recently two symposia were held on the taxation of mineral lands, and several of the papers contained considerable information on assessment practices of other states. Some of those approaches to assessment may have application to Pennsylvania and are presented in the remaining portion of this section.

Minnesota

Iron ore is the most important mineral product in Minnesota, and at one time northern Minnesota was the world's premier iron-mining region, and many local districts obtained almost all of their revenue from taxation of iron ore properties. Since World War II, discoveries of rich iron deposits in many foreign countries and technological changes in the steel-making process have greatly reduced the importance of Minnesota iron ranges to the world and to the State. Iron ore still is of considerable importance to the Minnesota economy, and local communities still derive a considerable portion of their revenues from taxation of the industry. The methods of taxing the industry, and especially the methods of taxing iron ore reserves, have changed drastically with changes in political and economic conditions. The history of taxation of the Minnesota iron deposits is presented in two papers by Weaton (1968, 1969), the source of the following information.

From 1881 to 1897 iron ore was taxed one cent per ton of ore mined and shipped in lieu of all other taxes. Such a low tax was designed to encourage the industry's development, but the law was declared unconstitutional and since that time iron ore has been subject to the ad valorem tax based upon an assessment value of 50 per cent true market value. Local assessors were unfamiliar with mining problems, and both the tax-paying mining companies and the tax-collecting communities complained of inequity so the tax was determined on the basis of mine output. This method was not satisfactory.

In 1907 a State Tax Commission was created for the purpose of determining the value of mines and mineral properties. The Tax Commission obtained technical information on the mining properties and set up five classes of operating mines and four classes of prospects. The

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1In Missouri and Arizona. For references to publications, see Weaton, 1968 and 1969.
classes of operating mines were determined on basis of mining costs and grade of ore; the classes of prospects were based upon how much exploration had been done and how close they were to good mining properties. The least developed prospects were assigned a value of from $3 to $50 an acre, which was essentially their speculative value. The better prospects and mines were valued according to the amount of ore and an estimated profit as the difference between the cost of mining and the average price of ore for the preceding five years. The present value was then calculated by discounting the annual estimated profit for twenty years at 4 per cent discount.

Since 1909 the classification of the mines and calculation of ore reserves has been the responsibility of the School of Mines which sends their reports to the State Tax Commission. Interested mining officials can call upon the Tax Commission, but not the Ore Estimation Division of the School of Mines, in regard to the classification of their mining properties. It is the Tax Commission, not the School of Mines, that determines the actual value of the property for tax purposes. If either the mining company or the taxing community are dissatisfied with the valuation, they are entitled to take the case to court. The system has been in effect for about sixty years in Minnesota, and both the state and the mining companies are satisfied. The School of Mines is protected from political pressure, and at the same time the Tax Commission is relieved from pressure to change the tonnage or the classification of the mines. This method is economical to the State, continuity of method and philosophy is assured, and the estimations are made by disinterested and competent engineers not subject to political pressures.

In Minnesota taconite land and facilities are exempt from ad valorem taxes but pay about five cents per ton of concentrate plus a dollar an acre for lands containing taconite reserves. The money is collected by the State but shared with the county, village or school district.

Arizona

Since territorial days mining has been a major industry of Arizona. In the early days gold and silver were the most important minerals produced, but copper is by far the most important mineral produced today. It is noteworthy that even in territorial days Arizona was deeply concerned with the valuation placed on mines and prospects for the purpose of assessing and collecting ad valorem taxes by local governmental units. Several methods of determining value have been tried, none of which are completely satisfactory. The various methods are described by Irvin (1969), the source of following information.

Prior to 1881 mines were taxed by the territory on net output but after that date the responsibility of taxing the mines was given to the counties. In 1906 a Board of Equalization determined that there was a great disparity among counties between assessed and true value of mines so the assessments for mines in some counties were raised drastically. The Bullion Tax Law of 1907 required that the operating mines be valued on the basis of the value of the output, but the assessor used conventional methods of evaluating mills, mining machinery, and non-producing patented mineral land. Unpatented mining claims were exempt from ad
valorem taxes.

In 1912 the State Tax Commission was given power over county boards of equalization. After repeal of the Bullion Tax Law operating mines were first appraised on both the net and gross income, but the method was soon changed to consider only net earning. The local assessor continued to use conventional methods for valuing mine machinery, buildings, and equipment on producing mines. In 1916 mines were divided into eight classes. During the Depression the State Tax Commission realized that the capitalization of net earnings method would lead to a zero valuation if a property remained inoperative for a number of years, and that it was desirable for local communities to have a stable tax base. Therefore, the capitalization of net income (for the previous ten years) was replaced by the Hoskold method which is based upon capitalizing future earnings and a normal and a speculative rate of return.

After a massive reevaluation of all classes of property, Arizona in 1967 set different assessment to full cash value ratios for different classes of property. Class 1 property (railroads and mines) are assessed at 60 per cent of value, and class 4 property at 18 per cent. Hazelett (1969, p. 5-5) points out that the high assessment ratio to the mines may be offset by the method used to estimate future earnings in Hoskold calculations. The tax department apparently allows about a 50 per cent deduction from projected future earnings to offset projected Federal income taxes, which can be greatly reduced by deductions for development costs, tax credits, and other special allowances.

Kansas

The Tri-State mining district of Oklahoma, Kansas, and Missouri formerly produced very substantial quantities of zinc and lesser amounts of lead ore. The typical ore deposit was nearly horizontal and underlay productive farm land; underground mining methods were used. The customary practice was for mining companies to lease potential mineral land from the farmers and to explore for minerals by drilling. The farmers also received a royalty for any ore mined. Kansas did not collect ad valorem taxes on the ore deposits until mining commenced (Roberts, 1944, p. 8). The rationale behind this policy is that the farmers might have difficulty in paying additional taxes for ore before they started to receive royalty and might be forced to sell their ore prematurely, thus creating a buyers' market.
BIBLIOGRAPHY


Weaton, G. F., 1968, "Taxation of Mineral Lands in Minnesota" in Missouri Mining Tax Symposium, October 17, 1968, Rolla: Department of Mining and Petroleum Engineering and Extension Division, University of Missouri, p. 16-43.


