REPORT OF THE VIRGINIA COAL AND ENERGY COMMISSION

TO THE GOVERNOR AND THE GENERAL ASSEMBLY OF VIRGINIA

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Report of the
Coal and Energy Commission
To
The Governor and the General Assembly of Virginia
Richmond, Virginia
January, 1987

To: The Honorable Gerald L. Baliles
and
The General Assembly of Virginia

I. INTRODUCTION

The Virginia Coal and Energy Commission was established as a permanent agency of the Commonwealth in 1979. Since that time, it has sought in a number of ways to carry out its charge to "study all aspects of coal as an energy resource and . . . to stimulate, encourage, promote, and assist in the development of renewable energy resources . . ." (§ 9-145.1 of the Code of Virginia). This document is submitted as the Commission's report on its 1986 activities.

The Commission met twice during the year. It received testimony regarding the following issues: Virginia gasohol program, the use of coal in state facilities, the status of the coal industry in Virginia, coal transportation concerns, and the economic problems associated with coal industry unemployment in Southwest Virginia. The Commission was especially privileged to have a special address presented by Governor Gerald L. Baliles at the October 9, 1986, meeting of the full Commission in Richlands, Virginia.

This report also discusses the deliberations of the Commission's subcommittees.

II. 1986 COMMISSION DELIBERATIONS

A. GASOHOL STUDY (SJR 15)

1. Commission Deliberations

On June 10, 1986, the Commission received testimony regarding the costs and benefits of gasohol from representatives of government, the ethanol industry and the petroleum industry. Mr. Ralph Davis, Senior Economist with the Division of Motor Vehicles (DMV), briefed the Commission on Virginia's tax incentive program for ethanol. He explained that the original law provided an 8 cents/gallon incentive on gasohol which declines by 2 cents every two years until it expires in 1990. In 1984, the law was amended to extend the 8 cents/gallon incentive for two additional years with the incentive declining to 6 cents/gallon by FY 1987, 4 cents/gallon by FY 1989, 2 cents/gallon by FY 1991, and expiring at the end of FY 1992.

According to Mr. Davis, the incentive has been effective in spurring investment in the industry. In fiscal year 1982, 13.8 million gallons of gasohol were sold. For the fiscal year 1985, sales had reached 214.2 million gallons. By the first quarter of 1986, Virginia was fifth in the nation in gasohol sales.

During the 1986 Session of the General Assembly, the law was again amended. Testimony during the session indicated that some changes needed to be made in the law. The Attorney General had ruled that the tax incentive was unconstitutional under the commerce and equal protection clauses of the U.S. Constitution. In addition, industry representatives testified during the session that up to 95% of the qualifying ethanol incentive originates outside the state. Although permissible, some legislators questioned whether this was the original intent of the law.

The revised law provides a grant to ethanol producers instead of tax incentives for gasohol blending. The total amount of ethanol that can qualify in any fiscal year is capped at 65 million gallons which limits the highway revenue loss to a maximum of $39 million in fiscal year 1987. According to DMV, the cumulative loss in state highway revenue had reached $27 million through FY 1985 and was projected to increase to $37.2 million by FY 1986.

S. Mason Carbaugh, Commissioner of the Department of Agriculture and Consumers Services (VDACS), reviewed the impact of ethanol production on Virginia agriculture. In describing the benefits of ethanol, he noted that "the use of agricultural products for fuel could help supplement farm income and strengthen prices. Rather than store surplus grain in bins and lose its potential value through deterioration, such farm commodities could be converted to ethanol and stored indefinitely as a fuel reserve."

The Commissioner stated that research performed by his department shows that the ideal cost effective plant should be designed to produce about 13 million gallons of ethanol annually. In Virginia, approximately $21 million in capital has been invested in plants producing ethanol, with an equal amount being tied up in plants currently not in operation. Although unable to estimate the impact of ethanol on Virginia's farmers, he stated that based on the present plant output, if all the ethanol distilled in the state were produced from Virginia corn, the potential for Virginia corn use would be 17 million bushels. He concluded by recommending that Virginia continue to promote the development of the ethanol industry.

Ethanol industry representatives testified to the numerous benefits derived from the use of ethanol, among them the benefits to agriculture, use as a substitute for lead in gasoline, enhancing the energy security of the U.S. and the reduction of environmental pollution. They emphasized that ethanol provides a necessary octane enhancer for those independent refiners competing against the majors, thereby assuring a more competitive marketplace.

Officials of the petroleum industry rebutted many of these claims. A represenative of the service stations and automotive repair shops denounced the gasohol incentive, saying that it places gasoline dealers in a position of competing against a government subsidized industry. A spokesman for a major oil company which does not sell gasohol noted that although gasohol is a renewable energy source it takes a great deal of energy to produce the

blend. To the argument that the ethanol industry created jobs, he pointed out that the industry is not labor intensive. He concluded by stating that even with the existing subsidies, the ethanol industry is no more competitive today than it was in the beginning without the subsidy.

2. Review of Ethanol Cost/Benefit Studies

In response to requests from several members to obtain cost/benefit estimates of the ethanol industry's impact, the staff reviewed a number of state, federal and industry sponsored studies (see Appendix A for study summaries). The review focused on the ethanol industry's impact on state and federal revenues, employment, and grain (i.e., corn) prices.

The fuel ethanol industry has grown from virtually nothing in 1978 to become an important sector of the gasoline market. More than 625 million gallons of ethanol have been produced and blended with 6 billion gallons of gasoline in 1985 (U.S.D.A., 1986). In 1980, a national survey found fewer than 10 ethanol plants in the U.S. By the end of 1985, there were 163 commercial ethanol plants, 74 of which were in operation (Information Resources, Inc., 1985). Ethanol sales in 1985 were 7.3% of the total gasoline sales.

There are currently 16 plants registered with DMV, 14 of these are Class 1 producers whose plants were installed or substantially completed before January 1, 1986. These plants may use wet ethanol (less than 194 proof) as a feed stock but the grant is limited to 3.5 million gallons per plant and total gallons for the class cannot exceed 45 million. According to the industry, of the 14 currently registered Class 1 plants, eight have fermentation capacity planned, in operation, or under construction. Five producers are currently fermenting or are within several months of starting operation. By 1988, the industry anticipates a fermentation capacity of approximately 32 million gallons and an estimated anhydrous capacity of 68 million gallons.

a. Tax Incentives and Revenue Impacts

In addition to the federal excise tax exemption of 6 cents/gallon for gasohol (60 cents for ethanol), 31 states currently provide some form of incentive (i.e., sales tax exemption, producer credits, excise tax exemptions) for the production and use of fuel alcohol. This incentive ranges from one cent to sixteen cents per gallon. Four states exempt ethanol blends completely from the state gasoline tax.

While a minimum state subsidy generally is needed for ethanol to be offered for sale, the volume of ethanol blend sales within a state does not necessarily reflect a state's subsidy level. Likewise, subsidy levels do not appear to be the sole determinant of whether plants will operate or not. Market penetration also is determined in some degree by the production within the state or in a nearby state. For example, in 1985, Alaska had an eight cents per gallon incentive but recorded no gasohol sales. In contrast, Iowa experienced the highest market penetration (37%) despite the fact that its exemption fell from two cents to one cent during the year. (U.S.D.A., 1986) One possible explanation is that Iowa, in addition to having substantial grain farming operation, is in that area of the midwest

where the greater part of the nation's fuel ethanol productive capacity has been developed by such companies as Archer Daniels Midland, A.E. Staley and others.

The gross loss to the Federal Highway Trust Fund from the federal gasoline excise tax exemption was an estimated $438 million in 1985. In most states with subsidies, the state transportation and highway department bears the costs of the gasohol program. In California, which has ended its exemption, the money came from the general fund. According to estimates of the Office of Highway Information, the total loss due to state subsidies was $302.5 million. Virginia experienced a $17.1 loss in 1985 due to the exemption. It is anticipated that the projected loss of $32 million will not be realized. The Virginia ethanol industry estimates that the loss will be approximately $22.4 million. In an attempt to place the impact of gasohol subsidies in a broader context, the Government Accounting Office in a 1984 study noted that the total costs of tax subsidies received by conventional energy industries (i.e., oil and gas) "have dwarfed" that received by the fuel ethanol industry. The GAO acknowledges while the tax revenues from the industry do not fully compensate for the highway construction fund revenue losses, the net impact of the ethanol industry is relatively small in terms of the percentage decrease of the total road fund revenues.

A 1981 Department of Energy study sought to answer the question whether current state and federal exemptions for gasohol result in a net increase or decrease of state and federal tax receipts. For purposes of comparison, the study assumed the operation of a 50 million gallon ethanol plant in each state. It found that all states would benefit economically from the operation of such a plant and those states classified as a mixed agricultural/industrial state such as Virginia ranked highest in terms of increased economic activity. Virginia was ranked 19th with an increase of $230 million in economic activity resulting from the production and sale of the output of a 50 million gallon plant. With respect to tax receipts, the study found that Virginia would lose $20 million in local and state receipts; however, federal receipts would increase by $26 million.

b. Employment

The number of jobs which will be generated as a result of the operation of a fuel ethanol plant will vary depending primarily on the size of the plant, and to a lesser extent, the technology utilized, number of shifts, stability of operation, etc. Many of the studies performed by the various states and industry groups to determine the impact on employment from ethanol production are based on the work done by Information Resources, Inc., and Resource Planning Associates, Inc. Information Resources, Incorporated in analyzing the employment levels associated with the various size ethanol plants estimates that the direct employment required per gallon per year producing capacity varies inversely with the size of the plant - ranging from 5.3 employees per million gallons for a 20 million gallon per year (MGPY) plant to 3.4 employees per million gallons for a 60 MGPY plant.

While the Information Resources, Inc., looked specifically at direct plant employment, an earlier study by Resource Planning Associates, Inc., contracted by the Department of Energy, not only estimated the direct plant employment but looked at the total employment generated from the operation

of a 50 MGPY facility. Their analysis showed that in corn producing states, 100 jobs would be created in direct plant employment, 24 in transportation related activities, 640 in farm employment and 700-800 in indirect employment. Thus, the total employment (indirect and direct) generated by such a plant is 1400-1650 persons. For corn importing states, while the direct employment in plant and transportation activities would be the same (124), there would be no farm employment generated and consequently, less indirect employment. The total employment (indirect and direct) for corn importing states is estimated to be 170-220 persons.

The current employment level in Virginia's 14 Class I plants and one Class III plant, according to industry officials, is 230 with an additional 40 involved in trucking activities and another 20 involved in handling brewery waste disposal. The 230 employees are significantly more than the 100 projected for a 50 million gallon plant by DOE study. This is due to a large extent in the differing economies of scale between the operation of one plant versus 14 different businesses as well as the fact that at least 50 employees are working in research and development with no production responsibilities.

c. Impact on Grain Prices

Since the 1979-1980 crop year, corn utilized in the production of ethanol fuel has increased from 22 million to 275 million bushels for the 1985-86 crop year. This means that the ethanol industry accounts for less than 3% of the total corn market of 8.5 billion bushels. Estimates of the impact on corn prices due to the production of ethanol vary. The Center for National Food and Agricultural Policy in its study for the Missouri Corn Growers Association estimates that the price of corn increases 15 cents per bushel for each additional 100 million bushels of corn used in the production of ethanol. The Department of Agriculture's estimates are significantly lower. In their study Fuel Ethanol and Agriculture, the Department estimates that corn prices will increase two to four cents per bushel as a result of ethanol induced demand for corn. In addition, they found that the increase in corn prices due to ethanol induced demand would also increase the costs to produce beef, pork and poultry. This would result in a rise of consumer food expenditures of approximately $8.6 billion. The study concludes that subsidized ethanol production is a very inefficient way to raise farm income. "It would be much more economical to burn straight gasoline in a car and pay farmers a direct subsidy equal to an amount they would receive as a result of ethanol production." (U.S.D.A., 1986)

Professor Umbeck of Purdue University in his study for the Indiana Corn Growers Association documents a 9.9 cents increase in the market price of a bushel of corn. He estimates that the increased demand for corn from domestic ethanol has increased the value of corn production by $849 million during 1985. Even after subtracting the tax revenue lost due to the six cents per gallon federal exemption, the net savings to the federal government in agricultural support costs, according to Prof. Umbeck, was $227 million for 1985.

d. Other Benefits

While the Commission focused on the fuel ethanol industry's impact on economic activity, employment and agriculture, it recognizes the long range positive benefits such an industry can play on our environment and energy security. There is general agreement that as an octane booster, ethanol replaces two potential harmful chemicals, lead in regular gasoline and benzine in unleaded gasoline. Ethanol blends may also result in the reduction of certain other air pollutants such as hydrocarbons and carbon monoxide.

A major incentive for producing ethanol is to reduce the U.S. gasoline demand and dependence on foreign oil. While the industry's current import on national energy security is small because ethanol output represents only a small fraction of gasoline demand, the potential exists with the development of new technology that fuel ethanol industry will play a greater role in our nation's effort to attain a greater degree of energy security in the future.

B. THE USE OF COAL IN STATE FACILITIES (HJR 107)

HJR 107 was passed by the 1986 General Assembly and requested the Coal and Energy Commission to study the degree to which Virginia coal is used in state facilities. The resolution recognized that generally, Virginia coal is of high quality and suggests that state facilities should set examples for the rest of the Commonwealth by using coal mined in Virginia to the greatest extent possible.

Representatives of Department of General Services appeared before the Commission in June and October to provide information on this topic and to explain the process by which coal is acquired for state facilities.

For the fiscal year beginning July 1, 1986, the Division of Purchases and Supply took in bids for coal to be supplied to 25 state agencies and 2 school divisions. Contracts were awarded based upon the lowest delivered costs per million BTU to eight different coal suppliers who bid coal meeting the specifications of the Division. Of the total bid tonnage of 125,545, 45,300 tons (or 36%) will be supplied by Virginia mines. This represents an increase over the contract for 1985, for which only 27% of the coal was supplied from Virginia mines.

The Division of Purchases and Supply, Department of General Services documented their basic specifications for stoker coal as follows:

1. Maximum ash content - 6.5% (dry basis)
2. Maximum sulfur content - 1.75% (with some exceptions)
3. Minimum acceptable BTU - 13,900 (dry basis)
4. Minimum ash softening temperature - 2,700°F
5. Maximum free-swelling index - 7
6. Maximum moisture content - 5%
7. Washed coal required

In addition to the physical characteristics of the coal as listed above, the price of the coal must be competitive since the contract award is

made to the company that offers the lowest delivered cost per million BTU on coal which meets the specifications. The provisions of the Virginia Procurement Act must be followed.

A Department representative reviewed the reasons why bids on Virginia coal had to be rejected on several occasions, citing insufficient quality and higher prices. Appendix B to this report documents the bid awards and summarizes why some bids were rejected for 28 state facilities. The most frequently noted deficiencies were excessive ash and sulfur. Rejections of bids were, in a good number of cases, based on price. In many cases where bidders offered Virginia-mined coal, their F.O.B. mine cost was higher than that of other bidders. An example was given where Kentucky-mined coal being supplied to several agencies cost $31.44 per ton F.O.B. mine. The F.O.B. mine costs of Virginia-mined coals ranged from $33.95 to $42.00 per ton. This higher cost is primarily attributed to transportation factors. A review of the transportation costs appears in Part III of this report under the section on Coal Subcommittee activities.

Virginia coal would have a competitive edge in the bidding process if prices were lower, if equipment in Virginia facilities was added, and perhaps if certain specifications were reduced. The Department of General Services made a brief analysis on these points as follows:

Ash Content - An increase in the ash limit would accelerate wear on ash handling equipment but, more importantly, would also increase particulant emissions from the stacks. This problem could be reduced by the addition of electronic precipators or baghouse filters installed at the coal buring facilities. This equipment is, however, very expensive.

BTU - Lowering the BTU requirement decreases the amount of heat available from the coal and increases the amount of particulant emission. Again, this could be accomplished with the addition of baghouse filters.

Sulfur - The Department of General Services is mandated to a particular sulfur limit by the State Air Pollution Control Board. A formula is used which takes into account heat value in determining acceptable sulfur limits. "Scrubbers" can be installed to reduce sulfur emissions; however, this equipment is expensive to install and operate.

Unwashed Coal - Some of the Virginia mined coal was unwashed (Washed coal requires use of a preparation plant.) Unwashed coal, however, has a higher ash and lower BTU content and extraneous matter is often mixed in with the coal.

In the effort to make more Virginia coal producers and mine operators aware of the specifications and requirements of coal to be used in state facilities, the Commission suggested that the Department of General Services provide a broader range of notice of these requirements. (A recommendation to this effect appears in Part IV of this report.) The Department responded by preparing a special "Notice to Virginia Coal Producers" dated December 11, 1986, which was sent to 551 coal companies. (See Appendix C).

Possible statutory changes have also been considered by the Commission which would attempt to give Virginia coal a competitive advantage over coal from other states where state facilities are the recipients. Recommendations in Part IV refer to such proposals.

The Virginia Procurement Act already contains a section in support of Virginia products and Virginia coal can benefit to some degree by its provisions:

> § 11-47. Preference for Virginia products and firms.--A. In the case of a tie bid, preference shall be given to goods, services and construction produced in Virginia or provided by Virginia persons, firms or corporations, if such a choice is available; otherwise the tie shall be decided by lot.
>
> B. Whenever any bidder is a resident of any other state and such state under its laws allows a resident contractor of that state a preference, a like preference may be allowed to the lowest responsible bidder who is a resident of Virginia.

The Department of General Services reports that it implements this provision whenever the circumstances as described arise.

III. SUBCOMMITTEE ACTIVITIES

A. ENERGY PREPAREDNESS SUBCOMMITTEE

The Energy Preparedness Subcommittee met in the Spring of 1986 to receive a briefing on Virginia's acquisition of oil overcharge funds. At that time, representatives of the Department of Mines, Minerals and Energy and the Governor's Office reported that Virginia had received over $53 million due to oil overcharges by the Exxon Corporation. The federal courts have ruled that the use of these funds is restricted to the following five programs:

1. Low-income fuel assistance
2. Weatherization
3. Institutional conservation
4. State energy conservation
5. Energy extension service

In Virginia, the first two programs are administered by the Department of Social Services and the latter three by the Department of Mines, Minerals and Energy. It was reported to the subcommittee that the overcharge funds are directed to supplement the above programs. However, such funds are not to be used as a replacement for already existing funds allocated to the programs, nor are any administrative costs to be covered by the overcharge funds. Subcommittee members expressed hope that the allowable uses of the fund might be broadened.

Recent staff inquires show that as of mid-December, 1986, about $4 million of the overcharge fund had been allocated to weatherization efforts and approximately $1.5 million had been directed towards low-income fuel assistance. Also, according to figures compiled by the Department of Energy, a total of $5.7 billion in overcharge funds have been collected by

the Department. Through September 3, 1986, $3.2 billion have been distributed to the states. Virginia's share as of the same date had reached $80.2 million. The Economic Regulatory Administration of the Department of Energy projects collections to reach $7.7 billion total in the next two years.

As a follow-up to the issue as to whether states would be able to expand on the allowable uses of the overcharge funds, a U.S. District Court order dated June 10, 1986, denied states' requests that they be able to buy capital equipment with overcharge funds or use the money for attorney's fees. Also denied were states' requests to use some of the money for administrative purposes.

On another topic, the subcommittee heard from representatives of Virginia Power. A proposal has been made to change the manner in which rates are accounted for state facilities. Members were informed that currently, state buildings are on a flat energy rate. A new billing procedure is being considered which would put the Commonwealth on a rate charge similar to regular jurisdictional customers, including a demand charge. This program could be operational by July, 1988. Officials with Virginia Power reported that the state could benefit under a demand rate schedule in potential savings while Virginia Power could reduce the need for future generation and service costs.

B. COAL SUBCOMMITTEE

The Coal Subcommittee took part in the review of the Virginia coal market and transportation issues during meetings of the full Commission in 1986.

Dr. Walter Hibbard, Director of the Virginia Center for Coal and Energy Research, presented his findings to the subcommittee and the full Commission at the October 9, 1986, meeting in Richlands. (A copy of the executive summary of his report is attached as Appendix "D".) At that time, Dr. Hibbard indicated that the Virginia coal market was behind West Virginia and Kentucky mainly because of transportation costs.

Dr. Hibbard explained that while most southwest Virginia coal mines are served by Norfolk Southern Railroad, the majority of the state's coal consumers are in the eastern portion of Virginia, dominated by CSX Railroad lines that lead principally to mines located in neighboring states. For most eastern Virginia consumers, purchasing Virginia coal demands switching rail cars between carriers, adding greatly to the coal's delivered cost.

Dr. Hibbard further reported that Norfolk Southern (NS) serves 371 of the 419 Virginia coal mines now operating. However, only one of Virginia Power's five in-state plants is connected to NS tracks; the other four plants are served by CSX (or CSX - controlled RF & P Railroad). As a result, the Commonwealth's largest utility purchases 80% of its coal from Kentucky and West Virginia.

In reviewing the status of the coal industry, Dr. Hibbard projected that production for Virginia coal in 1986 would be 45 million tons, a new record. However, even with increased productivity, the number of Virginia coal miners was down in 1986 to 10,240. The total number of coal employees

is down to about 12,000. It was further projected that if Virginia retains its present coal market share until 1990, production may be as high as 50 million tons, but coal industry jobs will probably reach only 13,000. Longwall mining and efficient diesel haulage are factors in increasing productivity and diminishing jobs. Dr. Hibbard's report suggests that Southwest Virginia's heavy dependence on a single industry (coal production) could result in serious consequences for the state's coalfield communities.

In Dr. Hibbard's closing remarks, the subcommittee and the full Commission were made aware of some recent political and technological developments which may be very helpful to the Virginia coal industry:

1. Legislation was enacted by the 1986 General Assembly which provides a tax break to utilities purchasing Virginia coal; this might increase shipments by 2 million tons annually.

2. Proposed revisions to the Federal Clean Air Act could increase regional utility shipments of low-sulfur Virginia coal by another 4 million tons per year.

3. Relief for coal mines held captive by shippers is possible with a railroad anti-monopoly bill proposed to Congress.

4. Liquid coal fuels under development by United Coal Company may foster additional sales of Virginia coal.

5. Fluid-bed combustion is an increasingly popular boiler technology that could make use of Virginia's abundant coal waste.*

* SOURCE: Energy Scout, Volume VI, Number VI, November, 1986.

C. RENEWABLE ENERGY SUBCOMMITTEE

The Renewable Energy Subcommittee met on August 14, 1986, for a combination meeting and site tour. The topics before the subcommittee in 1986 are listed below. The wood fuels update took place at the August meeting in Richmond, the photovoltaic and hydropower review took place at the site tour of Virginia Power's Lake Anna facilities on the same day, and the solar pond information was distributed to the members for their information in November.

1. Virginia Wood Fuel Programs

The State Forester informed the subcommittee that about 1.7 million cords of residential fuel wood was used in the Winter of 1985-1986 (see Appendix E). Estimates indicate that approximately this same amount will be used in the Winter of 1986-1987. The Department of Forestry is concentrating on industrial wood energy as the target for increased wood fuel marketing and use.

Members were also informed that wood energy programs had been very successful at three state facilities; Augusta Correctional Unit, Piedmont Geriatric Hospital and Longwood College. At each of these facilities, the wood energy program has resulted in reduced fuel costs over oil fuel programs. It was reported that in order to have other state facilities and private industries convert to wood energy, a wood supply must be guaranteed. It was also noted that oil price increases will enhance wood fuel programs.

2. Photovoltaic Cells

Virginia Power officials hosted a site tour of the photovoltaic cell demonstration project at their North Anna Power Station, Mineral, Virginia. The project is part of Virginia Power's ongoing Alternative Energy Study. The photovoltaic cell facilities are located on three acres of land across from the visitors center. The project was completed in January, 1986 at the cost of $1 million and is now providing information on the performance and efficiency of a photovoltaic cell network.

Three arrays of panels hold the cells and a monitoring station located nearby measures the output of energy. One set of panels tracks the sun as the earth rotates and the other two sets of panels are fixed in a southerly direction. It is anticipated that this project will produce about 124 megawatt hours per year to Virginia Power's output, which if converted to residential use, would be enough power to service 15 to 20 average homes.

Advantages to this form of energy include:

1. Ongoing cost-free resource (sunlight)
2. Little environmental impact (no noise or waste)
3. High reliability and little maintenance
4. Increasing efficiency in technology

Disadvantages were pointed out as follows:

1. Initial cost and operation currently runs about 15 times as much as conventional power sources
2. No storage capability is feasible at this time
3. The power must be converted from DC to AC current
4. 10 to 20 acres per megawatt is necessary under present technology

Members were informed that the technology for photovoltaic cells was improving and becoming more economical. A variety of uses for these cells may be possible in the future, especially in remote areas.

3. Hydroelectric Power

The site tour of the Virginia Power facilities included a tour of the North Anna Hydroelectric Project. The subcommittee was briefed on the layout of Lake Anna and the manner in which water circulates through the lake. Virginia Power officials explained that a plan has been implemented to penetrate the southside of the 95 foot main dam at Lake Anna, run piping along the inside of the spillway training wall, and tie this water flow into a power platform supporting two main generators. One generator output would be 209 kilowatts and the other 703 kilowatts. Subcommittee members observed the progress of the power platform construction during the visit.

The project was explained as a "run of river" operation, which means that only the available water flow is utilized. This method assures that the operation will not affect lake levels or downstream flows.

4. Solar Ponds

In November, 1986, Senator Goode informed staff of a project which he had read about pertaining to the use of solar energy to heat ponds of salt water as a source of electricity. A major demonstration project on this new technology is taking place in El Paso, Texas.

Staff obtained background information on the project and forwarded copies to members of the subcommittee (see Appendix "F").

Briefly described, the system is constructed to produce electricity and fresh water. Nearly one acre in size, the pond consists of a layer of brackish water on the surface and a layer of salt brine in the bottom. Heat from the sun is generated through the pond to produce up to 100 kilowatts. Future plans include the potential to produce drinking water from the salty pond water by using the thermal and electric energy from the pond to power a low temperature desalination unit.

D. OIL AND GAS SUBCOMMITTEE

The Oil and Gas Subcommittee met several times during 1986. Two primary issues came to the attention of the subcommittee and meetings and hearings were held in Abingdon and Richmond to address the problems.

1. Virginia Oil and Gas Act

The subcommittee was made aware of some concerns expressed by Congressman Frederick C. Boucher regarding the effectiveness of the Virginia Oil and Gas Act. In particular, two water pollution incidents have occurred in Southwest Virginia which were attributed to oil drilling activities. In 1983, the water supply for the Town of Jonesville in Lee County was temporarily contaminated and the problems were attributed to improper oil well drilling. In 1985, the drilling of an oil well near the Point Bank Fish Hatchery in Craig County reportedly caused the contamination of nearby groundwater and pollution of the hatching ponds. Congressman Boucher's inquiries were directed at the adequacy of the Virginia Oil and Gas Act and the enforcement of the Act in light of these two incidents.

In a public hearing held in Abingdon on June 19, 1986, officials from the Department of Mines, Minerals and Energy assured subcommittee members that the activities which led to the pollution incidents were violations of the law and that there was no fault in the language of the Oil and Gas Act. To prevent similar occurrences in the future, new safeguards are required by regulations.

During the public hearing, several local residents expressed concern that the Oil and Gas Act did not provide the same protection to citizens in certain areas of Southwest Virginia. The Act exempts those areas from the jurisdiction of the Oil and Gas Conservation Board (§ 45.1-300) and several citizens recommended tha the current exemption should be repealed so that all persons would be subject to the jurisdiction of the Board. In a follow-up meeting in Richmond in December, Dickenson County citizens testified that their property rights and royalty rights were being violated by oil and gas drilling activities and again urged the subcommittee to recommend the rescinding of the exemptions of the Southwest Virginia

localities from the Oil and Gas Conservation provisions of the law (Article 2, Virginia Oil and Gas Act). A recommendation to this effect appears in Part IV of this report.

In the effort to follow-up on the concerns expressed by citizens, the Department of Mines, Minerals and Energy (DMME) is stepping up its enforcement activities in the problem areas and more inspectors are being directed to oil and gas work from the Division of Mined Land Reclamation within the Department. It is also anticipated that DMME will make suggestions as to increasing agency control over reclamation of oil and gas pipeline and drilling sites.

The Virginia Oil and Gas Association (VOGA) is also responding to the concerns of citizens by investigating reports of property damage and illegal entry to properties. The Association indicates it is working with the citizens to resolve the problems and the subcommittee will continue to monitor the situation. Also, a special ad hoc group has been formed by VOGA to examine issues related to royalty payments under the current well-spacing provisions of the Act.

At a meeting of the subcommittee on January 13, 1987, further testimony was delivered by citizens of Dickenson County as to the disregard of private property rights by oil and gas industry personnel. Citizens again urged the subcommittee to endorse a draft bill proposed by Senator Buchanan which would remove the exemptions of the Southwest Virginia localities from the Oil and Gas Act. The subcommittee agreed that further study of the numerous issues and claims should take place in 1987. Members also agreed that an unannounced site visit to the areas which are the subject of citizen complaints would be appropriate and that the matter of proper and fair unobstructed access by landowners to their own private property should be reviewed. As an interim measure, the subcommittee voted to endorse the draft legislation proposed by Senator Buchanan with an effective date of March 31, 1987. (See Appendix G) A follow-up endorsement on the draft by the full Commission later that day resulted in a recommended effective date of July 1, 1987.

2. Virginia Recycled Oil Program

At the meeting of the full Commission in June, the Oil and Gas Subcommittee was briefed on a problem which had arisen due to the lower prices of oil. A representative of the Division of Energy, Department of Mines, Minerals and Energy, reported that the Recycled Oil Program in Virginia had begun in Virginia in the late 1970's when the price of oil made it practical for gas stations to voluntarily receive used oil from the public. The station would hold the oil for pickup by an oil recycling firm, which would pay up to 18 cents a gallon to the service stations for the oil. Stations would identify themselves as collection centers and the Division of Energy would provide information to the public as to the locations of the centers and the details of the program. Since the price of oil has dropped in the last year, the incentives to accept and contain this used oil have dwindled. The recycled oil has very little worth now and recycling companies are currently requiring service stations to pay to have the used oil picked up and properly disposed of.

At the December meeting of the subcommittee, members were told that 45% of the collection centers had dropped out of the state program with only 499 of the 914 centers remaining. Service station dealers who are not now willing to pay the 5 to 15 cents per gallon to have the oil collected are no longer participating.

The Oil and Gas Subcommittee reviewed and discussed several options as to how to remedy the situation. Options considered were as follows:

1. Have collection centers charge a user fee to be set by each station to cover the disposal fee costs.

    a. This approach is already being used in areas of Northern Virginia.
    b. No legislation is required.

2. Require businesses which sell 30 gallons or more of motor oil per month to install a facility to accept the return of used oil.

3. Set a tax on persons selling the motor oil to go into a fund for the recycling of the oil.

The Oil and Gas Subcommittee did not endorse any of these approaches at their December meeting. Division of Energy representatives informed the members that a Tri-State conference (VA, MD, DC) was to be held on December 17, 1986, to explore a regional solution to this problem. Staff has learned that the Division of Energy has chosen to pursue the suggested user fee approach as strictly an agency initiative and indications as to the acceptance of this program should be available in early 1987.

E. URANIUM SUBCOMMITTEE

This subcommittee had no meetings in 1986.

IV. RECOMMENDATIONS

The Virginia Coal and Energy Commission recommends the following:

1. The Department of General Services should provide a broader scope of notice to Virginia coal producers as to what is required to bid for supplying coal to state facilities. (See Appendix C).

2. The General Assembly should enact legislation that directs that only Virginia coal should be purchased for use in state facilities, or enact amendments to the Virginia Procurement Act to provide Virginia coal a competitive edge over coal being bid from other states. (See Appendix C1)

3. The General Assembly should enact legislation to rescind the exempted portions of Southwest Virginia from the Virginia Oil and Gas Act. As a result, the provisions of the Oil and Gas Conservation laws and the jurisdiction of the Oil and Gas Conservation Board would extend statewide. (See Appendix G).

Respectfully submitted,

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APPENDIX A

SUMMARY OF GASHOHOL STUDIES BY VARIOUS STATES AND U.S. AGENCIES

Kentucky Ethanol Industry

I. STUDY: Evaluation of the Kentucky Ethanol Fuel Industry Need For an Extended State Tax Incentive, H. Bruce Sauer, Office of Production and Utilization, Kentucky Energy Cabinet, July, 1985.

II. STUDY OBJECTIVES

A. To analyze the status of the local ethanol industry.

B. To provide a basis for establishing the Kentucky Energy Cabinet's position on a proposed extension and reduction of the states's tax credit for Ethanol.

III. STUDY BACKGROUND

The emergence of the ethanol fuel industry was due, in large measure to the gasoline price increases of the 1970's, corn surpluses and federal and state tax incentives. By early 1982 there were six active alcohol fuel projects in Kentucky with a total projected annual capacity of 55.5 million gallons. That same year the price of oil began to decline accompanied by increase in the average U.S. price of corn. This led the ethanol industry to seek a 35¢ per gallon ethanol excise tax credit for the short term period of July 1982-June 1982.

It became clear in late 1983 that revenues from ethanol and by-product sales were not going to keep pace with 1982 projections. Several factors appear to have contributed to this situation. The most important factor was the continued decline in the price of crude oil. This combined with the fact that ethanol production both in the U.S. and locally was increasing substantially, led the industry to propose a change in Kentucky's incentive, reducing the tax credit to 25¢ per gallon but extending it to June 30, 1992.

(NOTE: Maximum market penetration occurred during 1985 when alcohol fuel sources accounted for approximately 454 million gallons or 26.1% of total fuel sales.)

IV. STUDY FINDINGS

A. Industry Outlook

As ethanol price is determined in large measured by gasoline prices, the long term outlook for gasoline prices is crucial to the profit expectations of the ethanol producers. Another factor will be the impact of lead phase down. This could create a potential of 2-3 billion gallons of ethanol by 1995 but actual impacts will be refiner specific.

The industry expects a combination of stronger prices for ethanol and reduced production cost to provide net profits before 1992.

B. Legislative Costs (State Revenue Impact)

Claims for tax credits in Kentucky have grown at a steady rate since 1982. Market share jumped to 27.7% for the first quarter of 1985, but this was due primarily to a decline in non-ethanol blended gasoline consumption.

The cost of the extension contains two components. First, a reduced incentive for the last quarter of 1985 and the first two quarters of 1986 would save the state approximately $2.3 million in FY '86. The estimated average cost of the extension for FY's 1987-1992 would be $14 million per year. This level of cost would occur only if an additional 16 million gallons of annual production capacity becomes operational in Kentucky by FY '88. Without this additional capacity the annual cost is estimated at $10.9 million.

C. Economic Benefits

The expiration of the current Kentucky incentive could lead to the loss of all or part of the benefits the state receives from ethanol production. These benefits include an approximate $10 million increase in income to Kentucky corn farmers, more than 170 full time jobs for Kentuckians with a payroll of $4.5 million, 100,000 tons per year of coal sales at a value of $3 million, and cleaner air due to reduced hydrocarbon and carbon monoxide emissions. The implementation of lead phase-down by the Environmental Protection Agency should provide further improvement in air quality attributable to ethanol usage.

Extension of the incentive as proposed should help the local producers to achieve long-term viability. Expected increases in real oil prices and the octane demand created by lead phase-down should strengthen the revenue outlook by the late 80's, while corn prices are expected to remain relatively stable. While loss of the credit in 1992 could again create some tight short-term cash flows, significant reductions in interest and depreciation charges in the early to mid-1990's should insure a profitable outlook for the facilities.

V. CONCLUSION

Extension of the tax credit at a $.25 per gallon level is warranted. Public policy support initiated the development of this industry and must seriously consider its needs. Short-term need and long-term viability were key factors established by the ethanol industry in the process of preparing this report. Extension of the credit should protect the already substantial investment and benefits derived from ethanol production in the region and could encourage later growth of the local industry as lead phase-down effects on ethanol revenue are fully realized. The credit should be monitored on a regular basis to determine if any significant changes in industry outlook warrant a further revision of the credit, particularly if the economic outlook improves.

U.S. Department of Agriculture

I. STUDY: Fuel Ethanol and Agriculture: An Economic Assessment, Office of Energy, USDA, Agricultural Economic Report No. 562, 1986.

II. STUDY OBJECTIVE

To assess the economics of ethanol production through 1995 and the impact on farmers, consumers and government outlays for ethanol subsidies and agricultural price support programs.

III. STUDY METHODOLOGY & ASSUMPTIONS

The study uses a simulator model to assess the interaction of changing ethanol production levels on agricultural and food product demand and prices. Using as a base case that ethanol production would increase from 595 million gallons in crop year 1985 to just over one billion gallons in crop year 1995 the study examined two scenarios. One scenario had ethanol production doubling to 2 billion gallons by 1995, and a second where it declined to zero gallons in 1995. The assumption was that the most likely outcome will fall somewhere between the two extremes.

The study sought to answer such questions as:

... How much will farmers benefit from additional fuel ethanol production?

... How much subsidy will ethanol producers need?

... Will fuel ethanol production raise or lower net government outlays?

IV. STUDY FINDINGS

1. The ethanol industry cannot survive during the period studied without massive government subsidies, given the outlook for petroleum prices. Costs of producing ethanol in 1986 are estimated to be $1.41-$1.52 per gallon while the wholesale price of gasoline is projected to be $0.55 per gallon, and gasoline blenders value ethanol at $0.20-0.25 per gallon less than gasoline.

2. Unless the federal subsidies which are scheduled to expire December 31, 1992, are extended, fuel ethanol production likely will be terminated or sharply curtailed after 1992.

3. If large enough subsidies are provided, additional ethanol production would increase net farm income by an estimated $2.2 billion over the 1986-94 period, or $0.58 per additional gallon of ethanol. However, a much larger amount (some $1.25-$1.35 per gallon) would go for energy, chemicals, labor, and overhead costs incurred in converting corn to ethanol.

4. Subsidies required to sustain the ethanol industry will offset any savings in agricultural commodity programs resulting from the increased demand for corn.

5. Corn prices would increase by $0.02-$0.04 per bushel for each 100 million bushel increase in ethanol-induced demand for corn. However, soybean prices would fall by about $0.04 per bushel and soybean meal prices would fall by $0.12-$0.15 per hundredweight.

6. Higher corn prices from additional ethanol-induced demand would increase the cost of producing beef, pork, and poultry. Consumer food expenditures would rise by $8.6 billion, or an average of $2.29 for each additional gallon of ethanol produced.

7. When all the costs and benefits are tallied, the government, taxpayers, and consumers together would lose $6.1-$7.2 billion or $1.61-$1.92 per additional gallon produced during the 1986-94 period if ethanol subsidies were increased enough to prompt the ethanol industry to produce 2 billion gallons in 1995. Conversely, if ethanol production falls to zero, they would save some $6.8-$8.9 billion, or $1.35-$1.76 per gallon not produced.

8. Possible improvements in technology through 1995 are unlikely to reduce ethanol production costs enough to significantly alter these findings. Nor would the findings be altered materially if ethanol producers would get by with existing subsidies.

9. Subsidized ethanol production is a very inefficient way to raise farm income. It would be much more economical to burn straight gasoline in our automobiles and pay farmers a direct subsidy equal to the amount they would receive as a result of ethanol production.

V. STUDY CONCLUSION

When all economic costs and benefits are tallied, an ethanol subsidy program is not cost effective. The costs are so large that ethanol production cannot be justified on economic grounds even if existing producers could get by with present subsidies. If the principal argument for subsidizing ethanol is to boost farm income, we conclude from this analysis that it would be more economical to burn straight gasoline in our automobiles and pay corn growers a direct subsidy equal to the amount they would receive as a result of ethanol production.

General Accounting Office

I. STUDY: Importance and Impact of Federal Alcohol Fuel Tax Incentives, G.A.O., June, 1984.

II. STUDY OBJECTIVES

To gather data on some of the costs and benefits associated with the gasohol and the related tax incentives.

III. STUDY BACKGROUND

Since 1978 the federal government has provided a number of tax incentives to promote the development of the domestic ethanol industry. The most significant of these incentives has been the exemption of gasohol from federal gasoline excise taxes. As of the time of this report, the exemption was 5¢ per gallon of gasohol. The exemption is now 6¢ or 60¢ per gallon of ethanol.

IV. STUDY FINDINGS

Federal tax incentives have been vital to the establishment and development of the industry. Without a subsidy ethanol cannot compete with gasoline at current prices. The study indicated that it is difficult to determine how long the industry will be dependent on federal subsidies. This depends in large part on future oil prices, corn prices, technological developments which are difficult to predict.

A. Domestic Economic Effects and Federal Revenue Effects

1. The fuel ethanol industry has only a modest impact on U. S. economy. The study projected that ethanol production will meet only 1% of gasoline demand by 1990.

2. While economic impacts on certain localities could be significant, the industry's impact on national output, employment, agricultural prices, and the federal budget is very small. In 1982 the incentives resulted in a $100 million tax loss to the Treasury. This loss was partially offset by reduced agricultural support program costs due to the industry's demand for corn.

B. International Trade Impact

The industry has a modest impact on the nation's international trade balance. It reduced oil imports and increased the value of agricultural exports by raising their prices, but also increased fuel ethanol imports. Domestic fuel ethanol results in about a $210 million improvement in the nation's trade deficit.

C. Impact on National Energy Security

Fuel ethanol's impact on national energy security is small because the industry's current and projected output represents only a small fraction of gasoline demand.

D. Other Energy Industry Tax Benefits

The total value of tax subsidies received by conventional energy industries (i.e. oil, gas) have dwarfed that received by fuel ethanol industry. Therefore, fuel ethanol is not competing in a free energy marketplace.

V. STUDY CONCLUSIONS

1. It would be appropriate to continue the incentives until the 1992 scheduled expiration date. The private sector has invested in excess of $1 billion with the expectation that the market created by the tax exemption would be present until 1992.

2. Removing the subsidy can not be justified by the expectation of major budget savings or significant economic gains.

3. Increasing the incentive is not justified because the combination of current state and federal subsidies are adequate to make ethanol competitive.

(NOTE: The subsidy has been increased since this report to 6¢)

4. The incentives should be periodically reviewed to determine if the costs of gasoline and ethanol have narrowed to the extent that a subsidy would not be essential.

Missouri Corn Growers

I. STUDY: Ethanol Study Report for the Missouri Corn Growers Association. Center for National Food and Agricultural Policy

II. STUDY OBJECTIVE

To review the impacts of a potential Missouri state tax exemption for ethanol blended sales on the price of corn, state revenues and employment.

III. STUDY BACKGROUND

Since the 1979/80 crop year corn utilized for ethanol fuel has increased from 22 million bushels to an anticipated total in 1985/86 of 220 million bushels. This growth has been generated by the relatively high prices of gasoline in the late 1970's and early 1980's and federal and state tax incentives.

IV. FINDINGS

A. State Level Costs and Benefits

1. One half cent to one cent per bushel increase in price of corn.--Using an average production level of the 1984 and 1985 crop years, a one cent increase in the price of corn will generate an increase in the value of the Missouri corn crop of just over $2 million.

2. Using the market penetration forecast losses in tax revenues are projected to range from $3.7 million in 1987 to $8.6 million by 1990, assuming a 2 cents exemption. This is only the direct cost, the corn price impact is expected to be negligible and should not have an impact on the livestock industry.

3. Actual employment levels would depend on the size of the plant. Since Missouri's projected need is 47 million gallons by 1990 the potential exists for an additional 160-250 jobs directly related to operating the ethanol plant. The average wage rates vary from plant to plant but based on Information Resources Inc.'s data, hourly rates range between $13.60 - $15.72 or a total increase in new salaries between $4.5-$8.2 million.

B. Federal Level Costs and Benefits

1. The corn used in ethanol production in Missouri would generate a 1/2 cent price increase which would raise the value of the nation's corn crop by $36 million.

2. On the negative side, the loss in federal revenues associated with the federal 6¢ per gallon exemption could total $21-$26 million for the years 1988 through 1990.

3. The combination of gains from reductions in stock activity and deficiency payments when offset by lost tax revenues, indicate a prospective effect of approximately $20-$23 million, plus the $36 million increase in crop value.

V. CONCLUSIONS

There are a number of advantages and disadvantages associated with the passage of a tax exemption for ethanol-blended fuels. The disadvantages are captured in the foregone tax revenues at the state and federal levels. While the exact level would depend on the size of the exemption and on the level of market penetration, these would range from $5.2 to $52 million at the state level, and $16 to $62 million at the federal level.

Offsetting these reductions in government revenues are a number of factors. One is an anticipated increase in the price of corn, and thus the value of the corn crop. Exact levels would depend on the size of the crop. These gains range from $3.2 to $12.8 million at the state level and $142 to $567 million at the national level. Another advantage would be reductions in federal outlays through deficiency payments of some $88 to $352 million.

Indiana Corn Growers Association

I. STUDY: The Impact of the Ethanol Industry on the United States Corn Market. John R. Umbeck, Purdue University, 1985.

II. STUDY OBJECTIVE

To assess the impact of the ethanol industry on the U.S. corn market.

III. STUDY BACKGROUND

In 1985 it is expected that the U.S. ethanol industry will produce approximately 555 million gallons of ethanol using domestic corn. Using current production technology approximately 2.5 gallons of ethanol will be produced from each bushel of corn. This means that the ethanol industry will use about 222 million bushels of domestic corn or 2.61% of the total 8.5 billion bushel output in 1985.

For the purposes of his analysis Professor Unbeck assumes that the price of corn is $2.55 per bushel.

IV. STUDY FINDINGS AND CONCLUSIONS

1. The additional demand for the corn necessary to produce ethanol has increased the market price of corn 9.9 cents per bushel higher than it would have been without domestic ethanol production.

2. Using projected 1985 corn production figures and assuming that the price of corn is free to move with market conditions, the demand for corn from domestic ethanol production increased the value of corn products $849,150,000 this year.

3. When the market price of corn is below the government support price, each bushel of corn used in ethanol production reduces government purchases and storage by one bushel. The estimated 222 million bushels used in 1985 will save taxpayers $623 million in government loan and storage costs.

4. Even after subtracting the tax revenues lost through the 6¢ per gallon federal exemption the net savings to the federal government in agricultural support costs is over $227 million in 1985.

5. In 1984 Indiana residents used over 483 million gallons blended gasoline. To produce this ethanol required over 193 million bushels of

corn. This extra demand increased the price of corn to all farmers by 1% per bushel and total crop value was $76 million higher than it would have been without Indiana ethanol use. Indiana corn farmers received about $6.8 of this total.

6. Assuming that Indiana residents will increase their use of blended gasoline at the same rate as the rest of the nation, they will consume 620 million gallons. The 62 million gallons of ethanol required to produce this blended gas will increase the demand for corn by 25 million bushels and reduce government purchase and storage costs by over $70 million in 1985. These savings are generated from Indiana ethanol use only.

NOTE: Indiana started its alcohol fuel incentive program in 1981 with a 4 percent exemption from its sales tax. No exemption is provided from the motor fuels tax. In 1982, the exemption was increased to 5 percent. In 1983, it was decreased to 3 percent, in 1984, to 2.5 percent, and in 1985, to 1 percent. Alcohol fuel sales were first reported in 1982 when they accounted for 120,569,000 gallons, or 4.96% of total fuel sales. Maximum market penetration was reached in 1984 when alcohol fuel sales accounted for 587,369,000 gallons, or 23.3% of total fuel sales. Through the first 6 months of 1985, 277,994,000 gallons, or 21.98% of total fuel sales have been reported. Gasohol qualifies for the current exemption regardless of where it is produced, provided the alcohol is agriculturally derived. As of July 1, 1986 there will be no sales tax exemption for gasohol.

Nebraska

I. STUDY: Fuel Ethanol Production in Nebraska: An Economic Impact Analyses. Merrill Wackertin, prepared for Nebraska Energy Office and Nebraska Gasohol Committee, September, 1983.

II. STUDY OBJECTIVES

To assess and report the expected quantifiable economic impact of three industrial scale, fuel grade ethanol facilities proposed for construction.

III. STUDY BACKGROUND

A. The study was not designed to assess the economic and managerial feasibility of the proposed plants but solely to assess the impact from the construction and operation of three plants with a total 50 million per year capacity. During the time of the study planning had been underway for the construction, industrial sale fuel grade, ethanol from corn plants. The largest of these would have the capacity to produce 30 million gallons per year.

The study was necessarily short to medium range in its time frame since according to the authors "the potential variables in a truly long range analysis are both numerous and highly volatile and can be predicted only with a significant degree of inaccuracy." The focus of the study was the next several years and 1986 in particular. It was anticipated that based on construction plans the first major ethanol plants would be operating by 1985. The design of the study called for a separate analysis of the impacts from the plants construction and those resulting from the operation of the plants.

IV. FINDINGS

A. Economic Activity Impacts

Nebraska started its alcohol fuel incentive program in 1979 with 5 cents per gallon exemptions. In 1985, the exemption was decreased to 3 cents per gallon. Alcohol fuel sales were first reported in 1980 when they accounted for 23,507,000 gallons, or 2.9% of total fuel sales. Maximum penetration occurred during the first six months of 1985, when alcohol fuel sales of 119,989,000 gallons or 32.4% of the total fuel sales were reported. Currently there are no restrictions on the availability of the exemption; however there is a possibility of legislation to either restrict the exemption to ethanol distilled in Nebraska or to change the incentive to a production credit. (Doyle, 1986).

The construction of the three plants will involve capital costs of approximately $140 million to be spent over an 18-24 month period. A portion of the construction expenditure will leave the state but the study estimates that up to $100 million may be spent within the state. When the plants become operational they will generate an increase in the state's economic activity level (i.e. dollar amount of all transaction - production and consumption) of at least $192 million. State personal income will increase by about $90 million. The communities where the plants are located will especially benefit from the increased economic activity as the payroll is spent locally for goods and services.

B. Agricultural Impacts

The operational capacity of 50 million gallons will create a demand for 20 million additional bushels of corn at the regional level. This will result in positive net benefits to the state's agricultural sector, bringing additional income for farmers, other agricultural employees, and suppliers. The increase demand for corn may also "induce small increases in corn prices." The author suggested that if Nebraskas' projected 20 million bushel annual demand increase was entirely new, national corn prices could be expected to rise by over one cent per bushel. While corn prices might increase slightly, soybean could become "slightly depressed" as a result of the availability of distillers dried grains as a feedstock.

C. Employment Impacts

The construction of the ethanol plants will directly employ 1,000-1,250 man years of labor. When the plants begin operations they will employ a total of 200-400 persons. A total of up to 1,500 permanent new jobs will be generated by the direct and indirect impacts of the plants' operation.

D. Tax Revenue Impacts

The increase in total state tax revenues from the actual construction and from associated activities will be in excess of $4 million over the construction period. This total includes state personal income taxes, and state sales and corporate taxes. The operation of the plants will provide substantial tax revenues for the state and for the communities where the plants are located. The annual Nebraska state income tax is projected to increase by $2.11 million, the state sales tax revenues by $1.53 million, and the state corporate tax revenue by $.54 million for a total annual increase of $4.18 million.

V. STUDY CONCLUSION

The construction and operation of fuel grade ethanol facilities in Nebraska will have various positive net impacts on the state's economic condition. These include increases in the level of economic activity, employment, personal income, and tax revenues.

Department of Energy

I. STUDY: Analysis of Imports of Ethanol Production in 48 States, Resource Planning Associates, September, 1981.

II. STUDY OBJECTIVES

A. Present an analysis of the economics of fuel ethanol production distribution and use.

B. To determine whether current date and federal tax exemptions for gasohol result in a net increase or decrease of state and federal tax receipts.

III. STUDY ASSUMPTIONS

In order to have state to state comparability estimates of the economic effects are based on the operation of one 50 million gallon per year corn-to-ethanol plant located in each state which produces 500 million gallons of gasohol. Additional assumptions included (a) corn as the feedstock, (b) ethanol is produced from a commercial scale, dry-milling plant the by-product of which distillers dried grain (DDG) would be sold, (c) coal is the principal source of heat for production process and (d) ethanol blended with gasoline is consumed wholly within the state. No attempt was made to project the effects over time.

IV. STUDY FINDINGS

A. Impacts on Economic Activity

All states were found to benefit economically from a 50 million gallon per year ethanol plant. Virginia was one of 34 states classified as a mixed agricultural/industrial state. These states ranked highest in terms of increased economic activity and are corn producers with comparatively high economic multipliers typical of states with developed industrial and population centers. The other two classifications of states, the minimally industrial and minimally agricultural would generate less economic activity. The study ranks Virginia 19th ($230 million) in terms of increased economic activity due to production and sale of output from a 50 million gallon per year ethanol plant.

B. Employment Impacts

The operation of a 50 million-gallon-per-year ethanol facility would increase employment in all states, resulting in the following effects:

1. Creation of about 800 direct jobs in 41 states as a result of ethanol production, corn production, and harvesting, and of transportation feedstocks and by-products; and of 120 direct jobs in the six New England states and Nevada.

2. Creation of approximately 800 secondary jobs in 41 states as an indirect result of ethanol production; and of 100 secondary jobs in the six New England states and Nevada.

C. Tax Impacts

Such an ethanol plant has an inpact on local, state and federal taxes. In general, state tax receipts are decreased in states with high tax exemptions for gasohol. Virginia, according to the study, would lose $20 million in local and state receipts. Federal receipts, however, are increased in all states except Nevada and in New England, where no economic activity and therefore no new receipts are generated in the agricultural sector. The increase in federal tax receipts for Virginia would be $26 million.

V. STUDY CONCLUSIONS

1. States with a balance of industrial and agricultural activities derive more benefits from fuel ethanol production than states that are either minimally agricultural or minimally industrial.

2. State tax receipts decrease because of fuel ethanol production and sale in states with exemptions of more than 3.5 cents per gallon because sales, personal income, and corporate income tax increases from plant operations do not fully offset the reductions resulting from the tax exemption.

3. Federal tax receipts increase because of fuel ethanol production and sales, even with the 4 cent per gallon excise tax exemption (in 1986 increased to six cents per gallon), the Investment Tax Credit, and the Energy Investment Tax Credit. This occurs because increased personal and corporate income taxes from plant operations offset reductions from the excise tax exemption and tax credits. Due to this exemption, federal tax receipts are shifted away from the highway trust fund to the general fund.

4. State excise tax exemptions would probably be necessary in states that do not now have such an exemption to stimulate demand for the ethanol produced by a 50 million gallon per year fuel ethanol plant.

New Mexico

I. STUDY: New Mexico Blended Fuel Tax Deduction Impact Assessment Study. Polydyne, Inc. and Information Resources, Inc., New Mexico State University, January, 1986.

II. STUDY OBJECTIVES

A. Conduct a study of the characteristics of the New Mexico fuel industry, and its commercial viability; and

B. To assess the direct, indirect, and induced socio-economic impacts of the industry on the state's economy and revenue.

III. STUDY BACKGROUND

New Mexico established a tax deduction for ethanol blended fuels in 1980. The current law is due to expire June 30, 1991. The tax deduction is 11 cents/gallon through June 30, 1987. To qualify for the deduction at least 50% of the agricultural feedstocks must be produced in New Mexico.

Since 1980 the ethanol industry has invested $90 million. Ethanol blended fuel represents 10% of the gasoline demand. A total of $19 million in tax deduction have been made annually to an industry with an operational capacity of 15 million gallons/year. At the time of the study 4 of 31 plants were operating. Ethanol production has grown from 690,000 gallons in 1982 to 7.5 million gallons in 1985.

IV. STUDY FINDINGS

A. Employment and Personal Income

There was a positive impact due to the increased economic activity of industry and agriculture compared to the reduced economic activity associated with losses due to reduced highway construction funds. Approximately 75 people were employed directly in the industry in 1985. About four jobs are created for each new job in the ethanol industry. The net direct and indirect employment associated work with the ethanol industry well exceed 1600. Without the subsidies after 1992 there is an anticipated decline of anywhere from 490-640 person years.

The net direct, indirect and induced personal income benefits to the state's economy is estimated at $42 million in 1985 leveling out at $25 million by 1992. With no tax deduction extension in 1992 the personal income increase drops $10 million. More than $2.25 of personal income is generated for each dollar of ethanol sales.

B. Agricultural Impacts

The study indicated that the specific impact on New Mexico's agricultural sector was "not amenable" to simple assessment since there was little agricultural data which is directly related to the ethanol industry. A second problem, according to the researchers is that the ethanol industry is new and many plants have irregular production schedules so the data is of "uneven quality." The researchers noted that the industry "inherently has a stabilizing impact" on state's agricultural sector by providing for additional demand for milo which is projected to be 40% of the 1987 crop, and 50% by 1992.

C. Impact on State Revenues and Highway Funds

Cumulative tax revenues from the industry do not fully compensate for the highway construction fund revenue losses; approximately $18,750,000 in deductions have been granted for the years 1982-85. The estimated direct and indirect state revenue generated from the industry is $4.3 million. However the net impact of the ethanol industry is relatively small in terms of the percentage decrease of the total road fund revenues between 1981-1991 ($65 million or 5.5% of total). It is anticipated that with the expiration of state and federal deductions ethanol production will decline 25-43%.

V. STUDY CONCLUSIONS

1. The relatively small revenue impacts on the state highway funds are overshadowed by the positive impacts on employment, direct personal income and agriculture.

2. The ethanol fuel industry is not yet capable of supporting itself without state and federal tax deductions. Marginal plants, those producing 2-4 million gallons per year, may just break even by 1992. Large 10 million gallon plants should be self sustaining after 1992. Continued operation of submarginal plants (i.e. less than 2 million gallons per year) are not profitable beyond 1992 without a fuel tax deduction.

3. Because requirements for milo may approach 50% of the milo crop it could be argued that the price of milo could increase as a result.

U.S. Department of Agriculture

I. STUDY: Producing Ethanol from Grain - Agricultural Imports and Feasibility, U.S. Economics and Statistics Service, 1982.

II. STUDY OBJECTIVE

A. To assess the potential impact of alternative production levels on food and fiber sector; and

B. To compare the estimated ethanol production costs with the projected wholesale price of unleaded gasoline.

III. STUDY FINDINGS

In assessing the impact of ethanol production on the food and fiber section the study assumed that one of the factors affecting alcohol production will be ethanol's ability to compete with unleaded gasoline. For the purposes of the study three price levels were projected for the price of oil with minimum low price case assuming constant real oil prices throughout the eighties. The other assumptions include: (a) all alcohol is produced from corn; (b) unit costs for land, labor and fertilizer will follow historical trends, as much as 36 million acres can be added to crop production by 1990; (c) corn stocks are constrained to be no less than 5% of annual production.

The study found with respect to the impact on the food and fiber sectors:

1. Larger ethanol production level have proportionately greater impacts on corn prices than smaller levels. Ethanol production of 3.4 billion gallons per year is likely to cause about a 14% increase in the real price of corn. Real corn prices could increase 30% for 6.4 billion gallons per year and 40% for 8.4 billion gallons per year. As ethanol production increases, so does the demand for corn. Higher corn prices stimulate corn acreage and corn production which in turn restricts soybean acreage and soybean production.

2. Higher grain prices increase livestock feeding costs which reduces livestock production and raises livestock prices.

3. Higher food prices are generally caused by higher meat prices.

4. Large ethanol production levels raise farm income - monthly because of higher grain prices.

In comparing estimated ethanol production costs with the projected wholesale prices of unleaded gasoline the study found:

1. Alcohol production from corn is not likely to be competitive with gasoline in this decade without federal subsidies.

2. With a 40 cents/gal. federal subsidy only a small amount of ethanol is produced.

3. Both federal and state subsidies and real oil price growth of between 3-5% a year are necessary to make ethanol production about 3 billion gallons per year feasible.

IV. STUDY CONCLUSION

When all economic costs and benefits are calculated, an ethanol subsidy program is not cost effective. The costs are so large that ethanol production cannot be justified on economic grounds even if existing producers could operate with present subsidies. If the principal argument for subsidizing ethanol is to boost farm income, it would be more economical to use gasoline in our cars and pay corn growers a direct subsidy equal to the amount they would receive as a result of ethanol production.

North Dakota

I. STUDY: State Tax Incentives for the North Dakota Ethanol Industry: Issues and Alternatives. Upper Great Plains Transportation Institute, Fargo, North Dakota, July, 1986.

II. STUDY OBJECTIVES

A. To provide relevant background information on the ethanol industry and its impact on the state; and

B. Present various alternatives for policy makers.

III. STUDY BACKGROUND

The current exemption for gasohol is 8 cents per gallon, which will drop to 4 cents in 1987, remaining at this level until 1992. The exemption is funded through the Highway Destrubution Fund used for both road construction and maintenance. The incentive is in the form of a tax exemption at the retail level. The projected loss to the fund for the FY' 1985-1988 is $13.3 million. Ethanol production on a commercial scale began in July 1985 at annual production of about 10 million gallons. The market share of gasohol sales grew from 2.4% in May 1985 to over 21% by January, 1986.

IV. FINDINGS

A. Economic Impact

The assessment of the economic impact of ethanol production is in progress and is scheduled to be competed in late 1986. The assessment will consider the impact of ethanol production on personal income, increase in total business activity, increase in retail trade and the secondary employment generated. The researchers indicated that they would also consider the utilization of highway funds for purposes other than highway maintenance and construction and the fact that this could lower the employment in this section which raising the employment is the ethanol industry.

B. Alternatives and Implications

An analysis of the potential alternative for the future regarding the gasohol taxing situation is presented. Among the alternatives are:

1. Maintain exemption under existing law - This option will continue the negative impact on the Highway Distribution Fund. The total loss is estimated at $5.5 million for FY 1987 and $2.7 million for FY 1988.

2. Accelerate reduction of exemption - This would reduce the negative impact on the Fund but would lower the price at which ethanol producers will be able to sell their product. For each one cent per gallon that the exemption is reduced the approximate ethanol price reduction will be 10 cents per gallon.

3. Eliminate gasohol exemptions - This would relieve the Fund of subsequent revenue losses but might bankrupt some ethanol operations, by forcing them to ocmpete on an even basis with other fuels.

4. Direct industry subsidy - Used as a way to offset losses suffered from any reductions in the gasohol tax exemption. If adopted this approach will require criteria to be developed for those eligible for subsidy as well as where the monies will come from.

5. Gasoline tax increase to offset exemption effects - An additional tax would be levied on motor fuels.

APPENDIX B

Item 001 - Augusta County School Board: This item is included in our bid program at the request of Augusta County. The low bid was from Island Creek Coal Sales Company on a Kentucky-mined coal. The lowest cost Virginia-mined coal was approximately $.11 per million BTU higher due to a higher net cost per ton and slightly higher freight and oil treatment costs.

Item 002 - Bland Correctional Center: The low bid from Moore Coal on a West Virginia coal was disqualified due to the inclusion of erroneous information on the bid. The next low bid from United Coal for Kentucky-mined coal was rejected because it did not meet our ash content restrictions. The award was made to Central Coal for coal mined in Hurley, Virginia.

Item 003 - Brunswick Correctional Center: The low bid on a Kentucky coal from United Coal did not meet the ash content restrictions. The next low bid from Moore Coal was disqualified (See Item 002). The third low bid was from a Virginia-mined coal bid by Central Coal. Because the Air Pollution Control Board restricts coal used in new facilities to a maximum sulfur level of 1.39%, this coal did not meet our specifications for this location. The award was made to Mary Helen Coal Company on a Kentucky-mined coal. Please note the Inter-Mountain did not bid on oil treatment, which is required by Brunswick. The next highest Virginia-mined coal was bid by Jno. McCall Coal Company. This lower BTU value and the higher oil treatment cost caused the cost per million BTU to exceed the low acceptable bid by almost 4 cents.

Item 004 - Buckingham Correctional Center: The low bid from Moore coal was disqualified. The coal from Pond Fork mine, a Kentucky-mined coal bid by the next low bidder (Island Creek), exceeded the stated maximum free-swelling index (coke button). The award was made on Spurlock coal (Kentucky) also offered by Island Creek. The lowest Virginia-mined coal was offered by Hiller Fuel; however, the cost per ton was $2.51 higher than the successful bidder, making the cost per million BTU approximately $.10 higher.

Item 005 - Catawba Hospital: The low bid coal from Allegheny (Virginia-mined) exceeded the specified ash content and was unwashed. The next low bid from Moore Coal was disqualified. The award was made to the third low bidder, Westmoreland Coal, bidding on a coal mined in Appalachia, Virginia.

Item 006 - Eastern State Hospital: The low bidder (Island Creek) bid on Pond Fork (a Kentucky-mined coal), which exceeded our coke button requirement. The award was made to Island Creek for their Spurlock coal, which is also mined in Kentucky. Neither of the two Virginia coals offered met our specifications. One did not meet the minimum BTU requirement and was unwashed, while the other exceeded the maximum ash content as well as not meeting other bid requirements.

Item 007 - George Mason University: This is trucked-in coal. The low bidder (Intermountain) offered a West Virginia-mined coal; however, it exceeded our maximum on both coke button and ash content. The award was made on a Kentucky-mined coal bid by Mary Helen Coal Company. No Virginia coal was offered for this location.

Item 008 - Central Virginia Training Center: The low bid for West Virginia-mined coal, offered by Intermountain, exceeded both our ash and coke button limits. The second bid (Moore Coal) was disqualified. The award was made to the third low bid (Island Creek), which offered a Kentucky-mined coal. The lowest Virginia-mined coals, as offered by Central Coal and Westmoreland Coal, exceeded Island Creek's cost per ton FOB mine by $1.58 and $2.58, respectively.

Item 009 - State Penitentiary: The low bidder (Moore Coal) was disqualified. The award was made to the second bidder (Island Creek) on a Kentucky-mined coal. The lowest Virginia-mined coal was offered by Hiller Fuel. The higher cost per ton and the higher cost for oil treatment resulted in a cost per million BTU that was approximately $.10 more than the coal awarded. In addition, this coal exceeded our maximum ash limitation, and the bidder did not comply with other bid requirements.

Item 010 - Piedmont Geriatric Hospital: The low bid offered by Moore Coal was disqualified. The second low bidder (United Coal) offering a Kentucky-mined coal and the third low bid, offered by Central Coal on a Virginia-mined coal, exceeded the maximum sulfur limit of 1.39% for new installations. The fourth low bidder (Allegheny) also offered a Virginia-mined coal; however, this exceeded both the sulfur and ash limits and was unwashed. The award was made to Mary Helen on a Kentucky-mined coal. The next low Virginia-mined coal was more than 2 cents more per million BTU due to its lower BTU content.

Item 011 - Powhatan Correctional Center: The low bidder (Island Creek) exceeded both the ash softening temperature and the coke button limits on its Pond Fork coal which is mined in Kentucky. The second low bidder (Moore Coal) was disqualified. The award was made to Island Creek's Spurlock mine, which

is located in Kentucky. The only Virginia-mined coal offered for this item (McLean) failed to meet the minimum BTU requirements and was unwashed. Its FOB mine cost, freight costs, and oil treatment costs were also higher, which resulted in a cost per million BTU which exceeded the awarded cost by almost 44 cents.

Item 012 - Rockingham County Schools: This item is included in our bid program at the request of Rockingham County. The low bid from Moore Coal was disqualified. The second bidder (United Coal) and third bidder (Island Creek - Gund mine) bid on Kentucky coals which exceeded our ash content limits. The award was made to Central Coal Company on coal mined in Hurley, Virginia. The next higher bid (Allegheny) also quoted on a Virginia coal; however, this coal exceeded our maximum ash content and was unwashed.

Item 013 - Southampton Correctional Complex: The low bidder (United Coal bidding on a Kentucky-mined coal) offered an unwashed coal which exceeded our ash limitations. Moore Coal, the second low bidder, was disqualified. Island Creek's Gund mine was third low; however, it exceeded our ash limitation. The award was made to Central Coal on coal mined in Hurley, Virginia. The next lowest bid for Virginia coal was offered by Allegheny; however, this coal exceeded the ash limits and was unwashed.

Item 014 - Southside Mental Health and Mental Retardation Support Unit: The award was made to the low bidder, Island Creek, on a Kentucky-mined coal. The lowest cost Virginia-mined coal was bid by SSM; however, the FOB mine cost was approximately $2.50 more than Island Creek's, and the freight cost was $1.19 higher. The higher BTU offered by SSM was not sufficient to offset these cost factors.

Lot 015 - Staunton Correctional Center: The award was made to the low bidder, Island Creek, on a Kentucky-mined coal. The lowest cost Virginia coal was bid by Jno. McCall; however, the FOB mine price and the freight costs were higher.

Lot 016 - University of Virginia: The low bidder, Moore Coal, was disqualified. The award was made to the second low bidder, Island Creek, on a Kentucky-mined coal. The lowest cost Virginia coal was bid by Westmoreland Coal; however, both the FOB mine price and the freight cost were higher.

Lot 017 - Virginia Correctional Center for Women: The low bidder, Moore Coal, was disqualified. Award was made to the second low bidder, Island Creek, on a Kentucky-mined coal. The lowest cost Virginia coal was bid by Hiller Fuel; however, the FOB mine price was approximately $2.50 higher than Island Creek's, and the ash content was excessive.

Lot 018 - Virginia Polytechnic Institute and State University: The award was made to the low bidder, Westmoreland Coal, on a coal mined in Appalachia, Virginia. You will note that an extremely favorable intrastate freight rate is in effect between this shipping point and the delivery point for VPI & SU.

Lot 019 - Virginia State University: The low bidder, Moore Coal, was disqualified. The award was made to the second low bidder, Blue Crystal, on a Kentucky-mined coal. The lowest cost Virginia coal was bid by SSM; however, both FOB mine and freight costs were more.

Lot 020 - Nottoway Correctional Center: This location requires truck delivery; therefore, the low bidder (SSM) offering rail delivery of Virginia coal could not be accepted. The next low bidder (Mary Helen) offered Kentucky coal and was accepted. The only other bid on Virginia-mined coal was also offered by SSM; however, their BTU content was less than the Mary Helen coal which made their cost per million BTU to be approximately 2 1/2 cents more.

Lot 021 - Baskerville Correctional Unit: The award was made to Woodruff Coal, the low bidder, who offered a Kentucky-mined coal. No Virginia coal was offered for this location.

Lot 022 - Dinwiddie Correctional Unit: The award was made to Mary Helen, the low bidder, who offered a Kentucky-mined coal. No Virginia coal was offered for this location.

Lot 023 - Haynesville Correctional Unit: Same results as Lot 022.

Lot 024 - Virginia Polytechnic Institute and State University (Nut and Slack Coal): The lowest bid was submitted by Allegheny on Virginia-mined coal. This coal, however, was unwashed and exceeded both our ash and sulfur limits. The award was made to SSM, the next low bidder, also offering Virginia (Lee County) coal. Again, note the favorable intrastate freight rate.

Lot 025 - Clinch Valley College: The low bidder (Virginia Iron, Coal and Coke) offered a Virginia-mined coal; however, it exceeded our ash limit and did not meet our ash softening temperature requirement. Award was made to Woodruff, the second low bidder, offering Kentucky-mined coal. The third low bidder (United Coal) offered Virginia coal; however, it was unwashed and exceeded our limits for ash and moisture content.

Lot 026 - Caroline Correctional Unit: The low bidder (Hawley Coal) bid on a Virginia coal; however, it exceeded our volatile limit and failed to meet our ash softening temperature requirement. The second low bidder (Moore Coal) was disqualified. Award was made to Richey Coal on a West Virginia-mined coal.

Lot 027 - Harrisonburg Correctional Unit : The low bidder (Moore Coal) was disqualified. The second low bidder (Jefferson Coal) did not submit the required analysis report. The award was made to Richey Coal on a West Virginia-mined coal. Hawley bid a Virginia coal which exceeded our volatile limit and failed to meet our ash softening temperature requirement.

Lot 028 - Tazewell Correctional Unit: Same results as Lot 027.

ESTIMATED TONNAGE ~~1,000~~ 3 of 3

1¼" X ½" STOKER

NOTE: 1000 OT O=F.P

INSTITUTION AUGUSTA County School Board LOCATION STAUNTON VA.

86-87 RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
BLUE CRYSTAL	HUNTE BRANCH ELKHORN #1-2-3		CTO	BS	34.20	.91	6.0	2700	4.5	14100 28.2	32.50	17.26	.60	—	50.36	1.78582	2	Ky
JNO McCALL	GALE/KELCH #4 ALMA		NS	TH	31.07	.77	5.95	2730°	7.0	14150 28.3	34.00	18.39	1.00	—	53.39	1.89658	3	Va.
ISLAND CREEK	SPURLOCK ELK 1-2-3 HAZ #4		CTO	BS	38.94	.81	6.45	2800	3.5	13900 27.8	31.44	17.26	.70	—	49.40	1.77698	(1)	Ky

D Not to be Analyzed ① Unwashed Product

1½" X ¾" STOKER

NOTE: 1500 O.T.
0 F.P

INSTITUTION BLAND CORRECTIONAL CENTER LOCATION BLAND, VA

86-87 RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
AB & H	SAMOYED ENERGY ELKHORN #3		NW	T	37	1.0	6.12	2700°	5.0	14000 28.0	33.70	8.64	1.00	–	43.34	1.54786	7	Ky
WESTMORELAND	PINE BRANCH MARKER HIGH SPLINT		NS	6	35	1.0	6.30	2700°	7.0	14263 28.5	34.00	8.64	1.00	–	43.64	1.53123	5	Va.
CENTRAL COAL	VA ENERGY EAGLE		NS	T	34	1.60	6.5	2700°	7.0	14,300 28.6	33.00	8.64	1.00	–	42.64	1.49091	(2)	Va.
MARY HELEN	MARY HELEN L. CEDAR GROVE		NS	T	36	1.0	6.0	2700°	5.0	14400 28.8	34.48	8.64	.36	–	43.48	1.50973	3	Ky
MOORE COAL Disqualified	RESOURCES DEVELOP. FIRE CREEK		TRK		17.31	.65	5.24	2700°	6.5	14,862 29.7	34.00	6.80 TRK	.90	–	41.70	1.40405	1	WVa
WOODRUFF	MONTI CRISTO HAZARD		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	22.70	9.75 TRK	.75	–	43.20	1.54839	8	Ky
SSM	MCEC 1-2 #9		SO	6	36.0	1.0	6.5	2700	4.5	14150 28.3	33.95	8.64	.60	–	43.19	1.52615	4	Va
JNO McCALL	GALE/KELSA #4 ALMA		NS	TN	31.07	.77	5.95	2730°	7.0	14150 28.3	34.00	8.64	1.00	–	43.64	1.54205	6	Va.

~~Note Analysis~~ (1) Unwashed Product

ESTIMATED TONNAGE [illegible]

1¼" X ¾" STOKER

NOTE: 1500 OT
0 FP.

ITEM NO. [illegible] 343

INSTITUTION Brunswick Correctional Center LOCATION Lawrenceville, VA

86-87

RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.39%	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON: F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment	COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
B & H Processing	Samoyed Energy Elkhorn #3		N&W	Th	37.0	1.0	6.1	2700+	5.0	14000 28.0	34.28	17.73	1.00	—	53.01	1.89322	5	Ky
Westmoreland	Pine Branch Marker, High Splint		NS	6	35.0	1.0	6.3	2700°	7.0	14263 28.52	34.00	24.49	1.00	—	59.49	2.08591	7	Va
Enteal Coal	VA Energy Eagle		NS	Th	34.0	1.60	6.5	2700°	7.0	14300 28.6	33.00	17.73	1.00	—	51.73	1.80875	2	Va
Mary Helen	Mary Helen L. Cedar Grove		NS	Th	36.0	1.0	6.0	2700+	5.0	14400 28.8	34.48	17.73	.36	—	52.57	1.82535	3	Ky
Moore Coal Disqual.	Resource Dev Fire Creek		NS	Poca	17.31	.65	5.24	2700+	6.5	14862 29.72	34.00	17.35	.90	—	52.25	1.75926	1	WVa
Woodruff	Banner Hazard		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	30.70	22.25 TRK	.75	—	53.70	1.99642	6	Ky
SSM	MCEC 1-2 49		SO	6	36.0	1.0	6.5	2700	4.5	14150 28.3	33.95	24.49	.60	—	59.04	2.08622	8	Va
Jno McCall	Gale/Kelca #1 Alma		NS	Th	31.07	.77	5.95	2730°	7.0	14150 28.3	34.0	17.73	1.00	—	52.73	1.86326	4	Va.

① ~~Not to Analysis~~ ② Unwashed ~~Product~~

note

ESTIMATED TONNAGE 1100 ITEM NO. 001

1¼" X ⅜" STOKER

NOTE: 1100 OT
0 FP

INSTITUTION Buckingham Correctional Center LOCATION Dillwyn VA

86-87

RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.39%	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
BLUE CRYSTAL	HUNTS BRANCH ELKHORN*1-2-3		CO	BS	34.20	.91	6.0	2700	4.5	14100 28.2	32.50	21.02	.60	-	54.12	1.91915	4	Ky
MOORE COAL Disgnal	RESOURCES DEV FIRE CREEK		TRK		17.31	.65	5.24	2700	6.5	14862 29.7	34.00	17.00 TRK	.90	-	51.90	1.74748	1	WVa
WOODRUFF	BANNER HAZARD		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	20.00 TRK	.75	-	53.45	1.91578	3	Ky
ISLAND CREEK	SPURLOCK ELK 1,2,3 HAZ #4		CO	BS	38.94	.81	6.45	2800°	3.5	13900 27.8	31.44	21.02	.70	-	53.16	1.91224	(2)	Ky

1) Not a bona fide Analysis — (2) Unwashed Product

ESTIMATED TONNAGE _____

1¼" X ¼" STOKER

NOTE: 1200 TON'S - FREEZE PROOFED INSTITUTION CATAWBA HOSPITAL LOCATION CATAWBA, VA.

No-OIL TREATMENT 86-87 RAILROAD _____

NAME OF COMPANY	MINE – SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75%	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
AB&H PROCESSING	SAMOYED ENERGY ELKHORN #3		N&W	TH	37.0	1.0	6.1	2700+	5.0	14,000 28.0	34.78	16.84		.225	51.34	1.82358	8	KY
WESTMORELAND	PINE BRANCH MARKER, HIGH SPLINT		NS	6	35.0	1.10	6.3	2700°	7.0	14263 28.5	34.00	12.30		.40	46.70	1.63860	(2)	VA
CENTRAL COAL	VA ENERGY EAGLE		NS	TH	34.0	1.60	6.5	2700°	7.0	14300 28.6	33.00	16.84		.50	50.34	1.76014	4	VA
MARY HELEN	MARY HELEN L. CEDAR GROVE		NS	TH	36.0	1.0	6.0	2700+	5.0	14400 28.8	34.48	16.84		.19	51.51	1.78855	7	KY
MOORE COAL Disqual.	RESOURCES DEV FIRE CREEK ?		TRK		17.31	.65	5.24	2700	6.5	14862 29.7	34.00	13.95 TRK		.425	48.38	1.62896	1	WVa
WOODRUFF	BANNER HAZARD		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	15.00 TRK		.375	48.08	1.72330	3	KY
SSM	MCEC 1-2 #9		SO	6	36.0	1.0	6.5	2700	4.5	14150 28.3	33.95	12.30		.425	46.67	1.64917	3	VA
JNO MCCALL	GALE/KELSA #1 ALMA		NS	TH	31.07	.77	5.95	2730°	7.0	14150 28.3	34.00	16.84		.375	51.22	1.80990	6	VA

D No Lab Analysis ... (1) Unwashed Product

ESTIMATED TONNAGE _____ FILE NO. 006 1083

1¼" X ¼" STOKER

NOTE: 6000 OT
0 F.P.

INSTITUTION EASTERN STATE HOSPITAL LOCATION WILLIAMSBURG VA

86-87 RAILROAD _____

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75%	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
BLUE CRYSTAL	HUNTS BRANCH ELKHORN #1-2-3		C&O	BS	34.20	.91	6.0	2700	4.5	14180 28.2	32.50	19.57	.60	—	52.67	1.86774	2	Ky
GOODRUFF	BANNER HAZARD		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	27.00 TRK	.75	—	60.45	2.16667	3	Ky
ISLAND CREEK	SPURLOCK ELK 1-2-3 HAZ #4		C&O	BS	28.94	.81	6.45	2800°	3.5	13900 27.8	31.44	19.57	.70	—	51.71	1.86008	(1)	Ky

No Lab Analysis (2) Unwashed ~~Product~~

ESTIMATED TONNAGE 500
1¼" X ¾" STOKER

2 '06

INSTITUTION GEORGE MASON UNIVERSITY LOCATION FAIRFAX VA
86-87
RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1%	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON: F.O.B. Mine	COST PER TON: Freight	COST PER TON: Oil Treatment	COST PER TON: Freeze Proofing	COST PER TON: TOTAL Including Oil Treatment	COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
MARY HELEN	MARY HELEN L. CEDAR GROVE		TRK		36.0	1.0	6.0	2700+	5.0	14400 28.8	34.48	26.40 TRK	—	—	60.88	2.11389	①	Ky
MOORE COAL	RESOURCES DEV FIRE CREEK		TRK		17.31	.65	5.24	2700	6.5	14862 29.7	34.00	34.00 TRK	—	—	68.00	2.28957	3	WVa
WOODRUFF	BANNER HAZARD		TRK		34.0	1.0	6.5	2700	6.5	13950 27.9	32.70	27.25 TRK	—	—	59.95	2.14875	2	Ky

① ~~Not Lab Analysis~~ ② ~~Unwashed Product~~

ESTIMATED TONNAGE 1,000

ITEM NO. 008 1 of 4

1¼" X ¼" STOKER

INSTITUTION CENTRAL VIRGINIA TRAINING CENTER LOCATION LYNCHBURG VA

NOTE: 0 OT
0 FP

RAILROAD

86-87

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75%	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
B&H PROCESSING	SAMOYED ENERGY ELKHORN #3		NW	Th	37.0	1.0	6.1	2700	5.0	14000 28.0	33.44	17.01	–	–	50.45	1.80179	8	Ky
EASTMORELAND	PINE BRANCH MARKER HIGH SPLINT		NS	6	35.0	1.0	6.3	2700°	7.0	14268 28.5	34.00	17.01	–	–	51.01	1.78983	6	Va
ENTRAL COAL	VA. ENERGY EAGLE		NS	Th	34.0	1.60	6.5	2700	7.0	14300 28.6	33.00	17.01	–	–	50.01	1.74861	3	Va
IARY HELEN	MARY HELEN L. CEDAR GROVE		NS	Th	36.0	1.0	6.0	2700	5.0	14400 28.8	34.48	17.01	–	–	51.49	1.78785	5	Ky
IOORE COAL	RESOURCES DEV FIFE CREEK		TRK		17.31	.65	5.24	2700	6.5	14862 29.7	34.00	16.50 TRK	–	–	50.50	1.70034	1	W Va
JOODRUFF	BANNER HAZARD		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	16.95 TRK	–	–	4965	1.77957	4	Ky
SSM	MCRC 1&2 #9		SO	6	36.0	1.0	6.5	2700	4.5	14450 28.3	33.99	17.01	–	–	50.96	1.80071	7	Va
INO MCCALL	GALE/KELLA #4 ALMA		NS	Th	31.07	.77	5.95	2730°	7.0	14150 28.3	34.00	17.01	–	–	51 01	1.80248	9	Va

~~Not to Analy-sis~~ ② Unwashed Product

ESTIMATED TONNAGE 1,000
1½" X ¾" STOKER

ITEM NO. 008 [illegible] 2 [illegible] 4

INSTITUTION Central Virginia Training Center LOCATION Lynchburg VA

RAILROAD

86-87

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max.	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button	Btu/Lb. Dry Min. Guaranteed	COST PER TON: F.O.B. Mine	COST PER TON: Freight	COST PER TON: Oil Treatment	COST PER TON: Freeze Proofing	COST PER TON: TOTAL Including Oil Treatment	COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	
Island Creek	Spurlock Elk 1-2-3 Haz #4		C/O	BS	38.94	.81	6.45	2800	3.5	13900 27.8	31.44	16.15	–	–	47.59	1.71188	②	Ky

① Not at Analysis ② Unwashed ~~Product~~

3 of 3

ESTIMATED TONNAGE 2000

$1\frac{1}{4}$" X $\frac{1}{4}$" STOKER

NOTE: 2000 OT
0 F.P.

INSTITUTION STATE PENITENTIARY 86-87

LOCATION Richmond VA

RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON: F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment	COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
BLUE CRYSTAL	HUNTS BRANCH ELKHORN #1-2-3		C/O	BS	34.20	.91	6.0	2700	4.5	14,100 28.2	30.50	17.80	.60	–	50.90	1.80497	3	Ky
MOORE COAL DK9HM	RESOURCES DEV. FIRE CREEK		TRK		17.31	.65	5.24	2700	6.5	14,862 29.7	34.00	18.00 TRK	.90	–	52.90	1.78115	1	WVa
WOODRUFF	BANNER HAZARD		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	21.00 TRK	.75	–	54.45	1.95162	5	Ky
JNO McCALL	GALE/KELSA #4 ALMA		NS	Th	31.07	.77	5.95	2730°	7.0	14,150 28.3	34.00	18.99	1.00	–	53.99	1.90778	4	Va
ISLAND CREEK	SPURLOCK ELK 1-2-3 HAZ #4		C/O	BS	38.94	.81	6.45	2800°	3.5	13900 27.8	31.44	17.80	.70	–	49.94	1.79641	(2)	Ky

1) ~~Not to Analysis~~ (2) Unwashed ~~Product~~

ESTIMATED TONNAGE _____ Item 010 1 of 3

1½" X ¾" STOKER

NOTE: 1500 TONS - OIL TRTM 7 1%

600 TONS - FREEZE P. 29%

INSTITUTION PIEDMONT GERIATIC HOSPITAL LOCATION BURKEVILLE VA

B6-B7

RAILROAD _____

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.39%	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
B&H PROCESSING	SAMOYED ENERGY ELKHORN #3		N&W	TH	37.0	1.0	6.1	2700+	5.0	14,000 28.0	34.28	18.99	.71	.13	54.11	1.93250	7	Ky
WESTMORELAND	PINE BRANCH MARKER, HIGH SPLINT		NS	6	35.0	1.0	6.3	2700°	7.0	14263 28.3	34.00	18.99	.71	.23	53.93	1.89229	4	Va
CENTRAL COAL	VA ENERGY EAGLE		NS	TH	34.0	1.60	6.5	2700°	7.0	14300 28.6	33.00	18.99	.71	.29	52.99	1.85280	2	Va
MARY HELEN	MARY HELEN L. CEDAR GROVE		NS	TH	36.0	1.0	6.0	2700°	5.0	14,400 28.8	34.48	18.99	.26	.11	53.84	1.86945	(3)	Ky
MOORE COAL Disqual.	RESOURCES DEV FIRE CREEK		TRK		17.31	.65	5.24	2700	6.5	14862 29.7	34.00	18.62 TRK	.64	.25	53.51	1.80169	1	WVa
WOODRUFF	BANNER HAZARD		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	22.00 TRC	.53	.22	55.45	1.98746	8	Ky
SSM	MCEC 1-2 #9		SO	6	36.0	1.0	6.5	2700	4.5	14150 28.3	33.85	18.99	.43	.25	53.62	1.89470	5	Va
JNO MCCALL	GALE/KELSA #4 ALMA		NS	TH	31.07	.77	5.95	2730°	7.0	14150 28.3	34.00	18.99	.71	.22	53.92	1.90531	6	Va.

D Not to Analysis (2) Unwashed Product

ESTIMATED TONNAGE ~~X,000~~ 3 of 3

1½" X ¾" STOKER

INSTITUTION POWHATAN CORRECTIONAL CENTER LOCATION STATE FARM VA

86-87 RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
BLUE CRYSTAL	HUNTS BRANCH ELKHORN# 1-2-3		C&O	BS	34.20	.91	6.0	2700	4.5	14100 28.2	32.50	17.80	.60	-	50.90	1.80497	3	Ky
MOORE COAL (Disqualified)	RESOURCES DEV FIRE CREEK		TRK		17.31	.65	5.24	2700	6.5	14,862 29.7	24.00	18.00 TRK	.90	-	52.90	1.78115	1	WVa
WOODRUFF	BANNER HAZARD		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	23.00 TRK	.75	-	56.45	2.02330	4	Ky
ISLAND CREEK	SPURLOCK ELK 1-2-3 HAZ#4		C&O	BS	38.94	.81	6.45	2800	2.5	13988 27.8	31.44	17.80	.70	-	49.94	1.79641	(2)	Ky

D ~~Not to be Analysis~~ (2) Unwashed Product

ESTIMATED TONNAGE [illegible]

$1\frac{1}{4}$" X $\frac{1}{4}$" STOKER

NOTE: 1200 OT
0 FP

ITEM ... 012 , . 1087

INSTITUTION Rockingham County Schools LOCATION Harrisonburg VA

86-87 RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON: F.O.B. Mine	COST PER TON: Freight	COST PER TON: Oil Treatment	COST PER TON: Freeze Proofing	COST PER TON: TOTAL Including Oil Treatment	COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
AB&H Processing	Samoyed Energy Elkhorn #3		N&W	Th	37.0	1.0	6.1	2700+	5.0	14000 28.0	34.28	19.96	1.00	-	55.24	1.97286	7	Ky
Westmoreland	Pine Branch Marker, High Splint		NS	6	35.0	1.0	6.3	2700°	7.0	14263 28.5	34.00	26.67	1.00	-	61.67	2.16386	5	Va
Central Coal	VA Energy Eagle		NS	Th	*34.0	1.60	6.5	2700°	7.0	14300 28.6	33.00	19.96	1.00	-	53.96	1.88672	(1)	Va
Mary Helen	Mary Helen L. Cedar Grove		NS	Th	36.0	1.0	6.0	2700+	5.0	14400 28.8	34.48	19.96	.36	-	54.80	1.90278	2	Ky
Moore Coal	Resources Dev Fire Creek		TRK		17.31	.65	5.24	2700	6.5	14862 29.7	34.00	19.00 TRK	.90	-	53.90	1.81482		WVa
Woodruff	Banner Hazard		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	19.75 TRK	.75	-	53.20	1.90682	4	Ky
SSM	MCEC 1-2 #9		So	6	36.0	1.0	6.5	2700	4.5	14150 28.3	33.95	26.67	.60	-	61.22	2.16326	8	Va
Jno McCall	Gap/Kelsa #4 [illegible]		NS	Th	31.07	.77	5.95	2730°	7.0	14150 28.3	34.00	19.96	1.00		54.96	1.94205	6	Va.

(1) Not lab Analysis (2) Unwashed Product

Item 013 1 of 3

1¼" x ¾" STOKER

NOTE! 3200 OT
0 FP

INSTITUTION Southampton Correctional Complex LOCATION Capron, VA

86-87

RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON: F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment	COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
4 B & H Processing	Samoyed Energy Elkhorn #3		N&W	Th	37.0	1.0	6.1	2700+	5.0	14000 28.0	34.28	17.73	1.00	—	53.01	1.89322	7	Ky
Westmoreland	Pine Branch Marker, High Splint		NS	6.	35.0	1.0	6.3	2700°	7.0	14203 28.5	34.00	17.29	1.00	—	52.29	1.83474	5	Va
Central Coal	Va Energy Eagle		NS	Th	34.0	1.60	6.5	2700°	7.0	14300 28.6	33.00	17.73	1.00	—	51.73	1.80875	(2)	Va
Mary Helen	Mary Helen L. Cedar Grove		NS	Th	36.0	1.0	6.0	2700°	5.0	14400 28.8	34.48	17.73	.36	—	52.57	1.82535	3	Ky
Moore Coal	Resources Dev Fire Creek		NS	Poca	17.31	.65	5.24	2700	6.5	14862 29.7	34.00	17.35	.90	—	52.25	1.75926	1	WVa
Woodruff	Banner Hazard		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	25.25 TRK	75	—	58.70	2.10395	8	Ky
SSM	MCEC 1-2 #9		So	6	36.0	1.0	4.5	2700	4.5	14150 28.3	33.95	17.29	.60	—	51.94	1.83181	4	Va
Jno McCall	Gale/Kelsa #4 Alma		NS	Th	31.07	.77	5.95	2730°	7.0	14150 28.3	34.00	17.73	1.00	—	52.73	1.86326	6	Va.

~~1) Hot Lab Analysis (2) Unwashed Product~~

Item . 014 / 1763

ESTIMATED TONNAGE [illegible]

1½" X ½" STOKER

NOTE: 15000 OT
0 FP

INSTITUTION Southside Mental Health /M. Ret. LOCATION Petersburg, VA

86-87

RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment	COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
AB&H Processing	Samoyed Energy Elkhorn # 3		N&W	Th	37.0	1.0	6.1	2700+	5.0	14,000 28.0	33.70	18.99	1.00	—	53.69	1.91750	6	Ky
Blue Crystal	Hunts Branch Elkhorn #1-2-3		C&O	BS	34.20	.91	6.0	2700+	4.5	14100 28.2	32.50	17.80	.60	—	50.90	1.80497	3	Ky
Moore Coal	Resources Dev Fire Creek		NS	Poca	17.31	.65	5.24	2700	6.5	14862 29.7	34.00	18.62	.90	—	53.52	1.80203	2	WVa
Woodruff	Banner Hazard		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	23.95 TRK	.75	—	57.40	205735	7	Ky
SSM	MCEC 1-2 #9		SO	6	36.0	1.0	6.5	2700	4.5	14150 28.3	33.95	18.99	.60	—	53.54	1.89188	4	Va
Jno McCall	Gale/Kelsa #4 Alma		NS	Th	31.07	.77	5.95	2730	7.0	14150 28.3	34.00	18.99	1.00	—	53.99	1.90778	5	Va
Island Creek	Spurlock Elk1-2-3 Haz#4		C&O	BS	38.94	.81	6.45	2800	3.5	13900 27.8	31.44	17.80	.70		49.94	1.79641	(1)	Ky

~~1) No lab Analysis~~ (2) ~~Unwashed Product~~

Item 015 1.56 3

1¼" X ¼" STOKER

NOTE: 1500 FREEZEPROOF = 28% INSTITUTION STAUNTON CORRECTIONAL CENTER LOCATION STAUNTON, VA

O = OIL TRMT 86-87 RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
B&H PROCESSING	SAMOYED ENERGY ELKHORN #3		DW	TH	37.0	1.0	6.1	2700+	5.0	14000 28.0	31.28	18.39	—	.13	52.80	1.88572	4	Ky
BLUE CRYSTAL	HUNTS BRANCH ELKHORN #1-2-3		CO	BS	31.20	.91	6.0	2700+	4.5	14100 28.2	32.50	17.26	—	.17	49.93	1.77057	2	Ky
IND. MCCALL	GALE/KELSA #4 ALMA		NS	TH	31.07	.77	5.95	2730°	7.0	14100 28.3	34.00	18.39		.21	52.60	1.85866	3	Va
ISLAND CREEK	SPURLOCK ELK 1-2-3 HAZ #4		CO	BS	28.94	.81	6.46	2800°	3.5	13900 27.8	31.44	17.26		.25	48.95	1.76080	(1)	Ky

) Not a b Analysis (1) Unwashed Product.

ESTIMATED TONNAGE _____

1¼" X ⅜" STOKER

NOTE: 12000 - OT = 67%

6000 - FP = 33%

Item 016 1 of 4

INSTITUTION UNIVERSITY OF VIRGINIA

5940 TONS VIA RAIL

LOCATION CHARLOTTESVILLE VA

RAILROAD _____

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment RAIL/TRUCK	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
B&H PROCESSING	SAMOYED ENERGY ELKHORN #3		NW	Th	37.0	1.0	6.1	2700+	5.0	14000 28.0	33.70	18.91	.67	.15	53.43	1.90822	Ky	AL RA
WESTMORELAND 500 TONS ONLY	PINE BRANCH MARKER, HIGH SPLINT		NS	6	35.0	1.0	6.3	2700°	7.0	14263 28.5	34.00	19.10	.67	.26	54.03	1.89579	Va	AL RA
MARY HELEN	MARY HELEN L. CEDAR GROVE		NS	Th	36.0	1.0	6.0	2700+	5.0	14400 28.8	31.48	18.91	.24	.13	53.76	1.56667	2 Ky	RA
MOORE COAL	RESOURCES DEV FIRE CREEK		NS	Poca	17.31	.65	5.24	2700	6.5	14862 29.7	34.00	18.39	.66	.28	53.27	1.79361	WVa	AL RA
WOODRUFF	BANNER HAZARD		TRK		24.0	1.0	6.5	2700	6.0	13950 27.9	32.70	20.15 TRK	.56	.25	53.60	1.92115	(1) Ky	TRK
USM	MCRC 1-2 #9		SO	6	36.0	1.0	6.5	2700	4.5	14150 28.3	35.25	19.10	.40	.28	53.23	1.89859	Va	AL RA
ISLAND CREEK	SPURLOCK ELK 1-2-3 HAZ #4		CO	RS	38.94	.81	6.45	2800°	3.5	13900 27.8	31.44	17.80	.47	.30	50.01	1.79893	(1) Ky	RA

*Not Lab Analysis. (2) Unwashed Product.

ESTIMATED TONNAGE _____ Item. 017 1 of 3

1½" X ¼" STOKER

NOTE! 2000 OIL TRT = .67%

0 - FP

INSTITUTION VIRGINIA CORRECTIONAL CENTER FOR WOMEN LOCATION Goochland VA

86-87

RAILROAD _____

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
BLUE CRYSTAL	HUNTS BRANCH ELKHORN #1-2-3		C&O	BS	31.20	.91	6.0	2700+	4.5	14100 28.2	32.50	17.80	.40	—	50.70	1.79788	3	Ky
MOORE COAL	RESOURCES DEV FIRE CREEK Dist Mkt.		TRK		17.31	.65	5.24	2700	6.5	14862 29.7	34.00	18.00 TRK	.60	—	52.60	1.77105	1	W Va
WOODRUFF	BANNER HAZARD		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	23.05 TRK	.50	—	56.25	2.01613	4	Ky
ISLAND CREEK	SPURLOCK ELK 1-2-3 HAZ #4		C&O	BS	38.94	.81	6.45	2800	3.5	13900 27.8	31.44	17.80	.47	-	49.71	1.78813	(2)	Ky

D Not Lab Analysis (2) Unwashed Product

ESTIMATED TONNAGE ________ Item. 018 1 of 3

1½" X ½" STOKER

0 FP
0 OT

INSTITUTION VPI-SU LOCATION Blacksburg VA

86-87

RAILROAD ________

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON F.O.B. Mine	COST PER TON Freight	COST PER TON Oil Treatment	COST PER TON Freeze Proofing	COST PER TON TOTAL Including Oil Treatment	COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
B&H Processing	Samoyed Energy Elkhorn #3		N&W	Th	37.0	1.0	6.1	2700+	5.0	14000 28.0	33.70	16.02	—	—	49.72	1.77572	7	Ky
Westmoreland	Pine Branch Marker, High Splint		NS	6	35.0	1.0	6.3	2700°	7.0	14263 28.5	34.00	11.63	—	—	45.63	1.60106	(1)	Va
Mary Helen	Mary Helen L. Cedar Grove		NS	Th	36.0	1.0	6.0	2700+	5.0	14400 28.8	34.48	16.02	—	—	50.50	1.75348	5	Ky
Moore Coal	Resources Dev Fire Creek		NS	Poca	17.31	.65	5.24	2700	6.5	14862 29.7	34.00	15.57	—	—	49.57	1.66903	3	WVa
" " Alternate	" "		TRK		17.31	.65	5.24	2700	6.5	14862 29.7	34.00	9.00 TRK	—	—	43.00	No award by truck 1.44782		WVa
VA. Energy	VA. Energy Cedar Grove		NS	Th	33.03	1.27	6.40	2700°	7.0	14262 28.5	33.00	16.02	—	—	49.02	1.72000	4	Va
SSM	MCEC 1-2 #9		So	6	36.0	1.0	6.5	2700	4.5	14150 28.3	33.95	11.63	—	—	45.58	1.61061	2	Va
JNO McCall	Gale/Kelsa #1/ Alma		NS	Th	31.07	.77	5.95	2730°	7.0	14150 28.3	34.00	16.02	—	—	50.02	1.76750	6	Va

(1) Not to Analysis (2) Unwashed Product

ESTIMATED TONNAGE _____ ITEM. 014 1 of 3

1¼" X ⅜" STOKER

NOTE 6000 OT

0 FP

INSTITUTION VIRGINIA STATE UNIVERSITY LOCATION PETERSBURG VA

86-87

RAILROAD _____

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7½	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
AB&H PROCESSING	SAMOYED ENERGY ELKHORN #3		NW	TH	37.0	1.0	6.1	2700	5.0	14000 28.0	34.28	18.99	1.00	–	54.27	1.93822	5	Ky
BLUE CRYSTAL	HUNTS BRANCH ELKHORN #1-2-3		C&O	BS	34.20	.91	6.0	2700+	4.5	14100 28.2	32.50	17.80	.60	–	50.90	1.80497	(2)	Ky
MOORE COAL Disqualified	RESOURCES DEV FIRE CREEK		TRK		37.31	.65	5.24	2700	6.5	14862 29.7	34.00	18.60 TRK	.90	–	53.50	1.80135	1	W Va.
WOODRUFF	BANNER HAZARD		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	23.95 TRK	.75	–	57.40	2.05735	6	Ky
SSM	MCRC 1-2 #9		SO	6	36.0	1.0	6.5	2700	4.5	14150 28.3	33.95	18.99	.60	–	53.54	1.89188	3	Va
JNO MCCALL	GALE/KELSA #4 ALMA		NS	TH	31.07	.77	5.95	2730	5.95	14150 28.3	34.00	18.99	1.00	–	53.99	1.90778	4	Va.

~~Dilution Analysis~~ – (2) Unwashed Product

ESTIMATED TONNAGE 1600

Item. 020 1 of 2

1¼" X ¼" STOKER

NOTE: 1600 OT
0 FP

INSTITUTION NOTTAWAY CORRECTIONAL CENTER LOCATION BURKEVILLE VA

86-87

RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.39	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7½	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
MARY HELEN	MARY HELEN L. CEDAR GROVE		TRK		36.0	1.0	6.0	2700+	5.0	14400 28.8	24.48	21.50 TRK	.36	—	56.34	1.95625	(2)	Ky
MOORE COAL	RESOURCES DEV FIRE CREEK		TRK		17.31	.65	5.24	2700	6.5	14862 29.7	34.00	24.00 TRK	.90	—	58.90	1.98317	5	W Va
WOODRUFF	BANNER HAZARD		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	21.50 TRK	.75	—	54.95	1.96954	3	Ky
SSM	MCEC 1-2 #9		SO	6	36.0	1.0	6.5	2700	4.5	14150 28.3	23.95	18.99	.60	—	53.54	* 1.89188	1	RAIL VA W Va
SSM	MCEC 1-2 #9		TRK	6	36.0	1.0	6.5	2700	4.5	14150 28.3	33.95	21.50 TRK	.60	—	56.05	1.98057	4	Va

① Hot Lab Analysis ② Unwashed Product

* Note: Truck delivery only, ex Wayne Namelta
no siding available for delivery by rail

Item. 021 1 of 2

1¼" X ¾" STOKER
NOTE: 80 OT
0 FP

INSTITUTION Baskerville Unit #4 LOCATION Baskerville VA
RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON: F.O.B. Mine	COST PER TON: Freight	COST PER TON: Oil Treatment	COST PER TON: Freeze Proofing	COST PER TON: TOTAL Including Oil Treatment	COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
Mary Helen	Mary Helen L. Cedar Grove		TRK		36.0	1.0	6.0	2700+	5.0	14400 28.8	34.48	22.10 TRK	.36	—	56.94	1.97709	2	Ky
Moore Coal	Resources Dev. Fire Creek		TRK		17.31	.65	5.24	2700+	6.5	14862 29.7	34.00	28.00 TRK	.90	—	62.90	2.11785	3	W/Va
Woodruff	Banner Hazard		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	20.50 TRK	.75	-	53.95	1.93370	1	Ky

~~1) No Lab Analysis 2) Unwashed Product~~

Item 022 1 of 2

1¼" X ¼" STOKER

NOTE O OT
O FP

INSTITUTION DINWIDDIE UNIT 27 LOCATION DINWIDDIE VA

86-87

RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
MARY HELEN	MARY HELEN L. CEDAR GROVE		TRK		36.0	1.0	6.0	2700	50	14400 28.8	34.48	21.50 TRK	—	—	55.98	1.94375	(1)	Ky
POORE COAL	RESOURCES DEV. FIRE CREEK		TRK		17.31	.65	5.24	2700	6.5	14862 29.7	34.00	29.00 TRK	—	—	63.00	2.12122	3	WVa
WOODRUFF	BANNER HAZARD		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	23.95 TRK	—	—	56.65	2.03047	2	Ky
																		)

Note Analysis ② Unwashed Product

ESTIMATED TONNAGE 1200 — Ltr. No. 023 — 1 of 2

1¼" X ¼" STOKER

NOTE! ⊙ FP
○ OT

INSTITUTION HAYNESVILLE UNIT #17 — LOCATION HAYNESVILLE VA

86-87 — RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7½	Btu/Lb. Dry Min. Guaranteed	COST PER TON: F.O.B. Mine	COST PER TON: Freight	COST PER TON: Oil Treatment	COST PER TON: Freeze Proofing	COST PER TON: TOTAL Including Oil Treatment	COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
MARY HELEN	MARY HELEN L. CEDAR GROVE		TRK		36.0	1.0	60	2700+	5.0	14400 28.8	34.48	26.40 TRK	—	—	60.88	2.11389	(1)	Ky
MOORE COAL	RESOURCES DEV FIRE CREEK		TRK		17.31	.65	5.24	2700	6.5	14862 29.7	34.00	33.00 TRK	—	—	67.00	2.25590	3	WVa
WOODRUFF	BANNER HAZARD		TRK		34.0	1.0	6.5	2700	60	13950 27.9	32.70	26.50 TRK	—	—	59.20	2.12187	2	Ky
																		)

~~Hot Sb Analysis~~ (2) Unwashed Product

ESTIMATED TONNAGE _____ Item 024 Page 1 of 2

NUT & SLACK

INSTITUTION VPI-SU LOCATION BLACKSBURG VA

NOTE: 8 FT

86-87

RAILROAD _____

ME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.5%	Ash, Max. 7.0	AST 2400°F	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
NTRAL COAL	CRYSTAL RIVER ALMA DRAPER CD. 6 RUN		N.S	K	36.00	1.50	7.0	2500	6.0	14000 28.0	27.00	16.02	-	-	45.02	1.60786	4	WVa
UE CRYSTAL	CUMBERLAND VILLAGE ALMA		NW	T	34.59	.79	6.63	2800+	5.5	14100 28.2	30.50	16.02	-	-	46.52	1.64965	5	WVa
SM	MCRC 1-2 #9		So	6	36.0	1.5	7.0	2700°	5.0	13750 27.5	27.85	11.63	-	-	39.48	1.43564	(1)	Va.
O McCALL	CASE #4 CEDAR GROVE		NS	Th	35.0	.88	6.5	2800°	6.0	14050 28.1	28.25	16.02	-	-	44.27	1.57545	2	Ky
ITED COAL	BLACKFIELD UNWASHED WILLIAMSON & ALMA		NS	Th	35.0	1.26	7.0	2600	5.0	14000 28.0	28.45	16.02	-	-	44.47	1.58822	3	Ky 1

~~Coal Analysis~~ (2) Unwashed Product

Item . 025 . 1 of 2

ESTIMATED TONNAGE [illegible]

$1\frac{1}{4}$" X $\frac{1}{4}$" STOKER

NOTE 1500 FP
0 OT

INSTITUTION Clinch Valley College LOCATION Wise, VA
86-87
RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button 7%	Btu/Lb. Dry Min. Guaranteed	COST PER TON F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment	COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
JOODRUFF	BANNER HAZARD		TRK		34.0	1.0	6.5	2700	6.0	13950 27.9	32.70	4.00 TRK	–	.75	37.45	1.34230	(1)	Ky
UNITED COAL	REEDY BLAIR/CLINTWOOD		TRK		35.0	1.2	(7.31)	1700°	6.0	14000 28.0	34.60	3.00	–	.80	38.40	NOT ACCEPTABLE 1.37143 MOISTURE	2	Va

~~Wet Analysis~~ (2) Unwashed Product

ESTIMATED TONNAGE 12.5 ITEM NO. 026 1 of 2

STOVE COAL

INSTITUTION CAROLINE CORRECTIONAL UNIT #2 LOCATION RT 1 HANOVER VA

8:FP 86-87 RAILROAD

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button	Btu/Lb. Dry Min. Guaranteed	COST PER TON					COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
											F.O.B. Mine	Freight	Oil Treatment	Freeze Proofing	TOTAL Including Oil Treatment			
Disqualified MOORE COAL	RESOURCE DEV. FIRE CREEK		TRK		16.73	.58	3.66	2700		15243 30.5	38.00	26.00 TRK	—	—	64.00	2.09837	1	WVa.
RICHEY COAL	POCAHONTAS & FIRE CREEK		TRK		24.45	.90	6.0	2800		14500 29.0	44.00	26.00 TRK	—	—	70.00	2.41380	(2)	WVa

~~Hot lab Analysis~~ (2) Unwashed Product

ESTIMATED TONNAGE ___

Item 027 1 of 2

STOVE COAL
O = FP
O = OT

INSTITUTION Harrisonburg Correctional Unit #8 LOCATION Harrisonburg VA

86-87

RAILROAD ___

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button	Btu/Lb. Dry Min. Guaranteed	COST PER TON: F.O.B. Mine	COST PER TON: Freight	COST PER TON: Oil Treatment	COST PER TON: Freeze Proofing	COST PER TON: TOTAL Including Oil Treatment	COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
Moore Coal (Disqualified)	Resources Dev Fire Creek		TRK		16.73	.58	3.66	2700		15243 30.5	38.00	19.50 TRK	–	–	57.50	1.88525	1	WVa
Richey Coal	Pocahontas & Fire Creek		TRK		24.45	.63	5.37	2800		14736 29.5	44.00	18.00 TRK	–	–	62.00	2.10170	(2)	WVa

~~(1) No Lab Analysis (2) Unwashed Product~~

ESTIMATED TONNAGE _____ Item 028 1 of 2

STOVE COAL

O = FP

O - OT

INSTITUTION TAZEWELL CORRECTIONAL UNIT #31 LOCATION TAZEWELL VA

80-87

RAILROAD _____

NAME OF COMPANY	MINE SEAM	Grind	Originating R.R.	Freight Zone	Volatile	Sulfur, Max. 1.75	Ash, Max. 6.5%	AST 2700°F Min.	Coke Button	Btu/Lb. Dry Min. Guaranteed	COST PER TON: F.O.B. Mine	COST PER TON: Freight	COST PER TON: Oil Treatment	COST PER TON: Freeze Proofing	COST PER TON: TOTAL Including Oil Treatment	COST PER MILLION BTU Based on Dry Guarantee Including Oil Treatment	Award Position	Remarks
ORE COAL Disqualified	RESOURCES DEV. FIRE CREEK		TRK		16.73	.58	3.66	2700		1528 20.5	38.00	6.00 TRK	-	-	44.00	1.44263	1	WVa
CHEY COAL	POCAHONTAS & FIRE CREEK		TRK		24.45	.63	5.37	2800		14736 29.3	44.00	8.00 TRK	-	-	52.00	1.76272	(2)	WVa

Not to Analysis (2) Unwashed Product

APPENDIX C

COMMONWEALTH of VIRGINIA

Department of General Services
Division of Purchases and Supply
805 East Broad Street

OFFICE OF
DIVISION DIRECTOR

POST OFFICE BOX 1199
RICHMOND, VIRGINIA 23209
(804) 786-3842

December 11, 1986

NOTICE TO VIRGINIA COAL PRODUCERS

The Department of General Services, Division of Purchases and Supply, purchases coal for all of the state-owned facilities in Virginia as well as for two county school systems. Approximately 36% of the coal purchased is mined in Virginia. Most of the balance comes from Kentucky mines. In an effort to increase the amount of Virginia-mined coal used in state-owned facilities, we are sending the enclosed information packet to all known Virginia coal producers.

Please review these specification and delivery requirements. If you can comply with these requirements and wish to participate in our coal bidding program, complete and return the "Bidder's Mailing List Application" to the address indicated on the top of the form. On Page 2 of this application, enter Class Code 405 and Item Code 06. If you are interested in selling coal to the Commonwealth but cannot meet all of our requirements, please advise this office of your interest and indicate the specific requirements you cannot meet.

We are not asking for bids or pricing information. Our present coal contracts expire on June 30, 1987. If the one-year extension provision is not exercised, these contracts will be rebid during the spring of 1987. All we are requesting at this time is an indication of your interest and whether or not you can meet our requirements for either all or part of our needs.

If you have any questions concerning Virginia's coal purchasing program, write to one of the following individuals at the address shown on this letterhead or call them at the telephone numbers indicated:

Mr. H. L. Ford, Jr., (804) 786-4634
Mr. R. D. Kincaid, (804) 786-1603

We hope you will give serious consideration to establishing a supplier-customer relationship with the Commonwealth of Virginia.

Very truly yours,

Horace L. Ford, Jr.

Horace L. Ford, Jr., CPPO
Procurement Section Manager

HLFjr:hmr

cc: Mr. Donald F. Moore, Director

REQUIREMENTS FOR COAL
BY THE
COMMONWEALTH OF VIRGINIA

Bidders must comply with all provisions contained in our contract invitation for bids package. Bids which take exceptions to these provisions or offer alternative specifications cannot be considered. The following is a recap of the major requirements of our last invitation for bids.

General Requirements (applicable to all types of coal):

Proximate Analysis Report - Bids must be accompanied by a proximate analysis report made within six months of the date of the bid by a recognized commercial laboratory.

Delivery - Orders for contract coal are issued as needed by the receiving agencies, and deliveries must be made within 21 calendar days after receipt of the purchase order.

Price Escalation/De-escalation - Price increases may be allowed for changes in contractor's cost of material, labor and transportation no more often than every 90 days; however, contractor is required to document the amount and date of these changes.

Price Adjustments - The Commonwealth will assess price adjustments for individual deliveries which have deficiencies in the areas of BTU, ash and sulfur.

Preparation - Coal shall be washed and shall be free from dirt, bone, and slate.

Stoker Coal Specification Requirements:

Size - 1-1/4" x 1/4". Free of fines
Maximum Ash - Dry Basis (ASTM-D3174) - 6.5%
Maximum Sulfur (ASTM-D3177) - 1.75% for old facilities. 1.39% for new facilities. 1% for George Mason University.
Minimum Dry BTU (ASTM-D2015) - 13,900
Minimum Ash-Softening Temperature (ASTM-D1857) - 2,700^{o} F
Maximum Free-Swelling Index (ASTM-D720) - 7%
Maximum Moisture Content - 5%

Total Usage (tons) - 95,000, delivered to the following locations:
Bland (Pearisburg), Norfolk Southern delivery - 1500 tons
Lawrenceville, Norfolk Southern delivery - 1500 tons
Dillwyn, CSX delivery - 1100 tons
Catawba (Hanging Rock), Norfolk Southern delivery - 2400 tons
Williamsburg, CSX delivery - 6000 tons
Fairfax, truck delivery - 300 tons
Lynchburg, Norfolk Southern delivery - 9000 tons
Richmond, CSX delivery - 2000 tons
Burkeville, Norfolk Southern delivery - 2100 tons
State Farm (Goochland), CSX delivery - 6000 tons
Harrisonburg, Norfolk Southern delivery - 1200 tons

Capron, Norfolk Southern delivery - 3200 tons
Petersburg, Seaboard delivery (two locations) - 21,000 tons
Staunton, CSX delivery (two locations) - 6300 tons
Charlottesville, CSX delivery - 18,000 tons
Goochland, CSX delivery - 3000 tons
Blacksburg (Christiansburg), Norfolk Southern delivery - 7000 tons
Burkeville, truck delivery - 1600 tons
Baskerville, truck delivery - 80 tons
Dinwiddie, truck delivery - 120 tons
Haynesville, truck delivery - 120 tons

NOTE: Truck-delivered coal will be considered at all locations except for one of the Staunton locations.

Nut and Slack Coal Specification Requirements:

Size - 1-1/4" x 0" (not more than 10% retained on a 1-1/4" sieve and 40% to 50% passing the 1/4" sieve).
Maximum Ash - Dry Basis (ASTM-D3174) - 7.5%
Maximum Sulfur (ASTM-D3177) - 1.5%
Minimum Dry BTU (ASTM-D2015) - 13,250
Minimum Ash-Softening Temperature (ASTM-D1857) - 2400^{o} F
Maximum Free-Swelling Index (ASTM-D720) - 7%
Maximum Moisture Content - 6%

Total Usage (tons) - 30,000, delivered to VPI&SU, Blacksburg (Christiansburg) - Norfolk Southern delivery

Stove Coal Specifications:

Size - 2" x 1-1/4"
Maximum Volatile (ASTM-D3175) - 26
Maximum Ash - Dry Basis (ASTM-D3174) - 6.5%
Maximum Sulfur (ASTM-D3177) - 1.75%
Minimum Dry BTU (ASTM-D2015) - 13,900
Minimum Ash-Softening Temperature (ASTM-D1857) - 2600^{o} F
Maximum Moisture Content - 6%

Total Usage (tons) - 525, delivered to the following locations:
Hanover, truck delivery - 125 tons
Harrisonburg, truck delivery - 200 tons
Tazewell, truck delivery - 200 tons

NOTE: All of the above information is based upon our current requirements. Any changes in these requirements will be reflected in our next invitation for bids.

DPS-PF 8 (10-81)

COMMONWEALTH OF VIRGINIA

DEPARTMENT OF GENERAL SERVICES
DIVISION OF PURCHASES AND SUPPLY
P.O. BOX 1199
RICHMOND, VIRGINIA 23209

BIDDER'S MAILING LIST APPLICATION

(See Instructions For Preparation On Last Page)

1. Name of applicant. If individual, enter last name first.

(2) (41)

1a. Federal Employer's I.D. number.

(42) (50)

Social Security number, if individual.

(42) (50)

2. Address to which bid requests are to be mailed.

Street Address

(51) (75)

3. Main telephone number.

(102) (105) (111)

City **State** **Zip Code**

(76) (91) (93) (101)

4. Applicant is a

☐ mfg. ☐ authorized distributor ☐ jobber ☐ retail dealer ☐ factory rep. ☐ service contractor

(112-117)

5. Type of ownership or business. See definitions on last page.

☐ Minority owned or controlled ☐ Small business ☐ Female owned or controlled

(118-120)

If small business, enter number of employees

(121) (123)

6. Delivery zone information (see zone map on last page).

☐ Check here if bidding for delivery in all zones.

(124-147)

bidding for delivery only in certain zones, enter the appropriate numbers.

(124) (127) (130) (133) (136) (139) (142) (145) (147)

7. Identify the items on which you will consistently bid by referring to the *Commodity Class and Item Book.*

A. Open Market (One-Time Purchases): Enter the class and item numbers in numerical sequence and check column 'A'.

B. Term Contract (Annual Contract): Enter class and item numbers on which you would bid if those items were contract and check column 'B'. In some situations, these items may also be purchased under open market procedures. If you want to bid these items on an open market basis, you must also check 'A'.

EXAMPLE

A	B													
✓		Class	2,8,5	Items	2,1	2,3	5,2	5,4						
	✓	Class	5,4,3	Items	1,1	1,8	7,0							
✓	✓	Class	6,7,0	Items	0,2	0,6	1,5	2,4	2,5	5,4	5,7	5,9	6,5	6,8
✓	✓	Class	6,7,0	Items	7,0	7,3	8,0							

	A	B														
(2-3)			CLASS	(4)	ITEMS	(7)	(9)	(11)	(13)	(15)	(17)	(19)	(21)	(23)	(25)	(26)
(2-3)			CLASS	(4)	ITEMS	(7)	(9)	(11)	(13)	(15)	(17)	(19)	(21)	(23)	(25)	(26)
(2-3)			CLASS		ITEMS											
(2-3)			CLASS		ITEMS											
(2-3)			CLASS		ITEMS											
(2-3)			CLASS		ITEMS											
(2-3)			CLASS		ITEMS											
(2-3)			CLASS		ITEMS											
(2-3)			CLASS		ITEMS											
(2-3)			CLASS		ITEMS											

8. Address of main business office (if different from #2 above).

_____

_____

9. Type of organization (check one).

____Individual ____Partnership ____Corporation

10. If incorporated, in which state and date _____

1. Annual gross sales. Amount: $_____ For year ending _____

12. Commercial rating _____

13. Bank references _____

_____

14. Approximate inventory normally stocked $_____

15. Location of principal factory or warehouse _____

16. Approximate square footage of covered warehouse space _____

17. Approximate square footage of manufacturing space _____

18. Have you sold to the Commonwealth of Virginia in the past 2 years? _____

19. Other governmental entities to which you have sold in the past 2 years _____

_____

20. Principal line of business _____

21. How long in present business? _____

22. If your company has been in business less than one year, additional information concerning the experience of your personnel and/or affiliations of the company should be furnished. This may be in the form of a letter or entered under Bidder's Comments below.

23. **For printing firms only:** Attach a complete list of your printing equipment.

24. Bidder's comments:

25. The undersigned hereby certifies that the above and foregoing information is a full, true and correct statement of the facts. It is understood that failure to bid on four (4) consecutive bid invitations for any given class and item could result in removal from the mailing list for that class and item.

_____
Authorized signature

_____
Typed name

_____
Title

Please check this application to ensure that a response has been made to each question.

_____
Date

BUSINESS DEFINITIONS

Minority Business

The following definition of "Minority Business" may be found in Title 2.1, Chapter 7.5, code of Virginia.

"A Minority Business" is a business enterprise that is owned or controlled by one or more socially or economically disadvantaged persons. Such disadvantage *may* arise from cultural, racial, chronic economic circumstances or background or other similar cause. Such persons include, but are not limited to, Blacks, Puerto Ricans, Spanish-speaking Americans, American Indians, Eskimos, and Aleuts."

As defined by the State Office of Minority Business Enterprises:

"The term 'Minority Business Enterprise' means a business at least 50 per centum of which is owned by minority group members or, in case of a publicly owned business, at least 51 per centum of the stock of which is owned by minority group members. For the purpose of the preceding sentence, minority group members are citizens of the United States who include, but are not limited to, Blacks, Spanish-speaking, Oriental, Indians, Eskimos, and Aleuts."

Small Business

"Small Business" means a corporation, partnership, sole proprietorship, or other legal entity formed for the purpose of making a profit, which is independently owned and operated, has *either* fewer than 100 employees or less than $1,000,000 in annual gross receipts.

Female Owned or Controlled

A "Female Owned or Controlled Business" is a business enterprise at least 50 per centum of which is owned by females or in the case of a publically owned business at least 51 per centum of the stock of which is owned by females.

INSTRUCTIONS FOR PREPARATION OF BIDDER'S MAILING LIST APPLICATION

Please respond to each of the twenty-five (25) numbered items on the application form. If any item is not completed, the application will be returned to you for completion, and approval of the application will be delayed.

Forward the completed application to the Division of Purchases and Supply, 805 E. Broad Street, P.O. Box 1199, Richmond, VA 23209, for review and approval.

Additional explanation is offered for the following item numbers.

Item 1. Name of applicant. Enter the firm's name under which bids will be submitted unless you are applying as a factory representative (see Item 4 explanation). The approved bidder must submit bid proposals directly to the Division of Purchases and Supply in firm's name. Purchase orders and invoices must be issued in the same name.

Item 1a. Enter your firm's Federal Employer's Identification Number, unless you are applying as an individual (Item 9), in which case enter your social security number. The vendor's mailing list is computerized and your firm can only be recognized by these unique numbers.

Item 2. Space for a nine-digit zip code has been provided. If you use the five-digit code, please enter it in the first five spaces from the left.

Item 4. 'Factory representative' is defined as an applicant who will receive bid invitations in his name and submit bid proposals in the names of those he represents. In this case, the applicant must attach to the application, powers of attorney or other instruments from the companies represented as evidence of bona fide authority that the representative is empowered to act for and bind those companies. For purposes of this application, the term 'jobber' is synonymous with the term 'broker'.

Item 6. Virginia is divided into nine (9) geographical delivery zones. See zone map below. Applicant may elect to bid for delivery in all zones or select individual zone(s) in which he will bid. Bid invitations for items selected will be mailed only for the zones designated.

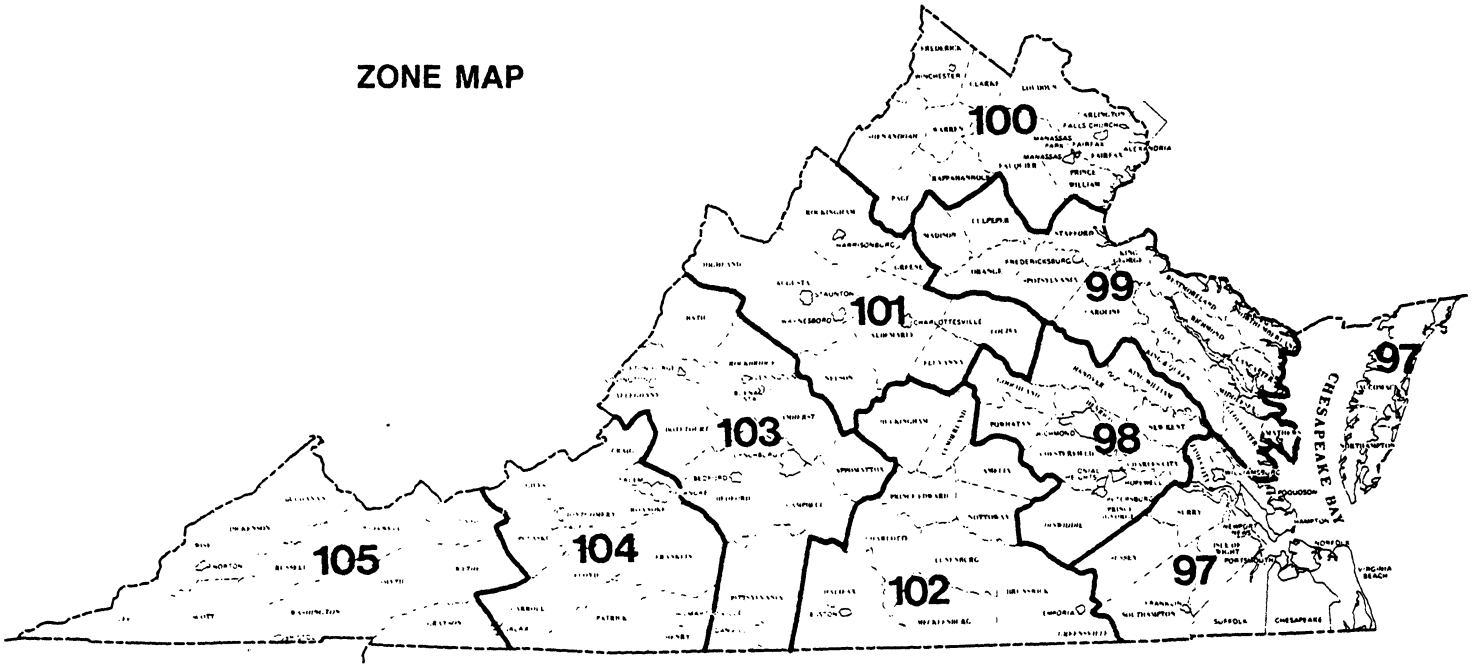
No firm or individual will be placed on the mailing list to receive bids at different addresses for the same class and item in the same bidding zone. Two branches of the same company may bid for delivery in the same zones only if bidding on different items.

Item 12. For commercial rating enter any rating that indicates your financial standing, such as financial reporting service rating, bank rating, credit association rating, etc.

Item 24. This space is to be used for additional explanation or comment any of the other items or for the presentation of other pertinent information.

Item 25. Handwritten signature is required.

ZONE MAP



1987 SESSION

LD6116105

SENATE BILL NO. 472

Offered January 20, 1987

A BILL to amend the Code of Virginia by adding a section numbered 11-47.1, relating to competitive bids for coal used in state facilities.

Patron—Bird

Referred to the Committee on General Laws

Be it enacted by the General Assembly of Virginia:

1. That the Code of Virginia is amended by adding a section numbered 11-47.1 as follows:

11-47.1. Priority for Virginia coal used in state facilities.—In determining the awards for bids on coal to be supplied for use in state facilities, the Department of General Services shall first consider competitive sealed bids on such coal from companies offering Virginia-mined coal. If all such bids fail to reasonably meet the specifications established by the Department of General Services for such coal, then the Department shall seek competitive sealed bids from any other companies.

Official Use By Clerks	
Passed By The Senate	**Passed By The House of Delegates**
without amendment ☐	without amendment ☐
with amendment ☐	with amendment ☐
substitute ☐	substitute ☐
substitute w/amdt ☐	substitute w/amdt ☐
Date: _____	Date: _____
_____	_____
Clerk of the Senate	Clerk of the House of Delegates

APPENDIX D

A STUDY OF THE VIRGINIA COAL INDUSTRY

Walter R. Hibbard, Jr.
Director, Virginia Center for Coal and Energy Research
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24060

EXECUTIVE SUMMARY

The Virginia coal industry faces many challenges. In our first study of the coal industry's infrastructure, it was determined that (1) except for 4 locations, each Virginia coal mine is served by a single railroad, (2) each coal consumer in the state is served by a single railroad, (3) coal's delivered cost was the most important factor in determining market share, and (4) Virginia faces excess coal-producing capacity and depressed coal prices (due to a depressed steel industry, foreign export competition, lower mine mouth costs at eastern Kentucky coal mines, and lower transportation costs for coal from West Virginia mines).

In our second study, of coal's utility markets, it was determined that Virginia mines supplied only 16 percent of the coal burned by the 37 utility plants and 20 utilities purchasing coal from the state. In fact, only 12 of these plants purchased most of their coal from Virginia.

Utilities frequently negotiate transport costs with railroads from certain railroad regions to one of their plants. The railroad having access to the plant usually wins. Next, the utility obtains bids from coal mines located in the winning railroad region, thus limiting competition to mines in that area.

The lowest delivered cost for steam coal usually results when the supplier mine and the consumer utility are located on the same railroad. 371 out of 419 Virginia coal mines presently operating are served by Norfolk Southern (NS) railroad. Only one out of five Virginia Power Company generation plants, however, use NS tracks. Thus, Virginia Power purchases most of its coal from eastern Kentucky and West Virginia mines -- mines served by CSX railroad.

Our third study investigated all markets for Virginia coal and prospects for future trends. Utilities are Virginia coal's largest market, comprising about 40 percent of mine shipments. Prospects for increasing that number depend on successfully penetrating Virginia coal's served market beyond the present 16 percent. The industrial market comprises about 24 percent of Virginia coal shipments. According to the Keystone Manual, most of these customers are in the southeastern U.S., and are served by both the NS and CSX railroads. Again, prospects for increasing industrial purchases of Virginia coal depend on lowering delivered costs. The export market is also approximately 24 percent of Virginia coal sales. Only about 25 percent of the exports out of Hampton Roads are Virginia coal. Market penetration here will also require lower delivered costs (relative to mines in eastern Kentucky and West Virginia) and meeting competition from foreign suppliers, principally to European buyers. Domestic coking coal is Virginia's smallest market segment, which has shrunk to 12 percent. Prospects are not encouraging. Only one coking plant remains in Virginia, and the present cost of imported coke is lower than that for domestic coke in U.S. markets.

Lower costs of Virginia coal at the mine depend on productivity, which correlates with (1) seam height, (2) injury frequency, (3) number of surface mines, (4)

longwall equipment, and (5) efficient diesel haulage. Average seam height, injury frequency, and the percentage of coal that is surface-mined are all decreasing. There are 12 longwall mining operations in Virginia. Diesel haulage is now legal in Virginia. Thus productivity is increasing, but despite record production in 1985, Virginia coal industry employment last year was down to 13,500 (from 19,000 in 1978). The economic multiplier is very large since total employment in the coal-producing counties was 68,872 last year (down from 75,299 in 1980). That means four area jobs per one coal company job -- unusually large, which is typical of single-industry areas.

If the Virginia coal industry retains its present market share, production for 1986 will be 45 million tons, a new record. But with increased productivity, the number of Virginia coal miners in 1986 is already down to 10,240, and the total number of coal company employees down to about 12,000. If Virginia retains its present coal market share until 1990, production may be as high as 50 million tons. But the higher productivity required to remain competitive will mean a total of only about 13,000 coal industry jobs.

Thus, prospects for the Virginia coal industry are uncertain unless something changes. The Quillen Act providing incentives for utilities buying Virginia coal might increase coal shipments by 1 to 2 million tons. Proposed revisions of the Clean Air Act that demand reduced SO_2 emissions might increase Virginia coal shipments by another 3 to 4 million tons. OPEC resurgence to raise the price of oil may result in higher coal prices and increased demand. These improvements may be countered, however. The CSX railroad has announced a program to increase its market share of coal shipments by 5 to 10 percent. And Virginia Power's barging program with NS has been cancelled because CSX lowered its rail rates for direct delivery of out-of-state coal.

The competition appears to be between railroads with little leverage left for the Virginia coal industry.

TABLE IV. VIRGINIA COAL PRODUCTION AND SHIPMENTS
(Million Tons)

	1978	1979	1980	1981	1982	1983	1984	1985	1990	1995	2000
PRODUCTION	32	37	41	42	40	36	41	42	50	52	55
% U.S.	5	5	5	5	5	5	5	5	5	5	5
% C.A.	18	18	18	18	18	18	17	18	19	19	19
SHIPMENTS	32	36	41	41	39	35	41	44	50	52	55
% U.S.	5	5	5	5	5	4	5	5	5	5	5
% C.A.	19	17	18	18	18	18	18	19	19	19	19
UTILITY	12	13	13	12	15	13	16	17	21	22	23
% U.S.	2	2	2	2	3	2	2	2	3	3	3
% C.A.	13	12	11	11	13	12	13	14	14	14	14
% VA.	38	36	32	29	38	37	39	39	42	42	42
COKING	10	9	9	9	5	6	7	6	7	7	7
% U.S.	14	12	13	15	12	16	16	15	16	15	15
% C.A.	29	23	26	27	22	26	27	26	28	27	26
% VA.	31	25	22	22	13	17	17	14	14	13	13
INDUSTRY	6	6	7	8	7	7	9	10	11	11	12
% U.S.	10	9	12	12	11	11	12	13	13	13	12
% C.A.	33	32	37	40	37	33	35	42	39	38	40
% VA.	19	17	17	20	17	20	22	24	24	21	23
EXPORTS	4	8	12	12	13	9	9	11	11	12	13
% U.S.	10	12	13	11	12	12	11	12	12	12	12
% C.A.	18	20	22	19	21	20	18	19	21	21	21
% VA.	13	19	29	29	33	26	22	25	22	23	24
EXP.MET.	3	7	10	10	11	7	8	9	9	10	10
% U.S.	10	13	16	15	17	14	14	15	14	15	14
% C.A.	16	21	21	18	22	19	18	19	20	21	20
% VA.	9	19	24	24	28	20	20	20	18	23	18
EXP.STEAM	1	1	2	2	2	2	1	2	2	2	3
% U.S.	10	7	7	4	5	7	4	6	7	6	7
% C.A.	33	17	25	25	20	25	20	22	22	22	30
% VA.	3	3	5	5	5	6	2	5	4	4	5

SOURCES: Virginia Division of Mines and Quarries Annual Reports 1978-1985. VCCER Reports on The Virginia Coal Industry. N.C.A. Reports on Power Plant Coal Deliveries 1978-1985. Coal Production DOE/EIA 0118(1978-1986). Coal Distribution DOE/EIA- 0125(1978-1986)

TABLE XXIII. EMPLOYMENT IN VIRGINIA'S COAL PRODUCING COUNTIES.
AUGUST 1986.

	BUCH	DICK	LEE	RUSS	SCOT	TAZE	WISE	TOTAL
COAL MINES	168	76	25	12	3	20	115	419
COAL MINERS	4187	1908	581	209	38	602	2715	10240
OFFICE WORKERS	151	67	20	17	2	25	683	965
TOTAL COAL JOBS	4338	1975	601	226	40	627	3398	11205
TOTAL AREA JOBS	10589	5062	8184	9520	11550	15240	15253	75398
% COAL JOBS	41	39	7	2	1	4	22	15
LABOR FORCE	12900	5980	9068	11101	12084	17584	17588	86305
UNEMPLOYED	2311	918	884	1581	534	2344	2335	10907
% UNEMPLOYED	17.9	15.4	9.7	14.2	4.4	13.3	12.0	12.6

SOURCES: VIRGINIA DIVISION OF MINES AND QUARRIES, VIRGINIA EMPLOYMENT COMMISSION

COAL STATISTICS FACT SHEET

YEAR-TO-DATE COAL PRODUCTION 38 WEEKS ENDING SEPTEMBER 20, 1986
MILLION SHORT TONS

	38 WEEKS 1986	COMPARED TO 38 WEEKS 1985
UNITED STATES	636.362	- 0.8 %
CENTRAL APPALACHIA	216.259	- 0.3 %
WEST VIRGINIA	91.587	- 1.2 %
EASTERN KENTUCKY	92.917	+12.3 %
VIRGINIA	31.755	+ 0.9 %
VIRGINIA AS A PERCENT OF CENTRAL APPALACHIA	14.68	+ 1.1 %
VIRGINIA AS A PERCENT OF UNITED STATES	4.99	+ 1.8 %
HAMPTON ROADS EXPORTS (8 MONTHS)	27.87	- 7.7 %
HAMPTON ROADS TOTAL (8 MONTHS)	31.34	- 8.4 %
UNITED STATES EXPORTS (7 MONTHS)	48.57	- 1.9 %
UNITED STATES IMPORTS (7 MONTHS)	1.24	+14.0 %

ANNUAL COAL PRODUCTION - MILLION SHORT TONS

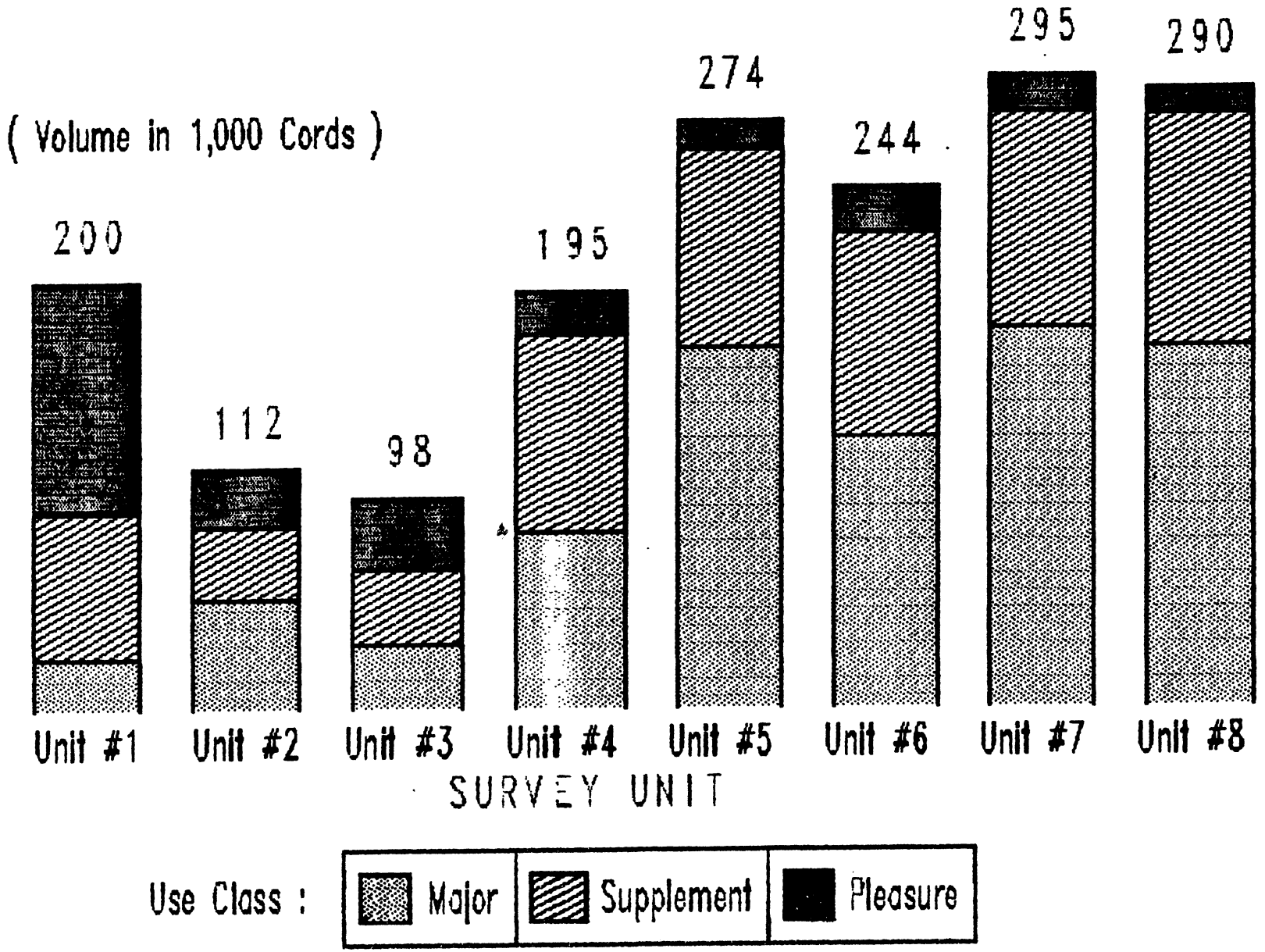
	1979	1980	1981	1982	1983	1984	1985	1986 Est
UNITED STATES	781	830	824	838	782	896	886	879
CENTRAL APPALACHIA	253	266	269	277	243	286	292	306
WEST VIRGINIA	112	120	112	128	114	130	127	125
EASTERN KENTUCKY	104	105	115	109	93	115	123	138
VIRGINIA	37	41	42	40	36	41	42	43
HAMPTON ROADS								
EXPORTS	34	49	48	53	36	36	44	41
TOTAL	35	51	50	57	39	42	50	46
U.S.EXPORTS	65	90	110	105	77	73	93	90
VIRGINIA'S RANK AS COAL PRODUCER STATE	7	6	6	6	7	8	7	7

1986 ESTIMATES ARE YEAR-TO-DATE 1986 PERCENT CHANGES APPLIED TO 1985 TOTALS.

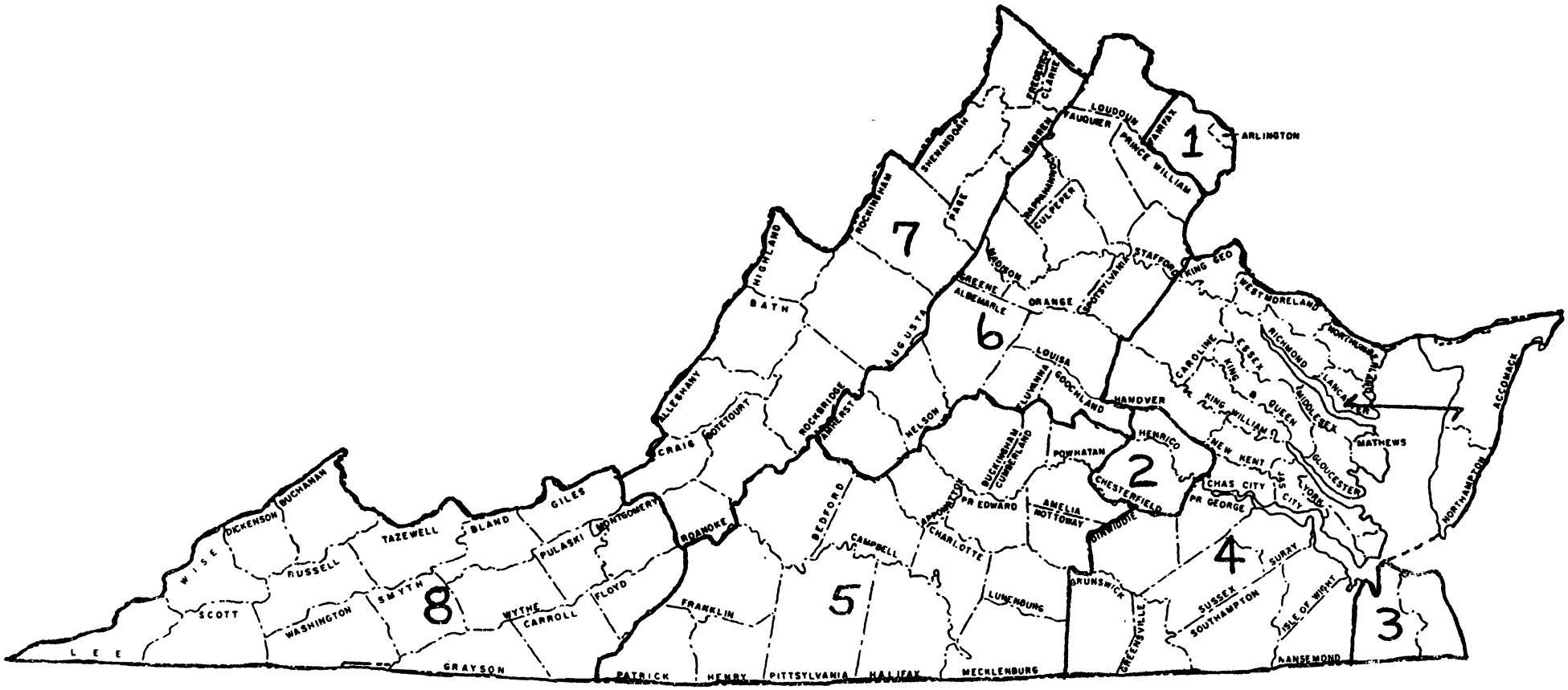
SOURCES: DOE/EIA WEEKLY COAL REPORTS, COAL OUTLOOK , AND VIRGINIA PORT AUTHORITY REPORTS.

WRH:10/1/86.

VOLUME of RESIDENTIAL FUELWOOD BURNED in WINTER of 1985/1986
Virginia State Used 1.71 Million Cords



FUELWOOD SURVEY UNITS



DIVISION OF INDUSTRIAL DEVELOPMENT AND PLANNING

APPENDIX F

The University of Texas at El Paso

Mechanical & Industrial Engineering Department

(915) 747-5450
El Paso, Texas
79968-0521

El Paso Solar Pond Facts

- Area = 0.83 acre - second largest in U. S., largest is TVA solar pond in Chattanooga, TN at 1.0 acre area. One pond in Israel is 60 acres.

- Pond operates at 85°C (185°F) in the bottom storage zone while the surface layer is at 10°C (50°F).

- First solar pond in the world to supply industrial process heat (1985).

- First solar pond in the U. S. to generate electricity, September 19, 1986. Has reached 70 kilowatts peak output - capable of reaching 100 kW. Only other solar pond producing electricity are in Israel, 5,000 kilowatts and Australia, 20 kilowatts.

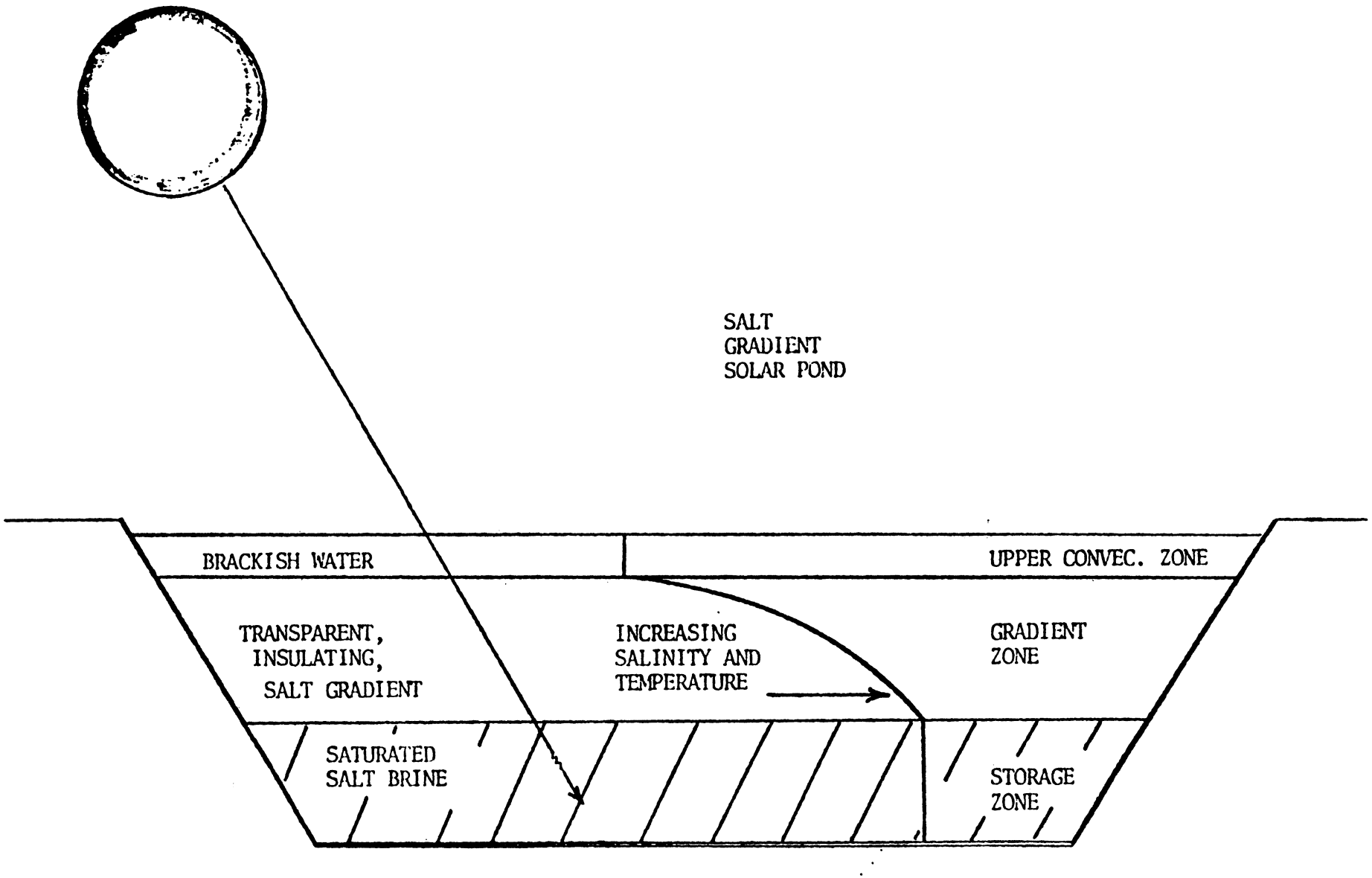
- Solar pond constructed and operated by U. T. El Paso with funding and help from:

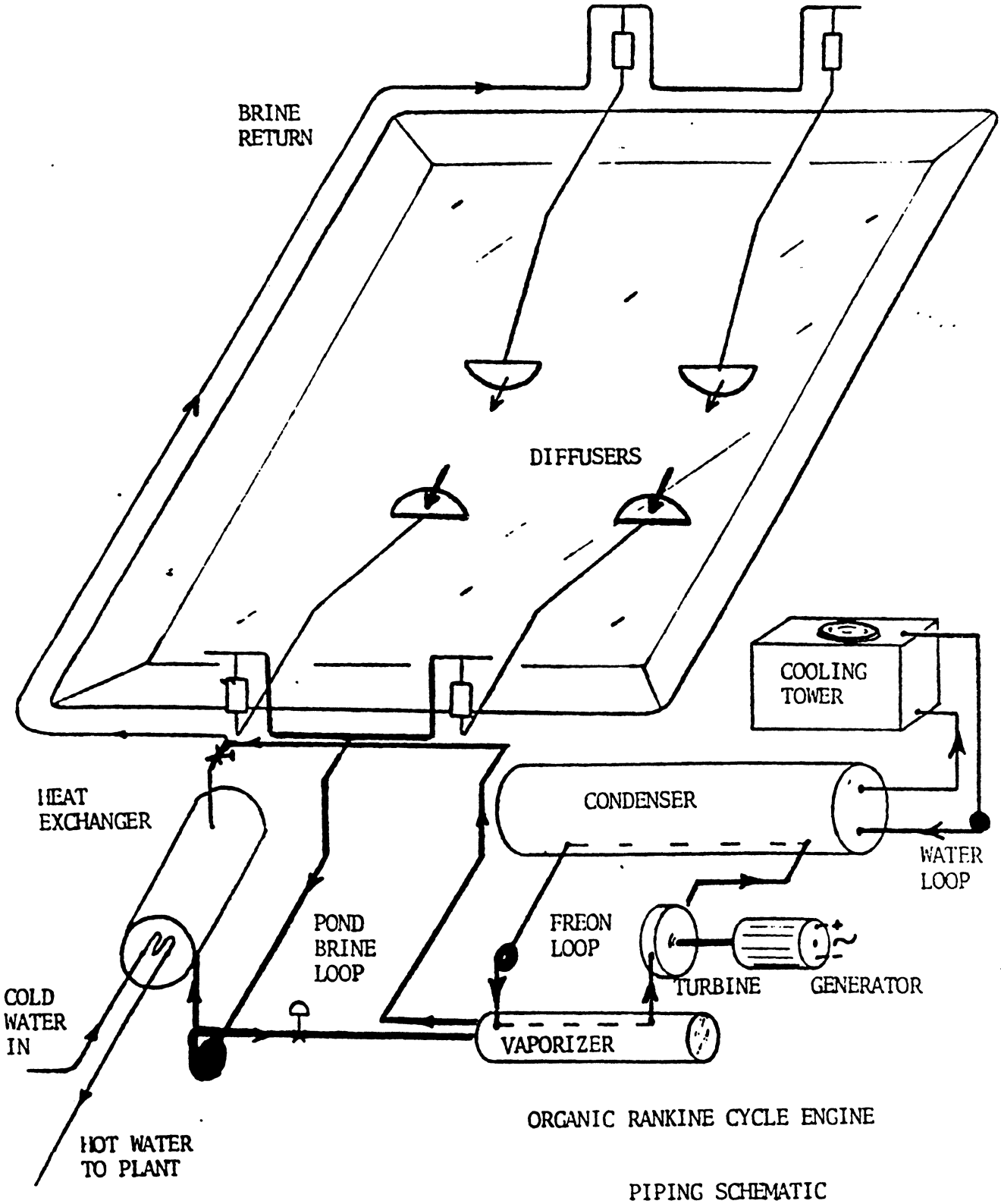
  U. S. Bureau of Reclamation
  El Paso Electricity Company
  Bruce Foods Corporation
  Texas Energy and Natural Resources Advisory Council (TENRAC)

- Outstanding and unique example of cooperative project between:

  University
  Federal Government
  Utility
  Private Industry
  State Government

- Future plans - In 1987, the El Paso Solar Pond will become the first solar pond in the U. S. and possibly the world to produce drinking water from brackish (salty) well water by using the thermal and electric energy from the pond to power a low temperature desalination unit.


SALT
GRADIENT
SOLAR POND
BRACKISH WATER
UPPER CONVEC. ZONE
TRANSPARENT,
INSULATING,
SALT GRADIENT
INCREASING
SALINITY AND
TEMPERATURE
GRADIENT
ZONE
SATURATED
SALT BRINE
STORAGE
ZONE



ORGANIC RANKINE CYCLE ENGINE

PIPING SCHEMATIC

1987 SESSION

LD7093108

SENATE BILL NO. 467

AMENDMENT IN THE NATURE OF A SUBSTITUTE

(Proposed by the Senate Committee on Agriculture, Conservation and Natural Resources on February 2, 1987)

(Patron Prior to Substitute–Senator Buchanan)

A BILL to amend and reenact §§ 45.1-287, 45.1-288, 45.1-293, 45.1-295, 45.1-296, 45.1-297, 45.1-299, 45.1-300, 45.1-301, 45.1-302, 45.1-304, 45.1-311, 45.1-313, 45.1-314, 45.1-316, 45.1-320, 45.1-321 and 45.1-322 of the Code of Virginia, relating to the Virginia Oil and Gas Act.

Be it enacted by the General Assembly of Virginia:

1. That §§ 45.1-287, 45.1-288, 45.1-293, 45.1-295, 45.1-296, 45.1-297, 45.1-299, 45.1-300, 45.1-301, 45.1-302, 45.1-304, 45.1-311, 45.1-313, 45.1-314, 45.1-316, 45.1-320, 45.1-321 and 45.1-322 of the Code of Virginia are amended and reenacted as follows:

§ 45.1-287. Declaration of policy.–It is hereby declared to be the public policy of the Commonwealth and the purpose of this chapter to:

1. Foster, encourage and promote the safe and efficient exploration for and development, production, utilization and conservation of the oil and gas resources located within the Commonwealth;

2. Provide ~~, in those areas of the Commonwealth where geological, geophysical and operational data are not adequate to suggest reliable guides for the orderly development of new reservoirs,~~ a statutory method of oil and gas conservation for the purposes of maximizing exploration, development, production and utilization of oil and gas resources;

3. Provide statutory procedures for the recognition and protection of the rights of persons owning interests in oil or gas resources contained within a pool;

4. Ensure the safe recovery of coal;

5. Maximize the production and recovery of coal without substantially affecting the right of a gas operator proposing to drill a gas well to explore for and produce gas; and

6. Ensure that the water resources of the Commonwealth are protected.

§ 45.1-288. Definitions.–As used in this chapter, unless the context clearly indicates otherwise:

1. "Barrel" means 42 U.S. gallons of 231 cubic inches each of liquids, including slurries, at a temperature of 60° Fahrenheit;

2. [Repealed.]

3. "Bridge" means an obstruction placed in a well at any specified depth;

4. "Carried well operator" means a well operator of a tract included in a drilling unit who elects to share in the operation of the well on a carried basis by agreeing to have his proportionate share of the costs allocable to his interests charged against his share of production from the well;

5. "Casing" means all pipe set in wells except conductor pipe and tubing;

6. "Cement" means hydraulic cement properly mixed with water;

7. [Repealed.]

8. "Coal operator" means any person who has the right to operate or does operate a coal mine;

9. "Coal protection string" means a string designed to protect a coal seam;

10. "Coal seam," "workable coal bed" and "workable coal seam" are interchangeable terms and mean any seam of coal twenty inches or more in thickness, unless a seam of less thickness is being commercially worked, or can in the judgment of the Department foreseeably be commercially worked and will require protection if wells are drilled through it;

11. "Combination well" means a well producing both oil and gas;

12, 13. [Repealed.]

14. "Conductor pipe" means the short string of large diameter used primarily to control caving and washing out of unconsolidated surface formations;

15. "Correlative rights" means the rights of each owner of oil or gas interests in a

single pool to have a fair and reasonable opportunity to obtain and produce his just and equitable share of production of the oil or gas in such pool or its equivalent without being required to drill unnecessary wells or incur other unnecessary expense to recover or receive the oil or gas or its equivalent;

16. "Cubic foot of gas" means the volume of gas contained in one cubic foot of space at a standard pressure base of 14.73 pounds per square inch and a standard temperature base of sixty degrees Fahrenheit;

17. "Deviation survey" means any process to determine the angle of deviation, using the surface location of the well as the apex, of the well bore from the true vertical beneath the apex on the same horizontal subsurface plane;

18. "Directional survey" means any process to determine (i) the angle of deviation, using the surface location of the well as the apex, of the well bore from the true vertical beneath the apex on the same horizontal subsurface plane, and (ii) the direction of an imaginary line from the true vertical beneath the apex to the well bore on the same horizontal subsurface plane;

19. "Drilling unit" means, as applicable, (i) the acreage on which one oil or gas well may be drilled under Article 2 (§ 45.1-299 et seq.) of this chapter or (ii) the acreage on which one gas well may be drilled under § 45.1-321 of this Code;

20. "Expanding cement" means any cement approved by the Inspector which expands during the hardening process, including but not limited to regular oil field cements with the proper additives;

21. "Exploratory well" means a well drilled either in search of a new, and as yet undiscovered, field of oil or gas, or with the expectation of greatly extending the limits of a field already partly developed;

22. "Facility" means any facility utilized in the oil and gas industry in this Commonwealth and specifically named or referred to in this chapter, other than a well or well site;

23. "Fluid injection well" means a well drilled or converted for the purpose of introducing water or other fluid pressure into and upon the producing strata for the purpose of recovering the oil contained therein;

24. "Gas" or "natural gas" means all natural gas whether hydrocarbon or non-hydrocarbon or any combination or mixture thereof, including hydrocarbons, hydrogen sulfide, helium, carbon dioxide, nitrogen, hydrogen, casing head gas, and all other fluids not defined as oil in this section;

25. "Gas-oil ratio test" means a test, by any means generally accepted in the oil and gas industry, to determine the number of cubic feet of gas produced per barrel of oil produced;

26. "Gas operator," as used in §§ 45.1-320 through 45.1-323 of this Code, means any person who has the right to develop and produce or does develop and produce gas from a pool and to appropriate the gas produced therefrom either for himself or for himself and others. In the event that there is no gas lease in existence with respect to the tract in question, the owner of the gas rights therein shall be considered a gas operator of the gas in that portion of the pool underlying the tract which he owns;

27. "Gas well" means any well which produces or appears capable of producing a ratio of 6,000 cubic feet of gas or more to each barrel of oil on the basis of the initial gas-oil ratio test;

28. "Initial gas-oil ratio test" means the gas-oil ratio test performed for the purpose of designating a well as an oil well or a gas well;

29. "Inspector" means the Virginia Oil and Gas Inspector appointed to assist the Chief under § 45.1-291 of this Code or such other public officer, employee or other authority as may in emergencies be acting in the stead, or by law be assigned the duties of, the Virginia Oil and Gas Inspector;

~~30. "Jurisdictional well" means an oil or gas well over which the Virginia Oil and Gas Conservation Board has jurisdiction as set forth in Article 2 (§ 45.1-299 et seq.) of this~~

~~chapter;~~

31. "Just and equitable share of production" means, as to each person, an amount of oil and gas or both in the same proportion to the total production from a well as that person's acreage bears to the total acreage in the drilling unit;

32. "Linear foot" means one foot in a straight line on a horizontal plane;

33. "Log" or "well log" means the written record progressively describing all strata, water, oil or gas encountered in drilling, depth and thickness of each bed or seam of coal drilled through, quantity of oil, volume of gas, pressures, rate of fill-up, fresh and salt water-bearing horizons and depths, cavings strata, casing records and such other information as is usually recorded in the normal procedure of drilling. The term shall also include the electrical survey records or logs if any are made;

34. "Mine" means an underground or surface excavation or development with or without shafts, slopes, drifts or tunnels for the extraction of coal, minerals or nonmetallic materials, commonly designated as mineral resources, excluding oil and natural gas, which contains mineral resources and the hoisting or haulage equipment and appliances, if any, for the extraction of the mineral resources. The term embraces all of the land or property of the mining plant, including both the surface and subsurface, that is used or contributes directly or indirectly to the mining, concentration or handling of the mineral resources;

35. "Mine operator" means any person who has the right to operate or does operate a mine other than a coal mine;

36. "Mud" or "mud-laden fluid" means any approved mixture of water and clay or other material as the term is commonly used in the industry;

37. "Oil" means natural crude oil or petroleum and other hydrocarbons, regardless of gravity, which are produced at the well in liquid form by ordinary production methods and which are not the result of condensation of gas after it leaves the underground reservoir;

38. "Oil well" means any well which produces or appears capable of producing a ratio of less than 6,000 cubic feet of gas to each barrel of oil on the basis of the initial gas-oil ratio test;

39. "Operator" means any person who has the right to operate or does operate a well or a mine;

40. "Owner" means (i) when used with reference to any well, any person who owns, operates, or has the right to operate such a well as principal or as lessee, and (ii) when used with reference to any coal seam, any person who owns, leases, operates, or has the right to operate the coal seam;

41. "Participating operator" or "participating well operator" means a well operator who elects to bear a share of the risks and costs of drilling, completing, equipping, operating, plugging and abandoning a well on a drilling unit and to receive a share of production from the well equal to the proportion which the acreage in the drilling unit he owns or holds under lease bears to the total acreage of the drilling unit;

42. "Person" means any natural person, firm, partnership, partnership association, association, company, corporation, receiver, trustee, guardian, executor, administrator, fiduciary or representative of any kind and includes any government, political subdivision or any agency thereof;

43. "Person under a disability" shall have the meaning ascribed to it in § 8.01-2 of this Code;

44. "Pillar" means a solid block of coal, ore or other material left unmined to support the overlying strata in a mine;

45. "Pipeline" means any pipe above or below the ground used or to be used for the transportation of oil or gas;

46. "Plat" or "map" means a map, drawing or print showing the location of a well or wells, mine or quarry;

47. "Plug" means the stopping of the flow of water, gas or oil from one stratum to another in connection with the abandoning of a well in accordance with the requirements of law;

48. "Pool" means an underground accumulation of oil or gas in a single and separate natural reservoir. It is characterized by a single natural-pressure system so that production of oil or gas from one part of the pool tends to or does affect the reservoir pressure throughout its extent. A pool is bounded by geologic barriers in all directions, such as geologic structural conditions, impermeable strata, or water in the formation, so that it is effectively separated from any other pool which may be present in the same geologic structure;

49. "Porosity" means a measure of the pore space in a given quantity of bulk rock, expressed as a percentage;

50. "Project area" means the well and any other disturbed area, including roads and off-site disposal, associated with the well;

51. "Red shales" mean the undifferentiated shaly portion of the Bluestone Formation normally found above the Pride Shale Member of the formation, and extending upward to the base of the Pennsylvanian strata, which red shales are predominantly red and green in color but may occasionally be gray, grayish green and grayish red;

52. "Royalty owner" means any owner of oil and gas in place, or oil and gas rights, to the extent that such owner is not a well operator or a gas operator;

53. "Safe mining through of a well" means the mining of coal in a coal seam up to and through a well which penetrates the coal seam but has been plugged pursuant to §§ 45.1-344 through 45.1-346 of this Code so that the casing and plug in the well where the well bore penetrated the coal seam is safely severed;

54. "Shot" or "shooting" means exploding nitroglycerine or other high explosive in a hole to shatter the rock and increase the flow of oil or gas;

55. "Spoil" means any overburden or other material removed from its natural state in the process of preparing or utilizing a well location;

56. "Stimulate" means any action taken by a well operator to increase the inherent productivity of an oil or gas well, including, but not limited to, fracturing, shooting or acidizing, but excluding (i) cleaning out, bailing or workover operations and (ii) the use of surface-tension reducing agents, emulsion breakers, paraffin solvents and other agents which affect the oil or gas being produced as distinguished from the producing formation;

57. "String of pipe" means the total footage of pipe of uniform size set in a well. The term embraces conductor pipe, casing and tubing. When the casing consists of segments of different size, each segment constitutes a separate string. A string may serve more than one purpose. The classification of a string is based on its primary function. The "surface string" has its upper end at the surface; the "intermediate strings" prevent caving, shut off connate water in strata below the surface string, and protect strata from exposure to lower zone pressures; and the "production string," where used, is the string through which the well is completed and frequently produced and controlled;

58. "Target formation" means the primary geological formation identified by the well operator in his application for a drilling permit filed under § 45.1-311 of this Code;

59. "Tracts comprising a drilling unit" means all separately owned tracts or portions thereof which are included within the boundaries of a drilling unit;

60. "Tubing" means the small diameter string set after the well has been drilled from the surface to the total depth and through which the oil or gas or other substance is produced or injected;

61. "Waste" means (i) physical waste, as that term is generally understood in the oil and gas industry; (ii) the inefficient, excessive, improper use, or unnecessary dissipation of reservoir energy; (iii) the inefficient storing of oil or gas; (iv) the locating, drilling, equipping, operating, or producing of any oil or gas well in a manner that causes, or tends to cause, a reduction in the quantity of oil or gas ultimately recoverable from a pool under prudent and proper operations, or that causes or tends to cause unnecessary or excessive surface loss or destruction of oil or gas; (v) the production of oil or gas in excess of transportation or marketing facilities, the amount reasonably required to be produced in the proper drilling, completing, or testing of the well from which it is produced; except gas

produced from an oil well or condensate well pending the time when with reasonable diligence the gas can be sold or otherwise usefully utilized on terms and conditions that are just and reasonable; and (vi) underground or above ground waste in the production or storage of oil, gas, or condensate, however caused;

62. "Waste disposal well" means a well drilled or converted for the disposal of drilling fluids, producing waters and other wastes associated with the exploration, development, or production of oil or gas;

63. "Water protection string" means a string designed to protect the fresh water sands;

64. "Well" means any shaft or hole sunk, drilled, bored or dug into the earth or into underground strata for the extraction or injection or placement of any gaseous or liquid substance, or any shaft or hole sunk or used in conjunction with such extraction or injection or placement. The term "well" does not include any shaft or hole sunk, drilled, bored or dug into the earth for the sole purpose of core drilling or pumping or extracting therefrom potable, fresh or usable water for household, domestic, industrial, agricultural or public use and does not include power boreholes, water boreholes, methane drainage boreholes, where the methane is vented or flared rather than produced and saved, or any other boreholes necessary or convenient for the extraction of coal or drilled pursuant to a uranium exploratory program carried out pursuant to the laws of this Commonwealth;

65. "Well operator" means any person who has the right to operate or does operate a well. For purposes of oil and gas conservation under Article 2 (§ 45.1-299 et seq.) of this chapter, the term means any owner of the right to develop and produce oil and gas from a pool and to appropriate the oil and gas produced therefrom either for himself or for himself and others. In the event there is no oil or gas lease in existence with respect to the tract in question, the owner of the oil and gas rights therein shall be considered a well operator of the oil and gas in that portion of the pool underlying the tract which he owns. In the event that the oil is owned separately from the gas, the definitions contained herein shall apply separately to the owners of the respective interests;

66. "Well work" means the drilling, redrilling, deepening, stimulating, pressuring by injection of any fluid, converting from one type of well to another, combining or physically changing to allow the migration of fluid from one formation to another, plugging or replugging of any well.

§ 45.1-293. Powers and duties of Inspector; regulations and orders.–A. Excepting the powers and duties of the Virginia Well Review Board and the Virginia Oil and Gas Conservation Board, the Inspector shall be charged with the enforcement of the laws of the Commonwealth relating to the exploration for and the production and transportation of oil and gas. He shall require that all well work be done in such a manner as to prevent the escape of oil or gas out of one stratum to any other stratum and the waste of oil or gas; prevent the intrusion of water into an oil or gas stratum from a separate stratum; prevent the pollution or contamination of state waters, as defined in § 62.1-44.3 of this Code, by oil, gas or salt water; and require the submission of reports, maps, well logs and other pertinent information on oil and gas wells. He shall advise the Virginia Well Review Board on the propriety of regulations necessary to effectuate the powers of the Inspector and the Virginia Well Review Board under this chapter and shall have such further powers as are conferred upon him by this chapter.

B. If the Inspector determines that an emergency exists which requires the adoption, modification, renewal or extension of an order without first giving advance notice and holding a public hearing, he shall issue an emergency order, and it shall have the same validity as if a public hearing with respect to the subject matter of the order had been held after due notice. Emergency orders shall remain in force no longer than thirty days from their effective date. The Inspector shall promptly, upon the adoption of any emergency order, give notice thereof by publication and hold a public hearing to make permanent, modify, or repeal the emergency order. Emergency orders shall prevail as against general regulations and orders if and when in conflict therewith. Special and emergency orders shall apply to particular fields, areas, or subject matter.

C. The Inspector shall administer the laws and regulations pertaining to all well work, and he and any agent of his office shall have such access to the plans, maps, logs, and other records and to all properties of well operators and coal and mine operators as may be necessary for this purpose. In addition, the Inspector shall have access to all such records and properties of well operators as may be necessary to provide data to enable the Chief, the Virginia Oil and Gas Conservation Board and the Virginia Well Review Board to perform their duties under this chapter. The Inspector may require the placing of meters at places designated by him to prevent waste or obtain accurate records of the production and transportation of oil or gas , *including such records as required under §§ 58.1-3712, 58.1-3712.1 and 58.1-3713* .

D. The Inspector shall be the principal executive of the staff of the Virginia Oil and Gas Conservation Board.

E. The Inspector shall have authority to prescribe qualifications of persons handling devices containing explosives or radioactive material.

§ 45.1-295. Oil and Gas Conservation Commission continued as Oil and Gas Conservation Board; membership; appointments and terms; vacancies; compensation and expenses.–A. The Virginia Oil and Gas Conservation Commission is continued and shall hereafter be known as the Virginia Oil and Gas Conservation Board. The Oil and Gas Conservation Board shall be composed of ~~three~~ *five* members and shall have the powers and perform the duties set out in this article and in Articles 2 (§ 45.1-299 et seq.) and 3 (§ 45.1-309 et seq.) of this chapter.

B. The Governor shall appoint, subject to confirmation by the General Assembly, the chairman and ~~the two~~ *four* additional members of the Virginia Oil and Gas Conservation Board, one for an initial term of two years, one for an initial term of four years, ~~and~~ one for an initial term of six years , *and of two additional members appointed in 1987, one shall serve an initial term of two years and one shall serve an initial term of four years . The Director or his designee shall at all times be either chairman or a member of the Virginia Oil and Gas Conservation Board.* Thereafter the members shall be appointed for terms of six years. All vacancies occurring on the Virginia Oil and Gas Conservation Board shall be filled by the Governor, subject to confirmation by the General Assembly, for the unexpired term within sixty days of the occurrence of the vacancy. As the terms of office, respectively, of the members expire, the Governor shall appoint, subject to confirmation by the General Assembly, to fill the vacancies so occasioned, qualified persons whose terms shall be for six years from the day on which that of their immediate predecessors expired.

C. Each member of the Virginia Oil and Gas Conservation Board shall receive compensation and expenses in accordance with the provisions of § 2.1-20.3 of this Code.

§ 45.1-296. Meetings of the Virginia Oil and Gas Conservation Board; notices; general powers and duties.–A. The Virginia Oil and Gas Conservation Board shall meet at such times and places as shall be designated by the chairman. The chairman shall call a meeting of the Virginia Oil and Gas Conservation Board upon the written request of another member of the Virginia Oil and Gas Conservation Board or of the Inspector. Notification of each meeting shall be given in writing to the other members by the chairman at least five days in advance of the meeting. ~~Two~~ *Three* members shall constitute a quorum for the transaction of any business which shall come before the Virginia Oil and Gas Conservation Board. All determinations of the Virginia Oil and Gas Conservation Board shall be by majority vote of its members.

B. The Virginia Oil and Gas Conservation Board shall have the power and duty to execute and carry out the provisions of this chapter applicable to the Virginia Oil and Gas Conservation Board.

C. The Virginia Oil and Gas Conservation Board is authorized to make such investigations and inspections of such records and facilities as are necessary and proper to the discharge of its duties and the performance of its functions under this article.

D. Without limiting its general authority, the Virginia Oil and Gas Conservation Board is hereby granted specific authority with respect to wells subject to the jurisdiction of the

Virginia Oil and Gas Conservation Board under § 45.1-300 of this Code:

1. To regulate the spacing of ~~jurisdictional~~ wells to achieve the purposes of Article 2 (§ 45.1-299 et seq.) of this chapter ~~;~~ .

2. Upon proper application and notice, to enter spacing and pooling orders and to provide for the unitization of interests ~~;~~ .

3. Upon proper application and notice, to establish maximum allowable production rates for ~~jurisdictional~~ wells for the purposes of preventing waste and protecting correlative rights, and to set a penalty, not exceeding $5,000 per violation per day, for production in excess of the maximum allowable production rate. The Inspector may file suit in the appropriate court for collection of penalties.

4. To classify pools as oil or gas or both, and to classify wells as oil or gas wells, for purposes material to the jurisdiction of the Virginia Oil and Gas Conservation Board under the definitions set out in § 45.1-288 of this Code ~~; and~~ .

5. To collect data, make investigations and inspections, examine properties, leases, papers, books and records, provide for the keeping of records and the making of reports and to take such actions as appear reasonably necessary to carry out the provisions of Article 2 of this chapter.

E. The Virginia Oil and Gas Conservation Board shall promulgate, pursuant to the provisions of the Administrative Process Act (§ 9-6.14:1 et seq.), regulations to prevent waste, protect correlative rights, establish spacing requirements, govern the practice and procedure before the Virginia Oil and Gas Conservation Board, including the setting of application fees, if any, and otherwise to implement and make effective the provisions of this chapter with respect to the powers of the Virginia Oil and Gas Conservation Board.

Any notices by the Virginia Oil and Gas Conservation Board required under the provisions of this chapter shall be given in the manner set forth in the applicable section of this chapter or, if no manner is set forth, as set forth in the Administrative Process Act (§ 9-6.14:1 et seq.).

F. The Virginia Oil and Gas Conservation Board may employ such personnel and consultants as may be necessary to carry out the provisions of this chapter.

§ 45.1-297. Virginia Well Review Board; membership; appointments and terms; vacancies; compensation and expenses.—A. There is hereby created the Virginia Well Review Board, which shall be composed of five members, and which shall have the powers and duties set forth in this article and in Article 3 (§ 45.1-309 et seq.) of this chapter.

B. The Director or his designee shall be the chairman of the Virginia Well Review Board, and the remaining four members shall be appointed by the Governor, subject to confirmation by the General Assembly. Of the public members of the Virginia Well Review Board, one shall be a representative of the oil and gas industry in the Commonwealth; one shall be a representative of the coal industry in the Commonwealth; and two shall be representatives of the public who are not, at the time of their appointments and during their terms of office, lessors *or lessees* of any interests in coal, oil or gas, and do not have any substantial connection with any mineral extractive or transportation industry.

C. Two of the public members of the Virginia Well Review Board shall be appointed for an initial term of two years, and two shall be appointed for an initial term of four years. Thereafter the public members shall be appointed for terms of four years. All vacancies occurring on the Virginia Well Review Board among public members shall be filled by appointment of the Governor, subject to confirmation by the General Assembly, for the unexpired term within sixty days of the occurrence of any vacancy. As the terms of office of the public members expire, the Governor shall appoint, subject to confirmation by the General Assembly, qualified persons whose terms shall be for four years from the day on which that of their immediate predecessors expired to fill the vacancies so occasioned.

D. Each public member of the Virginia Well Review Board shall receive compensation and expenses in accordance with the provisions of § 2.1-20.3 of this Code.

§ 45.1-299. Declaration of public policy; legislative findings.—A. It is hereby declared to

be the public policy of this Commonwealth and in the public interest to:

1. Encourage the maximum recovery of oil and gas while preserving capital;

2. Prohibit waste of oil and gas resources and unnecessary surface loss of oil and gas and their constituents; and

3. Safeguard, protect and enforce the correlative rights of operators and royalty owners in a pool of oil or gas to the end that each operator and royalty owner may obtain his just and equitable share of production from the pool.

B. The General Assembly hereby determines and finds that in order to encourage the maximum recovery of oil and gas from all productive formations, it is in the public interest to enact new statutory provisions relating to the production and conservation of oil and gas ~~and that the geological structures in the hereinafter described portions of the Counties of Buchanan, Dickenson, Lee, Russell, Scott, Tazewell and Wise and the City of Norton have been explored and developed to an extent sufficient to establish distinct geologic and other characteristics, when compared to those characteristics found in other counties and cities of the Commonwealth, so as to justify and require different statutory provisions than for those other counties and cities~~ .

§ 45.1-300. Applicability; exclusions; construction.–A. Except as provided in subsection B of this section, the provisions of this article shall apply to all lands located in the Commonwealth, whether publicly or privately owned or administered.

B. The jurisdiction of the Virginia Oil and Gas Conservation Board under this article shall not apply to or affect the following categories of oil and gas wells:

1. ~~Wells located in Buchanan, Dickenson, Lee, Russell, Scott, Tazewell and Wise Counties and the City of Norton, within the area thereof having outcropping strata of Pennsylvanian age and drilled to produce from depths shallower than the base of the Devonian shale, with a total depth not more than 300' below the base of the Devonian shale if the penetration below the base of the Devonian shale does not result in production from strata deeper than the base and is for the purpose of facilitating logging or stratigraphic testing or permitting the stimulation and completion of a well in a pool situated above the base.~~ *Gas wells subject to the distance limitations of § 45.1-319 of this title.*

2. Any well commenced prior to July 1, 1982, unless such well is, after completion, whether such completion is prior to or subsequent to July 1, 1982, deepened subsequent to July 1, 1982 and is not otherwise excluded by subsection B of this section.

3. Gas storage operations or any well employed to inject gas into or withdraw gas from a gas storage reservoir or any well employed for storage observation.

C. The provisions of this article shall not be construed to grant to the Virginia Oil and Gas Conservation Board authority or power to fix prices of oil or gas.

§ 45.1-301. Drilling units for wells.–A. To prevent waste of oil or gas, to avoid the drilling of unnecessary wells, or to protect correlative rights, the Virginia Oil and Gas Conservation Board, upon its own motion or upon application of any well operator or royalty owner, after notice and hearing as herein provided, shall have the power to establish or modify drilling units covering any pool. Drilling units when established or modified shall to the extent reasonably possible be of uniform size and shape for the entire pool.

B. In establishing or modifying a drilling unit, the acreage to be embraced within each unit and the shape thereof shall be determined by the Virginia Oil and Gas Conservation Board from the evidence introduced at the hearing but shall be of an area that can be efficiently and economically drained by one well. If at the time of a hearing to establish drilling units, there is not sufficient evidence from which to determine the area which can be drained efficiently and economically by one well, the Virginia Oil and Gas Conservation Board may enter an order establishing provisional drilling units for the orderly development of the pool pending the obtaining of information necessary to determine the ultimate spacing of wells for the pool.

C. On the date specified in the notice, the Virginia Oil and Gas Conservation Board shall hold a hearing to determine (i) the area to be included in the order; (ii) the acreage

to be embraced within each drilling unit and the shape thereof; and (iii) the area within which ~~jurisdictional~~ wells may be drilled on each unit. In receiving evidence, finding facts and entering orders, the Virginia Oil and Gas Conservation Board shall enforce and protect correlative rights of well operators and royalty owners. Evidence of the following facts may be considered by the Virginia Oil and Gas Conservation Board:

1. The surface topography and property lines of the lands underlain by the pool;

2. The plan of well spacing then being employed or proposed for the pool;

3. The depth at which production from the pool has been found;

4. The nature and character of the producing formation or formations and whether the substances produced or sought to be produced are gas or oil;

5. The maximum area which may be drained efficiently and economically by one well; and

6. Any other available geological or scientific data pertaining to the pool which may be of probative value to the Virginia Oil and Gas Conservation Board in determining the proper spacing of wells and establishing drilling units.

D. An order establishing or modifying drilling units shall specify the minimum distance from the nearest outside boundary of the drilling unit or another well at which a ~~jurisdictional~~ well may be drilled. The minimum distance provided shall be the same in all drilling units established or modified under the order with necessary exceptions for ~~jurisdictional~~ wells drilled or being drilled at the time of the filing of the application. If the Virginia Oil and Gas Conservation Board finds that a ~~jurisdictional~~ well to be drilled in compliance with the specified minimum distance would not be likely to produce in paying quantities or will encounter surface conditions which would substantially add to the burden or hazard of drilling the ~~jurisdictional~~ well, or that a drilling location within the area permitted by the order is or foreseeably will be prohibited by a lawful order of the Inspector, the Virginia Well Review Board or any other agency or court of the Commonwealth, the Virginia Oil and Gas Conservation Board may provide an exception to the minimum distances for the ~~jurisdictional~~ well and restrict the production from any such well so as to provide that no well operator or royalty owner shall produce or receive more than his just and equitable share of the production. *The justification for any such exception shall be specifically documented by the Board.*

E. An order establishing or modifying drilling units for a pool shall cover all lands determined by the Virginia Oil and Gas Conservation Board to be underlain by the pool, and upon additional findings of fact may be modified by the Virginia Oil and Gas Conservation Board from time to time (i) to include additional areas determined to be underlain by the pool or to delete areas determined not to be underlain by the pool, and (ii) to change the size or shape of one or more drilling units, or to permit the drilling of an additional well or wells thereon.

F. The Virginia Oil and Gas Conservation Board shall within forty-five days after issuing a notice of hearing to establish or modify drilling units for a pool either enter an order establishing or modifying such units or dismiss the proceeding.

G. After the issue date of a notice of hearing called to establish or modify drilling units, no additional ~~jurisdictional~~ well shall be commenced for production from the pool until the order establishing or modifying drilling units has been entered, unless the commencement of the ~~jurisdictional~~ well is authorized by order of the Virginia Oil and Gas Conservation Board.

§ 45.1-302. Pooling of interests in drilling units.–A. When two or more separately owned tracts are embraced within a drilling unit established pursuant to an order of the Virginia Oil and Gas Conservation Board entered under this article or when there are separately owned interests in all or a part of any such drilling unit, well operators owning such interests may pool their interests for the development and operation of the drilling unit by voluntary agreement, which agreement may be based upon the exercise of pooling and unitization rights granted in any oil or gas lease.

Where, however, the well operators have not agreed to pool their interests, the Virginia

Oil and Gas Conservation Board, upon the application of any well operator, shall enter an order pooling all interests in the drilling unit for the development and operation thereof. Each pooling order shall be entered only after notice and hearing. The hearing may, in the discretion of the Virginia Oil and Gas Conservation Board, be conducted in conjunction with or ancillary to the hearing to create drilling units provided for in § 45.1-301 of this Code.

Subject to the provisions of § 45.1-308 C of this Code and any contrary provisions contained in an oil and gas lease respecting the property, operations incident to the drilling of a well upon any portion of a unit covered by a pooling order shall be deemed to be the conduct of such operations upon each separately owned tract in the unit by the owners thereof. That portion of the production allocated or applicable to any tract included in a unit covered by a pooling order shall be in the same proportion which the acreage in that tract included in the unit bears to the total acreage included in the unit and shall when produced be deemed for all purposes to have been produced from each such tract by a well drilled thereon.

B. Any pooling order under the provisions of this section shall (i) authorize the drilling and operation of a ~~jurisdictional~~ well for the production of oil or gas from the pooled acreage; (ii) designate the well operator authorized to drill and operate the ~~jurisdictional~~ well; (iii) prescribe the time and manner in which all other well operators may elect to participate in the operation of the ~~jurisdictional~~ well or to exercise their rights of election under subsection C of this section; (iv) provide that all reasonable costs and expenses of drilling, completing, equipping, operating, plugging and abandoning the ~~jurisdictional~~ well shall be borne, and all production therefrom shared, by all participating operators in the proportion which the acreage in the pooled tracts owned or under lease to each participating operator bears to the total acreage in the unit; (v) provide to non-leasing landowners in a unit reasonable access to the unit records of the production and transportation of oil or gas collected or gathered by the Inspector; and (vi) make provisions for the payment of all reasonable costs of the operation, including a reasonable supervision fee, by all operators who elect to be participating operators.

The owner of an unleased tract who elects to be a participating operator shall, in addition to his share of production, be entitled to participate in accordance with the terms and conditions which he and the operator agree upon.

C. Upon the request of any well operator, the pooling order shall provide just and equitable alternatives whereby a well operator who does not elect to be a participating operator of a ~~jurisdictional~~ well may elect either to:

1. Sell his oil or gas ownership interest or leasehold interest to the participating operators on a reasonable basis and for a reasonable consideration which, if not agreed upon, may be submitted by the nonparticipating well operator to the Virginia Oil and Gas Conservation Board for a binding determination; or

2. Share in the operation of the well on a carried basis as a carried operator under the following conditions: in the event any participating operator in any portion of the pooling unit shall, pursuant to the terms of a drilling order, drill and operate, or pay the costs of drilling and operating, a ~~jurisdictional~~ well for the benefit of a carried operator, the carried operator shall be entitled to the share of production from the tracts pooled accruing to his interest, exclusive of any royalty or overriding royalty reserved in any leases, assignments thereof or agreements relating thereto of such tracts, but only after the proceeds allocable to his share equal (i) 300 ~~%~~ *percent* of the share of such costs allocable to the interest of the carried operator of a leased tract or portion thereof; or (ii) in the case of an unleased tract or portion thereof, *a reasonable percentage not to exceed* ~~100%~~ *200 percent* of the share of such costs allocable to the interests of the carried operator.

Any royalty or overriding royalty reserved in any leases deducted from the share of production of a carried operator pursuant to this section shall not be subject to charge for operating costs but shall be separately calculated and paid to the carried operator for payment to the royalty owner.

D. The Virginia Oil and Gas Conservation Board shall resolve all disputes among well operators regarding the amount and reasonableness of the well operation costs.

E. In the case of a well operator who is a person under a disability, the well operator who is an applicant under this section for authorization to drill and operate one or more ~~jurisdictional~~ wells may petition the appropriate court pursuant to subdivision 3 c of § 8.01-261 of this Code for the appointment of a guardian ad litem who upon appointment may make on behalf of the person under a disability any elections which the person would be entitled to make under this section if he were not under a disability.

§ 45.1-304. Notice of hearing.—A. The Virginia Oil and Gas Conservation Board shall give written notice of any hearing under § 45.1-301 or § 45.1-302 of this Code at least twenty days in advance of the hearing by certified mail, return receipt requested, to each well operator *or surface owner* of record identified by the applicant or the Virginia Oil and Gas Conservation Board as having an interest in the oil or gas underlying the tracts which are the subject of the hearing *or underlying any adjoining tract* . Any well operator entitled to notice who does not receive notice may petition the Virginia Oil and Gas Conservation Board for and upon the presentation of proper proof be entitled to an appropriate modification of any order issued under this article. In situations where the Virginia Oil and Gas Conservation Board is unable to provide such written notice because the identity or whereabouts of a well operator is unknown, the Virginia Oil and Gas Conservation Board shall cause a notice of the hearing to be published in a newspaper of general circulation in the county or city where the land or the major part thereof which is the subject of the hearing is located. Newspaper publication shall be made at least twenty days in advance of the date of the hearing.

B. Any well operator who has not appeared in response to notice of hearing, published pursuant to the directions contained in subsection A of this section, and whose identity or whereabouts remains unknown at the conclusion of a hearing conducted pursuant to this section, shall be deemed to have elected not to become a participating operator, and his share of the proceeds shall be paid to the Virginia Oil and Gas Conservation Board and held in escrow for his benefit as a carried operator. His share of the proceeds shall be deemed unclaimed property and shall be disposed of as provided in The Uniform Disposition of Unclaimed Property Act (§ 55-210.1 et seq.).

§ 45.1-311. Permit required for well work; fee; application; bond; operations plan; precedence of permits; drilling restriction.—A. It shall be unlawful for any person to commence any well work, including site preparation work which involves any disturbance of land, without first securing from the Inspector a well work permit. An application may propose and a permit may approve two or more activities defined as well work.

B. The application for a well work permit shall be accompanied by a fee of $100, the bond prescribed by subsection D of this section, the operations plan and map required by subsection E of this section, and the plat required by § 45.1-312 of this Code.

C. Every permit application filed under this section shall be verified, and shall contain the following:

1. The names and addresses of (i) the well operator, (ii) the agent required to be designated under § 45.1-310 of this Code and (iii) every person whom the applicant must notify under § 45.1-313 together with a certification that a copy of the application and all other required documentation has been mailed to all such persons by certified mail;

2. The number of the well or such other well identification as the Inspector may require;

3. The type of well;

4. The well work for which a permit is requested;

5. The approximate depth to which the well is to be drilled or deepened, or the actual depth if the well has been drilled;

6. Unless submitted in a previous permit application by the applicant, the location and thickness of all known coal seams, known water-bearing strata, and other known oil and gas strata between the surface and the depth to which the well is proposed to be drilled.

Information in the possession of the Inspector may be designated by the applicant and need not be resubmitted;

7. If the proposed well work will require casing or tubing to be set, the entire casing program for the well, including the size of each string of pipe, the starting point and depth to which each string is to be set, and the extent to which each string is to be cemented;

8. If the proposed well work is to convert an oil well or a combination well or to drill a new well for the purpose of introducing pressure for the recovery of oil as provided in § 45.1-349 of this Code, specifications of (i) where available, the casing records of the well, (ii) where available, the drilling log of the well, (iii) the maximum pressure to be introduced, (iv) the geological formation into which liquid or pressure is to be introduced, (v) a general description of the liquids to be introduced, and (vi) the location of all known coal seams, water-bearing strata, and other oil or gas strata above and below the geological formation into which such liquid or pressure is to be introduced;

9. If the proposed well work is to plug or replug the well, (i) a statement of the time at which the work of plugging or replugging is proposed to be commenced, which time shall not be less than ten days after the day on which the application is filed, (ii) a copy of all logs in the operator's possession not previously filed with the Inspector, and (iii) a work order showing in detail the proposed manner of plugging or replugging the well, in order that a representative of the Inspector and any interested persons may be present when the work is done. In the event of an application to drill, redrill or deepen a well, if the well work is unsuccessful so that the well must be plugged and abandoned, and if the well is one on which the well work has been continuously progressing pursuant to a permit, the operator may proceed to plug the well as soon as he has obtained the verbal permission of the Inspector or his designated representative to plug and abandon the well, except that the operator shall make every reasonable effort to notify immediately the royalty owner and the coal owner, if any, of the land at the well location, and shall also timely file the plugging affidavit required by § 45.1-348 of this Code;

10. The operations plan and map required under subsection E of this section for applications for permits to drill; and

11. Any other relevant information which the Inspector may require pursuant to regulations promulgated by the Virginia Well Review Board.

D. 1. When the well work permit application is filed, the applicant shall give bond, payable to the Commonwealth, with surety acceptable to the Inspector or at the election of the applicant a cash bond, to ensure compliance with all laws and regulations relating to the well work and the stabilization of the project area and the furnishing of reports and information required by the Inspector. The bond shall be set by the Inspector in an amount of $10,000 for plugging of the well plus $2,000 times the number of acres, to the nearest tenth of an acre, for stabilizing the project area. The bond shall remain in force until released by the Inspector. The Inspector shall release the bond when he is satisfied that the well has been abandoned and plugged, the project area has been properly stabilized in accordance with the operations plan and the reports and information required by Chapters 1 (§ 45.1-1 et seq.) to 14 (§ 45.1-158 et seq.) of this title have been furnished. The Inspector shall release that portion of the bond covering stabilization of the project area when the area is properly stabilized in accordance with the approved stabilization and drainage plan.

2. When an operator makes or has made application for permits to drill a number of wells, the Inspector, on request of the operator and in lieu of requiring a separate bond for each well, may require a blanket bond in such sum as he deems adequate; however, in no event shall the bond be in an amount less than $25,000.

3. The bonding requirements for wells shall be limited to those set forth in this section and the bonding requirements contained within §§ 45.1-1 through 45.1-225 of this Code shall not apply to oil and gas operations.

4. A well operator who has forfeited all or a portion of a previously posted bond shall be eligible to receive a subsequent well work permit to drill a new well only upon

satisfaction of such additional requirements, terms and conditions as may be set forth in regulations promulgated by the Virginia Well Review Board.

E. An operations plan shall accompany each application for a well work permit to drill, shall state the intended method of spoil placement and shall contain a stabilization and drainage plan including a map of the project area indicating the area to be disturbed. The drainage and stabilization plan shall meet the minimum requirements of the Virginia Erosion and Sediment Control Handbook as adopted and from time to time amended by the Virginia Soil and Water Conservation Board pursuant to § 21-89.4 of this Code. The operations plan and map shall become part of the terms and conditions of any permit which is issued and the provisions of the plan shall be carried out where applicable during and after the drilling operation.

F. In the event of any conflict between the terms of a well work permit under this article and a conservation order under Article 2 (§ 45.1-299 et seq.) of this chapter, the well work permit shall control. The Virginia Well Review Board may promulgate regulations governing the conditions under which a well operator must return to the Virginia Well Review Board for reconsideration of a conservation order in light of a conflicting well work permit.

G. In no event shall drilling be initiated or completed on any tract where the oil and gas underlying the tract have not been severed from the surface interest thereof by an appropriate title document, without the written consent of the person who owns the tract.

H. The powers and duties of enforcement of the laws of the Commonwealth relating to the exploration for and the production and transportation of oil and gas having been vested in the Inspector, no county, city or town or other political subdivision of the Commonwealth shall impose or require any other license, local permit, fee or bond to perform any well work, or impose any condition which varies from or is in addition to the conditions contained in the well work permit and the operations plan approved thereby , *except as provided in § 58.1-3712, 58.1-3712.1 and 58.1-3713* .

§ 45.1-313. Notice to site owners, adjacent owners, etc.; filing of objections.—A. Within one day of the day on which the permit application is filed with the Inspector, the applicant shall mail, by certified mail, return receipt requested, copies of the application, well plat and, if required by § 45.1-311 E of this Code, operations plan, as notice of the well work to the following persons under the following circumstances:

1. In the case of an application requesting a well work permit which includes drilling, redrilling, deepening, plugging or replugging of a well, the notice shall be to all persons required to be identified on the well plat *and all other gas royalty owners within 1250 feet of the proposed well location* .

2. In the case of an application for well work which does not include drilling, redrilling, deepening, plugging or replugging a well, the notice shall be sent to the owner of record of any coal seam and coal operator, if any, who has registered an operations plan with the Department within 500' of the well location.

B. If the applicant publishes in a newspaper of general circulation in the jurisdiction in which the proposed well site is located, no later than the day on which the application is submitted to the Inspector, a notice of the application in such form as the Virginia Well Review Board shall by regulation prescribe, then in the case of tenants in common and other co-owners, mailed notice to the owners of an aggregate of more than fifty percent of the interest shall be constructive notice to the remainder of such owners for purposes of this article.

C. All notices, whether mailed or published, given under this section shall contain a statement of the time within which objections may be made and shall state the name and address of the person to whom objections shall be forwarded.

D. Any person receiving actual or constructive notice of an application for a well work permit, within fifteen days from receipt of such notice, shall file with the Inspector any objection which he may have to the proposed location. Any person who is entitled to receive notice but for any reason does not receive notice shall have standing to file with

the Inspector any objection which he may have to the proposed well work at any time before the permit is issued.

E. 1. Prior to the issuance of any well work permit, the applicant shall certify to the Inspector the persons entitled to notice and submit proof of notice. Proof of notice to any person may be by the certified mail return receipt, proof of publication where publication is provided for, or a statement signed by the person entitled to notice that he has received a copy of the application and that he has no objection to the granting of the well work permit.

2. If the applicant files statements of no objection signed by all persons entitled to the statutory notice, the Inspector may issue the permit before the expiration of the fifteen-day notice period provided for under subsection D of this section.

3. If objections are filed by another or found by the Inspector, a person signing a statement of no objection as provided in this subsection E shall nonetheless be entitled to notice of the hearing under § 45.1-315 of this Code and subsequent notices provided by this article.

§ 45.1-314. Review of application; issuance of permit in the absence of objections; wells within certain distances of boundary; what permit to recite.—A. The Inspector shall review each application for a well work permit along with accompanying material and shall determine whether a permit shall be issued. The Inspector shall cause such inspections to be made of the proposed project area as to assure adequate review of the application, and if it is determined that the proposed drilling operation will constitute a hazard to the safety of any person, that stabilization or proper drainage control is not feasible, or that the waters of the Commonwealth, as defined in § 62.1-44.3 of this Code, public park, certified historic landmark or publicly owned recreational area would be materially damaged, and unless the requirements of the State Water Control Law and regulations of the State Water Control Board are complied with, the permit shall not be issued, or if issued shall be conditioned so as to prevent the occurrence of the hazard or damage.

B. If, after adequate review, the application for a well work permit is found to be in order, and if no timely objection has been made by any person to whom notice is required to be sent by § 45.1-313 of this Code, the Inspector shall issue the requested permit. ~~The Inspector may, however, in any case in which an oil or gas well is proposed to be drilled within 500' of any boundary of a tract of land, if in his opinion the drilling would cause drainage of oil~~ *In any case in which an oil well is proposed to be drilled within 500 feet of any boundary of another oil royalty owner, or in which a gas well is proposed to be drilled within 1,250 feet of any boundary of another gas royalty owner, and the other royalty owner has made a timely objection, the Inspector shall, if in his opinion the drilling would cause drainage of oil* or gas from the adjacent land, require as a condition of the granting of the permit the achievement, prior to any production from the well, of either (i) the creation of a contractual or statutory drilling unit including some or all of the adjacent land *in accordance with §§ 45.1-321 and 45.1-322 of this Code* or (ii) an agreement, satisfactory to the owner of the oil and gas underlying the adjacent land, relating to the drilling of an offset well thereon if the well for which a permit is sought produces oil or gas in paying quantities.

C. Any permit so issued shall recite the filing of an application for a well work permit and a plat showing the required information, that proof of statutory notice under § 45.1-313 of this Code has been submitted, that no objection has been filed or found by the Inspector, that the permit application is approved and that the well operator is authorized to do the permitted well work at the indicated location.

D. Failure of a royalty owner to file a timely objection shall not result in forfeiture of any royalty rights to which he is entitled under the provisions of this Code.

§ 45.1-316. Objections by surface owner or royalty owner.—The Inspector shall hear and decide objections to the issuance of a well work permit raised by *(i)* royalty owners and surface owners who are entitled to notice of the well work application *or (ii) any other gas royalty owner within 1250 feet of a proposed new gas well* . The Inspector shall have no

jurisdiction to hear objections by a royalty owner with respect to any matter subject to the jurisdiction of the Virginia Oil and Gas Conservation Board under Article 2 (§ 45.1-299 et seq.) of this chapter, whether or not the royalty owner appeared before the Virginia Oil and Gas Conservation Board. On other matters involving an application for a well work permit, the Inspector shall consider only the following questions in deciding on objections by a royalty owner:

1. Whether the proposed well work directly impinges upon the royalty owner's oil and gas interest, and if so, whether the proposed well work is an unreasonable and arbitrary exercise of the well operator's contractual right to extract the oil or gas;

2. Alternatively, whether the proposed well work threatens to violate the objecting royalty owner's property rights or statutory rights aside from the contractual rights of the royalty owner.

§ 45.1-320. Gas drilling unit when permit refused or conditioned; contents; notice.—A. Whenever (i) a well work permit to drill a new gas well subject to the provisions of § 45.1-319 of this Code has been refused on account of objections by a coal owner, or (ii) the Inspector has issued a well work permit upon the condition provided in § 45.1-314 B of this Code for drilling a gas well ~~which is not subject to the Virginia Oil and Gas Conservation Board's jurisdiction under Article 2 (§ 45.1-299 et seq.) of this chapter~~ *in Buchanan, Dickenson, Lee, Russell, Scott, Tazewell or Wise Counties or the City of Norton, within the area therof with outcropping strata of Pennsylvanian age not deeper than specified in subsection B of § 45.1-319, or (iii) a royalty owner has raised objections under § 45.1-316* , the gas operator may apply to the Virginia Oil and Gas Conservation Board for establishment of a drilling unit encompassing a contiguous tract or tracts if the gas operator believes that such a drilling unit will afford one well location, agreeable to the objecting coal owner, for the production of gas from under the tract on which the permit was sought.

B. An application to establish a gas drilling unit shall be filed with the Virginia Oil and Gas Conservation Board and shall contain the following:

1. The name and address of the applicant;

2. A plat prepared by a registered engineer or certified land surveyor showing (i) the boundary of the proposed gas drilling unit, (ii) the county or city in which the unit is located, (iii) the unit acreage and the boundaries of the unit and the tracts which make up the unit, (iv) the owners of record of each tract, (v) the proposed gas well location on the unit, and (vi) the proposed gas well location for which the Inspector refused to issue or conditioned a drilling permit;

3. The names and addresses of (i) the royalty owners of the oil and gas underlying the tracts which make up the proposed unit and (ii) the gas operators of the tracts which make up the proposed unit;

4. The approximate depth and target formation to which the well for the proposed unit is to be drilled;

5. A statement indicating whether a voluntary pooling agreement has been reached among any or all of the royalty owners of the gas underlying the tracts which comprise the proposed unit and the gas operators of such tracts;

6. An affidavit of publication of the notice required in subsection C of this section; and

7. Any other relevant information the Virginia Oil and Gas Conservation Board may require by regulation.

C. Prior to the filing of an application under this section, the applicant shall cause to be published such notice of intent to file an application to establish a gas drilling unit as may be prescribed by regulation promulgated by the Virginia Oil and Gas Conservation Board.

D. At the time an application to establish a gas drilling unit is filed, the applicant shall forward a copy thereof by certified mail, return receipt requested, to every person whose name and address were included on the application pursuant to subdivisions B 2 and B 3 of this section, together with a notice, in such form as may be prescribed by the Inspector,

that the application is being mailed to the recipient pursuant to the requirements of this section. The application and notice need not be forwarded to any royalty owner or gas operator who has previously agreed to voluntary pooling by contractually empowering the gas operator, by assignment or otherwise, unilaterally to declare a unit.

§ 45.1-321. Establishment of gas drilling units; hearings; matters to be considered.–A. At the time and place fixed by the Virginia Oil and Gas Conservation Board for consideration of the application to establish a gas drilling unit, the applicant shall present proof that the drilling location on the proposed unit has been agreed to by all of the owners of the coal seams underlying such drilling location. The applicant and the royalty owners and the other gas operators of the gas underlying the tracts which make up the unit, or such of them as are present or represented, shall hold a conference with the Virginia Oil and Gas Conservation Board to consider the application. The persons present or represented at the conference may agree upon the boundary of the gas drilling unit as proposed by the applicant or as changed to satisfy all valid objections of those persons present or represented. Any agreed change in the boundary of the unit shall be shown on the plat filed with the Virginia Oil and Gas Conservation Board as part of the application. If agreement is reached at the conference upon the boundary of the unit among the applicant and the royalty owners and other gas operators of the gas underlying the tracts which make up the unit, or such of them as are present or represented, and if the agreement is approved by the Virginia Oil and Gas Conservation Board, the Virginia Oil and Gas Conservation Board shall issue a written order establishing and specifying the boundary of the unit.

B. If the applicant and the royalty owners and other gas operators of the gas underlying the tracts which make up the proposed gas drilling unit, or such of them as are present or represented, are unable to agree upon the boundary of the unit, then the Virginia Oil and Gas Conservation Board shall hold a hearing without recess of more than one business day to consider the application to establish the unit. At the hearing, the Virginia Oil and Gas Conservation Board shall first reduce to writing all objections to the gas drilling unit either as originally proposed or as offered to be modified by the gas operator. These written objections and the modifications offered by the gas operator shall become a part of the permanent record. The Virginia Oil and Gas Conservation Board shall then proceed to hear and decide the objections under the procedure for litigated issues under § 9-6.14:12 of this Code and render its decision as provided in the following subsections of this section.

C. In determining whether to grant or deny an application to establish a unit, the Virginia Oil and Gas Conservation Board shall consider the following:

1. The surface topography and property lines of the lands making up the unit;

2. The correlative rights of all gas operators and royalty owners therein;

3. Whether a gas operator or royalty owner objecting to the unit has proved by a preponderance of the evidence that the unit is substantially smaller than the area that will be produced by the proposed gas well; and

4. Other evidence relevant to the establishment of the boundary of a drilling unit.

5. That a presumption exists that any well within 1250 feet of any boundary of any other gas royalty owner shall cause draining of gas from such adjoining parcel.

D. The Virginia Oil and Gas Conservation Board shall not grant an application to establish a gas drilling unit nor approve any unit, unless it finds that:

1. The applicant has proved that the drilling location on the unit has been agreed to by all of the operators of the coal seams underlying the drilling location, or, if a coal seam is not controlled by a coal operator, by the owner of record;

2. A drilling permit has been previously refused on one of the tracts making up the unit;

3. ~~The unit includes all acreage within the minimum distance limitations provided by § 45.1-305 of this Code unless the gas operators and royalty owners of any excluded acreage have agreed to such exclusion~~ *The unit includes either (i) all acreage within 1250 feet of*

the well, unless the gas operators and royalty owners of any excluded acreage have agreed to such exclusion, or (ii) all acreage within half the distance to the nearest gas well if the nearest gas well is less than 2,500 feet from the proposed well location, unless the gas operators and royalty owners of any excluded acreage have agreed to such exclusion ; and

4. The unit includes a portion of the acreage from under which the gas operator intended to produce gas under the drilling permit which was refused.

E. If a gas drilling unit decision involves a change in the boundary of the unit from the boundary originally proposed, the Virginia Oil and Gas Conservation Board shall indicate the changed boundary on a copy of the plat filed with the application and, if the changed boundary location becomes final, on the plat itself.

§ 45.1-322. Pooling of interests in gas drilling units; limitations; matters to be considered. –A. Whenever the Virginia Oil and Gas Conservation Board establishes a gas drilling unit pursuant to the provisions of § 45.1-321 of this Code, it shall also include provisions for pooling the separately owned interests in the gas to be produced from the unit. If a voluntary pooling agreement has been reached among all persons owning separate gas operating interests in the tracts comprising the unit prior to or during the hearing held pursuant to § 45.1-321 of this Code, the Virginia Oil and Gas Conservation Board shall approve the agreement. In the event no voluntary pooling agreement is reached, the Virginia Oil and Gas Conservation Board shall determine the pooling of interests in the unit.

B. At or in conjunction with the hearing, the Virginia Oil and Gas Conservation Board shall first reduce to writing all pooling claims and proposals with respect to the gas drilling unit either as originally proposed or as offered to be modified by the gas operator. These written claims and proposals shall become a part of the permanent record. The Virginia Oil and Gas Conservation Board shall then proceed to hear and decide the claims and proposals under the procedure for litigated issues under § 9-6.14:12 of this Code and render its decision as provided in the following subsections of this section.

C. Subject to the provisions of § 45.1-308 C of this Code, operations incident to the drilling of a well upon any portion of a unit covered by a pooling order shall be deemed to be the conduct of such operations upon each separately owned tract in the unit by the owners thereof. That portion of the production allocated or applicable to any tract included in a unit covered by a pooling order shall be in the same proportion which the acreage in that tract included in the unit bears to the total acreage included in the unit and shall, when produced, be deemed for all purposes to have been produced from each such tract by a well drilled thereon.

D. Any pooling order under the provisions of this section shall (i) authorize the drilling and operation of a gas well for the production of gas from the pooled acreage; (ii) designate the gas operator authorized to drill and operate the well; (iii) prescribe the time and manner in which all other gas operators may elect to participate in the operation of the well or to exercise their rights of election under subsection E of this section; (iv) provide that all reasonable costs and expenses of drilling, completing, equipping, operating, plugging and abandoning the well shall be borne, and all production therefrom shared, by all participating gas operators in the proportion which the acreage in the pooled tracts owned or under lease to each participating gas operator bears to the total acreage in the unit; (v) provide to nonleasing landowners in a unit reasonable access to the unit records of the production and transportation of gas collected or gathered by the Inspector; and (vi) make provisions for the payment of all reasonable costs of the operation, including a reasonable supervision fee, by all gas operators who elect to be participating operators.

The owner of an unleased tract who elects to be a participating operator shall, in addition to his share of production, be entitled to participate in accordance with the terms and conditions which he and the operator agree upon.

E. Upon the request of any gas operator, the pooling order shall provide just and equitable alternatives whereby a gas operator who does not elect to be a participating

operator may elect either to:

1. Sell his gas ownership interest or leasehold interest to the participating operators on a reasonable basis and for a reasonable consideration which, if not agreed upon, may be submitted by the nonparticipating gas operator to the Virginia Oil and Gas Conservation Board for a binding determination; or

2. Share in the operation of the well on a carried basis as a carried gas operator under the following conditions: in the event any participating operator in any portion of the drilling unit shall, pursuant to the terms of a pooling order, drill and operate, or pay the costs of drilling and operating, a gas well for the benefit of a carried gas operator, then the carried gas operator shall be entitled to the share of production from the tracts pooled accruing to his interest, exclusive of any royalty or overriding royalty reserved in any leases, assignments thereof or agreements relating thereto, of such tracts, but only after the proceeds allocable to his share equal (i) 300 ~~%~~ *percent* of the share of such costs allocable to the interest of the carried gas operator of a leased tract or portion thereof; or (ii) in the case of an unleased tract or portion thereof, *a reasonable percentage not to exceed* ~~100%~~ *200 percent* of the share of such costs allocable to the interest of the carried gas operator. Any royalty or overriding royalty reserved in any leases deducted from the share of production of a carried gas operator pursuant to this section shall not be subject to charge for operating costs but shall be separately calculated and paid to the carried gas operator for payment to the royalty owner.

F. The Virginia Oil and Gas Conservation Board shall resolve all disputes among well operators regarding the amount and reasonableness of the well operation costs.

G. In the case of a gas operator who has not appeared in response to notice of hearing, published pursuant to the directions contained in § 45.1-304 of this Code, and whose identity or whereabouts remains unknown at the conclusion of a hearing conducted pursuant to this section, the gas operator shall be deemed to have elected not to become a participating operator and his share of the proceeds shall be paid to the Virginia Oil and Gas Conservation Board and held in escrow for his benefit as a carried gas operator. His share of the proceeds shall be deemed unclaimed property and shall be disposed of as provided in The Uniform Disposition of Unclaimed Property Act (§ 55-210.1 et seq.).

H. In the case of a gas operator who is a person under a disability, the gas operator who is an applicant under this section for authorization to drill and operate a gas well may petition the appropriate court pursuant to subdivision 3 c of § 8.01-261 of this Code for the appointment of a guardian ad litem who upon appointment may make on behalf of the person under a disability any elections which the person would be entitled to make under this section if he were not under a disability.

I. The provisions of this section or any other section of this chapter shall not be construed to grant to the Virginia Oil and Gas Conservation Board authority or power to fix prices of oil or gas.

Official Use By Clerks	
Passed By The Senate	**Passed By The House of Delegates**
without amendment ☐	without amendment ☐
with amendment ☐	with amendment ☐
substitute ☐	substitute ☐
substitute w/amdt ☐	substitute w/amdt ☐
Date: _____	Date: _____
Clerk of the Senate	Clerk of the House of Delegates