TESTIMONY SUBMITTED TO
THE HOUSE COMMITTEE ON RESOURCES

SUBCOMMITTEE ON WATER AND POWER

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Good afternoon. My name is Kevin Bliss. I am the Washington representative of the Interstate Oil and Gas Compact Commission (IOGCC).

The member states of the IOGCC harvest more than 99% of the oil and natural gas produced onshore in the United States. Formed by Governors in 1935, the IOGCC is a congressionally ratified interstate compact. The organization, the nation's leading advocate for conservation and wise development of domestic petroleum resources, includes 30 member and 7 associate states. The mission of the IOGCC is two-fold: to conserve our nation's oil and gas resources and to protect human health and the environment. Our current chairman is Governor Dave Freudenthal of Wyoming.

The IOGCC endorses H.R. 5110, "More Water for More Energy Act of 2006". We fully support the bill's stated objective of facilitating "the use for irrigation and other purposes of water produced in connection with development of energy resources." The United States is blessed with large volumes of useable water that are unavoidably brought to the Earth's surface in the pursuit of oil and natural gas.

I might also add that states are the principal regulators of water produced with natural gas and oil and have many decades of such regulatory experience. They have more regulatory experience with produced water than any entity. Since adoption of the Federal Safe Drinking Water Act, most states have accepted primacy to continue their regulation of produced water through the Underground Injection Control program administered by the United States Environmental Protection Agency.

In backing the bill, the IOGCC would like to share with the committee some of the preliminary findings of a national research effort – nearing completion – that it is conducting with co-researcher ALL Consulting. The study focuses on the management of produced water from conventional and unconventional onshore exploration and production operations in the United States. It is funded by the U.S. Department of Energy's National Energy Technology Laboratory. Several states have also participated in the research. Additionally, the project has been supported in many ways by non-governmental organizations, the energy industry, and several federal agencies that have provided access, in-kind support, data, and information.

One factor contributing to the commission of this research was the realization that water produced as a consequence of accelerating oil and natural gas production activities could be put to beneficial use particularly in areas of the mid-continent and west where water, always a valuable commodity, has been made more precious by prolonged drought conditions.

The research required detailed evaluation of oil and gas operations throughout the United States, including site visits to operations in many states. Researchers observed firsthand how industry has innovatively dealt with water management challenges – from identifying roadblocks to beneficial use of water to identifying areas where alternative uses of produced water may be feasible. Alternative uses identified in the study included using produced water for agricultural irrigation purposes; power generation; aquifer storage/recovery; enhanced oil recovery; surface discharge; and water for wildlife, among others.

In some areas of the country, conventional water management practices might be limited. Therefore, the research has identified practices and options for managing water where beneficial use alternatives could be limited. Consequently, a produced water analysis tool is being prepared for use by all stakeholders involved in oil and gas development proposals and operations.

The final handbook for the project is scheduled to be completed by the end of October, and the produced water analysis instrument will be completed by the end of 2006. Upon completion of both, the IOGCC will be glad to provide this committee with copies.

Research performed by the IOGCC and its member states documents the presence of produced water whose quality is compatible with irrigation. Water of this quality dominates some oil and gas basins and is in the minority in other basins. Some of this water is useable in its native state. There are instances where some can be used for irrigation with minor changes to the way ranchers and farmers manage their crops. Treatment prior to field application benefits other sources.

Some of this water is being used for irrigation in parts of the arid western United States.

A factor that inhibits use of this valuable resource is that its distribution changes as the petroleum industry exploits new and different oil and gas resources. Useable water needs to be tracked by local agencies to determine its character and location to facilitate efficient use. The proposed legislation would go a long way toward helping to connect petroleum producers, water treatment companies, and irrigators so that more beneficial uses can be derived from the resource.

Produced Water Resources

Several of America's petroleum basins illustrate the dimensions of this resource. Produced water ranges from fresh water less than 1,000 parts per million (ppm) of dissolved solids (less than 0.1% salt) to a saturated salt solution carrying more than 300,000 ppm (30% salt). Seawater is approximately 30,000 ppm.

Permian Basin of Texas

The Permian Basin covers a large portion of western Texas and southeastern New Mexico. The majority is located in Texas. The basin contains a variety of hydrocarbon reservoirs that produce water. The basin, approximately 260 miles by 300 miles with a total surface area exceeding 86,000 square miles, is filled with sedimentary rock up to 25,000 feet thick. The Permian Basin continues to be one of most prolific oil basins in the United States. As of 2002, production was 17% of the total United States oil output and 84% of Texas' production.

Oil and gas production occurs in rocks dating from the Cambrian to the Cretaceous with most production coming from reservoirs of Paleozoic age. More than 35 billion barrels (bbls) of oil, 5.5 billion bbls of natural gas liquids and 90.7 trillion cubic feet of natural gas have been produced from the basin as of the 1990s. Along with these enormous hydrocarbon riches, water is also produced at an average of eight bbls of water for every bbl of oil. A daily average of just less than 10 million bbls of water is produced from the Permian Basin. This water is being brought to the surface in an area that receives less than 10 inches of rain per year.

The numerical distribution of produced water for the Permian Basin is presented in Figure 1 below. These data come from the national produced water database managed by the United States Geological Survey (USGS). The database contains more than 10,000 individual samples of produced water for the basin. Produced water salinity varies from approximately 1,000 ppm to more than 300,000 ppm dissolved salt. Median salinity is approximately 88,000. Approximately 6 percent of the water samples in the database fall below 10,000 ppm and could have local beneficial uses. Depth of those samples less than 10,000 ppm range from 25 feet to more than 19,000 feet but most of these low salinity water samples were taken from less than 4,000 feet. Water this deep probably cannot be harvested economically by wells drilled expressly for water but could be exploited as a by-product of oil and gas production.

The much larger segment of produced water with salt content between 10,000 and 50,000 ppm can be used after treatment to remove the salts through desalination systems. This water could be utilized for specialized areas. Water in excess of 50,000 ppm probably has use only in pressure maintenance projects such as water floods at local oil fields.

Powder River Basin

The Powder River Basin (PRB) forms part of the Unglaciated Missouri Plateau section of the Great Plains. Extending from northeastern Wyoming into southeastern Montana, the basin contains up to 18,000 feet of sedimentary rock. The basin covers an area of approximately 34,000 square miles. Oil and gas has been developed in the Powder River Basin since the discovery of the Salt Creek field in 1908. Conventional oil and gas exploration has been declining in the Montana portion of the basin, with considerable decreases in oil production since 1986. However, since the 1990s, the PRB increasingly has become a larger source of natural gas revenues for Montana and Wyoming, with production of coal bed natural gas (CBNG) contributing to the majority of the increased production.

Quite unlike the Permian Basin, PRB oil and gas development yields more than 1.5 million bbl per day of water, much of it high in quality. The numerical distribution of produced water quality for the PRB is presented graphically in Figure 2 below. The USGS water database contains 3,012 individual samples for the basin. While produced water salinity ranges from approximately 1,000 ppm to more than 300,000 ppm dissolved salts, the median salinity is moderately brackish at 7,376 ppm. More than half the produced water quality samples (60%) in the USGS database have a total dissolved solids (TDS) concentration less than 10,000 ppm and a total of 93% of the samples had salinity below 50,000 ppm. Major differences in subsurface geology account for the PRB and Permian Basin graph variances.

PRB oil and gas production yields more than 1.5 million bbls of water per day in an area that averages less than 15 inches of precipitation annually. The basin has been in a severe drought for the past eight years, causing shortages of hay. CBNG water is being used in the basin to a minor extent but could be utilized more widely for surface and subsurface irrigation to support farming and ranching.

Summary

The IOGCC and its member states understand the produced water resource and its importance. Particularly in the arid western United States, the possibility exists of using produced water to augment meager surface water supplies and rainfall. Oil-bearing geological basins contain water of various qualities, as illustrated by the Permian and Powder River basins. The former produces huge volumes of water daily but only a small percentage is suitable for irrigation. The latter produces only modest volumes of water, but most is suitable for irrigation. It is the fine points of produced water distribution that inhibits its use in agriculture.

Historically, watering has been achieved either by flood irrigation using spreader dikes constructed across the channels of ephemeral streams or through water storage in large reservoirs. Although water produced from CBNG is considered potable and has been utilized extensively for human consumption and stock watering in the PRB of Wyoming, irrigation practices utilizing CBNG water have only a recent history within the region. The experience with irrigation using CBNG-discharge waters has been gained with various types of sprinkler irrigation through the use of center pivots, side-roll systems, and high pressure, large flow sprinklers. In addition, subsurface drip irrigation is gaining popularity in the arid west. Each of these techniques can utilize large volumes of water daily to produce crops such as alfalfa and grass.

Agricultural irrigation with produced water can be facilitated by tracking the availability, suitability, and permittabilty of the resource. Each oil and gas field produces water of slightly different quality and quantity. When this water is accurately inventoried, ranchers and farmers can make definitive plans for its use. Inventories would need to be basin-wide or countywide and should include best management practices for the particular water character. Inventories would be given the widest possible dissemination to reach the majority of ranchers and farmers. And this information would need to be updated as oil and gas production conditions changed.

Again let me reiterate IOGCC support for HR 5110 and our commitment to provide the subcommittee with the results of our research as soon as it is complete.

In closing let me make one final observation. This research which the IOGCC has been conducting on produced water, as I mentioned above, was funded by the U.S. Department of Energy (DOE) and its National Energy Technology Laboratory. This year the Administration and the House and Senate Appropriations Committees have eliminated the appropriation for federally funded oil and natural gas research and development through DOE's Office of Fossil Energy. Such a decision will put an end to research efforts such as this and deal a serious blow to the ability of our country, particularly the small producer, to keep pace technologically and keep the United States its primary supplier of oil and natural gas for domestic consumption.

Thank you for the opportunity to appear here today. If we can provide any additional information, please do not hesitate to ask.