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RURAL WATER PROJECTS

Federal Assistance Criteria and Potential Benefits of the Proposed Lewis and Clark Project

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Mr. Chairman and Members of the Subcommittee:

It is a pleasure to be here to participate in your oversight hearings on rural water project funding. In the past year, we have issued two reports that address issues involving rural water projects. One, issued in May of 1998 to your Senate counterpart, looked at the characteristics of a number of proposed rural water projects and compared them with the criteria of a number of existing programs for funding assistance.[1] One of the projects covered in that report was the proposed Lewis and Clark project in South Dakota, Iowa, and Minnesota. The other report was issued to you in May of this year.[2] It focused on the benefits that could be expected from constructing a project such as Lewis and Clark.

Specifically, my statement today will cover (1) federal assistance criteria for rural water projects and (2) potential benefits of rural water projects such as Lewis and Clark.

In summary, regarding federal assistance criteria for rural water projects, our work looked at three programs. These were the Rural Utilities Service program of the Department of Agriculture (USDA), the Drinking Water State Revolving Fund of the Environmental Protection Agency (EPA), and the Bureau of Reclamation (BOR) of the Department of the Interior. We found that the USDA and EPA programs had specific criteria that a proposed water project must meet to be considered for funding and that none of the three projects we examined, including the Lewis and Clark project, had characteristics that met all of the criteria of any one of the programs. We further found that while BOR did not have a formal program and, thus, did not have formal criteria, it did have a long-standing policy on reimbursement for its contributions to projects with which none of the three proposed projects—again including Lewis and Clark—could comply.

Regarding potential benefits of rural water projects, our work, using Lewis and Clark as the example, found that the local water users, such as households and business would receive most of the benefits of the project, which could include higher personal incomes and improved lifestyles. While the federal government would realize only minimal financial benefits, the project would benefit the federal government to the extent that it will be a means of achieving public policy objectives.

[1]Rural Water Projects: Federal Assistance Criteria (GAO/RCED-98-204R, May 29, 1998).

[2]Rural Water Projects: Identifying the Benefits of the Proposed Lewis and Clark Project (GAO/RCED-99-115, May 28, 1999).

Since the proposed Lewis and Clark Rural Water Project was a focus of each of our reviews, I would like to provide some background on that project before describing our findings in greater detail.

Background

The project is to address the dual problems of inadequate quantities of water and poor quality of water. The cost of the project is estimated to be $282.9 million (in 1993 dollars). The 300,000 people in 14 counties near the junction of South Dakota, Iowa, and Minnesota use groundwater as their principal municipal and industrial water source. The 100,000 urban residents of Sioux Falls, the largest city in the area, obtain water from the city's municipal water system, while rural residents of the area obtain water primarily from smaller rural water districts. A number of rural residents obtain their own water from private wells. Good-quality water, however, is in short supply in this area. Shallow aquifers, a major source of water in the area, often hold insufficient quantities of water for expanding populations and economic activities, and quantities can be limited during times of drought. Also, the groundwater commonly obtained from these shallow aquifers is vulnerable to contamination from nitrates and pesticides from the intense agriculture that is the main economic activity of the area. Groundwater is often plentiful in deeper aquifers, but it is highly mineralized and, thus, requires expensive treatment.

Because of the insufficient quality and quantity of water, 22 water districts in the area advocate the building of a major municipal water system known as the Lewis and Clark Rural Water Project which would draw water from the Missouri River. These districts are requesting legislation that would authorize a federal grant to cover the construction of the project. The proposed legislation provides a formula for federal and nonfederal sharing of the costs of this construction. With the exception of the city of Sioux Falls, the federal government would fund 80 percent of the costs for the project's planning and construction, and nonfederal interests would fund the remaining 20 percent. For the city of Sioux Falls, the federal government and nonfederal interests would each provide 50 percent "of the incremental cost to the city of participation in the project."

"Incremental cost" is not defined in the proposed legislation, and there is more than one way to interpret these words. In our report, we considered the "incremental cost" that would be subject to 50/50 federal funding to be Sioux Falls' proportionate share of the project's capital costs based on

its water demand as cited in the project's feasibility study. This proportionate share is 42.6 percent of the $282.9 million project's total cost less a small amount (about $8.5 million), which we interpret the federal government would pay for environmental enhancements. Hence, we estimated the cost shares as follows: The federal government would be responsible for $192.9 million, or 68 percent; Sioux Falls' nonfederal cost share would be $58.5 million, or 21 percent; and the other than Sioux Falls' nonfederal cost share would be $31.5 million, or 11 percent.

The Bureau of Reclamation concurred that our interpretation of incremental costs is reasonable but pointed out that other interpretations may exist. According to the Executive Director of the Lewis and Clark Rural Water System, for example, the project's sponsors interpret the "incremental cost to the city of participation in the project" as the amount of savings that would be realized if Sioux Falls was dropped from the project. That is, the sponsors equate incremental cost to an estimated savings from downsizing the pipelines, treatment plant, and wells to account for water that no longer would be delivered to Sioux Falls. They believe that this savings would be $55.2 million and that the nonfederal cost share for Sioux Falls would be 50 percent of this amount, or $27.6 million.

Project Characteristics Do Not Meet Some Criteria for Participation in Selected Federal Programs

We identified a number of elements from laws, regulations, and policies from USDA, EPA, and BOR that constitute the criteria that proposed rural water projects must meet. USDA's program has direct criteria for participation. EPA—which provides grants to the states that must, in turn, develop their own plans and policies for participation—establishes minimum requirements for those plans which constitute applicable criteria. BOR, which has no formal program for rural water projects, does have a long-standing policy on full reimbursement for its contributions to the local projects it funds. It has concentrated its activities in the 17 western states that constitute its service area.

The characteristics of the Lewis and Clark project meet some but not all of the criteria of the three agencies. The project does not meet some of USDA's criteria in that it includes a city (Sioux Falls) with a population exceeding the definition of a rural area as a location with fewer than 10,000 people. Thus, only the rural component of the Lewis and Clark project would meet the criterion. The project also does not meet the criterion for economic feasibility for repayment in that it envisions federal funding through grants of 80 percent of the design and construction costs (50 percent for the

Sioux Falls component). This amount exceeds the USDA program's maximum grant limitation of 75 percent of eligible project costs.

The project also does not meet some of the criteria of the EPA program. For example, it does not meet the economic feasibility requirement for the state loan program in that it depends on grants to cover 80 percent (50 percent for the Sioux Falls component) rather than a loan. In addition, the inclusion of an entity with more than 10,000 people would call into question the project's applicability for the portion of the EPA's state grant moneys that states are to use for projects with populations under 10,000.

Similarly, the project's dependence on grants is inconsistent with BOR's long-standing policy of having water users repay 100 percent of the costs of projects. In addition, 2 of the 3 states involved in that project—Iowa and Minnesota—are not among the 17 western states that constitute BOR's service area.

Nature of the Benefits of the Lewis and Clark Rural Water Project

The benefits associated with a rural municipal and industrial water project such as the Lewis and Clark project are a result of increases in both the quantity and quality of water. These benefits can generally be categorized as (1) societal benefits, (2) economic benefits, and (3) fiscal benefits.

The societal benefits include improvements in the health, safety, and lifestyle of residents served by the project. Health improvements could result from the Lewis and Clark project because of the improved quality of the water. For example, EPA's research reveals that a reduction in sulfate concentration in a community's drinking water could result in fewer gastrointestinal illnesses and that reductions in nitrate concentrations in drinking water could result in fewer infants being at risk of serious illness or death. The project could improve safety in the region by making more water available for fighting fires in the smaller communities. Lifestyle improvements could result from a better quality of water being available for drinking, bathing, and washing clothes or more water being available for landscaping. The societal benefits also include contributing to the federal government's efforts to pursue its goal of furthering economic development in rural America.

The economic benefits are increases in the economic value of the national or regional output of the goods and services produced as a result of increases in the quantity or quality of water. The Lewis and Clark project could have an impact on hog and cattle production, milk production, and

other agricultural products made from soybeans, corn, and eggs that are processed by local plants. For example, farmers have reported increased weight gains in hogs when rural areas have switched to water having lower sulfates and hardness. Similarly, dairy farmers have attributed increased milk yields to better quality water. Although the water from the Lewis and Clark project will not be used for irrigation, community officials stated that an increased availability of water could provide opportunities for the economic development of industries whose processes require large amounts of water, such as ethanol plants and food processing plants, in the Lewis and Clark service area. In addition, the improved quality of the water would increase the longevity of water heaters, water softeners, and other appliances by reducing mineral deposits and thereby saving residents repair and replacement costs.

The fiscal benefits are net increases in government revenues that result from an increase in economic activity. Proposed construction projects such as the Lewis and Clark project would have an impact on fiscal revenues. Should the Lewis and Clark project be built, increased sales tax revenues could result from an increase in economic activity, and increased income tax revenues could result from the higher earnings associated with this economic growth, particularly in the agricultural sector. Increases in the quantity and quality of water could lead to increases in property values, which in turn could increase property tax revenues. However, the net fiscal benefit to the various levels of government would depend also on the impact of the project on various government expenditures, including increases in infrastructure spending or increases in government outlays to meet increased demands for government services.

Beneficiaries of the Lewis and Clark Rural Water Project

The local water users, such as households and businesses, would receive most of the benefits from the Lewis and Clark project. Thus, the project's 22 member districts would not benefit directly because, as nonprofit water providers, they function as their customers' agents in obtaining water and deliver water to users at or near cost. The benefits accruing to local water users could include (1) higher personal income resulting from the increase in economic activities; (2) decreased costs for replacing water heaters, maintaining water softeners, and servicing other appliances; and (3) societal benefits, such as improved health and lifestyles.

State and local governments would benefit primarily from the increases in tax revenues resulting from an anticipated increase in the production and sales of goods and services. State and local governments could also benefit

from increased sales and income taxes generated from the construction activities of the Lewis and Clark project. County governments and school districts could be the beneficiaries of increased property tax revenues.

The federal government would realize only minimal financial benefits from the Lewis and Clark project. Increases in federal income tax revenues resulting from increased economic activities attributable to the project would likely be minimal. However, the project would benefit the federal government to the extent that it will be a means of achieving such objectives as meeting federal drinking water standards, improving the quality of rural life, and investing in the infrastructure of rural America.

How Benefits From the Lewis and Clark Rural Water Project Are Valued

The societal benefits, such as meeting federal drinking water standards, improvements in health and lifestyle, and investing in the development of the infrastructure of rural America, cannot be measured monetarily with reasonable accuracy. For example, water experts we interviewed stated that improved public health is a major benefit, but the benefit is difficult to measure. Improvements in health were also cited by district representatives as a major benefit of the Lewis and Clark project. However, neither the reduction in illnesses nor the subsequent reduction in health care costs that might be attributable to better quality water can be valued with precision.

Similarly, it is not possible to accurately assign a monetary value to an improved lifestyle attributed to better quality water. However, the Congress has recognized the long-standing need to improve the quality of water in rural America. For example, the Rural Utility Service, through its water and wastewater loan and grant program, has helped fund almost 17,000 water and sewer projects serving more than 12,500 rural communities in the last 30 years. Also, the objective of EPA's Drinking Water State Revolving Loan Fund program is to ensure that the nation's drinking water supplies remain safe and affordable.[3]

The economic benefits of water projects such as the Lewis and Clark project are, for the most part, difficult to quantify because of the difficulty in attributing with any precision an increase in economic activity directly

[3]The Safe Drinking Water Act Amendments of 1996 (P.L. 104-182, sec. 130) authorized a Drinking Water State Revolving Loan Fund to help public water systems finance the infrastructure needed to achieve or maintain compliance with the act's requirements and to promote public health protection objectives. Section 1452 authorizes the Administrator of EPA to make grants to states to capitalize drinking water state revolving loan funds, which in turn can provide low-cost loans and other types of assistance to eligible water systems.

to an increase in water. Water is rarely the sole factor responsible for economic change, but water can facilitate economic expansion. For example, hog farmers are unlikely to decide to raise more hogs based solely on the availability of better quality water. Instead, they are also likely to consider the cost of feed, the amount of available space in their sheds, and the market demand as reflected in the price paid for their product by slaughterhouses.

Despite the difficulty of measuring the economic benefits, increases in the value of the output of goods and services resulting from the Lewis and Clark project can be viewed from either the national or regional perspective. Although both perspectives are measures of changes in the value of goods and services produced, the regional benefits could be significantly different from the national benefits because regional benefits capture the transfer of economic activities into the project's service area from outside the region. Regional transfers will result in no net national benefits.

At the national level, we believe the increases in the value of goods and services due to the Lewis and Clark project would be minimal. Increases in the output of goods and services do not necessarily result in an increase in their value. For example, hog production, one of the major industries in the tristate area, was initially expected to increase locally because of anticipated improvements in the quantity and quality of water. However, production exceeded the demand of slaughterhouses in 1998, resulting in plummeting prices. The hog price in December 1998 was $14.70 per 100 pounds, down from an average price of $52.90 in 1997. Similarly, the December 1998 beef cattle price of $55.80 per 100 pounds was down from an average price of $63.10 in 1997, resulting in lower incomes.

From the regional perspective, however, the economic benefits of water projects are greater. The regional benefits reflect not only the increase in value of the goods and services produced in the region but also the regional economy's gain from transfers of industries into the area. For example, local planners expect that on completion of the Lewis and Clark project, food processing and ethanol plants may relocate to their region.

Because of the difficulty of identifying and directly attributing changes in economic activities to the quantity and quality of water, analysts have developed other methods that, for the most part, can approximate the value of benefits accruing from a water project. One method, called a willingness-to-pay study, surveys water users and asks them how much

they are willing to pay for an increase in the quality and quantity of their water. BOR analyzed a survey conducted by the Lewis and Clark project's sponsors in 1992 and estimated that residents in the project's service area were only willing to pay an additional $3.34 million per year to ensure a safe and reliable future water supply. Over the 40-year life expectancy of the Lewis and Clark project, this amounts to about $87 million in 1998 dollars.[4] As a result, BOR concluded that from a purely economic standpoint, the Lewis and Clark project does not pay for itself since the cost of the proposed project is $282.9 million in 1993 dollars. However, if the project is required to meet future water quality standards or solve reliability problems that must be dealt with regardless of cost, BOR concluded that the Lewis and Clark project may be the most cost-effective way to reach such goals. Moreover, economists that we contacted said that figures reported by respondents in willingness-to-pay studies may underestimate total benefits because respondents may fear that their water bills would be increased by the amounts they report.

Another method used by economists in estimating the value of a water project's benefits consists of estimating the cost of reasonable alternatives that would be avoided if the project is built. In other words, how much the beneficiaries are willing to pay for an alternative water system provides an estimate of the value they would place on the benefits they expect to receive from the increase in the quality and quantity of their water. At the water district level, this cost represents the value of the project's benefits to all water users in the district, including households, farms, and businesses. This method can approximate the value of benefits if the alternative will produce the same quantity and quality of water as the proposed project.

To that end, we asked the 22 individual water districts to identify and estimate the cost of reasonable alternatives that would be avoided if the Lewis and Clark project is built. Reasonable alternatives for the water districts in the project's service area include drilling additional wells, modifying or building treatment plants, and purchasing water from other water districts. A summary of these alternatives and their individual costs appears in appendix I.

We estimate that the sum of these alternative costs for Lewis and Clark members ranges between about $71 million and $81 million in 1998 dollars. However, these figures should be considered minimum values because many alternatives would not produce the same quality of water as

[4]Discounted at 3 percent.

the Lewis and Clark project and because two districts did not estimate the cost of their alternatives. In addition, only 5 of 16 alternatives that would require large capital investments were based on detailed written cost estimates or engineering studies, so several of the verbal estimates we obtained may lack accuracy.

The net fiscal benefits attributable to the Lewis and Clark project would depend largely on changes in the economic activities in the region as well as on changes in the governments' outlays for services and infrastructure. BOR estimated the tax revenue increases expected from the construction activities of the Lewis and Clark project to be about $16.5 million in 1992 dollars. Its estimate included the excise, fuel, sales, and income taxes expected to be collected by South Dakota, Iowa, and Minnesota from the contractors and laborers. However, the estimate did not include increases in tax revenues anticipated from an increase in regional economic activities.

Mr. Chairman, this concludes my prepared statement. We will be pleased to respond to questions you or Members of the Subcommittee may have.

Contact and Acknowledgments

For further information, please contact Susan D. Kladiva at (202) 512-3481. Individuals making key contributions to this testimony included Arleen Alleman, Ronald M. Belak, Brad Hathaway, Mehrzad Nadji, Rudolfo G. Payan, Doreen Feldman, and Kathleen Gilhooly.

Member Districts' Alternatives to the Lewis and Clark Rural Water Project Compared With the Project's Commitments

Member district	Average daily water use (gallons)	Lewis and Clark commitment (gallons/day)	Nonfederal proportionate share of Lewis and Clark (1998 dollars)[a]	Alternative to Lewis and Clark	Cost of alternative (1998 dollars)	Nature of cost estimate for alternative
Lincoln-Pipestone, Minnesota	3,000,000	300,000[b]	$769,000	None available	Not available	Not applicable
Rock County, Minnesota	583,000	300,000	769,000	Drill more shallow wells in Rock River aquifer	$2,887,000	Written estimate prepared by district manager
Luverne, Minnesota	1,200,000	500,000	1,282,000	Drill additional shallow wells	388,000 to 1,388,000	Verbal estimate
Worthington, Minnesota	2,720,000	1,730,000	4,436,000	None available	Not available	Not applicable
Sheldon, Iowa	1,300,000	1,000,000	2,564,000	Drill more wells and update water lines	6,332,000 to 6,832,000	Written proposal prepared by engineering firm
Sibley, Iowa	400,000	650,000	1,667,000	Purchase additional water from Osceola Water District	2,556,000	GAO estimate based on water price supplied by district
Clay County, Iowa	750,000	1,000,000	2,564,000	Drill more wells and build joint treatment plant with Spencer, Iowa	3,102,000	Written estimate based on studies prepared by engineering firm
Rural Water District 1, Iowa	1,725,000	1,000,000	2,564,000	Drill more deep wells and upgrade treatment plant	Not estimated	Not applicable
Hull, Iowa	165,000	300,000	769,000	Join nearby district in its expansion and purchase 150,000 gallons/day	2,447,000	Written cost estimate supplied by nearby district and GAO estimate of value of water purchase
Sioux Center, Iowa	1,000,000	600,000	1,538,000	Drill wells west of town and build water line	560,000	Verbal estimate provided by city's utility department
Boyden, Iowa	55,000	100,000	256,000	Pump existing wells and eventually add new wells	Not estimated	Not applicable

(continued)

Member district	Average daily water use (gallons)	Lewis and Clark commitment (gallons/day)	Nonfederal proportionate share of Lewis and Clark (1998 dollars)[a]	Alternative to Lewis and Clark	Cost of alternative (1998 dollars)	Nature of cost estimate for alternative
Beresford, South Dakota	280,000	250,000	641,000	Replace treatment plant	2,000,000	GAO estimate based on data provided by water department
Centerville, South Dakota	200,000	220,000	564,000	Hook up to nearby rural water systems	4,412,000 to 5,012,000	Verbal estimate provided by city official
Harrisburg, South Dakota	70,000	250,000	641,000	Drill more wells, construct new treatment and softening plants	2,153,000	Verbal estimate supplied by utility department
Lennox, South Dakota	200,000	400,000	1,026,000	Drill more wells	1,021,000	Verbal estimate provided by water department
Madison, South Dakota	800,000	1,000,000	2,564,000	Build a new treatment plant	0 to 8,040,000	Detailed study prepared by engineering firm
Parker, South Dakota	150,000	490,000	1,256,000	Drill high-volume well and build water tower	278,000	Verbal estimate supplied by water department
Sioux Falls, South Dakota	15,678,000	10,000,000	64,101,000	Develop Wall Lake aquifer	30,000,000	Informal estimate by city
Tea, South Dakota	150,000	330,000	846,000	Purchase balance (180,000 gallons per day) from Lincoln Co.	2,331,000	GAO estimate based on data supplied by city
Lincoln County, South Dakota	533,000	900,000	2,308,000	Purchase shortfall (up to a maximum of 800,000 gallons per day) from Sioux Falls	2,762,000	GAO estimate based on data supplied by water district
Minnehaha, South Dakota	1,600,000	2,000,000	5,128,000	Implement stringent water conservation	Not applicable	Not applicable

(continued)

Member district	Average daily water use (gallons)	Lewis and Clark commitment (gallons/day)	Nonfederal proportionate share of Lewis and Clark (1998 dollars)[a]	Alternative to Lewis and Clark	Cost of alternative (1998 dollars)	Nature of cost estimate for alternative
South Lincoln, South Dakota	600,000	150,000	385,000	Drill three wells; build booster station, lines and softening plant	7,650,000	Informal estimate supplied by water district
Total	33,159,000	23,470,000	$98,638,000	—	$70,879,000 to $81,019,000	—

[a]These proportionate shares in 1998 dollars are not equal to proportionate shares discussed in the report's text, which are in 1993 dollars.

[b]Lincoln-Pipestone has plans to increase their commitment to 1 million gallons per day.

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