

Water Review

A Perspective on Western Water Issues Prepared by the Family Farm Alliance and Its Members

ARIZONA

Coal Plant Emissions Upgrade Could Take the Air Out of Arizona Farmers

OVERVIEW

The Central Arizona Project (CAP) awaits a critical decision from the U.S. Environmental Protection Agency (EPA) on emissions controls upgrades that may be mandated for the Navajo Generating Station (NGS).

The emission requirements being considered by EPA are intended to satisfy unique visibility criteria – driven in part by the proximity of NGS to Grand Canyon National Park - and they may carry with them a heavy cost. NGS is a coal-fired plant that provides 95% of the power required to move Colorado River water into Central Arizona. Additional capital or operating costs at that plant translate into higher bills for every single water user in the state that receives CAP water.

EPA is reviewing two options to meet the unique emissions standards associated with visibility in the Grand Canyon region. Each of these options carries significant costs, but one of the alternatives is clearly preferable to CAP water users. EPA selection of the second, much more costly alternative could actually drive existing surface water users to begin extracting limited groundwater resources.



Navajo Generating Station.
Source: Central Arizona Project

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CAP Irrigators and NGS Emissions

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THE AREA

In 1946, the Central Arizona Project Association was formed to educate Arizonans about the need for CAP and to lobby Congress to authorize its construction. It took the next 22 years to do so, and in 1968, President Lyndon B. Johnson signed a bill approving construction of CAP. The bill provided for the Bureau of Reclamation of the Department of the Interior to fund and construct CAP and for another entity to repay the federal government for certain costs of construction when the system was complete.

In 1971, the Central Arizona Water Conservation District (CAWCD) was created to provide a means for Arizona to repay the federal government for the reimbursable costs of construction and to manage and operate CAP. Construction began at Lake Havasu in 1973 and was completed twenty years later south of Tucson. The entire project cost over \$4 billion to construct.

Maricopa Stanfield Irrigation & Drainage District (MSIDD) and Central Arizona Irrigation and Drainage District together use about half the agricultural water that the CAP delivers in the state. The two districts are about the same size and have very similar water costs.

The power that drives the pumps within CAP to move water from the Colorado River into the interior of the state comes from the Navajo Generating Station (NGS), a 2,250 megawatt coal-fired steam plant operated by the Salt River Project (SRP).

“Our District receives between 150,000 and 190,000 acre-feet per year, all of which is subject to the cost of pumping water,” said Brian Betcher, General Manager of MSIDD. “Any increase in pumping cost at the NGS flows directly through to us.”

CAP AND NGS

The Navajo Generating Station is essentially the sole source of power for CAP facilities. Out of about 4.3 million megawatt hours of energy available each year from the CAP share of NGS, CAP uses about 2.8 million megawatt hours to deliver CAP water. The balance (about 1.5 million megawatt hours per year) is sold. The resulting revenues that are generated are used to assist in meeting CAWCD's annual obligation to repay the costs of construction of the CAP and, ultimately, to fund the costs of Indian water rights settlements in Arizona.

A PRIMER ON NO_x EMISSIONS CONTROL METHODS

Reducing nitrogen oxide (NO_x) emissions from large utility coal-fired boilers has been a primary focus of the U.S. power generation industry since passage of the 1970 Clean Air Act and subsequent legislation. By the early 1990s, nearly all such boilers had installed some form of low-NO_x burner (LNB) technology and/or overfire air (OFA) to reduce emissions of the pollutant 40% to 70% from uncontrolled levels. Working in concert with a selective catalytic reduction (SCR) system, LNBs and OFA can further lower NO_x emissions, but at significantly higher capital cost.

SCR is a means of converting NO_x - with the aid of a catalyst - into nitrogen and water.

Owners of coal-fired boilers with first- or second-generation LNBs have another option for further reducing NO_x emissions — replacing them with newer models or advanced combustion technology.

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Impacts from Coal Plant Emissions Upgrades

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EMISSIONS CONTROLS AT NGS

The NGS participants have installed state of the art controls for sulfur dioxide emissions and are achieving high levels of particulate emissions control. NGS is the only plant to have had such controls installed exclusively for visibility purposes. EPA is currently evaluating controls on NO_x emissions from NGS under EPA's Regional Haze rules to protect visibility in nearby areas like Grand Canyon National Park.

Two types of controls are under consideration to reduce NO_x emissions at NGS: low NO_x burners with separated overfire air (LNB/SOFA), which are currently being installed voluntarily by the NGS participants at a cost of \$46 million, and SCR. The installation of SCR would result in the formation of additional particulates, which may require the installation of polishing baghouses (fabric filters) to control downstream particulate emissions.



Central Arizona Project irrigators face significant water rate increases resulting from emissions upgrades contemplated for Navajo Generating Station.
Source: Bureau of Reclamation

IMPACT ON CAP WATER RATES

SRP has made a significant effort to update and refine cost estimates and has recently sent refined estimates to EPA. Preliminary information from SRP's new study provides the following findings:

- The estimated total capital cost of LNB/SOFA, currently being installed at NGS, is \$46 million. At a capital cost of \$46 million, CAP energy charges could increase by about \$0.56 per acre foot of water delivered.
- SCRs are estimated to cost \$544 million, plus \$11.9 million in added annual OM&R costs. This could increase CAP energy charges by over \$8 per acre foot – a 17% increase.
- SCRs and polishing baghouses would cost \$1.13 billion, plus \$21 million in additional annual operations and maintenance expense – double the cost of SCRs alone. This could increase CAP energy charges by over \$16 per acre-foot – a 34% increase over the current 2010 rate of \$49 per acre-foot.

These are the *most favorable* cost impacts that CAP water users could expect from EPA's requiring SCRs or SCRs plus baghouses as "Best Available Retrofit Technology" (BART) for NGS. These cost estimates assume: (1) that the NGS participants would install these expensive controls in the face of significant uncertainties regarding continued operation of NGS and (2) that the participants would have 20 years to amortize their investment.

Stringent emissions controls could increase CAP energy charges by 34% over current power rates, according to the SRP.

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Irrigators Face Impacts and Uncertainty

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IMPACT TO IRRIGATION DISTRICTS AND GROWERS

MSIDD serves water to about 65,000 acres. On an annual basis, about 110,000 acre-feet is pumped from groundwater wells. Approximately 160,000 acre-feet is CAP water. MSIDD pays an average of roughly \$39 per acre-foot for CAP water.

As noted above, CAP's current estimates of increased pumping costs resulting from the installation and operation of the LNB/SOFA is \$0.56 per acre-foot. Installing and operating the SCR plus polishing bag houses could increase the cost by over \$16 per acre-foot. If some of the owners do not agree to pay for the new equipment, and the plant is closed, the cost for the power to pump the CAP water skyrockets, with increases of \$30 to \$115 per acre-foot.

"We can absorb the costs of the LNB/SOFA treatment," said Betcher. "However, the more expensive options would cripple our ability as a District to provide surface water to our growers, driving us back to a place where we will be mining groundwater."

So, what do these cost increases mean for family farmers? Consider the plight of Dan Thelander, whose Tempe Farming Company uses about 2.7 acre-feet of CP water per acre annually. An increase of \$0.56 per acre-foot would equate to about \$1.51 per acre per year. For the 2,500 acres encompassing Tempe Farming Co., this comes to about \$3,800 per year.

"Not good, but manageable," says Thelander.

If the cost of water goes up by over \$16, the per-acre costs jump to over \$44, or nearly \$111,500 per year for Thelander's farm. Thelander grows mostly cotton, wheat and alfalfa, and the price he receives for the cotton and wheat is based totally on the world market



Higher pumping costs for Central Arizona Project cotton growers cannot be passed along to customers because cotton prices are based on world market prices. Photo source: Bureau of Reclamation

price. So, very little of this increased cost for those crops can be passed along to his customers.

"Only the cost of producing the alfalfa might possibly be passed along somewhat to the dairies that we sell to, but even then, they buy hay from all over the state," said Thelander. "The bottom line is that I cannot pass along much of the in-

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Irrigators Face Impacts and Uncertainty

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creased cost and with thin margins already, I will lose money if I take the expensive water. If I won't be able to afford the increased costs of \$16, then what happens?"

Other farmers and districts will be faced with similar economics. MSIDD may not be able to purchase CAP water, and would have to turn to increased groundwater pumping, which carries with it higher pumping costs and impacts to local aquifers. Ironically, CAP water was originally brought to this area to reduce local groundwater pumping.

"The end result is that there will be a significant number of acres that could not be farmed because of lack of water," Thelander predicts.

Thelander, MSIDD and other districts and growers in the CAP service area are asking EPA to determine that the less expensive LNB/SOFA is adequate to control NOx emissions from NGS rather than requiring the installation of SCR technology.

"Pinal County agriculture cannot absorb the huge increased cost of water that the installation of the SCRs would cause," he said. "Arizona can't afford anything more."

IMPACT ON DEVELOPMENT FUND REVENUES

The Lower Colorado River Basin Development Fund allows for the collection of revenues from the sale of surplus power to aid in the repayment of the CAP. Funds are also made available for a multitude of specified purposes identified in the Arizona Water Settlements Act.

Using the new SRP cost estimates, installation of SCRs would reduce Development Fund revenues by about \$149 million between 2016 and 2036 and \$1.1 million per year thereafter. Installation of SCRs plus polishing baghouses would reduce Development Fund revenues by about \$292 million between 2016 and 2036 and \$1.9 million per year

thereafter.

Revenues to the Development Fund are credited first against CAWCD's annual repayment obligation and are then used to fund the costs of Indian water rights settlements. By 2015, CAWCD expects Development Fund revenues to exceed the annual repayment obligation, so these lost Development Fund revenues would adversely affect Indian tribes with water rights settlements. Indian tribes would lose the benefit of additional Development Fund revenues that could total as much as \$60 to \$90 million *a year* between 2016 and 2023 alone.

UNCERTAINTIES

The water contract for NGS must be renewed by 2014. The lease for the Plant site must be renewed or extended by 2019. Los Angeles Department of Water and Power has already announced its intention to withdraw or dispose of its 21.2% interest in NGS by 2020. Greenhouse gas regulations could also increase operating costs significantly.

Because of these uncertainties, it may be more reasonable to assume that an immediate requirement to install SCRs would result in Plant closure than to assume that the participants would make a substantial additional investment in emission controls at the present time.

Plant closure would have very significant adverse impacts on CAP energy charges and Development Fund revenues. CAWCD would have to acquire a substitute source of pumping power, potentially at market rates. The Central Arizona Water Conservation District estimates that, by 2017, CAP pumping energy costs could increase by 50 to 300 percent (rising from \$65 per acre foot to \$95 to \$180 per acre foot) if it is necessary to purchase power at market rates.

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Implications for CAP Irrigators and Arizonans

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IMPLICATIONS

SRP, CAWCD, MSIDD and other CAP water users are working hard to influence EPA's decision on this matter. Right now, the issue is stalled, because the Obama Administration has recognized that the Navajo and Hopi Nations, which supply all of the coal to NGS, would be negatively affected.

A recent report released by the National Parks Conservation Association will likely bring more political pressure to bear on this matter. The new report finds several man-made threats are contributing to the deterioration of Grand Canyon National Park, from mining to aircraft flyovers to management of the Colorado River upstream from the canyon. Notably, regional haze from power plants and cities hundreds of miles away can mar the views of the canyon, the report said. However, NGS is downwind of the Canyon except for a few days of the year.

What is also hazy is the degree of public health and aesthetic benefits that will result from the various emissions upgrade options under consideration at NGS. When comparing alternatives, experts predict there will be no noticeable difference to the human eye but there could be a difference registered on measuring devices.

"What's difficult here is the potential for new, extreme costs," said Betcher. "We are dealing with a visibility issue - not a health issue-and one that is probably not caused by NGS to begin with"

The Central Arizona Water Conservation District believes that EPA is not free to require controls

for NO_x at NGS that cannot be shown to be cost beneficial.

"The Clean Air Act and the Agency's Regional Haze rules permit (EPA) to take a reasonable, measured approach to controlling NO_x emissions at NGS, one that protects visibility...while avoiding a result that could jeopardize the long term operation of NGS," CAWCD wrote in an October 28, 2009 letter to EPA.

There sometimes is a limit to what businesses (and consumers, too) can absorb when government regulations increase operating costs. That is clearly the case with NGS, where costs associated with improving air emissions standards - driven in large part by concerns to protect air clarity in Grand Canyon National Park - could put some farmers out of business, according to Thelander. And these very real costs do not even reflect possible future cap-and-trade decisions contemplated in Washington, D.C., that would also add cost to pumping water in Central Arizona.

Recent EPA rule-making efforts are adding other new costs to

farmers and ranchers in Arizona and other parts of the West (*see Family Farm Alliance June/July 2010 "Monthly Briefing"*), and some question whether the federal government wants them to stay in business, or not.

And other questions remain that demand answers. What is food security worth? Is it more or less important than perceived aesthetic values of nature? How much of the water that produces crops are we willing to shift to other uses?



Ron Rayner, former member of the CAP board of directors and current Family Farm Alliance director.

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Ron Rayner owns A Tumbling T Ranches in Central Arizona and is a former CAP director. He often ponders these questions, and believes by maintaining irrigated lands we can create 'water security' by having a resource that can be shifted to municipal and industrial uses to offset short-term drought constraints. He recently has become more concerned about the loss of highly productive irrigated lands in the West that are very consistent suppliers to the marketplace.

"In the past weeks we have seen news stories about heat and drought and fires in Russia and the Ukraine," said Rayner. "Wheat futures prices have moved up sharply on speculation that the country that supplies 30 percent of the world's exportable wheat will have none to sell after meeting their own needs. My friends in Arizona and California's Imperial Valley are busy lining up wheat seed for planting this fall. We will have the first available new crop supplies in the northern hemisphere next May."

The importance of this matter cannot be overstated. The potential loss of NGS has major ramifications for food security, water delivery, Native Americans, and the economy of Arizona.

DONOR SUPPORT

Make your tax-deductible gift to the Alliance today! Grassroots membership is vital to our organization. Thank you in advance for your loyal support. If you would like further info, please contact Dan Keppen at his NEW e-mail address: dankeppen@charter.net, or visit our website: www.familyfarmalliance.org.

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