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Selenium Trading in the San Joaquin River Valley

Abstract

The farmers of the Grasslands Area District in the San Joaquin Valley have implemented a unique system to address the dangerous levels of selenium resulting from uncontrolled agricultural runoff in the area. Operating under a cap and trade system, the Grassland Area Farmers created a regional entity to administer a selenium load trading system, mandate compliance with regional discharge caps, and generally enforce the terms of a Use Agreement with the U.S. Bureau of Reclamation. This system has been successful in reducing the selenium discharges into the San Joaquin River; however, replication of this system may depend upon a careful consideration of specific factors.

Background: The Problem

As a means of addressing two primary problems with agriculture in California, water shortages and increasing soil salinity, the Central Valley Project was proposed in 1932 and management responsibility was given to the U.S. Bureau of Reclamation.¹ In 1960, Congress authorized the building of the San Luis Drain as a part of this project; the Drain was originally proposed as a 188-mile concrete-lined drain which would carry saline-laden irrigation runoff into the Sacramento-San Joaquin River Delta and the San Francisco Bay.² The Kesterson National Wildlife Refuge was proposed as a storage area to control water flowing through the Drain, with its status as a wildlife refuge only secondary; however, the San Luis Drain was never completed, resulting in the discharge of runoff directly into the Kesterson Refuge.³ Ponds were built at Kesterson in 1971; although the inflow was purely fresh water throughout the 1970s, by 1981 the inflow had become exclusively agricultural irrigation drainage.⁴ Problems with selenium levels began to be noticed shortly afterward.⁵ Agricultural drainage carried selenium into the ponds, where it became concentrated as the selenium remained and the water that carried it in evaporated.⁶ In 1982 entire populations of carp and bass began disappearing

¹ COMMITTEE ON IRRIGATION-INDUCED WATER QUALITY PROBLEMS, WATER QUALITY COUNCIL, IRRIGATION-INDUCED WATER QUALITY PROBLEMS 21 (1989) [hereinafter IRRIGATION-INDUCED WATER QUALITY PROBLEMS].

² David B. Rosenbaum, *Drain is Still in Contention*, ENGINEERING NEWS-REC., May 22, 1995, at 37.

³ IRRIGATION-INDUCED WATER QUALITY PROBLEMS, *supra* note 1, at 20-21

⁴ *Id.* at 21.

⁵ *Id.*

⁶ *Id.*

from the Refuge.⁷ By the spring of 1983, birds had begun dying and experiencing reproductive problems, and the U.S. Fish and Wildlife Service closed the Kesterson ponds.⁸ In 1985 the Department of Interior announced its intention to close the Kesterson Refuge, and that same year the San Luis Drain was closed to further drainage.⁹ Although attention was focused on pollution affecting the Kesterson Refuge, drainage water containing selenium continued to be discharged to other federal and state refuges into the early 1990s, resulting in threats to local ecosystems and violations of water quality standards for the San Joaquin River.¹⁰

Negotiations

To address the issues raised by toxic levels of selenium and allow reopening of the San Luis Drain, in 1988 the San Luis and Delta-Mendota Water Authority (SLDMWA) and the U.S. Bureau of Reclamation began negotiating a use agreement for a portion of the San Luis Drain.¹¹ From the beginning, the negotiation process included a variety of stakeholders.¹² Included in the negotiations were representatives from the U.S. Environmental Protection Agency, the California Department of Fish and Game, the U.S. Fish and Wildlife Service, the Central Valley Regional Water Quality Control Board, Contra Costa County, the Contra Costa Water District, and Environmental Defense.¹³

In 1994, Environmental Defense proposed a cap and trade program to address selenium levels in the district, consisting of a discharge cap for the region and an allocation trading system for district farmers.¹⁴ This system became the basis of the Use Agreement reached between the Bureau of Reclamation and the SLDMWA in 1995.¹⁵ The 1995 Agreement was set to expire in five years; in 2001, the Agreement was renewed for another eight years, expiring in December 2009.¹⁶

The 1995 Use Agreement set a regional cap on the selenium load which may be discharged in a month or in a year.¹⁷ The load, set by consensus of the affected parties, matched the historic average discharge for the initial two years and then decreased by 5% each year afterward.¹⁸ Under the Use Agreement, the local farmers could design their own methods for compliance. In the event of

⁷ *Id.*

⁸ *Id.* at 21, 23.

⁹ *Id.* at 23.

¹⁰ Environmental Defense, Nonpoint Source Pollution Control: Breaking the Regulatory Stalemate 1, *available at* <http://www.envtn.org/docs/GTLP-PNG.PDF> (last visited Dec. 12, 2006).

¹¹ *Id.*

¹² *Id.*

¹³ *Id.*

¹⁴ Environmental Defense, *supra* note 10, at 1.

¹⁵ *Id.*

¹⁶ GRASSLAND BYPASS PROJECT, 2000-2001 ANNUAL REPORT 16 (2000-2001).

¹⁷ Environmental Defense, *supra* note 10, at 2.

¹⁸ Terry F. Young & Joe Karkoski, *Green Evolution: Are Economic Incentives the Next Step in Nonpoint Source Pollution Control?*, 2 WATER POLICY 151, 157 (2000).

noncompliance, the Use Agreement specified that the Bureau of Reclamation could impose penalties if the limits were exceeded and close the San Luis Drain entirely if selenium loads were over 120% of the regional limit.¹⁹ The Use Agreement also required that the regional farm districts form an entity with legal authority to administer and enforce the discharge requirements.²⁰ In response to the 1995 Use Agreement, the local farm districts formed the Grassland Area Farmers as the regional entity to administer and enforce discharge requirements.²¹

The Grassland Area Farmers

The Grassland Area Farmers (GAF) is composed of irrigation and water districts in the San Luis area and is one part of the larger Grassland Bypass Project.²² The GAF operates under the auspices of the SLDMWA; the districts who are currently members of the group are the Camp 13 Drainers, the Charleston Drainage District, the Firebaugh Canal Water District, the Panoche Drainage District, the Widren Water District, the Broadview Water District, and the Pacheco Water District.²³ These districts account for 97,000 acres of farmland in the Grasslands drainage basin. The operation of the GAF is overseen by the Grassland Basin Drainage Steering Committee,²⁴ which is led by the regional drainage coordinator, Joe McGahan.²⁵ Compliance by the GAF with the Use Agreement is monitored by the Oversight Committee for the Grassland Bypass Project; the Oversight Committee consists of the U.S. Bureau of Reclamation and four other state and federal agencies.²⁶

Funding for the GAF comes from a variety of sources. State Revolving Fund loans are used to improve the area irrigation systems.²⁷ Funds provided by Proposition 13, a state bond program which provides funds for water projects in California, were used by the Farmers to purchase and renovate 4,000 acres of land in the drainage area to implement the San Joaquin River Water Quality Improvement Project (SJRIP).²⁸ Under the SJRIP, the member districts have planted salt tolerant crops and constructed distribution facilities, resulting in the displacement of over 1,000 pounds of selenium,

¹⁹*Id.*

²⁰*Id.*

²¹*Id.*

²²GRASSLAND BYPASS PROJECT, *supra* note 16, at 16.

²³Grassland Basin Drainage Steering Committee, Meeting Notice, November 3, 2006, *available at* http://www.sldmwa.org/pdf_documents/Committees/GBDS%20Committee/Notices/GBD%20Mtg%20Ntc%20061117.pdf [hereinafter Meeting Notice].

²⁴*California Farmers Adopt Tradable Loads Program to Reduce Selenium in Agriculture Irrigation Runoff*, NONPOINT SOURCE NEWS-NOTES, March 2000, *available at* <http://www.epa.gov/owow/info/NewsNotes/issue60/agricult60.html> [hereinafter *California Farmers*].

²⁵Meeting Notice, *supra* note 23.

²⁶Terry F. Young & Joe Karkoski, *Green Evolution: Are Economic Incentives the Next Step in Nonpoint Source Pollution Control?*, 2 WATER POLICY 151, 157 (2000).

²⁷GRASSLAND BYPASS PROJECT, *supra* note 16, at 16.

²⁸*Id.* at 20. Proposition 13, also known as the 2000 Water Bond, authorized the sale of \$1.97 billion in general obligation bonds by the California to support water quality and water reliability projects in California. State Water Resources Control Board, Proposition 13, August 22, 2005, <http://www.swrcb.ca.gov/funding/prop13.html>.

14,000 tons of salt and 62,000 tons of boron which would have otherwise drained into the Grassland Bypass Project and the San Joaquin River.²⁹ Proposition 13 funds are also being used to install subsurface drains on 550 acres in the SJRIP lands.³⁰ In addition to state funds, the Farmers also receive funds under Section 319 of the Clean Water Act to develop and implement the tradable loads program.³¹

To meet the selenium load limits, the Grassland Area Farmers have implemented a wide variety of practices, including formation of a regional drainage entity, newsletters and other communications with the farmers, a monitoring program, an active land management program, installation of improved irrigation systems, installation and use of drainage recycling systems, and tiered water pricing.³²

Tradable Load Allocation by the Grassland Area Farmers

The tradable loads system was first promulgated as a rule by the Grassland Basin Drainage Steering Committee in March 1998.³³ Under the tradable load system, the total selenium load for the region is allocated among the member districts, who can then either meet their load allocation or buy additional load allocation from other districts.³⁴ The allocation for each district is determined by a formula which weighs three factors: the total acreage of a district, the tilled acreage of a district, and the historic discharge level of a district.³⁵ Once a discharge load is allocated, the district has discretion as to what measures will be undertaken to ensure compliance with the allocation, including imposing sanctions on individual farmers who fail to meet district-imposed requirements.³⁶ Monitoring duties are assigned to the Regional Drainage Coordinator.³⁷ The existence of a tradable load program proved to be essential to securing agreement as to allocation; one district only agreed to its allocation so long as a specific trade would be conducted in the future.³⁸

The tradable load program allows any district to trade part or all of its allocation to any other member district for any sort of “legal consideration,” whether money, goods, or services.³⁹ The only limitation on trading inside the group is that the trade must be consistent with the monthly and yearly

²⁹*Id.*

³⁰*Id.*

³¹Environmental Protection Agency. *Grassland Bypass Project: Economic Incentives Program Helps to Improve Water Quality*, Section 319 Success Stories Vol. III, <http://www.epa.gov/nps/Section319III/CA.htm> (last visited Dec. 12, 2006).

³²Annual Report, *supra* note 13, at 16.

³³*California Farmers*, *supra* note 24.

³⁴*Id.*

³⁵Young & Karkoski, *supra* note 26, at 159.

³⁶*Id.* at 160-1.

³⁷*California Farmers*, *supra* note 24.

³⁸Young & Karkoski, *supra* note 26, at 159.

³⁹*Id.*

allowable load.⁴⁰ As Terry Young and Joe Karkoski described, this limitation means that “no party could buy a May allocation and use it to discharge in July or some other month.”⁴¹ However, parties are allowed to trade retroactively, allowing a district which exceeded its allocation in one month to trade for an additional discharge allocation before any sanctions or fines accrued.⁴² Trading outside of the group is prohibited, as only the member districts have permission to discharge into the San Luis Drain under the Use Agreement.⁴³ There is also no limitation on trading to reduce the appearance of “hot spots,” or concentrations of pollution, because the pollutant produced enters the water body at the same location, regardless of where the pollution is produced within the districts.⁴⁴

Although heavy rain from El Niño prevented the full implementation of a trading program in 1998, the system was reintroduced for the water year 1999 on January 18, 1999.⁴⁵ The 1998 rule's only sanction for noncompliance was to require immediate cessation of discharge;⁴⁶ according to the new rule, however, the fee for any selenium loading in excess of the target load would be divided among the districts which exceeded their selenium allocation.⁴⁷ Even if the region as a whole did not exceed its regional allocation, the system imposed fees on those districts who exceeded either their monthly or yearly allocations; the system also awarded monthly and annual rebates to those districts whose discharge was below their allocation, which were to be paid by the incentive fees imposed on the exceeding districts.⁴⁸ In the water year 2000, for example, the rebate was a proportional share of a total figure reflecting the amount by which the GAF exceeded or was below its allocation.⁴⁹

Although the initial load allocations for 1996-1997 and 1997-1998 were not met, in part due to the heavy rains of 1998, the GAF have come in under the load allocation for every year after 1997-1998.⁵⁰ The selenium load discharged from the area has been reduced from 9,600 to 3,700 pounds, by 61%, and the salt load has been reduced by 39%.⁵¹

⁴⁰*Id.*

⁴¹*Id.*

⁴²*Id.* at 160. The only trade which occurred in 1998 was a retroactive trade. *Id.*

⁴³*Id.*

⁴⁴*Id.*

⁴⁵*California Farmers, supra* note 24.

⁴⁶Young & Karkoski, *supra* note 26, at 159.

⁴⁷*California Farmers, supra* note 24.

⁴⁸Grassland Basin Drainage Steering Committee, Rule Enforcing Selenium Load Allocation and Establishing a Tradable Loads Program for Water Year 2000, *available at* <http://agecon2.tamu.edu/people/faculty/woodward-richard/et/GrasslandRules.htm> (last visited Dec. 12, 2006).

⁴⁹*Id.*

⁵⁰Summary of Selenium Loads at Station B, Grassland Bypass Project, San Francisco Estuary Institute, <http://www.sfei.org/grassland/reports/>. Note, however, that although discharge levels have been consistently below the yearly load allocation, the discharge levels do occasionally exceed the monthly allocation, as in March of 2003, 2004, and 2005. *Id.*

⁵¹U.S. Bureau of Reclamation, Grassland Bypass Project, Aug. 25, 2005, <http://www.usbr.gov/mp/grassland/index.html>.

Replication of the Program

Terry Young and Joe Karkoski have identified several key factors which affect the replicability of the Grasslands program.⁵² First, there must be adequate motivation.⁵³ Here, the drain used by the farmers was closed by the federal government following an environmental disaster. The farmers were required to negotiate with the federal government for permission to use the drain, and as such were forced to devise a system to meet the load reductions demanded by the government. Second, there must be an effective legal mechanism and institutional structure.⁵⁴ In the case of the Grassland Area Farmers, the legal mechanism was provided by a contract with the Bureau of Reclamation. Third, there must be specific discharge targets set and a monitoring system implemented which can determine if those targets are being met.⁵⁵ Finally, there must be an effective means of enforcement of the program.⁵⁶ This may be provided by the legal mechanism which creates the program, as with the 1995 Use Agreement, which mandated specific consequences, including termination of the contract, for failure to meet load allocations and required the establishment of a body charged with the power to enforce the program.

Another unique feature which contributed to the success of the program is the large amount of local control involved.⁵⁷ Although the total load allocation is set by the Bureau of Reclamation, the individual district allocations are set by the Grassland Area Farmers themselves. Decisions as to how to meet those allocations are made by the individual districts. This level of involvement required by the program encourages farmer participation and buy-in and promotes a culture of responsible management. Further, allowing for individual districts to determine how to meet load allocations allows one district to learn from the success or failure of another district.

Conclusion

The success of the Grassland Area Farmers highlights what features would be necessary to replicate the system in Georgia. There must be adequate motivation for a program, such as the threat of cutting off drainage rights or wastewater discharge. There must also be specific and enforceable consequences for failure to meet allocations, such as the restriction of drainage and specific fees. Finally, there must be a measure of flexibility to the program, allowing for individuals and districts to have some control over how an allocation will be met. Where these factors are available, however, there is potential for dramatic success with a tradable load allocation program.

⁵²Young & Karkoski, *supra* note 26, at 166.

⁵³*Id.*

⁵⁴*Id.*

⁵⁵*Id.* at 166.

⁵⁶*Id.*

⁵⁷*Id.*