



# Grassland Area Farmers Tradable Loads Program

Lower San Joaquin River, California

## Overview

In the early 1990s, various groups began requesting that the State of California develop more stringent water quality standards to protect a large wetland area in California’s highly agricultural Central Valley. The Grasslands Water District was discharging irrigation drainage water with high selenium levels through these wetlands to the San Joaquin River.

Seven irrigation and drainage districts, referred to as the Grassland Area Farmers and represented by the San Luis & Delta-Mendota Water Authority, anticipated challenges complying with new water quality standards for the wetlands. Rather than discharge to the wetlands, they requested to discharge to the San Luis Drain, a drainage channel constructed to manage irrigation drainage. The California Regional Water Quality Control Board Central Valley Region issued an order allowing the Grassland Bypass Channel to be built and connected to the San Luis Drain. The Order, which is not an NPDES permit,<sup>1</sup> regulates the discharge from the San Luis Drain to Mud Slough, a tributary of the San Joaquin River, by applying individual selenium load allocations to each of the seven districts as well as a collective regional cap on selenium loads.

If the Grassland Area Farmers collectively exceeded the regional cap in the Order, they had to pay a tiered “incentive fee” based on the percent exceedance. If a district exceeded its selenium load allocation, it could either pay its portion of the incentive fee or purchase credits from another district. In addition, the ability to use the San Luis Drain would be terminated for all districts if the regional cap was exceeded by more than 20 percent. The Tradeable Loads Program provided a means for farmers

### Type of Trading

Nonpoint Source–Nonpoint Source

### Pollutant(s) Traded

Selenium

### Basis for Trading

Regional selenium loading caps

### Participants

Seven irrigation and drainage districts

<sup>1</sup> If, after final deposition of Pacific Coast Federation of Fishermen’s Associations v. Donald R. Glaser, 945 F.3d 1076 (9th Cir. 2019) it is determined that additional permitting is needed for discharges from the Grassland Drainage Area, the Central Valley Water Board will begin the appropriate permitting process.

to protect the wetlands from the contaminants in the irrigation runoff while continuing to operate and reduce selenium discharges to the San Luis Drain and the San Joaquin River over time.

The Grassland Area Farmers have been successful in significantly reducing the selenium load discharged from the Grassland Bypass Project to Mud Slough and the San Joaquin River and are achieving the water quality objective for selenium of 5 micrograms per liter ( $\mu\text{g/L}$ ) in the Water Quality Control Plan for the California Water Quality Control Board Central Valley Region (CRWQCB-CVR, 2018). Districts used various methods to reduce selenium discharges. For example, one method was drainage recycling, where drainage water was applied to salt-tolerant crops (Breetz et al., 2004). However, the trade agreements relied on monitoring of selenium discharges to determine compliance without requiring documentation of the reduction methods used in or as part of the trade agreement. Therefore, the methods used to reduce selenium discharges were not widely available.

## Benefits

Selenium loading to Mud Slough and the San Joaquin River decreased every water year (i.e., 1 October through 30 September) from 1995 to 2001, except in 1998 which was a wetter than average year, and regional selenium load targets were met nearly every month through February 2004 (Breetz et al., 2004). However, it is unknown what percentage of those decreases is attributable to the Grassland Area Farmers Tradable Loads Program and what percentage is attributable to other water conservation measures implemented by farmers due to drought conditions.

As of December 2019, the discharge from the San Luis Drain to Mud Slough is required to meet a water quality objective for selenium of 5  $\mu\text{g/L}$  and incentive fees are no longer needed to promote further reductions in selenium loading (Bureau, 2020). Management activities implemented by the Grassland Area Farmers, previously encouraged by incentive fees under the Tradeable Loads Program, have significantly reduced the load of selenium discharged by the Grassland Bypass Project and support compliance with the 5  $\mu\text{g/L}$  selenium water quality objective. The annual pounds of selenium discharged from the Grassland Bypass Project have been reduced by 99 percent from water year 1995 to water year 2021 (SLDMWA, 2021).

## Summary of Trading Activity

Between 1999 and 2000, 39 trades (in nine trade agreements) were executed via bilateral contractual agreements between districts. A total of \$14,320 was used to purchase credits. The regional cap was not exceeded after that time so no trades have been executed since 2000.

## Eligible Trading Partners

Only the seven districts that make up the Grassland Area Farmers were eligible to participate in trading. All trades were conducted at the district level; the individual farmers in the eligible districts did not participate in trading (Austin, 2001).

## Market Driver

Agricultural activity in the Central Valley depends on irrigation; however, irrigation leaches salts and trace metals from soils that are then discharged into irrigation drains. Discharge of this water negatively affects sensitive areas in the San Joaquin River watershed. The Grassland Bypass Project diverted irrigation drainage around wetland areas into the San Luis Drain, a drainage canal owned by the United States Department of the Interior, Bureau of Reclamation (U.S. Bureau of Reclamation). To use the drain, the Grassland Area Farmers entered into a Use Agreement with the U.S. Bureau of Reclamation that set a regional selenium cap (i.e., aggregate monthly and annual selenium discharge

limits) for discharges from the drain. This cap served as the basis of the Grassland Area Farmers Tradable Loads Program (Austin, 2001).

The initial regional cap decreased over time and the Use Agreement included a system of incentive fees, which increased over time. In addition, if the Grassland Area Farmers' discharges exceeded the regional cap by more than 20 percent, the Authority's use of the drain would terminate. The initial regional cap contained in the 1995 Use Agreement was developed using a consensus-based stakeholder approach and presented in the form of interim monthly and annual load limits for the first five years of the Grassland Bypass Project (CRWQCB-CVR, 2001). The Grassland Area Farmers and the Bureau of Reclamation signed on to the 2001 Use Agreement, which extended through December 2009.

## Trading Mechanisms

Formal trading occurred only during 1999 and 2000. The Grassland Basin Drainage Steering Committee was the governing body of the Grassland Area Farmers and trades were conducted under rules ratified by this committee. Rules were developed for each water year. Trades occurred via bilateral negotiation between districts, typically during monthly meetings of the Steering Committee. The executive officer of the Steering Committee assisted in negotiations as necessary.

The rules included a penalty structure to ensure each member was responsible for a proportional contribution to regional incentive fees caused by selenium load exceedance. Trading was voluntary; districts could at any point choose to buy or sell selenium load and negotiate the price.

The Steering Committee allocated the regional cap for selenium among the seven districts based on tilled acreage, total acreage, and historical selenium loads from each district (Anderson, 2000). A consensus-based process involving the participating districts ultimately determined the final selenium load allocations although there was no precise formula for calculating the load allocations (Linnemann, 2004). These allocations acted as baselines for the trading partners. If a district discharged less than its district-level load allocation, the remaining allocation could be sold as credits.

## Credit Generation

Credits were calculated based on actual monthly selenium loads and were retroactive in nature as it could take several months to obtain and analyze monitoring data (Breetz et al., 2004). Districts that discharged below their selenium load allocation generated credits eligible for trading. Districts with discharges that exceeded their selenium load allocation had to trade with another district or pay their percentage of the regional incentive fee established for that water year. Trades involved either direct purchases of selenium load allocations or an exchange of allocations between districts (Anderson, 2000).

## Pollutant Trading Ratios

No trading ratios were used because credits were based on actual monthly selenium loads measured by each irrigation district (Breetz et al., 2004).

## Monitoring and Assessment

The drainage districts monitored selenium loads at the 62 sumps where water was pumped into the San Luis Drain. A combination of flow measurements and analytical sampling was used to determine selenium loading, although farmers and districts could estimate weekly updates on loading as well.

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Selenium loading data generated by district monitoring activities were processed over one to two months to calculate retroactive credits under the trading rules (Anderson, 2000).

## Challenges

The internal penalty structure initially calculated the percentage of the incentive fee owed by a district by dividing the pounds of selenium above the district's allocation by the total pounds exceeded by all districts (Anderson, 2000). The Steering Committee determined that this resulted in a disincentive to reduce selenium loading because districts that exceeded their allocation only had to pay a penalty if the entire group exceeded the regional cap and the districts that did not exceed their individual selenium allocation were not rewarded at all. To remedy this, in 2000 (the final trading year) the Steering Committee revised the penalty structure to also include rebates for districts that discharged under their allocation (Austin, 2001).

## Resources

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United States Department of the Interior Bureau of Reclamation (Bureau). 2020. Use Agreement Between the United States of America and the San Luis & Delta-Mendota Water Authority for Use of the San Luis Drain for the Grassland Bypass Project Long-Term Stormwater Management Plan.

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