



RJS

December 28, 2012

Rudy Schnagl  
Central Valley Regional Water Quality Control Board  
11020 Sun Center Drive #200  
Rancho Cordova, CA 95670-6114

12 DEC 31 PM 3:07  
RECEIVED  
SACRAMENTO  
CVRWQCB

Subject: Waste Discharge Requirement Order No. 5-01-234, Update of Long Term Drainage Management Plan.

Dear Rudy,

The above Waste Discharge Requirements (WDR) require submission of an update of the long-term drainage management plan for the Grassland Bypass Project. The WDR's were issued to the San Luis & Delta-Mendota Water Authority (Water Authority) and the U. S. Bureau of Reclamation. The Water Authority members that participate in the Grassland Bypass Project are hereafter referred to as the Grassland Area Farmers.

The long-term drainage management plan was submitted on September 30, 1998 in compliance with WDR No. 98-171. The plan has been updated annually since 1999.

**Milestones since Last Update**

842 SIXTH STREET

The milestones that have occurred for the Grassland Bypass Channel Project since the 2010 update are as follows:

SUITE 7

- ◆ The Grassland Area Farmers have reduced the discharge of selenium from the Grassland Drainage Area by 94% since the beginning of the project as measured at the end of Water Year 2012. This is much lower than the discharge in Water Year 2011, partially because WY 2012 was a dry year type compared to a wet year type in WY 2011, but also due to increased reuse activities. There were no exceedances of monthly selenium load allocations during Water Year 2012.
- ◆ The Grassland Area Farmers have continued to develop funding for the Westside Regional Drainage Plan as described in previous reports. Panoche Drainage District received \$4.25 million in September 2010 through the U.S. Bureau of Reclamation's San Joaquin River Salinity Management Program with \$4.2 million pending for 2012. These funds continue to be used to implement a number of activities outlined in the Westside Regional Drainage Plan including projects for groundwater management, development of the reuse area, source control projects and environmental mitigation.
- ◆ The Grassland Area Farmers continue to utilize and expand the San Joaquin River Water Quality Improvement Project (SJRIP). The total acreage of the SJRIP has been increased to more than 6,000 acres, with approximately 5,200 developed to

P.O. BOX 2157

LOS BANOS, CA

93635

209 826-9696

209 826-9698 FAX

salt tolerant crops for drainage reuse. Approximately 23,200 acre feet of drain water were reused on the SJRIP in Water Year 2012.

- ◆ The Grassland Area Farmers are continuing to work closely with the U.S. Bureau of Reclamation to develop an in-valley drainage solution for the Grassland Drainage Area. The In-Valley Solution Plan includes irrigation improvements, seepage reduction, land retirement, recirculation, drainage reuse, and drainage treatment. Reclamation is in the process of developing a demonstration level treatment plant on land in the SJRIP to test treatment methods utilizing subsurface agricultural drainage. Construction on this plant began in December 2012.
- ◆ The discharge from the Grassland Bypass Project in Calendar Year 2011 (wet year type) was 1,972 pounds of selenium with a load limit of 4,480 pounds. The selenium load discharge during Calendar Year 2012 (dry year type) is projected to be 700 pounds of selenium, approximately 72% below the annual load limit of 2,496 pounds. The actual pounds discharged are not available pending receipt of monitoring reports and will be included in the next update report.

### **Statement of Goals**

The principal goal of the Grassland Area Farmers remains is described in the September 30, 1998 long term drainage management plan. This goal is summarized as providing for the achievement of the water quality objectives fixed by the Regional Board and their Basin Plan related to subsurface drainage discharges from the drainage area while maintaining viable agricultural production in the area.

### **Inflows Not Within the Control of Grassland Area Farmers**

The issue of high drainage flows caused by major storm events continues to be a concern. The 2010-2019 Use Agreement provides for mechanisms to deal with rain induced drainage through the high-rainfall and upper watershed exemptions. It also describes a planning process that may evaluate the utilization of a portion of the San Luis Drain to bypass storm water flows around some wetland areas after 2019, in order to minimize the impact of such flows. Under the Use Agreement, development of a formal plan must begin no later than 2016. Another source of inflows to agricultural drainage systems of the Grassland Drainage Area that continues to be of interest is the contribution from seepage out of the San Luis Canal/California Aqueduct. This issue was described in the 2004 annual report and estimated impacts are being updated.

### **Future Regulation and Milestones**

The Regional Board has adopted a TMDL for salt and boron and one for dissolved oxygen. These TMDLs have subsequently been approved by the State Board and the State Office of Administrative Law. These regulations encompass discharges from a much larger area than the Grassland Drainage Area. The Grassland Area Farmers are a participant in these processes.

### **Discharge during Water Year 2012**

Table 1 sets forth discharges from the Grassland Drainage Area for the period Water Year 1995 (October 1994 through September 1995) through Water Year 2012. The Grassland Bypass Project began in Water Year 1997. The volume of drainage has been reduced significantly compared to pre-project (1995) discharges:

- Discharge volume (acre feet) has been reduced by 82%
- Selenium load has been reduced by 94%
- Salt load has been reduced by 84%
- Boron load has been reduced by 74%

Figure 1 shows this historic discharge (acre feet) and selenium concentration from the Grassland Drainage Area since 1995. As expected, the discharged volume has reduced significantly since the project implementation. However, the concentration of selenium has also reduced – by almost 65% since the beginning of the project. The cause of this selenium concentration reduction is likely the combined result of water delivery infrastructure improvements, irrigation system modernization, and reuse activities on the San Joaquin River Improvement Project.

Selenium load discharged from the Grassland Drainage Area compared with 2012 monthly targets in WDR 5-01-234 are shown in Figure 2. Figure 3 shows the 2012 discharged load along with historic discharges and the “glidepath” in the Use Agreement incorporating the load values from the August 4, 2005 request for revision of the TMML for selenium. Figure 4 shows an estimate of the impact of control activities that occurred during Water Year 2012. Conservation, which includes improved irrigation application, tiered water pricing, tailwater controls, the tradable loads program, and seasonal land fallowing accounted for a reduction of approximately 7,600 pounds of selenium from historic loads. Reuse and treatment, which includes recycling, use of subsurface drainage water on salt tolerant crops and displacement of subsurface drainage water such as for wetting of roadways for dust control, resulted in a 4,300 pound reduction in discharge in Water Year 2012. The remaining 800 pounds was discharged to the San Joaquin River through the Grassland Bypass Project.

The water quality objective for the San Joaquin River at Crows Landing is a 5-ppb 4-day average selenium concentration. This objective was not exceeded in all months through June 25, 2012 and is not expected to have been exceeded the remainder of the year.

### **Meeting Water Quality Objectives within Grassland Area Channels**

The Regional Board has established a two parts per billion monthly average selenium objective for water delivery channels within the wetland areas. Previous long term drainage management plans discussed the activities within the Grassland Drainage Area to keep their agricultural subsurface drainage out of those channels to meet this water quality objective. The Grassland Area Farmers have caused the objective to be exceeded on a few occasions. During 1997 and 1998 storm water discharges caused by surface runoff from heavy rainfall and discharge from coastal streams overwhelmed the agricultural drainage system and flowed into wetland channels, violating the objectives.

In February of 2005, significant storm events required the Grassland Area Farmers to divert water through the Agatha Canal in accordance with their Storm Water Management Plan, exceeding the objective for several days. No storm-related diversions into wetland channels by the Grassland Area Farmers have been made since that time.

The Grassland Area Farmers continue to work with the Regional Board to identify and manage discharges to wetland water delivery channels from outside of the Grassland Drainage Area that may cause exceedances of the selenium water quality objective within the wetland areas. The attached Figures 5 and 6 show monthly average selenium concentrations for four sites within the wetland area. Exceedances within the last 70 months have shown marked improvements and low exceedance rates (see Table 2).

### **Tools to be used For Long Term Drainage Management**

Conservation, reuse and treatment, and river discharge will continue to be the main tools available to the Grassland Area Farmers during the next several years.

During Water Year 2001, Panoche Drainage District on behalf of the other Grassland Area Farmers implemented the San Joaquin River Water Quality Improvement Project (SJRIP). Table 3 shows the usage of subsurface drainage water within the SJRIP area in Water Year 2012, including drain water reused on the newly expanded area. The project resulted in a displacement of 3,440 pounds of selenium. The SJRIP is a multi-phase project, which was initiated with the purchase of 4,000 acres of land in the year 2000 within the Grassland Drainage Area by Panoche Drainage District. During 2008, an additional 2,000 acres were purchased, of which 480 acres were developed for reuse. Currently the total developed reuse area is approximately 5,200 acres. Additionally, the Grassland Area Farmers are in the process of designing a number of infrastructure projects that will increase the operational flexibility and efficiency of the SJRIP. Future phases call for installing subsurface tile drainage systems in the remainder of the SJRIP area to maintain a salt balance within the soil and for disposal of the collected water through treatment and salt disposal options. A portion of these future phases are budgeted in the Prop 50 \$25 million grant and federal appropriations awarded to Panoche Drainage District and the Water Authority. Other funds within this grant will be used to investigate drainage treatment options for final salt disposal.

### **Future Needs**

In order to maintain the drainage control strategy for the Grassland Area Farmers, there are several needs. They are as follows:

- ◆ The completion of the SJRIP Project including planting and construction of subsurface drainage systems.
- ◆ Purchase of additional SJRIP lands of up to 2000 acres for planting of additional cropping to be irrigated with subsurface drainage water.
- ◆ Implementation of treatment and disposal of salt from the SJRIP lands. The U.S. Bureau of Reclamation has begun construction of a demonstration-scale treatment

plant within the SJRIP and will receive its source water from tile systems within the SJRIP.

- ◆ Retirement of land could be part of the ultimate solution to the problem within the Grassland Drainage Area. The Grassland Area Farmers have developed a land retirement policy that was identified and described in the September 30, 1998 Long Term Drainage Management Plan. In addition to this plan, Broadview Water District and Widren Water District have recently been purchased and have been followed. Other lands within the Grassland Drainage Area are also being considered for following.
- The Grassland Area Farmers and other local interests have been participating with the USBR in their San Luis Drainage Feature Re-Evaluation Program. The goal of the Grassland Area Farmers is to develop local projects that can be implemented to provide drainage service that meets regulatory requirements, including the selenium load reduction targets, while still maintaining a viable agricultural economy.
- The Grassland Area Farmers continue to work with the USBR, other local stakeholders and interested parties to resolve long standing drainage issues. The main component would be full implementation of the Westside Regional Drainage Plan.

### **Recent Developments**

There are four recent and on-going developments related to efforts of the Grassland Area Farmers to meet the regulatory requirements of the Waste Discharge Permit and the Use Agreement. The first two were indicated in the 2004 annual report.

- ◆ The Westside Regional Drainage Plan has been developed by the San Joaquin River Exchange Contractors Water Authority, the Broadview Water District, Panoche Water District and Westlands Water District. This process is meant to complement the USBR San Luis Drain Feature Re-evaluation process and to help resolve longstanding drainage issues within the area. The Grassland Area Farmers are aggressively pursuing funding opportunities to implement the Westside Regional Drainage Plan, and have met on a number of occasions with the USBR to move this plan forward. A number of state and federal grants have help significantly in funding portions of this plan.
- ◆ The San Joaquin River Water Quality Management Group was formed out of the "UOP Discussions" between statewide water interests and Delta interests to develop a plan to meet Vernalis salinity objectives. There are many components to this plan that is being developed, one of the major ones being the future reductions of discharge from the Grassland Drainage Area.
- ◆ In December, 2006 the Grassland Area Farmers complied with the requirement in the Use Agreement that a Mud Slough Compliance Plan be developed by 2006 to meet Mud Slough water quality objectives. This letter also outlined a process to continue discharges to the San Joaquin River beyond the term of the then-current Use Agreement, which expired in December, 2009.

- ◆ In the summer of 2007 the Grassland Area Farmers initiated discussions with stakeholders regarding a time extension of the Grassland Bypass Project. The discharge of selenium and salinity has significantly reduced since the initiation of the Grassland Bypass Project. The Westside Regional Drainage Plan has been developed and significant funding has been obtained to implement parts of the plan. However, the final funding and technical steps are not yet in place and therefore the Grassland Area Farmers have requested up to a 10 year extension of the Use Agreement. The EIR for this extension was approved by the San Luis & Delta-Mendota Water Authority on October 8, 2009 and the Record of Decision by the US Bureau of Reclamation was issued on December 21, 2009 with a subsequent signing of the new 2010-2019 Use Agreement. This action required a Basin Plan Amendment. The Basin Plan Amendment was approved by the Central Valley Regional Board on May 27, 2010 and by the State Water Resources Control Board on October 5, 2010. The Grassland Area Farmers are currently meeting with Regional Board staff on the development of revised Waste Discharge Requirements for the Project which are expected to blend in requirements under the Irrigated Lands Regulatory Program.

### **Conclusion**

The Grassland Area Farmers have demonstrated their commitment to the project as evidenced by the accomplishments as detailed in this report. They are also committed to the goals and milestones in the new 2010-2019 Use Agreement. This will include maintaining efforts to meet monthly and annual selenium targets while at the same time aggressively pursuing the long term solutions and funding that will be necessary to meet these future requirements.

If you should have any questions please feel free to call. I can be reached at (559) 582-9237.

Very Truly Yours,



Joseph C. McGahan  
Drainage Coordinator  
Grassland Area Farmers

JCM/jcl

Cc: Donald R. Glaser, USBR Sacramento  
Dan Nelson, SL&DMWA  
Grassland Basin Drainage Steering Committee  
Michael Jackson, USBR Fresno

**Table 1**  
**Discharge Comparison from Grassland Drainage Area**  
**Values October thru September**

	WY 95	WY 96	WY 97	WY 98	WY 99	WY 00	WY 01	WY 02	WY 03
Volume (AF)	57,574	52,978	39,856	49,289	32,317	31,342	28,235	28,358	27,345
Se (lbs)	11,875	10,034	7,096	9,118	5,124	4,603	4,377	3,939	4,032
Salt (tons)	237,530	197,526	172,602	213,533	149,081	139,303	142,415	128,411	126,500
B ('1,000 lbs)	868	723	753	983	630	619	423	544	554
Se (ppm)	0.076	0.070	0.066	0.068	0.058	0.054	0.057	0.051	0.054
Salt (µmhos/cm)	4,102	3,707	4,306	4,308	4,587	4,420	5,016	4,503	4,600
Boron (ppm)	5.5	5.0	7.0	7.3	7.2	7.3	5.5	7.1	7.5

	WY 04	WY 05	WY 06	WY 07	WY 08	WY 09	WY 10	WY 11	WY 12	Reduction from WY 95 to WY 12
Volume (AF)	27,640	29,957	25,995	18,531	15,665	13,166	14,529	18,513	10,486	82%
Se (lbs)	3,860	4,305	3,563	2,554	1,736	1,264	1,577	2,047	750	94%
Salt (tons)	121,138	138,908	119,646	79,094	66,254	55,556	67,661	87,537	38,400	84%
B ('1,000 lbs)	530	585	539	278	269	233	315	419	234	73%
Se (ppm)	0.051	0.053	0.050	0.051	0.041	0.035	0.040	0.041	0.026	
Salt (µmhos/cm)	4,358	4,611	4,577	4,244	4,206	4,196	4,631	4,702	3,642	
Boron (ppm)	7.1	7.2	7.6	5.5	6.3	6.5	8.0	8.3	8.2	

Note: WY 97, 98, & 05 include discharges through Grasslands

Note: GAF quality data used where RWQCB data was missing or pending.

**Table 2**  
**Exceedance of 2 ppb Monthly Mean Water Quality Objective**

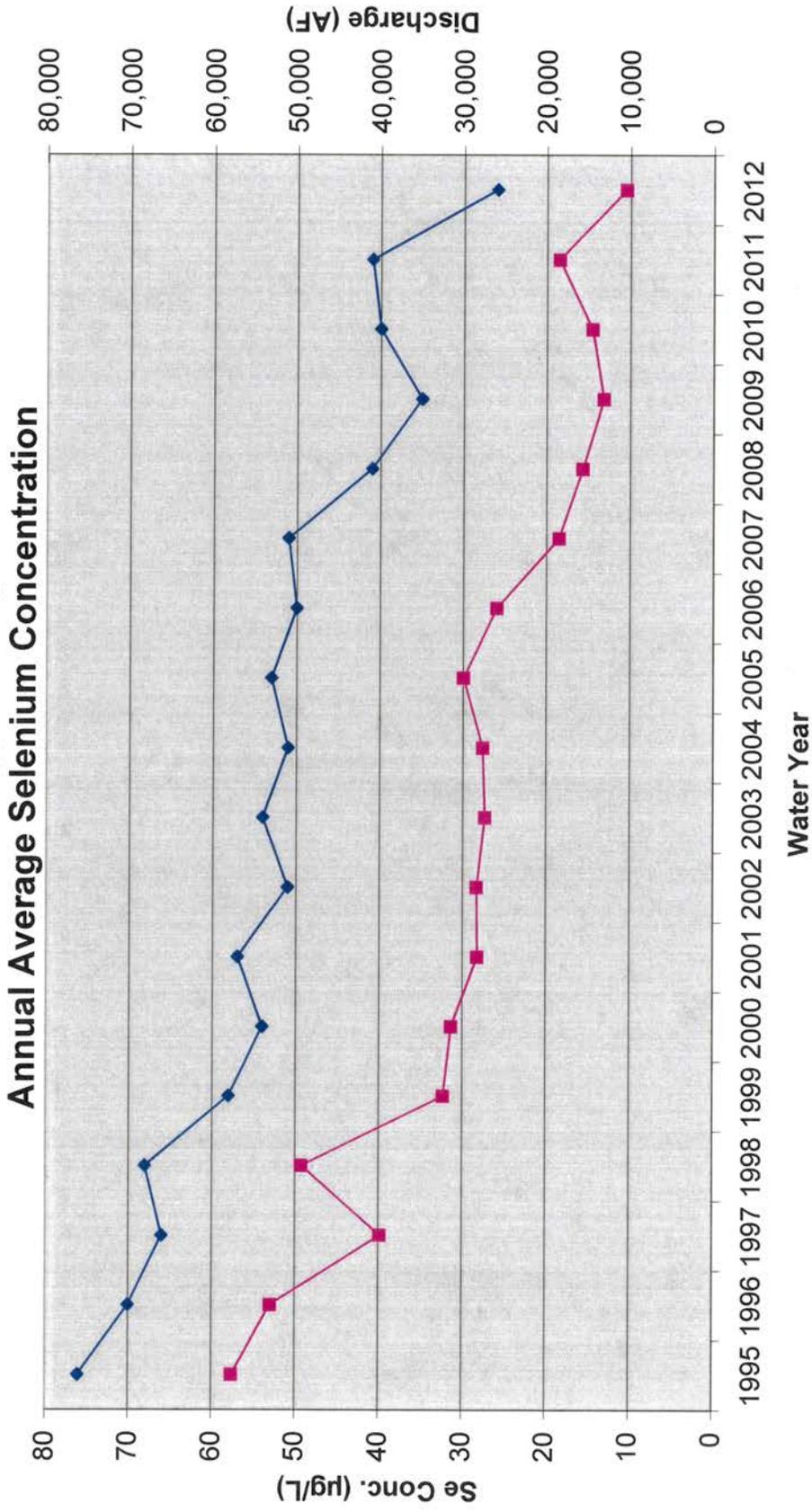
	Site			
	J	K	L2	M2
% months exceeding 2 ppb monthly mean selenium objective Oct 1996 through Aug 2006	19%	13%	32%	13%
% months exceeding 2 ppb monthly mean selenium objective Sept 2006 through July 2012	3%	3%	8%	0%

Months exceeding 2 ppb but with no flow were excluded from calculations

**Table 3**  
**San Joaquin River Improvement Project**  
**Water Year 2012**

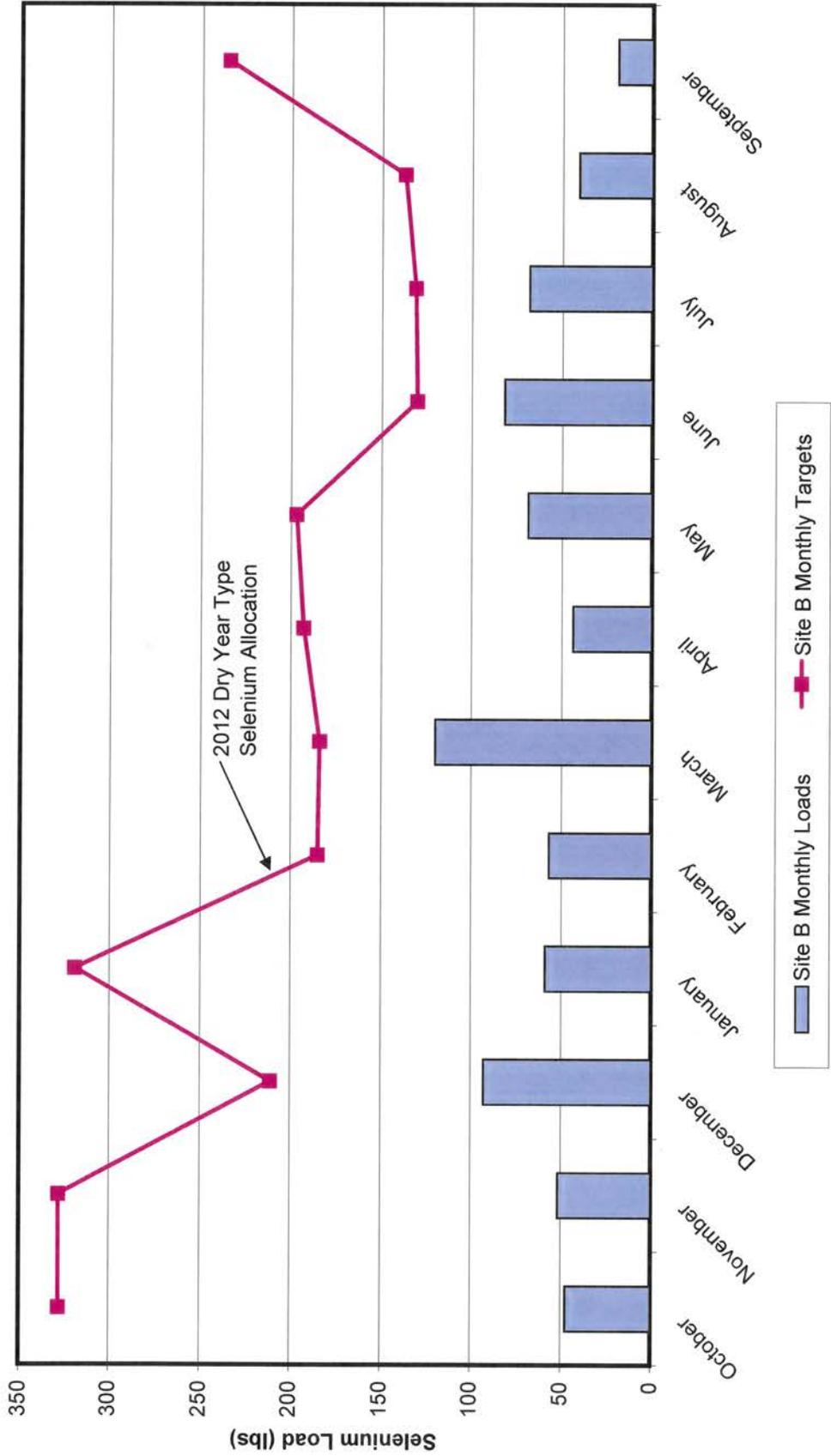
MONTH	WATER APPLIED (AF)			SELENIUM LBS	SALT TONS	BORON LBS
	DRAIN	OTHER	TOTAL			
OCT 11	1,641	609	2,250	257	8,278	36,004
NOV 11	1,752	167	1,919	257	9,441	43,796
DEC 11	1,307	249	1,556	225	7,177	32,141
JAN 12	1,359	25	1,384	137	8,075	26,330
FEB	1,747	92	1,839	213	8,874	41,193
MAR	2,178	109	2,287	293	11,718	61,207
APR	1,930	117	2,047	327	11,916	57,392
MAY	1,846	400	2,246	336	11,997	56,981
JUN	2,584	642	3,226	438	13,398	59,567
JUL	2,779	669	3,448	434	14,757	67,650
AUG	1,954	990	2,944	237	7,876	34,590
SEP	2,124	793	2,917	286	9,405	45,407
<b>TOTAL</b>	<b>23,201</b>	<b>4,862</b>	<b>28,063</b>	<b>3,440</b>	<b>122,912</b>	<b>562,258</b>

**Figure 1**  
**Grassland Bypass Project**  
**Annual Average Selenium Concentration**

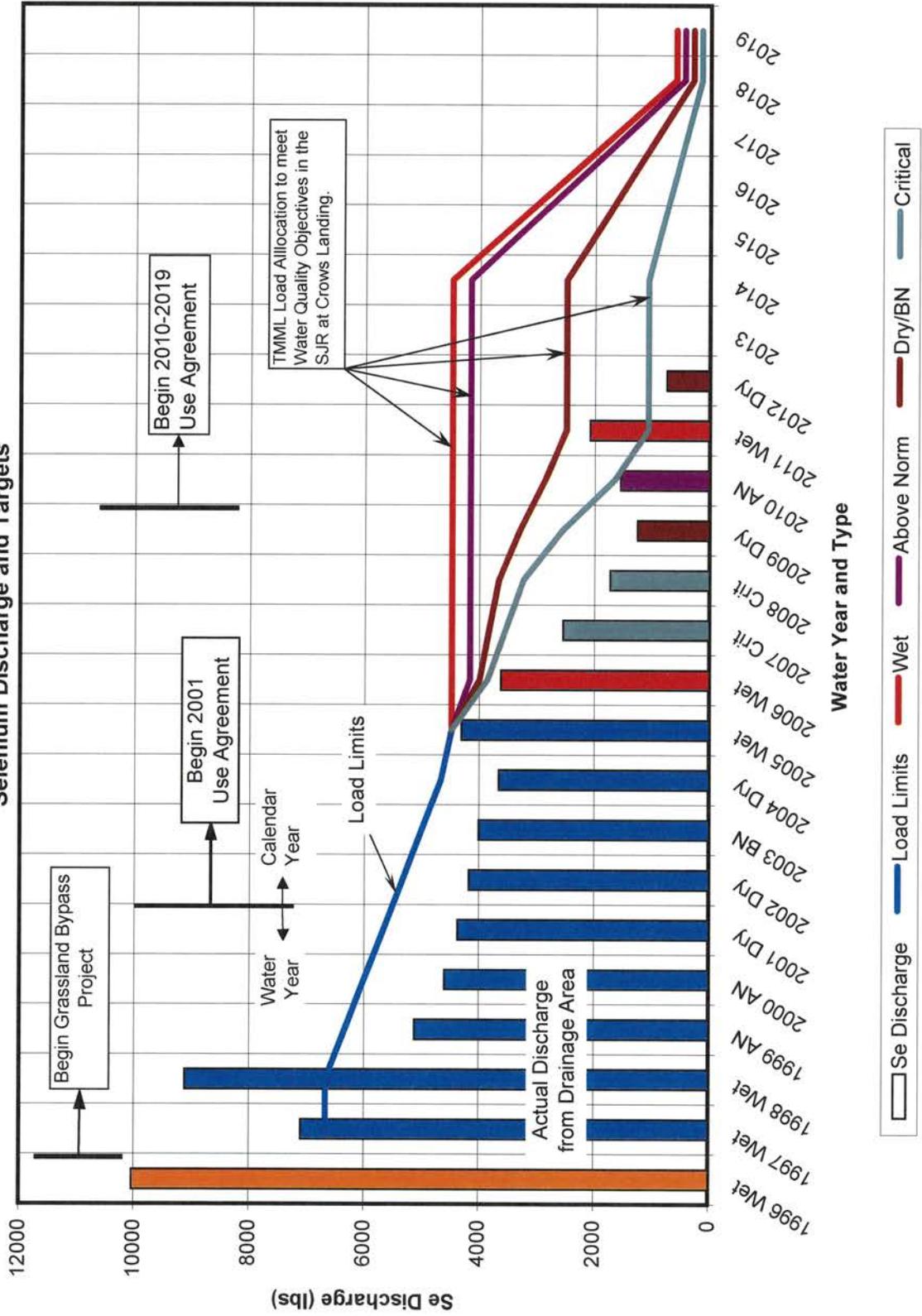


◆ Annual Average Se Concentration  
 ■ Discharge (AF)

**Figure 2**  
**Discharge from the Grassland Drainage Area**  
**October 2011 through September 2012**

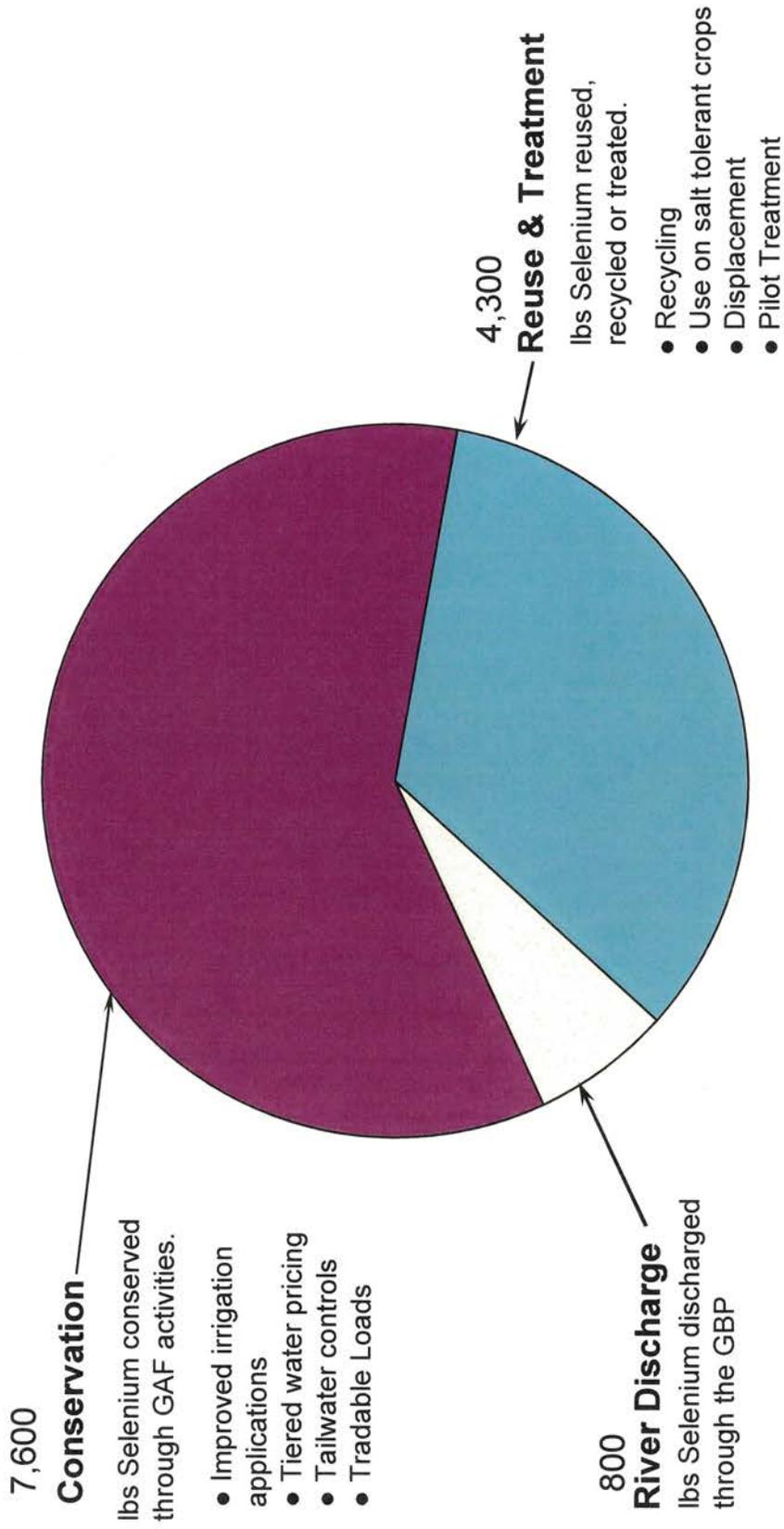


**Figure 3**  
**Grassland Drainage Area**  
**Selenium Discharge and Targets**



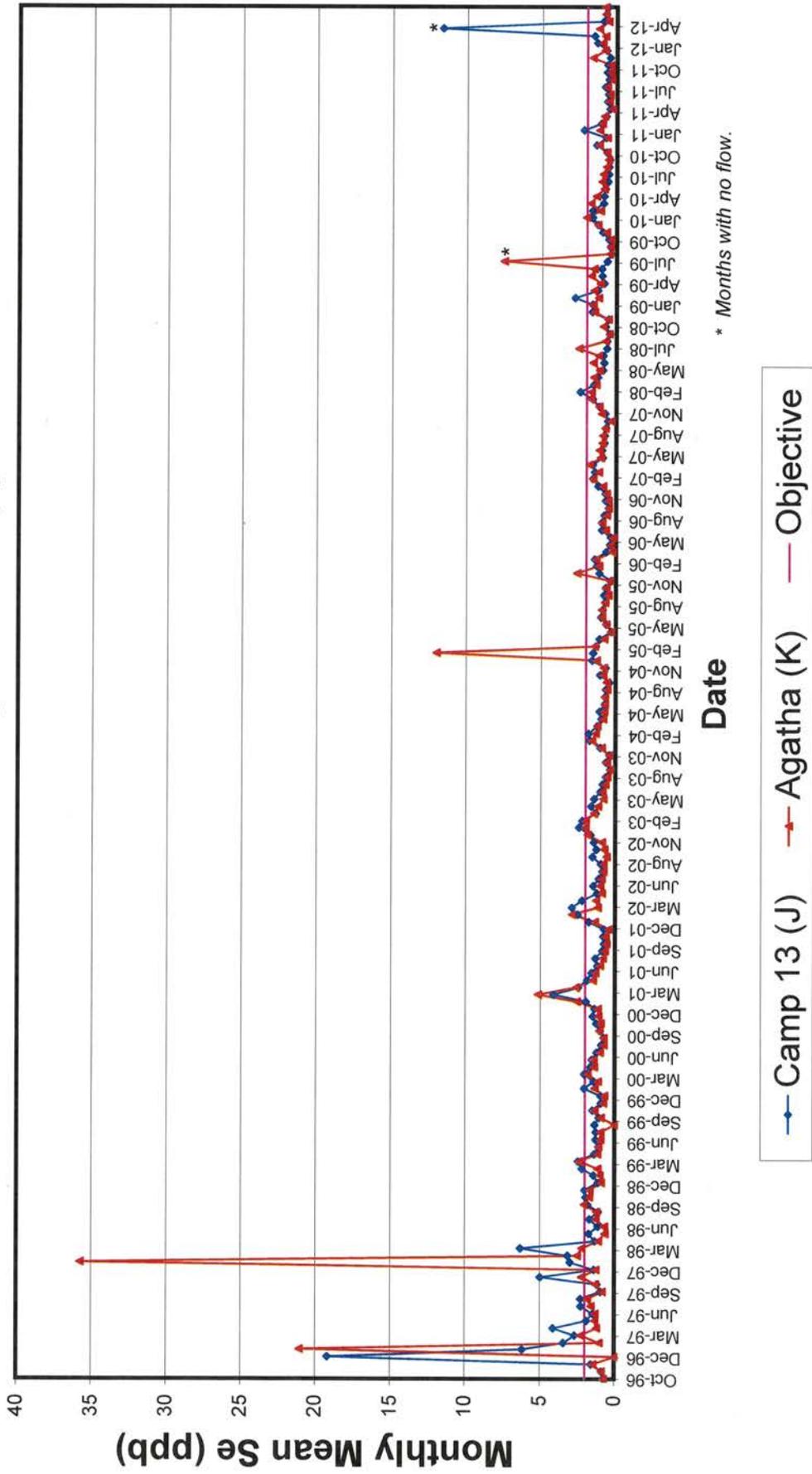
**Figure 4**

Historic Drainage Water (lbs selenium)  
57,000 AF 12,700 lbs Se 240,000 Tons Salt



**2012 Drainage Management**

**Figure 5**  
**Camp 13 (J) and Agatha Canal (K)**



\* Months with no flow.

—●— Camp 13 (J)    —●— Agatha (K)    — Objective

**Figure 6**  
**San Luis Canal at Splits (L2) - Santa Fe Canal at Splits (M2)**

