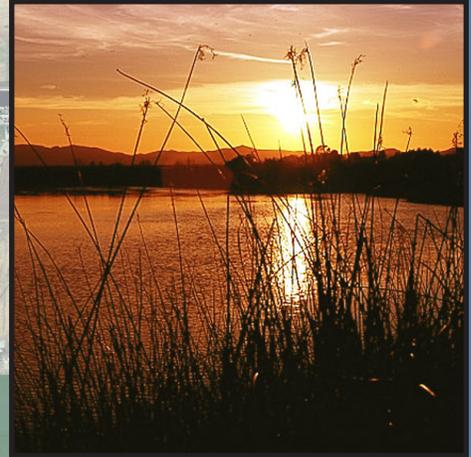


**Contra Costa Water District  
Proposition 1E Grant Proposal  
Round 2  
Attachment 6**

**Monitoring, Assessment, and  
Performance Measures**



**East Contra Costa County Region  
Contra Costa Water District  
Round 2 Stormwater Flood Management Grant Proposal**

**ATTACHMENT 6 –  
MONITORING, ASSESSMENT & PERFORMANCE MEASURES**

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The following pages provide information on the monitoring, assessment and performance measures for the proposed Contra Costa Canal Levee Elimination and Flood Protection Project. In accordance with the PSP, this attachment includes the following information:

- ✓ The metrics used to evaluate project performance
- ✓ The monitoring systems in place to verify project performance
- ✓ A description of the data collection process and how the data will be evaluated to ensure the goals and objectives of the IRWM Plan are being met
- ✓ A discussion of how the project is consistent with the Basin Plan
- ✓ A project performance measures table including
  - Project Goals
  - Desired Outcomes
  - Output Indicators
  - Outcome indicators
  - Measurement Tools and Methods
  - Targets

**Overview**

The full, five-phased Contra Costa Levee Elimination and Flood Protection Project (Project) will replace 21,000 feet of the unlined Contra Costa Canal (the Canal) with a pipeline and install a Canal flood isolation structure that will allow Contra Costa Water District (CCWD) to remotely isolate the Canal following a major flood or earthquake. Completion of the Project will reduce regional flood risk and to improve water supply reliability and delivered water quality for CCWD’s 500,000 customers. Secondary benefits include increasing water supply and water supply reliability for the State Water Project and Central Valley Project and improving public safety by limiting access to the open Canal. Segment 1 of the Project, encasement of the Canal from Pump Plant #1 to Marsh Creek, was completed in 2009. Construction of the flood isolation structure and Segment 2 pipeline is scheduled to begin as early as the fall of 2013.

The portion of the Project included in this proposal involves installing approximately 5,000 feet of pipe and replacing the Canal embankments along the portion of the unlined Canal immediately adjacent to the Dutch Slough Properties. The proposed Project is intricately linked with the Dutch Slough Tidal Marsh Restoration Project which will construct 3.4 miles of new flood protection levees surrounding the Emerson, Gilbert and Burroughs Parcels adjacent to the Canal. Together, these projects will improve regional flood protection four-fold. Based on historical water levels, flood frequency curves in the area, and previous damage to the Canal, there is a 2% chance of major failure in the Canal embankments any given year. By eliminating the Canal embankments and upgrading the Dutch Slough levees, the risk of major flood damage in the region decreases from 2% in a given year to 0.5% or less.

Other benefits of the Project include improving source water quality by preventing intrusion of saline groundwater, improving public safety by eliminating the drowning risk of the open water Canal, and improving CCWD's water supply reliability. This Project meets the following Program Preferences:

### **Metrics Used to Evaluate Project Performance**

Project performance will be evaluated primarily by conducting pre- and post-Project monitoring and data analysis, by tracking construction progress with respect to established milestones, and by tracking budget expenditures with respect to the established budget. Specifically, the following metrics will be used to evaluate Project performance:

- Tracking the reductions in flooding following future storm events.
- Based on historical data analysis, encasing the Canal will decrease electrical conductivity (salinity) in the Canal by up to 50  $\mu\text{s}/\text{cm}$ , depending on conditions. Rock Slough water quality monitoring is done on a daily basis, making improvements in water quality easily quantifiable by comparing pre- and post-Project conditions.
- Meeting the construction goals and schedules will also be important milestones by which to judge the success of the Project.
- Ensuring the Project remains within the allotted budget is also an indicator of a successful Project.
- Tracking the performance of the pipeline in withstanding seismic activity will confirm the improved seismic reliability afforded by the Project.

### **Monitoring Systems**

Project performance will be verified by measuring water quality and storm event damage pre- and post-implementation. Water quality monitoring is conducted daily at Rock Slough.

### **Data Collection and Evaluation Process**

The bulk of the technical work has already been completed for this Project, including water quality sampling. No additional data collection is needed for the remaining phases of this Project.

### **Consistency with Basin Plan**

This Project will significantly reduce the potential for levee failure and associated flood damages. In addition, as discussed in detail in Attachment 7, the Project will prevent intrusion of saline groundwater into the Canal, directly contributing to achievement of Basin Plan chloride concentration objectives for Canal supplies. This Project is also expected to improve taste and odor in delivered water. This Project is consistent with the Region 5 Basin Plan, which includes water quality objectives for the Canal.

**Project Performance Measures Table: Contra Costa Canal Levee Elimination and Flood Protection Project**

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
1. Reduced flood risk	1. Enhanced flood protection (reduction in levee failure risk) following major storm events	1. Reduction in flood events following major storm events	1. Measure of reduction in frequency of flooding following major storm events	1. DWR – Public Safety <a href="http://www.water.ca.gov/nav.cfm?topic=Public_Safety">http://www.water.ca.gov/nav.cfm?topic=Public_Safety</a>	1. Lack of flooding following major storm events
2. Improved levee stability	1. Enhanced levee reliability (reduction in failure risk resulting from storm events)	1. Reduction in failures following major storm events	1. Measure of reduction in failures following storm events	1. Tracking magnitude of storm events and associated impacts	1. Measurable increase in magnitude of storm events not causing failure
3. Construction of the Dutch Slough Tidal Marsh Restoration and Canal Levee Elimination and Flood Protection Projects as soon as possible.	1. Access by CCWD to DWR Property for Temporary Construction Easements and shallow groundwater dewatering areas.  2. DWR wetland Establishment and Creation adjacent to the Contra Costa Canal.	1. CCWD access to construction easement. CCWD use of the Dutch Slough Properties for dewatering.  2. Completion of the Dutch Slough Tidal Marsh Restoration after the Canal adjacent to the property is placed in a pipeline.	1. Up to 5,000 feet of Canal is replaced by a pipeline adjacent to the Dutch Slough Tidal Wetland Project site.  2. DWR creates/establishes up to 1,200 acres of tidal wetlands adjacent to the Canal Property. New wetlands do not result in additional shallow groundwater entering the Contra Costa Canal.	1. Construction drawings and site visits.  2. As built construction drawings. Water quality within the unlined Canal is the same as the water quality within Rock Slough.	1. CCWD commences construction adjacent to the Dutch Slough Tidal Marsh Restoration Project starting in 2015 with substantial completion by the end of 2017.  2. Dutch Slough Tidal Marsh Restoration Project construction is coordinated with Canal Levee Elimination and Flood Protection

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
					Projects so both Projects can be completed as soon as possible.
4. Maintain compatibility of CCWD's water supply conveyance facilities with land uses	1. Compatibility of CCWD's supply with planned land uses in the area, including ecosystem restoration 2. Isolation of surface water supply from groundwater resources	1. Number of proximate ecosystem restoration projects capable of being implemented 2. Measure of reduction in groundwater seepage into the Canal	1. Increased compatibility with planned land use in the Project area 2. 2-5%* reduction in salinity	1. Post-construction salinity monitoring at Pumping Plant No. 1 implementing USEPA and Standard Lab Methods 2. Standard treated drinking water monitoring implementing USEPA and Standard Lab Methods	1. 2-5%* reduction in salinity. 2. Encasement of entire 4 miles of unlined Canal in five phases with current phase completed by 2018 3. Achievement of all primary and secondary drinking water standards
5. Improve operations of the CVP and SWP	1. Improved flexibility of SWP and CVP operations	1. Measure of reduction in water quality compliance issues at Pumping Plant No. 1	1. 2-5%* reduction in salinity.	1. Post-construction salinity monitoring at Pumping Plant No. 1 implementing USEPA and Standard Lab Methods 2. Standard treated drinking water monitoring implementing USEPA and Standard Lab Methods 2. CALFED Delta Improvements Package <a href="http://calwater.ca.gov/DeltaImprovements/">http://calwater.ca.gov/DeltaImprovements/</a>	1. 2-5%* reduction in salinity. 2. Achievement of all primary and secondary drinking water standards 3. Reduced releases to meet salinity and OMR requirements

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
				DIP/DeltaImprovementPackage.shtml	
6. Improved public health protection	1. Increased security	1. Absence or reduction of injuries and drownings	1. Measure of length of Canal encased compared to entire 4 mile length	1. Tracking DWR Public Safety records <a href="http://www.water.ca.gov/nav.cfm?topic=Public_Safety">http://www.water.ca.gov/nav.cfm?topic=Public_Safety</a> 2. Project as-built documentation	1. Encasement of entire 4 miles of unlined Canal in three phases with entire second phase completed by 2013 (first phase was completed in 2009)
7. Improved water quality	1. Improvement in delivered water quality to CCWD 's customers	1. Measure delivered water quality with respect to federal and state drinking water regulations	1. 2-5%* reduction in salinity.	1. Post-construction salinity monitoring at Pumping Plant No. 1 implementing USEPA and Standard Lab Methods 2. Standard treated drinking water monitoring implementing USEPA and Standard Lab Methods	1. 2-5%* reduction in salinity. 2. Achievement of all primary and secondary drinking water standards

\*When the water quality compliance point standard at Rock Slough governs, water supply benefits to the Central Valley and State Water Projects occur because upstream releases can be reduced because no local degradation occurs in the Canal.

