

Final Project Report

Aptos Beach at Valencia Creek
(AKA North Polo Drive Sewer Extension Project)



Santa Cruz County Sanitation District
ARRA Agreement #08-356-550-1
Clean Water State Revolving Fund Project # C-06-6909-110
Proposition 50 Project # 07-586-550
Clean Beaches Initiative Prop 50 funding (ARRA restart)

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I Problem Statement & Relevant Issues

Introduction

The Aptos Beach at Valencia Creek (AKA North Polo Drive Sewer Extension) Sewer Replacement Project was initiated with Proposition Clean Beaches Initiative (CBI) Grant #07-586-550. The original grant agreement was signed October 28, 2008. During the design phase in the fall of 2008, the CBI grant funding was suspended due to the state budget crisis. In February 2009, President Obama signed into law the American Recovery and Reinvestment Act (ARRA). This provided more than \$280 million in funding to the California Clean Water State Revolving Fund. Priorities for the funding included "shovel-ready" projects that would immediately create jobs. The Aptos Beach at Valencia Creek Sewer Replacement Project was "re-started" with ARRA funds and a new ARRA funding agreement was issued in June 2009 (#08-356-550). Amendment 1 was processed in January 2010 (#08-356-550-1), adding more time to the project schedule.

All State Water Resources Control Board (SWRCB) and ARRA reporting requirements were met including six progress reports, six invoices, annual reports in September 2009 and September 2010, six ARRA Jobs Reports, annual and final Monitoring Reports, the Natural Resources Project Inventory form, and photo documentation.

Water Quality in Valencia Creek

Historically, Aptos/Rio Del Mar Beach and the Aptos Creek Lagoon have had relatively high bacteria levels and a high frequency of postings as unsafe for swimming. The mouth of the creek and lagoon are permanently posted as having water unsafe for human contact. Aptos Creek is the primary source of bacteria at Aptos/Rio Del Mar Beach. The highest bacteria levels in the creek occur from the confluence with Valencia Creek in the lower watershed to Aptos Creek Lagoon. The beaches affected by the project (Aptos/Rio Del Mar Beach and Seacliff State Beach) are both heavily used, with some of the highest annual visitations in northern California.

Both beaches affected by the project are identified as "Priority" in the Clean Beach Task Force Prop 50 Guidelines for these reasons: 1.) The beaches have a high frequency (greater than 4 percent) of exceeding bacterial standards during weekly monitoring; 2.) They have consistently demonstrated bacterial contamination problems.

From 2000 to 2004, Aptos/Rio Del Mar Beach was closed a total of 70 days with no associated sewage spills.

II Project Goals and Objectives

Purpose

The purpose of this project was to reduce bacteria inputs, protect water quality, enhance fish habitat and protect recreational uses in Aptos and Valencia Creeks and Aptos/Rio del Mar and Seacliff State Beaches. The project consisted of constructing 1,200 lineal feet of 8-inch public sanitary sewer main line and six manholes along North Polo Drive; stubbing in 16 sewer laterals to the property lines of existing homes on failing septic systems adjacent to Valencia Creek; and air testing and video testing the sewer line. The new sewer main was connected to the existing sewer system located at the end of Polo Avenue approximately 100 feet east of the intersection of Rhodes Avenue and Polo Avenue.

Goal and Objectives

The goal of the project was to improve water quality in Valencia Creek, Aptos Lagoon and Aptos/Rio Del Mar and Seacliff Beaches by reducing bacteria inputs from septic systems.

The water quality objectives of the project were to:

1. Characterize pre-project and post-project levels of nitrogen compounds and indicator bacteria (*E. coli*, enterococcus, and total coliform) in Valencia Creek, Lower Aptos Creek and ocean waters at Aptos/Rio del Mar Beach.
2. Characterize amount of contamination originating from human sources before and after project completion at the above locations.

III Project Description

Background

Santa Cruz County Environmental Health Services (EHS) monitored Aptos Creek and tributaries in 2005 in order to better characterize sources of bacterial contamination. This monitoring built on previous investigations by EHS and included water quality testing, genetic testing to identify sources of bacteria, and a health risk survey to measure the actual incidence of illness at the most heavily used county beaches, including Aptos/Rio Del Mar. Information from both of these efforts is presented in a report titled "Assessment of Sources of Bacterial Contamination At Santa Cruz County Beaches," March 2006. Ribotyping for analysis of the source of fecal coliform shows that the human contribution is about 2% in Aptos Creek and in the ocean near Aptos Creek Lagoon. The highest bacteria levels in the creek occur from the confluence with Valencia Creek to the mouth of Aptos Creek Lagoon. Private sewer laterals are identified as a source of contamination in the TMDL for pathogens in the Aptos Creek Watershed. (Office of Administrative Law approved 10/2010).

Design

The project did not need any discretionary permits and received a CEQA notice of exemption dated March 12, 2008.

Consultant Bowman and Williams (Jeffrey Naess – project engineer) was hired to provide design services, prepare contract documents, and assist with the formation of an assessment district for sewer main construction.

Construction

The Santa Cruz County Sanitation District (SCCSD) Board approved the plans and specifications for advertising on September 17, 2009. The project was advertised in September 2009. The pre-bid meeting was held on October 5, 2009. The bid opening was delayed one week to allow contractors ample time to address ARRA Buy American provisions. On October 29, 2009, the District received six bids (one was deemed incomplete) for the construction of the North Polo Drive Sewer Extension Project.

The low bidder was McGuire and Hester of Oakland, California, in the amount of \$205,986, not including contingencies and overhead. The Engineer's Estimate for the project was \$337,250. The costs of the improvements included all planning, design, construction administration and general administration services, the acquisition of necessary easements and rights of way, the acquisition of licenses, franchises and permits, and the construction of all ancillary improvements that were necessary for, or convenient to the construction of all improvements.

Harrell and Associates (financial advisor) recommended to the Board of Supervisors that the finance mechanism for the remaining funds be in the form of a traditional bond sale, which occurred on November 17, 2009. The contract was awarded to McGuire and Hester by the SCCSD Board on November 5, 2009.

A Joint Facilities Agreement between the County of Santa Cruz and SCCSD was signed on November 6, 2009. The Notice to Proceed was issued on December 1, 2009. Construction began December 4, 2009 and was completed by February 25, 2010. The work consisted of constructing 1,200 lineal feet of main sewer line and six pre-cast concrete manholes along North Polo Drive, stubbing in sixteen sewer laterals to the property lines, and air testing and video testing the sewer line. The contractor also completed mandrel testing.

The final walk-through by the SCCSD construction inspector occurred on March 3, 2010. The Notice of Completion (NOC) was approved by the Board of Supervisors on May 6, 2010 and filed on May 10, 2010. Signs crediting the American Recovery and Reinvestment Act were in place all year. All Buy American requirements were met. Water quality monitoring occurred according to the approved Monitoring Plan.

After construction was complete, homeowners began the process of properly abandoning septic tanks, applying for sewer connection permits and connecting to the sewer line. Septic tank abandonment work occurred in February 2010. The estimated cost per household to abandon septic tanks and connect to the sewer line was about \$2,000, plus \$1,500 in connection fees to the District. The SCCSD provided a Sanitation Inspector, who ensured that homeowners

abandoned tanks properly by cleaning tanks, then filling them with clean sand or other suitable material. As of January 10, 2011, 10 homeowners had abandoned septic tanks and connected to the new sewer line. One has a stub to the property. Six homeowners have not yet abandoned their septic tanks or connected to the new sewer line. As those homeowners' septic tanks fail, they will be notified by EHS that they need to work with SCCSD to abandon their tanks properly.

Monitoring

Water quality monitoring was a requirement associated with the grant. The Clean Beaches Task Force recommended that the SCCSD work with EHS to develop a monitoring approach to quantify the benefits of the project. EHS created a Monitoring and Reporting Plan in April 2008 and revised it in September 2008. The final Monitoring Report is presented in its entirety in Appendix B. The monitoring included sampling from all major tributaries throughout the study area in order to measure sources of indicator bacteria, even if they originated outside the project area.

Monitoring started in February 2008 and continued for one year after the completion of construction. EHS completed an annual summary on water quality monitoring activities in December 2010, which was submitted to the Grant Manager on January 5, 2011.

Project Costs

Below is a list of estimated Project costs compared to actual Project costs, including how much of the grant funds were spent utilizing Prop /ARRA and matching sources. The costs of the overall project came in well under budget, while the total construction costs came in slightly over budget because the existing roadway deteriorated during construction and required full width repaving.

Total Financing Summary

	Estimated	Actual
Agency's Cash	\$109,269.52	\$74,031.70
Agency's other funds (assessment district)	\$170,110.49	\$161,000.00
CWSRF Financing (via ARRA)	\$168,750.00	\$168,750.00
Total Costs	\$448,130.01	\$403,781.70

Costs Broken Down by Category

	Estimated	Actual
Construction Costs	\$205,986.00	\$209,322.26
Allowances - Planning	\$95,943.00	\$86,183.70
Allowances - Design	\$45,000.00	\$37,385.00
Allowances - Construction	\$67,500.00	\$35,560.29
Allowances - Administration	\$33,701.00	\$35,330.45
Total Costs	\$448,130.00	\$403,781.70

SCCSD provided a total of \$74,031.70 for this project. This included costs for creating an assessment district in 2009-2010; deepening the sewer to allow for future connections to be made downstream of the project without the need for a pump station; and the connection fee for backwash disposal at a future well site into this sewer. The remaining funds needed for construction were provided by an assessment district that was approved unanimously by the

adjacent homeowners for up to \$15,491 per connection. In addition, homeowners each paid an average of \$3,500 to decommission their septic tanks and connect to the new sewer system.

IV Monitoring Results

For a full explanation of the monitoring results, see the final Monitoring Report presented in its entirety in Appendix B.

The monitoring site nearest to the project location on Valencia Creek in theory would have been the site where the project's influence would be most easily detected. However, no significant trends were observed in the data. Average nitrate concentrations decreased between 2008 and 2010 at the site closest to the project location and Enterococcus and Fecal Coliforms (or *E. coli* for 2010) increased during the same period.

V Discussion

In summary, sewer improvements were successfully completed in the North Polo Drive area by the end of January 2010. Given the monitoring results, it is difficult to identify any changes in water quality conditions resulting from the project. Limited nitrate results suggest some improvement that may be a result of reduced septic systems along North Polo Drive. Given the relatively small number of septic systems that were abandoned along North Polo Drive, compared to the high number of septic systems and other potential sources of contamination in the Aptos, Valencia and Trout Gulch watersheds, it was not expected that water quality improvements resulting from the North Polo sewer project would be immediately detectable.

Next Steps

Given that this was a relatively small-scale project in a large watershed, the County recognizes the need to continue investigating and addressing a variety of non-point pollution problems in Aptos, Valencia and Trout Gulch watersheds beyond this one project. For instance, through the Monitoring Plan for this project, the County discovered that Valencia Creek and Trout Gulch both have high levels of indicator bacteria and elevated levels of nitrate, suggesting some contribution from septic systems. More work should be done in Trout Gulch to identify and eliminate potential sources of bacteria, based on these results. The County and SCCSD will continue to pursue funding sources to assist with ongoing projects that will improve the water quality in all three watersheds.

For a full discussion of the monitoring results, see the final Monitoring Report presented in its entirety in Appendix B.

VI Conclusions

The Aptos Beach at Valencia Creek Sewer Replacement project met its purpose of reducing bacteria inputs, protecting water quality and enhancing fish habitat in Aptos and Valencia Creeks and Aptos/Rio del Mar and Seacliff State Beaches.

The project was constructed on time and according to plan, resulting in the construction of 1,200 lineal feet of 8-inch public sanitary sewer main line and six manholes along North Polo Drive,

stubbing in 16 sewer laterals to the property lines of existing homes on failing septic systems adjacent to Valencia Creek, and connecting the new sewer main to the existing sewer system located at the end of Polo Avenue approximately 100 feet east of the intersection of Rhodes Avenue and Polo Avenue.

The project met its goal to improve water quality in Valencia Creek, Aptos Lagoon and Aptos/Rio Del Mar and Seacliff Beaches by reducing bacteria inputs from septic systems. By removing one more potential source of bacteria, and identifying areas where future work should be focused, this project moves us one more step toward knowing how to address bacterial contamination at Aptos/Rio del Mar Beach.

Additional Project Benefits

The anaerobic degradation occurring within the sludge layer of septic tanks results in the emission of greenhouse gases composed primarily of methane and carbon dioxide. Septic tanks account for about 0.5 percent of the total per capita emission of greenhouse gasses in the United States, according to a 2010 study by the Water Environment Research Foundation. By decommissioning the septic tanks on North Polo Drive, this project also played a role in reducing greenhouse gas emissions in the project area.

By creating the sewer assessment district in 2009-2010, SCCSD created a sustainable means of financing ongoing maintenance for the infrastructure. Creating the assessment district was one of the most challenging aspects of the project.

Contact Information

Questions about this project or this report should be directed to:

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PHOTOS



Photo 1 – Sewer Main Excavation



Photo 2 – Sewer Inspection



Photo 3 – Shoring and sewer pipe



Photo 4 – New Manhole

APPENDIX A

Summary of Deliverables

DESCRIPTION	Milestone Date	Date Submitted
GPS Information	Completed	
Project Assessment and Evaluation Plan	Completed	
Quality Assurance Project Plan	Completed	
Monitoring Plan	Completed	
Copy of CEQA/NEPA	Completed	
Copy of Landowner Agreements	N/A	
Applicable Permits	As needed	N/A
WORK TO BE PERFORMED BY RECIPIENT	--	
Plans and Specifications		
As-Advertised Construction Documents	August 2009	10/30/2009
Bid Summary, Proof of Advertising, and Construction Notice to Proceed	Sept. 2009	10/30/2009
Project Implementation	Nov. 2009 – Nov. 2010	Notice of Completion 5/6/2010
Photo Documentation (Pre, During, and Post)	Sept. 2009 – Nov. 2010	1/15/2010; 9/30/2010
Invoicing	Quarterly	10/30/09; 1/30/2010; 4/15/2010; 8/6/2010; 1/20/2010
Construction completion date	November 30, 2011	Notice of Completion filed 5/6/2010
Project Completion Date	March 1, 2012	June 27, 2011
REPORTING	--	
Progress Reports	Quarterly	10/30/2009; 1/30/2010; 4/15/2010; 8/6/2010; 9/30/2010; 1/20/2011; 4/20/2011
Annual Monitoring Summary	Annually	1/5/2011
Natural Resource Projects Inventory Project Survey Form	At end of project	June 21, 2011
Signed Cover Sheets for all permits	As needed	
Annual Progress Summary	Annually by 9/30	Progress report serves as 2009 annual report; 9/30/2010
Draft Project Certification	January 1, 2012	4/20/2011
Final Project Certification	February 1, 2012	

APPENDIX B
Monitoring Report

APPENDIX C As-Built Drawings

See attached PDF