

## 2 Introduction

### 2.1 Purpose

This report describes the results of an evaluation of alternatives for reducing the likelihood of flooding in the Vista Grande Drainage Basin in Daly City, California. The study was performed by Jacobs Associates under contract to the City of Daly City (City).

Storm-related flooding has been a recurring issue in the Vista Grande Watershed Drainage Basin, specifically in the vicinity of the Vista Grande Canal at Lake Merced Boulevard and John Muir Drive. The drainage system in this area collects storm flows from a 2.5-square-mile basin in Daly City and conveys them via several underground culverts to the Vista Grande Canal, located adjacent to John Muir Drive in San Francisco. From there, the water flows to the Vista Grande Tunnel and Outfall Structure, through which it is discharged into the Pacific Ocean near Fort Funston.

The alternatives under consideration address the need for additional flow capacity, the opportunity to reduce peak flows through stormwater detention, and the possibility for stormwater re-use. Each alternative will impact the surrounding natural environment and community differently. Jacobs Associates (JA) developed and evaluated 17 alternatives based on criteria related to: anticipated public benefits, operability, environmental compliance and impacts, land use requirements and acquisition costs, constructability, and lifecycle costs.

### 2.2 Project Background

The project was initiated as a follow-up to the Vista Grande Watershed Plan prepared by RMC Water and Environmental (RMC) in 2006, and in response to public concerns about localized flooding within the basin and the water levels in Lake Merced. This project is one of several efforts to address these issues. Other studies currently underway are considering wetlands development, additional water re-use strategies, and improvements to the upstream drainage system.

The existing stormwater system consists of:

- Stormwater catchments and culverts,
- The Vista Grande Canal,
- The Vista Grande Tunnel, and
- The Daly City beach outfall.

The existing canal and tunnel do not have adequate hydraulic capacity to convey the flows associated with the design storm event, which is a 25-year storm lasting four hours. The City selected the design storm event based on the Vista Grande Watershed Plan (RMC, 2006) which included a public outreach effort.

The alternatives evaluation contained in this report is based on the assumption that the existing Vista Grande Tunnel will remain in service. For events exceeding the design storm, it may be possible to share use of an existing City of San Francisco outfall that is located just north of the Vista Grande Tunnel and Outfall.

## 2.3 Previous Studies

### 2.3.1 Vista Grande Watershed Study

In 2006, RMC Water and Environmental developed the Vista Grande Watershed Study for the City of Daly City and the City and County of San Francisco. The study was a planning-level report that identified potential solutions to flooding at the Vista Grande Canal and in the Vista Grande Drainage Basin for a 10-year storm event. To prepare the study, RMC incorporated stakeholder input, set objectives by which to evaluate the alternatives, and included consideration of watershed-wide alternatives. The final recommendation of the study was to implement a combination of sequenced solutions as a long-term watershed program that would address flooding issues while meeting community and environmental objectives. The RMC study provided a broad perspective and established conceptual performance criteria for an integrated solution.

### 2.3.2 Vista Grande Diversion Feasibility Evaluation, Lake Merced Technical Memorandum No. 2

In 2001, CH2M-Hill completed the Vista Grande Diversion Feasibility Evaluation Project for the City of Daly City, San Mateo County, and the City and County of San Francisco (CCSF). This project evaluated the options for diverting treated stormwater from the Vista Grande Canal to Lake Merced. The goals were to reduce flooding problems at the canal and provide a source of water to manage Lake Merced water levels. The study examined the hydraulic and water quality issues associated with such diversions, and outlined potential water treatment options. This study was useful in understanding the potential public benefits associated with stormwater re-use.

### 2.3.3 Vista Grande Storm Sewer Project Draft Report

In 1983, Kennedy/Jenks Engineers prepared a report for the City of Daly City on the Vista Grande Storm Sewer system. The purpose of the study was to analyze the capacity of the Vista Grande stormwater drainage system, present findings of deficiencies, and identify potential alternatives to reduce flooding.

## 2.4 Ongoing Studies

Two other related studies are currently underway, which may result in changes to the existing stormwater collection system upstream or changes to the existing outfall structure. Both would impact the alternatives evaluated herein.

### 2.4.1 Daly City Stormwater System Evaluation

RMC Water and Environmental is currently studying the upstream stormwater collection system and will be providing improvement recommendations. Such improvements would reduce the likelihood of flooding within the watershed. Improvements to the upper portions of the watershed would be implemented after downstream improvements are completed. The design flows assumed in the evaluation performed by JA includes consideration of those improvements. The study includes a calibrated hydraulic model of the proposed improvements that would serve as the foundation for an updated stormwater hydrograph for the tunnel design. The study will also be necessary to finalize the hydraulic design criteria for the Vista Grande Drainage Basin tunnel design.

### 2.4.2 Daly City Vista Grande Outfall Structure Evaluation

Brown and Caldwell is working for the City of Daly City to evaluate long-term solutions for the stability of the existing Vista Grande Outfall Structure, outfall pipe, and drop shaft. Alternatives for the beach structure range from continued maintenance in place to relocation back to the current face of the bluff.

## **2.5 Acknowledgements**

This report was prepared by staff members of Jacobs Associates, Brown and Caldwell Engineers, Environmental Science Associates, and Treadwell and Rollo Geotechnical Consultants. Roxanne Stachon of RMC Water and Environmental and Bill Faisst of Brown and Caldwell provided valuable assistance in coordinating this effort with related studies currently underway for the City.

Patrick Sweetland and Robert Ovadia of the City of Daly City provided valuable direction and input to the project team in the development of this report.

## **2.6 Limitations**

This report summarizes preliminary design concepts, opinions, and preliminary conclusions based on information that is currently available. These opinions and preliminary conclusions may be superseded as additional information becomes available, as a result of design changes or modifications to the project requirements. This report should not be relied upon for detailed construction planning or bidding.