EXECUTIVE SUMMARY

The City of Yreka contracted with Willdan Engineering to study the feasibility of constructing stormwater detention facilities within the Humbug Gulch watershed. Specifically, the desired location is on the Bureau of Land Management (BLM) property west of the end of Osgood Mine Road.

Authorization

In July 2011, the City of YREKA (City) authorized Willdan to proceed with the feasibility study. In accordance with the approved scope of work, the project proceeded with the first phase of the milestone oriented approach (limited hydrologic evaluation). This authorization is funded by grant funding from the California Community Development Block Grant (CDBG) Program.

Purpose

The Humbug Gulch drainage basin is one of the largest in the City, and the existing storm drain systems through which it passes do not have adequate capacity to convey the peak runoff amount generated by larger storm events. The existing storm drain facilities could be upgraded to increase their capacity. However, with this feasibility study the City desires to explore opportunities to reduce the peak stormwater flow rates impacting these facilities. Based upon recommendations presented in the previous City of Yreka Master Plan of Drainage, for the Humbug Gulch watershed, the peak flow rate from the 100-year event should be reduced to a 10-year event magnitude to keep from overwhelming the existing storm drain system.

Where the Humbug Gulch runoff enters the improved core of the City near the Green Heron Subdivision near the west end of Lane Street, the existing 100-year peak flow rate is approximately 1595 cfs and the 10-year peak flow rate is approximately 645 cfs. These values were obtained from the City of Yreka Master Plan of Drainage (MPD). This study analyzed locations for the stormwater detention facilities on the BLM property near the western end of Osgood Mine Road, on private property along the Lower Humbug Gulch watershed, and near the confluence of the Upper and Lower Humbug Gulches.

Methodology

To develop a comprehensive understanding of Yreka's drainage system and to determine the locations that require drainage improvements, data from an extensive research effort of existing drainage facilities was compiled, and a hydrologic analysis was completed for the entire City. This was the effort undertaken in the MPD, and the subject project utilized that analysis to create hydrologic modeling pertinent to the study area. Detention basins of different sizes, locations,



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and outfall facilities were modeled throughout the study area using HEC-HMS software. These analyses were performed to determine whether the desired amount of stormwater detention is physically and economically feasible, and if so, approximately where the facilities should be located and what size facility would be required.

Results

The analyses identified two alternatives that would produce the desired amount of stormwater detention. The first alternative, Alternative 1, involves constructing two detention basins, one on the BLM property along the Upper Humbug Gulch water course, and one on private property along the Lower Humbug Gulch water course. The size of both of these facilities would be non-jurisdictional, that is, not requiring the approval and administration of the California Department of Water Resources - Division of Safety of Dams. The second alternative, Alternative 2, consists of constructing one large detention basin near the confluence of the Upper and Lower Humbug Gulches. This larger facility would be of jurisdictional size and would need to be located on what is currently private property.

Conclusions and Recommendations

The analyses performed reveal that the desired amount of stormwater detention can be achieved by either of two alternatives. Alternative 1 involves constructing two smaller, non-jurisdictional basins, one on each of Upper Humbug and Lower Humbug Gulch. Alternative 2 involves constructing one large jurisdictional basin at the confluence of Upper and Lower Humbug Gulch. The projects are estimated to cost:

- Alternative 1: \$4,800,000
- Alternative 2: \$6,233,000

Both cost estimates include design and construction costs with a 25 percent contingency, but the cost of property acquisition has not been included. Both alternatives will require some acquisition of private property, the amount of which will be determined by the final design plans. At the level of design provided herein, it is estimated that Alternative 1 will require approximately 5.5- to 6-acres of private property to accommodate the basin on Lower Humbug Gulch and 7-acres of BLM property on Upper Humbug Gulch. Alternative 2 will require approximately 12.5- to 13-acres to accommodate the basin at the confluence. Comparing the two alternatives, Alternative 1 is less expensive, will involve less property acquisition, and the basins will be non-jurisdictional in size. Alternative 2 is more expensive, would involve only a single construction project, and would be jurisdictional in size. Based on the analyses done to date, Alternative 1 seems to provide the City with the best option for attaining the desired level of Humbug Gulch flood protection.



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