THE CITY OF SAN DIEGO

M E M O R A N D U M

DATE: March 23, 2016

TO: Jeff Murphy, Director, Planning Department

FROM: Kris McFadden, Director, Transportation & Storm Water Department

SUBJECT: Greenwood Cemetery Annexation: Storm Water Division Cost for Services

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Storm Water Division has estimated the storm water infrastructure commitments, including the operation and maintenance (O&M) of storm water assets and compliance costs for known water quality regulations the City would assume within the affected area over the next 100 years. Please see the following table for a breakdown of those costs:

Asset Type	100yr O&M Costs (Today's dollars)	100yr Capital Costs (Today's dollars)	Total 100yr Costs (Today's dollars)
Nonstructural Water Quality Best Management Practices (BMPs)[1]	$1,446,146	$0	$1,446,146
Structural Water Quality BMPs[2]	$4,077,100	$8,046,145	$12,123,245
		Total 100yr Costs	**$13,569,345**

1. Cost estimated by applying the City's level of effort to comply with the Chollas Creek Dissolved Metals and Bacteria Total Maximum Daily Loads (TMDLs) from the San Diego Bay Water Quality Improvement Plan (WQIP) on a per acre bases to the acreage of the affected area ($11,952/per acre nonstructural compliance costs over 100 years x 121 acres = $1,446,146). See Attachment 1 for calculations.
2. Cost estimated by extrapolating the County of San Diego's 20-year structural BMP compliance cost from the San Diego Bay WQIP out 100 years to capture the full lifecycle cost (20-year CIP cost of $1,609,229 CIP x 5 = $8,046,145 with annual O&M costs of $40,771 x 100 years = $4,077,100 for a total 100-year cost of $12,123,245). See Attachment 2 for a more detailed breakdown of compliance costs.

Assumptions/notes:

- Costs have been projected out 100 years to account for the full asset lifecycle consistent with the Storm Water Division's Watershed Asset Management Plan.
- Costs associated with the replacement and O&M of all private storm drain pipes and inlets in the affected area are not included because they are the responsibility of the private property owner. All public pipes and inlets in the affected area (e.g., pipes in the right of way) are already maintained by the City; therefore, new costs are not included.

- Costs associated with O&M of the channelized segment of Chollas Creek and adjacent earthen drainage ditch in the southeast portion of the affected area are not included because they are the responsibility of the abutting private property owners.

If you have any questions, please contact Drew Kleis, Deputy Director, at (858) 541-4320.

Sincerely,

Kris McFadden
Director

KM/cb

Attachments: 1. Nonstructural BMP TMDL Cost Estimate for County's Jurisdiction in Chollas Creek (Greenwood Cemetery)
2. County of San Diego Cost to Implement WQIP Strategies in Chollas Creek HSA

cc: Paz Gomez, Deputy Chief Operating Officer, Infrastructure/Public Works
Drew Kleis, Deputy Director, Transportation & Storm Water Department
Gene Matter, Assistant Deputy Director, Transportation & Storm Water Department
Andrea Demich, Senior Civil Engineer, Transportation & Storm Water Department
Clem Brown, Program Manager, Transportation & Storm Water Department
Brian Schoenfisch, Program Manager, Planning Department

#1:Nonstructural BMP TMDL Cost Estimate for County's Jurisdiction in Chollas Creek (Greenwood Cemetery)

*Cost estimate derived from City's nonstructural WQIP BMP costs in Chollas Creek: see assumptions/process below:

City of San Diego acreage in Chollas Creek:
13027
County acreage in Chollas Creek (Greenwood Cemetery):
121

City of San Diego 16-yr Nonstructural Chollas Creek Costs from WQIP (FY16-31):
$24,911,003

City of San Diego 16-yr NS Chollas Creek costs per acre:
$1,912

City of San Diego Annual NS Chollas Creek costs from WQIP:
$1,556,938

City of San Diego NS Chollas Creek costs for additional 84 years (to get to 100-yr estimate):
$130,782,766

City of San Diego 100-yr Nonstructural Chollas Creek Costs from WQIP (FY16-2115):
$155,693,769

City of San Diego 100-yr NS Chollas Creek costs per acre:
$11,952

County 100-yr NS Chollas Creek costs:
$1,446,146

County 100-yr NS Chollas Creek costs from WQIP:
$1,446,146

TETRA TECH

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Attachment 2

Technical Memorandum

To:	**Ruth de la Rosa, County of San Diego**	**Date:**	**June 12, 2015**
From:	**Alison Witheridge, Tetra Tech Inc.**	**Subject:**	**County of San Diego Cost to Implement WQIP Strategies in Chollas Creek HSA**
cc:	**Clint Boschen, Tetra Tech, Inc.** **Matt Rich, Amec Foster Wheeler**	**Project:**	**San Diego Bay Water Quality Improvement Plan**

Introduction

On May 8, 2013, the San Diego Regional Water Quality Control Board (San Diego Regional Board) adopted the National Pollutant Discharge Elimination (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer System (MS4) Draining the Watersheds Within the San Diego Region (Municipal Permit) (Order Number R9-2013-0001). The Municipal Permit requires Copermittees to develop a Water Quality Improvement Plan (WQIP) for the San Diego Bay Watershed Management Area (WMA). Within the San Diego Bay WMA, the County of San Diego (County) has jurisdiction in all three hydrologic units (HUs): Pueblo San Diego, Sweetwater River, and Otay River; however, the highest priority water quality condition is within Chollas Creek Hydrologic Sub Area (HSA). In Chollas Creek HSA (hereafter referred to as "Chollas"), the County's limited jurisdiction includes one residence, part of one road, Greenwood Cemetery, Jackie Robinson Family YMCA, and part of one MS4 outfall.

Tetra Tech was contracted through Task Authorization No. 42-2014-012 to estimate the costs to implement County strategies within Chollas. This Technical Memorandum documents and describes the data used to estimate the costs for nonstructural and structural strategies.

Nonstructural Strategy Costs

Prior to the development of the WQIP, a Comprehensive Load Reduction Plan (CLRP) was created in two phases for Chollas. The CLRPs presented an integrated water quality plan, similar to the WQIP, and identified nonstructural and structural strategies using literature values and modeling results. In the CLRPs, costs were estimated for enhanced, TMDL-driven nonstructural and structural strategies. However, County nonstructural costs for specifically for Chollas were not included due to the small jurisdictional area in Chollas.

In the WQIPs, unlike the CLRPs, enhanced and existing strategies to improve water quality are included in the strategy list. Jurisdictional Runoff Management Programs (JRMPs) are the primary strategies to improve water quality, therefore to determine the WQIP strategy costs for Chollas, the County's JRMP costs were used as the basis for the cost estimate. The County's JRMP Annual Report (AR) for Fiscal Year (FY) 2013-2014 includes a fiscal analysis providing the jurisdictional, watershed, and regional expenditures

for the County to comply with the San Diego Region Municipal Permit (County of San Diego 2014). To identify the expenditures associated with Chollas, the portion of County land area regulated under the San Diego Region Municipal Permit that lies within Chollas was established using GIS (Geographic Information Systems).

The County's land area within the Colorado River Regional Board (Region 7) and the area within San Juan Creek Watershed, historically regulated under the South County Permit, were not included for this analysis. To evaluate the portion of the County that falls within Chollas, the percent of land area within Chollas relative to the County's total jurisdictional area under the Municipal Permit was identified. An additional analysis determined the portion of the County's jurisdiction in Chollas relative to the area within the San Diego Bay WMA. These percentages were applied to the expenditures documented in the JRMP AR to estimate the County's annual costs to implement the JRMP within Chollas.

The percent of the County's jurisdictional area within Chollas relative to the area accounted for in the fiscal analysis is approximately 0.01%. The percent relative to the area in San Diego Bay is 0.06%. A summary of the results is presented in Table 1.

Table 1. Summary of GIS Jurisdictional Analysis Results

Analysis Criteria	Results
County jurisdiction within Chollas	121 acres
County jurisdiction regulated within the San Diego Municipal Permit	1,473,258 acres
Percent Chollas area within Chollas	0.01%
County jurisdiction within San Diego Bay WMA	196,082 acres
Percent Chollas area within San Diego Bay WMA	0.06%

The JRMP AR includes jurisdictional, watershed, and regional expenditures (County of San Diego 2014). To calculate the jurisdictional expenditures in Chollas, the jurisdictional expenditures were multiplied by 0.01%, the percent of area within Chollas relative to the Municipal Permit area. The County's watershed expenditures are distributed throughout San Diego Bay WMA. The percent of jurisdictional area within Chollas relative to the area within the WMA (0.06%) was multiplied by the watershed expenditures. The regional expenditures reported in the fiscal analysis did not account for the cost share revenue received from the other Copermittees (County of San Diego 2014). When the revenues are accounted for, the County's share of the regional effort is $939,565, or about 30% of the total regional expenditures (de la Rosa 2015). The County's regional costs were also multiplied by 0.01% to calculate the regional costs attributed to Chollas. The estimated total annual nonstructural expenditures for Chollas are approximately $2,788 (Table 2).

Table 2. Estimated County Nonstructural Strategy Costs in Chollas

Expenditure Category	County Expenditures	Estimated County Expenditures in Chollas
Jurisdictional	$26,163,662	($26,163,662) * (0.01%) = $2,616
Watershed (San Diego Bay WMA)	$129,571	($129,571) * (0.06%) = $78
Regional	$939,565	($939,565) * (0.01%) = $94
Total	**$27,232,798**	**$2,788**

Structural Strategy Costs

Structural strategies were identified in the CLRP and the WQIP compliance analysis for the County within Chollas. The CLRP Phase II effort identified green infrastructure and green street costs for the County in Chollas. During WQIP development, the City of San Diego funded a compliance analysis in Chollas to identify the level of effort needed to meet Metals TMDL targets using watershed and BMP models. BMP selection was based on CLRP II information, and the results of this analysis provided each jurisdiction the level of effort needed from structural BMPs. Several updates were made to the model between CLRP Phase II and the final WQIP compliance analysis. Updates included use of a site-specific water effects ratio (WER), site-specific total-to-dissolved metals conversion factor, and updates to the model cost functions. Updates to the cost functions were based on interviews with City of San Diego staff, conversion from 20-year life cycle costs to annual costs, and updates to construction costs. Model results provided the amount and type of structural BMPs recommended to meet targets and their associated costs.

Structural costs include Capital Improvement Program (CIP) and Operation and Maintenance (O&M) costs. CIP costs include planning, design, and construction of structural projects. This cost may be incurred across several years, depending on the project. Annualized O&M costs incorporate routine maintenance (such as basic pruning, performed four times per year) and intermediate maintenance (such as replacing sod, performed once every five years). Model results for the County recommended a total of 0.4 acres of green infrastructure and green streets. Green infrastructure CIP costs are approximately $1.1 million and annual O&M costs, assuming 100% bioretention, are approximately $22,000. Green street CIP costs are approximately $0.5 million and annual O&M costs, assuming 50% bioretention and 50% permeable pavement, are approximately $19,000. Costs and associated modeled BMP footprints for the County's jurisdiction in Chollas are presented in Table 3.

Table 3. Projected County Structural Strategy Costs in Chollas

BMP Category	BMP Footprint (acres)	CIP Cost	Annual O&M Cost
Green Infrastructure	0.20	$1,097,872	$22,128
Green Streets	0.20	$511,357	$18,643
Total	**0.40**	**$1,609,229**	**$40,771**

Summary

County nonstructural strategy costs were estimated based on the relative portion of jurisdictional area in Chollas and the known cost of jurisdictional, watershed, and regional programmatic costs. The total estimated annual cost for nonstructural strategy implementation in Chollas is $2,788. Structural strategy costs were determined using model output from the WQIP compliance analysis within the County's jurisdiction in Chollas. Total CIP costs are estimated at $1,609,229, and total annual O&M costs are $40,771. For the portion of the County's jurisdictional area within Chollas, total one-time costs are estimated at $1,609,229 and total annual costs are $43,559, as outline in Table 4.

Table 4. Summary of Costs for the County's Jurisdiction within Chollas

Strategy Type	One-Time Costs	Annual Costs
Nonstructural	N/A	$2,788
Structural	$1,609,229	$40,771
Total	**$1,609,229**	**$43,559**

References

County of San Diego. 2014. "Jurisdictional Runoff Management Program Annual Report Fiscal Analysis." *Transitional Jurisdictional Runoff Management Program (JRMP) Annual Report for Fiscal Year (FY) 2013-14.* October 16, 2014.

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