

**TO:** James L. App, City Manager  
**FROM:** Doug Monn, Interim Public Works Director  
**SUBJECT:** Award Contract to Update the City's 1976 Storm Drain Master Plan  
**DATE:** December 20, 2005

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**NEEDS:** For the City Council to award a contract to update the City's 1976 Storm Drain Master Plan.

**FACTS:**

1. On March 3, 2005, the City issued a Request for Proposal (RFP) to update the City's 1976 Storm Drain Master Plan.
2. Two firms responded to the City's request. Attached for Council's review is a summary of the proposals received.
3. In June 2005, the CIP budget was adopted and an appropriation of \$292,300 was made to update the Master Plan.
4. On September 6, 2005, an Ad Hoc Committee (Councilmen Strong & Nemeth) was formed to assist staff in reviewing the proposals received.
5. On November 22, 2005, the Ad Hoc Committee met with Schaaf & Wheeler personnel.
6. The Committee concluded that the proposal submitted by Schaaf & Wheeler was the most complete and comprehensive proposal, demonstrating the most experience in updating a municipality's Storm Drain Master Plan.

**ANALYSIS  
AND**

**CONCLUSION:** Schaaf & Wheeler has submitted the attached Scope of Work and fee proposal to update the City's Storm Drain Master Plan.

**POLICY**

**REFERENCE:** Adopted Capital Improvement Program

**FISCAL**

**IMPACT:** As stated, the CIP budget adopted in June 2005 appropriated \$292,300 to update the Master Plan.

**OPTIONS:**

- a. That the City Council authorize the City Manager to execute a contract with Schaaf & Wheeler to update the City's Storm Drain Master Plan in the amount of \$194,978.
- b. Amend, modify, or reject the above option.

Attachments

- 1) Budget
- 2) Scope of Work and Fees
- 3) Review of Proposals Memo

**PROPOSED**  
**Capital Improvement Projects Budget**  
 FY 2005-2006 to 2008-2009

	ORIGINAL APPROPRIATION	REMAINING APPROPRIATION	REQUEST TYPE	FY 2005-06	FY 2006-07	FY 2007-08	FY 2008-09	TOTAL NEW REQUEST
<b>STORM DRAIN IMPROVEMENTS</b>								
Downtown area storm drain system improvements (new drain inlets and pipeline)	\$ -	\$ -	NP	\$ -	\$ -	\$ -	\$ 390,000	\$ 390,000
<b>Subtotals</b>				\$ -	\$ -	\$ -	\$ 390,000	\$ 390,000
<b>FUNDING USES:</b>								
Storm Drainage Impact Fund							390,000	390,000
<b>Total Uses</b>			<b>Original Budget</b>	\$ -	\$ -	\$ -	\$ 390,000	\$ 390,000
			<b>Remaining Budget as of 4/30/05</b>	\$ -	\$ -	\$ -		
<b>*Carry-over Projects From Current CIP Budget:</b>								
Update 1976 Drainage Master Plan			\$ 292,300	\$ 292,300		100% Impact Fees (only in Study @ \$250K)		
Sherwood Industrial Park Drainage Study			26,600	26,600		100% Impact Fees		
Melody Basin/Park Study			25,000	25,000		100% General Fund		
			\$ 343,900	\$ 343,900				

\*Final amount subject to final year end results

<b>FUNDING SOURCES:</b>	
Storm Drainage Impact Fees Balance Forward	\$ 354,000
Drainage Impact Fees Revenues	134,300
<b>Balance Available</b>	139,400
<b>Total Estimated Expenditures</b>	144,800
<b>Projected Ending Balance</b>	150,300
	922,800
	(708,900)
	\$ 213,900

**NOTES:**

1 Doesn't match up w/any study project

NP = New project

SUP = Supplemental request to augment current appropriation

**Schaaf & Wheeler**  
CONSULTING CIVIL ENGINEERS

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Offices in  
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April 28, 2005

Ms. Ditas Esperanza, P.E.  
Capital Improvement Engineer  
City of Paso Robles  
1000 Spring Street  
Paso Robles, CA 93446

**Subject: Paso Robles Storm Drain Master Plan**

Dear Ms. Ditas:

Schaaf & Wheeler is pleased to provide the City of Paso Robles with this proposal to prepare a Storm Drainage Master Plan Study. Thank you for the opportunity.

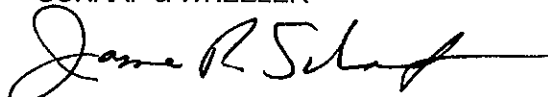
As our proposal demonstrates, we have a wealth of experience with storm drain master planning, urban hydrology, storm water infrastructure, storm water detention and percolation, storm water pump station design and operational evaluation.

Presently, we are collaborating with the cities of San Mateo and Livermore to unravel their respective storm water issues and we were recently hired by the City of Belmont to manage that city's storm water capital improvements projects. We are working to apply the latest EPA management standards – the new C.3 and hydromodification management plan (HMP) provisions of the National Pollutant Discharge Elimination System (NPDES).

Schaaf & Wheeler has assembled an outstanding team of professionals to provide the necessary collaboration with you and other City staff. **Mr. James R. Schaaf, PhD, P.E.**, will be the Project Manager and direct liaison between our team and the City of Paso Robles. **Mr. Daniel J. Schaaf, P.E.**, will be the Project Engineer in charge of all technical aspects of this project. The project manager and primary team members work out of our San Francisco and Santa Clara offices. Proposed key personnel are available and will be assigned to this project until its completion.

We are very interested in working with the City of Paso Robles on the Storm Drain Master Plan and we are prepared to discuss our project approach with you and your staff in greater detail. We are confident that we can negotiate an agreement that meets the City's needs, including schedule and budget. Thank you for considering our proposal and, if you should need any additional information, please do not hesitate to contact me.

Very truly yours,  
SCHAAF & WHEELER



James R. Schaaf, PhD, P.E.  
President

# PASO ROBLES

SCHAAF & WHEELER PROPOSAL FOR STORM DRAIN MASTER PLAN UPDATE

## Scope and Approach

### G. Project Understanding

The City of Paso Robles wishes to master plan its storm drainage system. The study is needed to identify those improvements and additional infrastructure that will provide a satisfactory level of service, and allocate the costs of those improvements between existing and future development in an equitable manner.

The previous master plan was performed in the 1976 and Paso Robles has expanded over the past 29 years. The master plan will encompass the existing city development and the areas shown in the General Plan as future development.

Storm runoff is generally self-contained with streets, storm drain inlets and pipes feeding detention basins and channels which feed into the Salinas River. Portions of the City have experienced localized flooding over the years, exacerbated by a lack of an underground storm drain system in older areas of the city.

There is also a concern with regards to the drainage from development north of Highway 46 East near Golden Hill Road. With the mix of residential development and prosperous agriculture unique drainage issues come into play. These concerns need to be addressed in this master plan, along with some systematic resolution.

The storm drain plan needs to evaluate existing storm drain system capacities and recommend improvements needed to achieve an acceptable level of service. In Paso Robles this will generally be defined as carrying a twenty five-year design hydraulic grade below the curb for existing systems (0.5 feet below ground for new systems), and carrying the 100-year design discharge within the street right-of-way (1 foot below adjacent structures). Existing system deficiencies (defined by the level of service) will be categorized, and programmed capital improvements identified to restore an acceptable level of service. Improvements might include:

- Parallel or replacement storm drain pipes
- Additional curb and gutter
- Expanded or additional storage and/or detention basins
- New pumping facilities.

“Residential / agriculture drainage issues will be addressed.”



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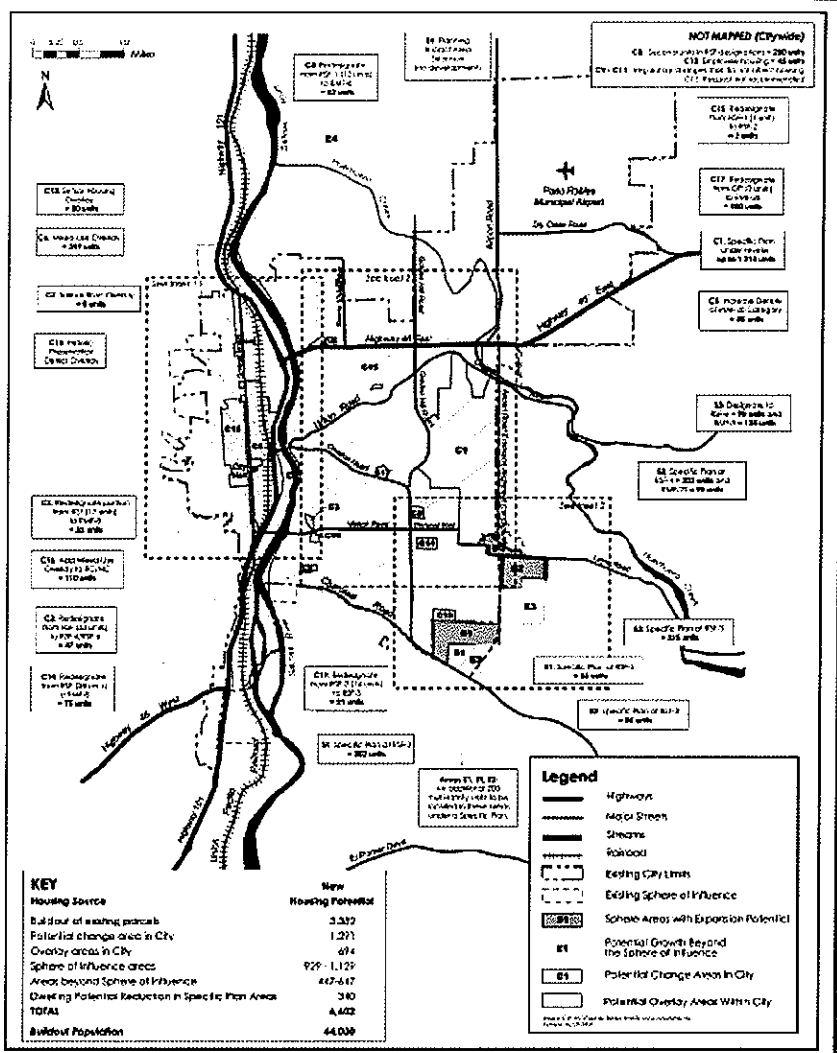
SCHAAF & WHEELER PROPOSAL FOR STORM DRAIN MASTER PLAN UPDATE

## Scope and Approach

### G. Project Understanding (cont'd)

There is an interaction between the creeks and the storm drain network on the west side of Paso Robles that needs to be addressed in this study. Runoff from the hills travels through open channels until it reaches the urban downtown area. The pipe systems that connect to the creeks are undersized causing flows to travel along the city streets. In certain areas, Highway 101 blocks these overland flows causing flooding. An improved drainage system through the urban area will need to be sized.

Responsibility for funding this portion of the CIP can be equitably distributed among existing developed parcels. Additional runoff caused by potential future development (general plan zoning) will then be evaluated using the same level of service criteria. Upgrades to existing storm drainage infrastructure and trunk systems for undeveloped areas will be formulated so that those costs are assigned to particular zones of development responsible for the impact. In this way there is a project nexus between public costs and development impact fees.



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SCHAAF & WHEELER PROPOSAL FOR STORM DRAIN MASTER PLAN UPDATE

## Scope and Approach

### H. Work Program

A scope of work is outlined here. Our estimated fee for the work, including data collection, is \$195,000.

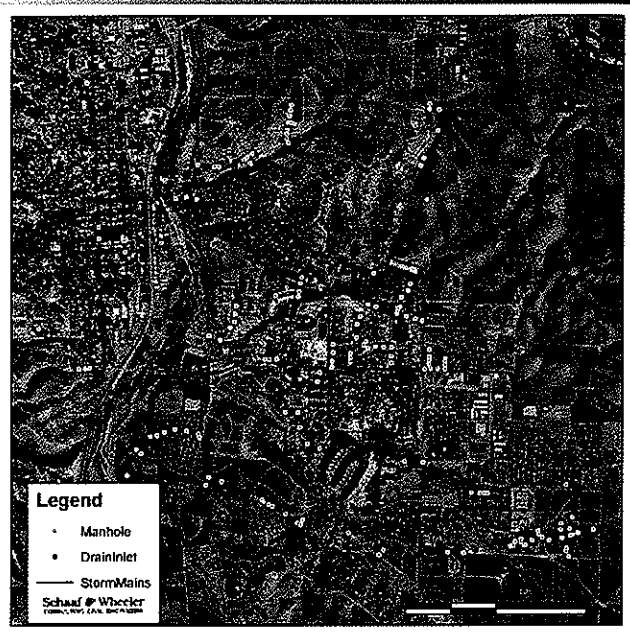
#### **Task 1** *Project Initiation*

1. Gather available system data beginning with the 1976 storm drain master plan and the 2004 Storm Drain Atlas.
2. Visit major drainage facilities and basins. Document photographically.
3. Establish drainage standards to use in modeling and evaluation (level of service).
4. Review historic drainage problems and storm system operation with City staff.
5. Identify constraints including allowable drainage to the Salinas River.
6. Review local NPDES permit conditions.

#### **Task 2** *Data Collection*

Digital aerial photography and two-foot contour topography for Paso Robles is available from the City. The 2004 Storm Drain Atlas, compiled by Boyle Engineering, outlines the existing system in GIS format. Unfortunately, the GIS has many data gaps. This data is critical to the storm drain modeling and analyses. More than 30-percent of the pipes in the atlas are missing inverts, nearly half the manholes and 60-percent of the inlets are missing rim elevations and there is no data for the manhole or inlet inverts. Schaaf & Wheeler plans to collect this data to complete the modeling and further upgrade the City's GIS.

This proposal presents a data collection program that provides data resolution appropriate for a planning level study. The elevation data for the 319 inlets and 88 manholes missing rim elevations will be generated from the new topography. The missing data for the inverts will be generated by "dipping" the manholes and



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SCHAAF & WHEELER PROPOSAL FOR STORM DRAIN MASTER PLAN UPDATE

## Scope and Approach

### H. Work Program (cont'd)

inlets. This will use a two-person crew and may require some additional services from the City's staff for traffic control.

At the City's discretion, an option to provide higher resolution data could be prepared should there be a desire to obtain design level data.

#### Task 3 **Geographic Information System**

ARCGIS will be used to convert the Storm Drain Atlas data into a GIS ready for storm drain modeling. The Atlas' missing data will be populated with our field collection and topography generated data. The systems shown in the Atlas are assumed to be the existing City storm drain infrastructure. Because this study will look at the 100-year event, there will also need to be sufficient data about the streets and right-of-ways. The following data comprises the storm drain GIS:



- Storm drain system alignments for all pipes 12 inches in diameter and larger
- Storm drain outfall locations at basins and channels
- Diameters of all storm drain pipes
- Storm drain pipe material and condition, if known
- Manhole and inlet locations, rim elevations and invert elevations
- Facilities locations
- Street networks with curb and crown height and roadway width
- Open channel networks with channel characteristics
- Delineation of watersheds for each inlet along with basin attributes (land use, soil type, slope, etc.)

#### Task 4 **GIS-based Storm System Model**

After careful consideration, we propose to utilize Danish Hydraulic Institute's MIKE-URBAN model. We have successfully used this model in San Mateo, Livermore, and Belmont finding it to be robust yet stable and easier to use than SWMM for instance.

MIKE-URBAN is a package of software programs designed for the analysis, design and management of urban drainage systems, including storm water sewers and sanitary sewers. The model works

# PASO ROBLES

SCHAAF & WHEELER PROPOSAL FOR STORM DRAIN MASTER PLAN UPDATE

## Scope and Approach

### H. Work Program (cont'd)

with add-on modules to ARCGIS and can simulate runoff, open channel flow, pipe flow, infiltration, pumping, water quality and sediment transport. This program has been chosen to model the Paso Robles storm drain system because of its capabilities with pipe flow, detention, percolation, pumps, street and open channel flow; the incorporation of the SCS hydrology method; and the overall stability of the model. It is important to note that many storm drain models cannot model the interaction between pipe and street flow. This will be key when modeling the 100-year event.

To improve the reliability of rainfall-runoff modeling, we calibrate Antecedent Moisture Conditions (AMC) to replicate frequency analyses of local streamflow data and balance our design storm pattern to match local rainfall-duration-frequency data.

#### **Task 5 Existing System Evaluation**

Once the GIS model is built, we will evaluate existing storm drainage facilities against the drainage criteria established in Task 1. The task includes:

- Estimate storm runoff within system components for various return periods (10, 25, 50 and 100-year), based on level of service criteria.
- Establish storm drain pipe and street capacities at different levels of service. For instance new systems may have a criterion that the 25-year flow is carried below the street with half a foot of freeboard, while existing systems are allowed to carry water in the streets at some maximum spread into the traveled way.
- Map areas of overflow due to storm drain system capacity limitations. This will be done for the 10, 25, 50 and 100-year events.
- Compare results with historic observations for a basis in reality.
- Distinguish between unacceptable flooding caused by local facility inadequacies versus problems with major drainage facility capacities or maintenance efforts.





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## Scope and Approach

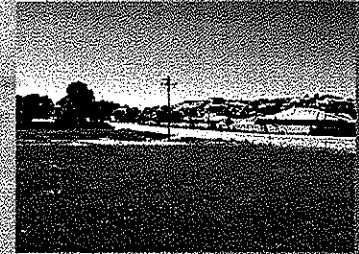
### H. Work Program (cont'd)

#### **Task 6 Future System Evaluation**

Evaluate existing system responses to ultimate build-out development scenarios based on land use plans provided by the City.

#### **Task 7 Development Impact Analysis**

Infrastructure will be designed to meet ultimate level-of-service requirements. However, the master plan will separate capital costs into two categories: 1) improvements that remedy existing deficiencies; and 2) improvements or additional facilities needed to meet ultimate build-out. This task thus provides a preliminary impact analysis of planned new development upon storm drain infrastructure. Capital costs necessary to provide the design level of service for new development will be compared to capital costs necessary under existing conditions.



#### **Task 8 Storm Drain System Remediation**

Task 8 provides a prioritized Capital Improvement Plan for storm drain system remediation to accommodate both existing deficiencies and future growth in Paso Robles as analyzed in Tasks 5 and 6. Infrastructure will be designed to meet ultimate level of service requirements. Near term and ultimate development conditions will be used to help establish CIP priorities. Remediation may be in the form of parallel drains, replacement drains, diversions, additional inlets, additional detention and/or pump stations.



#### **Task 9 Special Drainage Problems**

This task will incorporate the special drainage problem in Paso Robles that don't fit into the modeling components. The unique problem of residential development draining landscaping and other warm weather flows onto agricultural lands will be addressed. Water quality issues will also be studied under this task.

#### **Task 10 Master Plan Document**

Analytical work will be presented in a Storm Drain Master Plan report as described above. The master plan can also be considered as a basis of design to other engineering professionals working in Paso Robles. This task includes:

- Draft Storm Drain Master Plan
- Working Sessions (4) with City staff
- Final Storm Drain Master Plan incorporating City comments
- Presentation of Findings to City Council

# PASO ROBLES

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## Scope and Approach

### I. Work Budget

NO.	PHASE & TASK ITEMS DESCRIPTION	SUBTOTAL M.H.'S	IN-HOUSE LABOR COSTS \$	REIMB. EXPENSES \$	TOTAL COSTS \$
<b>1.0</b>	<b>PROJECT INITIATION / COORD</b>				
1.1	Gather Information	24	\$ 2,920		\$ 2,920
1.2	Field Reconnaissance	64	\$ 7,752	\$ 150	\$ 7,902
1.3	Meeting Initiation and Attendance	24	\$ 3,456		\$ 3,456
1.4	Research	26	\$ 3,336		\$ 3,336
1.5	Project Management	24	\$ 4,128		\$ 4,128
		162	\$ 21,592	\$ 150	\$ 21,742
<b>2.0</b>	<b>Data Collection</b>				
2.1	Inlet and Manhole Dipping	168	\$ 18,528		\$ 18,528
2.2	Office GPS Computation	16	\$ 1,736		\$ 1,736
2.3	Manhole elevation check	16	\$ 1,736		\$ 1,736
2.4	Compile and Draft Base Map	14	\$ 1,572	\$ -	\$ 1,572
		214	\$ 23,572	\$ -	\$ 23,572
<b>3.0</b>	<b>GIS</b>				
3.1	Establish GIS	37	\$ 4,140		\$ 4,140
		37	\$ 4,140	\$ -	\$ 4,140
<b>4.0</b>	<b>STORM DRAIN MODEL</b>				
4.1	Design Storms	12	\$ 1,460		\$ 1,460
4.2	Streamflow Frequency Analysis	17	\$ 1,972		\$ 1,972
4.3	Watershed AMC Calibration	38	\$ 4,312		\$ 4,312
4.4	Hydrologic Parameters	36	\$ 4,020		\$ 4,020
4.5	Run Model to Debug	72	\$ 8,164		\$ 8,164
		175	\$ 19,928	\$ -	\$ 19,928
<b>5.0</b>	<b>EXISTING SYSTEM EVALUATION</b>				
5.1	Level of Service	132	\$ 14,656		\$ 14,656
5.2	Runoff Modeling	112	\$ 12,596		\$ 12,596
5.3	List of System Deficiencies and Cause	36	\$ 4,592		\$ 4,592
5.4	Spill Mapping	120	\$ 13,764		\$ 13,764
		400	\$ 45,608	\$ -	\$ 45,608

# PASO ROBLES

SCHAAF & WHEELER PROPOSAL FOR STORM DRAIN MASTER PLAN UPDATE

## Scope and Approach

### I. Work Budget (cont'd)

NO.	PHASE & TASK ITEMS DESCRIPTION	SUBTOTAL M.H.'S	IN-HOUSE LABOR COSTS \$	REIMB. EXPENSES \$	TOTAL COSTS \$
<b>6.0</b>	<b>FUTURE BUILD-OUT (Area 1)</b>				
6.1	Zoning and Land Use	22	\$ 2,664		\$ 2,664
6.2	Runoff Parameters	26	\$ 3,248		\$ 3,248
6.3	Delineate Watersheds	36	\$ 4,192		\$ 4,192
6.4	Impact to Existing System	26	\$ 3,076		\$ 3,076
		110	\$ 13,180	\$ -	\$ 13,180
<b>7.0</b>	<b>DEVELOPMENT IMPACT ANALYSIS</b>				
7.1	Propose SD to correct (E) Deficiencies	76	\$ 9,056		\$ 9,056
7.2	Repeat 7.1 at Ultimate Build-out	64	\$ 7,560		\$ 7,560
7.3	Track Differences	24	\$ 3,008		\$ 3,008
		164	\$ 19,624	\$ -	\$ 19,624
<b>8.0</b>	<b>STORM DRAIN SYSTEM REMEDIATION</b>				
8.1	Prioritize Projects	36	\$ 4,848		\$ 4,848
8.2	CIP and Cost Allocation	56	\$ 6,736		\$ 6,736
8.3	Graphics	26	\$ 2,904		\$ 2,904
		118	\$ 14,488	\$ -	\$ 14,488
<b>9.0</b>	<b>SPECIAL PROBLEMS</b>				
9.1	Warm Weather Flows	36	\$ 4,848		\$ 4,848
9.2	Water Quality	28	\$ 3,680		\$ 3,680
9.3	Others	20	\$ 2,768		\$ 2,768
		84	\$ 11,296	\$ -	\$ 11,296
<b>10.0</b>	<b>MASTER PLAN DOCUMENT</b>				
10.1	Draft SDMP	88	\$ 10,568	\$ 100	\$ 10,668
10.2	Review Session	8	\$ 1,272	\$ 100	\$ 1,372
10.3	Final SDMP	68	\$ 7,888	\$ 100	\$ 7,988
10.4	Presentation to City Council	8	\$ 1,272	\$ 100	\$ 1,372
		172	\$ 21,000	\$ 400	\$ 21,400
	<b>PROJECT TOTALS</b>	<b>1636</b>	<b>\$ 194,428</b>	<b>\$ 550</b>	<b>\$ 194,978</b>

TO: Storm Drain Master Plan Ad Hoc Committee

FROM: Bob Lata, Ditas Esperanza, John Falkenstien, Doug Monn

SUBJECT: Review of Proposals for Storm Drain Master Plan

DATE: June 17, 2005

We offer the following comments for consideration of our review on the two proposals received to prepare the City's update of the Storm Drain Master Plan.

In reviewing the two proposals in relation to the Request for Proposals and the quality of their content, we found the proposal by Schaaf and Wheeler (S&W) to be substantially superior to the proposal by West Consultants. In summary:

- S&W obviously spent more time to research current information (e.g. the gaps cited in the Storm Drain Atlas);
- S&W is proposing to model 12 inch and larger storm drain lines; West is limited to 24 inch and larger lines;
- S&W appears to have substantially more experience, particularly in urban storm drainage studies; the work examples cited by West were for the most part smaller development projects or non-urban area studies;
- S&W has more demonstrated experience regarding work done in SLO County;
- The S&W proposal was clearer and better written.

In summary, even though the S&W proposal was about twice the cost of the West proposal, the level of apparent quality and level of detail for what is proposed would seem to be worth the long-term investment.

We will be scheduling a meeting to discuss these comments. Thanks!