Stantec Consulting Inc.
2590 Venture Oaks Way
Sacramento CA 95833
Tel: (916) 569-2500 Fax: (916) 921-9274
stantec.com

Stantec

July 25, 2006
File: 84438704, 84400042

Raney Project Management and Planning
1401 Halyard Suite 120
West Sacramento, CA 95691

Attention: Tim Raney

Dear Tim:

Reference: Clover Valley DEIR
Response to Letter of June 21, 2006

This letter will respond to questions raised in a letter to your attention dated June 21, 2006 sent by Douglas Moore with West Yost Associates. As you are aware, since we received a copy of this letter there has been a series of discussions and meetings between Mr. Moore and Stantec staff to discuss the various concerns raised in that letter. The City of Rocklin approved those discussions and meetings between Stantec and West Yost Associates.

A number of issues were raised in the June 21, 2006 letter. The main crux of the concerns related to the need for additional hydraulic modeling and preparation of detailed plans or reports during the CEQA process. Based on the discussions and meetings between Mr. Moore and me, the additional modeling and updated report generation has been recognized as part of subsequent final design efforts rather than being needed now to complete the CEQA process. The existing models are sufficient to analyze potential impacts from this project development and to provide the basis for determination of required mitigation measures to address any noted impact.

The responses provided below address the various questions or comments contained in the June 21, 2006 letter.

Flooding Issues

The hydrology of the Clover Valley project has undergone an extensive review, including preparation of hydrologic and hydraulic models to analyze potential impacts associated with development in this valley. Those models (copies of which have been on file with the city as part of the preparation of the DEIR) have been approved by FEMA in their Conditional Letter of Map Revision (CLOMR) correspondence dated August 6, 2001 (copy attached). These models have also been reviewed and approved by Placer County and the City of Rocklin.

Reference: Clover Valley DEIR
Response to Letter of June 21, 2006

Since the original preparation of the hydrologic and hydraulic models, the proposed Clover Valley project has been re-designed to significantly reduce the number of units and to eliminate one of the proposed roadway crossings over the creek. The elimination of the one roadway crossing and the reduction of the number of lots in the development plan to 558 units will not increase impacts generated in the previously prepared hydrologic or hydraulic model results. The eliminated crossing was designed to provide negligible head loss through the culverts at this location (no detention) and is of little or no consequence in determining upstream water surface elevations. Similarly, the runoff associated with the higher number of residential units previously reviewed will not need to be reexamined as part of the EIR process since runoff associated with the lower development currently planned would be less than that analyzed in the earlier models. Once this project moves forward, there will be a need to prepare updates to the current hydrologic and hydraulic models incorporating the approved street and lotting plan parameters, the nominal potential PCWA increase of flow from the Sunset Water Treatment Plant facility, and final road crossings culvert sizing. However, for purposes of public review under CEQA, the modeling previously completed adequately identifies (and even slightly overstates) all potential flooding impacts that could result from development of the project.

All proposed building pads are to be constructed with sufficient freeboard (two feet or more) above the new 100-year water surface elevation. Even in the unlikely event that the culverts become blocked with debris, water will overtop roadways and be conveyed around the blockage, but still not impact the surrounding lots.

Roadway Crossings and Detention

The proposed roadway crossings are designed as culverts, not bridges. All of the low flow culverts at the roadway crossings will be designed to span the main creek and will be sized to minimize, if not eliminate, any constrictions to the seasonal flows. The project proposes to use adequately sized arched culverts with a natural invert at all four roadway crossings of the creek providing undisturbed flow (negligible head loss through culvert) of the identified seasonal creek flow. The footings for these seasonal flow structures will be placed outside of this seasonal flow area by spanning the creek with the intent of providing an undisturbed creek bed and a corridor for animal migration.

At the two upstream roadway crossings (Valley View Parkway and Forest Clover Road) additional culverts will be placed at a slightly higher elevation to provide capacity for larger storm events including the 100-year event. No detention is to be provided at these two upstream locations.

In addition to the seasonal flow culverts at the two downstream locations (Valley Clover Way and Nature Trail Way), on-line detention basins will be created naturally by restricting the larger storm event runoff. The detention basins will be created by adjusting the elevation of the additional culverts at both locations based on the hydraulic models. The basins will be designed to provide a controlled discharge to eliminate downstream flow impacts outside the project. No grading or sculpting of the basins is proposed. On the contrary, any impacts from the temporary ponding of water in these natural detention basins will not be dissimilar to the current impacts during large storm events. Examining the location and extent of the current floodplain limits confirms this similarity. Although the area of inundation will be increased and the ponding will last slightly longer, there are not any significant impacts to the area.

Reference: Clover Valley DEIR
Response to Letter of June 21, 2006

The culverts sizing requirements have been preliminarily determined based on the approved drainage models and are noted in the DEIR. Final design efforts will refine the culvert sizes and will need to provide an equivalent hydraulic capacity. Adjustments to the size and configuration are anticipated as part of final design with the requirement that creek flow characteristics (water surface elevations, detention evacuation periods, etc.) for the final designs are compatible with the approved studies.

The impact area associated with the detention basin backwater has been shown on the grading plans and related storm drainage studies. Similarly, the time needed to evacuate the basins to provide storage for subsequent storms is included in the FEMA studies and drainage studies on file at the city. The storage period for the detention basin is between 24 and 48 hours depending on the storm event considered. A new exhibit depicting the locations and extent of the floodplains has been prepared to provide additional clarity on these limits. Additionally, unit hydrographs have been prepared that depict the flow regimes resulting from the detention basins. Copies of the floodplain exhibit and unit hydrographs are attached.

The alternative of using of off-line detention basins has been previously examined and was determined to create more impacts than the on-line system proposed. Off-line basins would require the construction of a series of basins necessitating additional grading, the construction of berms/levees around the basins, impacts to the seasonal wetland areas due to the need to construct the basins immediately adjacent to the creek, additional tree removals, as well as impacts on the project development.

Offsite Impacts
Developed flows leaving the project site have been analyzed to examine potential downstream impacts. The DEIR makes note of the reduced flows leaving the site as a result of the proposed detention basins. Notwithstanding the increase of stormwater runoff from the development within the project limits, there will not be any increase in the rate of flow leaving the project site caused by this development. The detention basins are created to regulate peak flows leaving the project site and eliminate downstream impacts along creeks, bridges, and other existing conveyance structures. The offsite flows released from the Clover Valley project have been examined from the project southerly boundary downstream through the Dry creek system to the eventual discharge into the Natomas East Main Drainage Canal. No significant impacts accruing to increased flooding, erosion or increased water surface elevations were noted.

Maintenance
The roadway crossings will not further degrade the existing wetland and seasonal riparian areas water quality function or habitat value. The proposed impacts to Corps jurisdictional areas are noted in the DEIR and will be permitted under the 404 Permit process. Proposed project impacts of less than three acres to wetlands and seasonal riparian areas noted in the DEIR are inclusive of areas needed to provide maintenance at the upstream and downstream side of each roadway crossing. For the purpose of our determining impacts, we have assumed an additional distance of 15 feet from the roadway improvement prism of impact (roadway fills and slopes) on both the upstream and downstream side for impacts.

It is my understanding that maintenance of the roadway culvert crossings and in-street pipe collection and conveyance system components will be performed by the city. As the roadway crossings are across open space, there will be a requirement for maintenance to be coordinated

with the Wildlife Heritage Foundation, the agency responsible for monitoring any activities within this project's open space areas.

Onsite Drainage System
The pipe collection and conveyance system components have been designed to reflect the current street and lotting pattern. The drainage study is on file at the city and depicts the tributary areas, projected runoff, pipe sizing and other related data. This drainage study will also be updated based on final design of the approved project.

Water quality
Water quality issues are also addressed in detail in the DEIR. As part of the proposed drainage system, there will be a requirement to place a water quality treatment structure on each pipe system prior to discharge into Clover Valley Creek. The exact type of structure and its size will be determined as part of final design. These structures, while typically addressing sediment and floatable capture, also provide ancillary treatment for nutrients, metals and other contaminants. This project will be conditioned to incorporate Best Management Practices (BMP's) using Best Available Technology (BAT) at the time of final design. The structures will be designed in accordance with City of Rocklin and Placer County standards.

Water quality issues during construction and post construction will be addressed through established Stormwater Pollution Prevention Plan (SWPPP) requirements. This project will be conditioned to comply with all applicable California Regional Water Quality Control Board standards and requirements. Water quality monitoring to validate the effectiveness of water quality treatment techniques is noted as mitigation measures in the DEIR (see Section 4.11).

Sediment
Concerns regarding the potential for increased sediment loading downstream from the project have been analyzed. Based on a comparison of the existing and post-project creek flows and velocities, it has been determined that this project will not create additional offsite sediment loading. During construction, this project will be required to construct, maintain and monitor erosion control and water quality elements as required by the SWPPP. Following construction, water quality structures are to be designed to capture the sediment loads from the constructed project prior to runoff reaching the creek.

It is noted that sediment transport and deposition does take place along this creek and that similar sediment transport and deposition will continue in the future with or without this project.

Funding for Maintenance
Maintenance for the various storm drainage system components will be the responsibility of the City Public Works Department and/or the Homeowners Association with funding provided through a Mello Roos District (CFD), Lighting and Landscape District, HOA fees or other city approved mechanism.

Reference: Clover Valley DEIR
Response to Letter of June 21, 2006

We are hopeful that the above comments will address all outstanding questions and issues relating to storm water and water quality on this project. If you have any further questions or comments on the responses, please do not hesitate to contact me.

Sincerely,

STANTEC CONSULTING INC.

Michael O'Hagan, PE
Managing Principal
Tel: (916) 569-2521
Fax: (916) 921-9274
mohagan@stantec.com

Attachments: Floodplain Exhibit and Sections
Unit Hydrograph Exhibit and Sections
Velocity Exhibit and Graph
Resume

c. Doug Moore, West Yost & Associates
David Mohlenbrok, City of Rocklin
Rick Massie, Massie and Co.
Dave Garst
Rick Jarvis, Jarvis, Fay & Doporto, LLP

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MANAGING PRINCIPAL, URBAN LAND ENGINEERING

Michael O'Hagan PE

Stantec

Michael O'Hagan has more than 28 years of experience in project management and civil engineering design on projects for both public and private sector clients. His experience includes large multi-use development projects, levee design, site development and erosion control projects, as well as the associated roadway, sewer, water, and drainage design elements. Mr. O'Hagan has a thorough knowledge of federal, state, and local design standards via his experience on projects requiring coordination with the Army Corps of Engineers, FEMA, Fish and Wildlife Services, Department of Water Resources, State Reclamation Board, and cities and counties throughout Northern California.

EDUCATION

BS, General Engineering, United States Military Academy, West Point, New York, 1973

REGISTRATIONS

Professional Engineer #36985, State of California

Professional Engineer #26269, State of Arizona

Professional Engineer #11930, State of Montana

Professional Engineer #7760, State of Nevada

MANAGING PRINCIPAL, URBAN LAND ENGINEERING

Michael O'Hagan PE

Stantec

PROJECT EXPERIENCE

MASTER PLANNING

Clover Valley, Rocklin, California (Principal Engineer)

Principal-in-Charge/Project Manager for a 622-acre proposed residential development in the City of Rocklin. The project is currently undergoing environmental and entitlement reviews based on a package Stantec prepared that included a General Plan Amendment, Rezone, Large Lot and Small Lot Tentative Subdivision Map, General Development Guidelines, and all required engineering studies and modeling. The project will include over five miles of major roadways, four creek crossings, and two miles of 12-inch and 16-inch water transmission mains to serve the project. Significant environmental constraints including 28,000 oak trees, Corps identified riparian and seasonal wetlands, cultural resources, and elderberry plants have been addressed and incorporated into the project design to provide an environmentally acceptable project consisting of 558 single family lots, 366 acres of public open space and park, and a five-acre commercial parcel. Project permitting elements have included coordination with the Corps of Engineers, FEMA, Fish and Wildlife Services, and the California Department of Fish and Game.

Dry Creek/West Placer County Community Facilities District, Placer County, California (Principal-in-Charge)

Principal-in-Charge for the master planning and design for the major infrastructure extension required to serve this 4,500-acre community plan near Roseville. Design included stormwater analysis to update the existing 100-year flood plain limit for five miles of Dry Creek, removal and reconstruction of a major arterial bridge across Dry Creek to provide adequate drainage capacity, and 12 miles of road improvements with varying right-of-way width from 120 to 144 feet, intersection improvements, signalization, bike lanes, nature trails, sidewalks and roadside landscaping.

Stoneridge Specific Plan Area - Planning, Annexations, and Entitlements, Roseville, California

Principal Engineer for this 1,089-acre mixed-use planned community. The Stoneridge community will support more than 2,800 residential units, commercial and business professional employment areas, and more than 320 acres of parks and environmentally sensitive open space.

** denotes projects completed with other firms*

MANAGING PRINCIPAL, URBAN LAND ENGINEERING

Michael O'Hagan PE

Stantec

MIXED-USE

Lighthouse Marina, West Sacramento, California (Project Manager)

Project Manager and Design Engineer for a 300-acre mixed-use urban development project located along the Sacramento River. Responsibilities included project management and review; design of site infrastructure including sewers, water system, storm drainage pump station with backup emergency generator, streets, and site grading; processing, submitting, and acquiring permits for a riverside development from the US Army Corps of Engineers, California Department of Fish and Game, California State Lands Commission, and California State Reclamation Board; coordination with project staff; and coordination with local, state, and federal agencies.

MULTI-UNIT / FAMILY RESIDENTIAL

The Landing at Riverlake, Sacramento, California (Project Manager)

Project Manager and Principal Engineer for the design of a 145-unit apartment complex with a prominent water feature, which received a Gold Nugget Award in 1989 for best design of a multifamily project. The Landing is highlighted by continuing a lake front environment throughout the project with interior navigable waterways. The project included civil, mechanical and electrical engineering, as well as landscape architecture and site planning.

NON-SECTOR SPECIFIC

Sacramento River Bank Repair and Reconstruction, Sacramento, California (Principal-in-Charge)

Principal-in-Charge for a fast-track bank repair and restoration project which required the development of a hybrid stabilization and protection system for approximately 650 feet of levee along the Sacramento River. Work included coordination of surveying, civil and landscape design services, as well as securing approvals and permits from local, state and federal agencies.

ROADWAYS

Hazel Avenue/Sierra College Boulevard Widening, Sacramento County, California (Principal-in-Charge and Project Manager)

Principal-in-Charge and Project Manager for the widening of Hazel Avenue in Sacramento County and Sierra College Boulevard in Placer County. The project allows this major transportation corridor between Sacramento and Placer counties to accommodate four through traffic lanes, including the addition of a raised median and shoulder improvements for bicycles and pedestrians. The improvement plans require coordination with Placer County and the City of Roseville for the northern portion of the project. Work has included surveying and mapping, preparation of roadway widening plans, drainage analysis, utility relocations, and coordination with future development plans in the area. The project also included an ongoing public outreach program, including engineering support and input for a series of public meetings with residents.

** denotes projects completed with other firms*

MANAGING PRINCIPAL, URBAN LAND ENGINEERING

Michael O'Hagan PE

Stantec

SEWER SYSTEM DESIGN

Trunk Sewer Upgrade, South Placer Municipal Utility District, Placer County, California (Principal-in-Charge)

Principal-in-Charge for design of a trunk sewer upgrade in the cities of Roseville and Rocklin for a portion of the South Placer Municipal Utility District sewer system. His responsibilities included project management, design review, quality control and permitting coordination for removal of an existing 24-inch trunk sewer and replacement with 6,600 feet of 42-inch trunk sewer.

TELECOMMUNICATIONS

Cellular Tower Design and Construction, 14 Sites Throughout Northern California and Nevada (Principal in Charge)

Principal in Charge and Project Manager for survey, mapping, civil, electrical, and planning services at over 14 tower facility locations in California and Nevada. Stantec worked with Cellular One representatives to secure approval of entitlement permits and attended public hearings on ramifications of tower construction/operation. Design efforts included work on grading and drainage, security fencing, site access/egress, electrical grounding design and utility coordination, preparation of lease and/or parcel map documents. Tower facilities included design of mono-pole, self-supporting, and guyed towers ranging in height from 75 feet to over 280 feet. Entitlement and design efforts included working with numerous public, local, state, and federal agencies including FAA, FEMA, and California Public Utility Commission. Site requirements varied from placement of tower and related prefabricated building on vacant sites to adding towers and related electrical appurtenances to the roofs of high rise buildings in downtown Reno, Nevada.

** denotes projects completed with other firms*

FILE 370 60005

Federal Emergency Management Agency

Washington, D.C. 20472

AUG 0 6 2001

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 01-09-356R

The Honorable George Magnuson
Mayor, City of Rocklin
3970 Rocklin Road
Rocklin, CA 95677-2720

Community: City of Rocklin, CA
Community No.: 060242

104

Dear Mayor Magnuson:

This responds to a request that the Federal Emergency Management Agency (FEMA) comment on the effects that a proposed project would have on the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for Placer County, California, and Incorporated Areas (the effective FIRM and FIS report for your community), in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated January 25, 2001, Mr. Pal A. Hegedus, Senior Principal, The Spink Corporation, requested that FEMA evaluate the effects along Clover Valley Creek that updated topographic information and the proposed development of the Clover Valley Lakes subdivision from Clover Valley Road to approximately 11,300 feet upstream would have on the flood hazard information shown on the effective FIRM and FIS report. The proposed project will include placement of fill and construction of Summit Drive, Bear Clover Way, Clover Valley Parkway, White Clover Drive, and White Tip Way and associated reinforced-concrete box culverts at the stream crossings. Although most of the project site is shown on the effective FIRM as in the unincorporated areas of Placer County, the entire area of the proposed subdivision was annexed by the City of Rocklin.

All data required to complete our review of this request for a Conditional Letter of Map Revision (CLOMR) were submitted with letters from Mr. Glenn Uyeda, P.E., Senior Hydraulic Engineer, Stantec Consulting Inc.; Ms. Michelle Ridgeway, also with The Spink Corporation; and Mr. Hegedus.

We reviewed the submitted data and the data used to prepare the effective FIRM for your community and determined that the proposed project meets the minimum floodplain management criteria of the NFIP. The submitted existing conditions HEC-2 hydraulic computer model, dated March 27, 2001, based on updated topographic information, was used as the base conditions model in our review of the proposed conditions model for this CLOMR request. We believe that, if the proposed project is constructed as shown on the submitted plans entitled "Culvert Crossings at Clover Valley Lakes" and the submitted topographic work map entitled "Clover Valley Creek Conditional Letter of Map Revision," both prepared by The Spink Corporation and dated January 24, 2001, and the data listed below are received, a revision to the FIRM would be warranted.

Our review of existing conditions revealed that the elevations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) increased in some areas and decreased in other areas along Clover Valley Creek compared to the effective Base Flood Elevations (BFEs) from approximately 350 feet upstream to approximately 10,900 feet upstream of Clover Valley Road. The maximum increase in BFE, 3.8 feet, occurred approximately 8,400 feet upstream of Clover Valley

Road. The maximum decrease in BFE, 1.8 feet, occurred approximately 4,000 feet upstream of Clover Valley Road.

As a result of the proposed project, the BFEs will increase in some areas and decrease in other areas compared to the existing conditions BFEs for Clover Valley Creek from approximately 350 feet upstream to approximately 10;900 feet upstream of Clover Valley Road. The maximum increase in BFE, 9.4 feet, will occur approximately 4,000 feet upstream of Clover Valley Road. The maximum decrease in BFE, 1.9 feet, will occur approximately 8,400 feet upstream of Clover Valley Road.

As a result of existing conditions and the proposed project, the width of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, along Clover Valley Creek will increase in some areas and decrease in other areas compared to the effective SFHA width from approximately 350 feet upstream to approximately 10,900 feet upstream of Clover Valley Road. The maximum increase in SFHA width, approximately 510 feet, will occur approximately 4,100 feet upstream of Clover Valley Road. The maximum decrease in SFHA width, approximately 210 feet, will occur approximately 4,000 feet upstream of Clover Valley Road.

As a result of existing conditions and the proposed project, the width of the regulatory floodway along Clover Valley Creek will increase in some areas and decrease in other areas compared to the effective floodway width from approximately 350 feet upstream to approximately 10,900 feet upstream of Clover Valley Road. The maximum increase in floodway width, approximately 350 feet, will occur approximately 4,300 feet upstream of Clover Valley Road. The maximum decrease in floodway width, approximately 70 feet, will occur approximately 2,650 feet upstream of Clover Valley Road.

As a result of existing conditions and the proposed project, the BFEs will increase in some areas and decrease in other areas compared to the effective BFEs for Clover Valley Creek from approximately 350 feet upstream to approximately 10,900 feet upstream of Clover Valley Road. The maximum increase in BFE, 10.6 feet, will occur approximately 1,300 feet upstream of Clover Valley Road. The maximum decrease in BFE, 2.3 feet, will occur approximately 4,000 feet upstream of Clover Valley Road.

Upon completion of the project, your community may submit the data listed below and request that we make a final determination on revising the effective FIRM and FIS report.

- A signed letter from the community, stating that no insurable structures will be affected by the proposed revision

- Detailed application and certification forms, which were used in processing this request, must be used for requesting final revisions to the maps. Therefore, when the map revision request for the area covered by this letter is submitted, Form 1, entitled "Revision Requester and Community Official Form," must be included. (A copy of this form is enclosed.)

- The detailed application and certification forms listed below may be required if as-built conditions differ from the preliminary plans. If required, please submit new forms (copies of which are enclosed) or annotated copies of the previously submitted forms showing the revised information.

  Form 4, entitled "Riverine Hydraulic Analysis Form"

Form 5, entitled "Riverine/Coastal Mapping Form"

Form 7, entitled "Bridge/Culvert Form"

Hydraulic analyses, for as-built conditions, of the base flood and the regulatory floodway must be submitted with Form 4, and a topographic work map showing the revised floodplain and floodway boundaries must be submitted with Form 5.

- Effective June 1, 2000, FEMA revised the fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps. In accordance with this schedule, the current fee for this map revision request is $3,400 and must be received before we can begin processing the request. Please note, however, that the fee schedule is subject to change, and requesters are required to submit the fee in effect at the time of the submittal. Payment of this fee shall be made in the form of a check or money order, made payable in U.S. funds to the National Flood Insurance Program, or by credit card. The payment must be forwarded to the following address:

  Federal Emergency Management Agency
  Fee-Charge System Administrator
  P.O. Box 3173
  Merrifield, VA 22116-3173

- As-built plans, certified by a registered professional engineer, of all proposed project elements

- Community acknowledgment of the map revision request

- Certification that all fill placed in the currently effective base floodplain and below the proposed BFE is compacted to 95 percent of the maximum density obtainable with the Standard Proctor Test method issued by the American Society for Testing and Materials (ASTM Standard D-698) or an acceptable equivalent method for all areas to be removed from the base floodplain

- A copy of the public notice distributed by your community stating its intent to revise the regulatory floodway, or a statement by your community that it has notified all affected property owners and affected adjacent jurisdictions

- A letter stating that your community will adopt and enforce the modified regulatory floodway, OR, if the State has jurisdiction over either the regulatory floodway or its adoption by your community, a copy of your community's letter to the appropriate State agency notifying it of the modification to the regulatory floodway and a copy of the letter from that agency stating its approval of the modification

After receiving appropriate documentation to show that the project has been completed, FEMA will initiate a revision to the FIRM and FIS report. Because the BFEs would change as a result of the project, a 90-day appeal period would be initiated, during which community officials and interested persons may appeal the revised BFEs based on scientific or technical data.

The basis of this CLOMR is, in whole or in part, a culvert project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the culverts rests with your community.

This CLOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by calling the Chief, Community Mitigation Programs Branch, Mitigation Division of FEMA in San Francisco, California, at (415) 923-7184. If you have any questions regarding this CLOMR, please call our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Max H. Yuan, P.E., Project Engineer
Hazards Study Branch
Hazard Mapping Division

For: Matthew B. Miller, P.E., Chief
Hazards Study Branch
Hazard Mapping Division

Enclosures

cc: The Honorable Donald Lunsford
Chairman, Placer County Board
of Supervisors

Mr. Tim Hackworth
Director
Department of Public Works
Placer County

Mr. Dave Palmer
Acting City Engineer
City of Rocklin

Mr. Pal A. Hegedus
Senior Principal
The Spink Corporation

stantec.com

Transmittal

Stantec Consulting Inc.
2590 Venture Oaks Way
Sacramento CA 95833
Tel: (916) 569-2500 Fax: (916) 921-9274

Stantec

To:	David Mohlenbrok	From:	Michael O'Hagan, PE
Company:	Rocklin Planning /Environmental Department	☑	For Your Information
		☐	For Your Approval
Address:	3970 Rocklin Road Rocklin CA 95677	☑	For Your Review
		☑	As Requested
Phone:	916.625.5160		
Date:	August 21, 2006		
File:	84438708, 84400042		
Delivery:	Mail		

Reference: **Clover Valley Project**
Hydrology/Hydraulic Data and Responses to DEIR

David:

We are providing you and the additional copied individuals noted below, copies of the various data that was forwarded to Doug Moore at West Yost & Associates during our last round of responding to questions and comments. All this information has previously been coordinated with and sent to Doug Moore separately.

As our recent inquiries if all questions have been answered satisfactorily have gone unanswered, we are assuming that West Yost & Associates has everything they need to complete their responses to the DEIR comments.

Let me know if you need anything more.

STANTEC CONSULTING INC.

Michael O'Hagan, PE
Managing Principal
Tel: (916) 569-2521
Fax: (916) 921-9274
mohagan@stantec.com

Reference: Clover Valley Project
Hydrology/Hydraulic Data and Responses to DEIR

Attachment: Cross-section exhibit, velocity profiles, hydrographs, and HEC-1 output reports

c. Tim Raney, Raney Project Management
[redacted]arvis, Fay & Doporto, LLP
Rick Massie, Massie Company
Dave Garst, Clover Valley Partners

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Transmittal

Stantec Consulting Inc.
2590 Venture Oaks Way
Sacramento CA 95833
Tel: (916) 569-2500 Fax: (916) 921-9274

Stantec

To:	Doug Moore	From:	Davina Gonzalez
Company:	West Yost & Associates	☑	For Your Information
Address:	1260 Lake Boulevard, Suite 240 Davis, CA 95616	☐	For Your Approval
		☐	For Your Review
		☐	As Requested
Phone:	(530) 792-3275		
Date:	August 9, 2006		
File:	84438704, 101		
Delivery:	Courier		

Reference: Clover Valley Hydrology/Hydraulics

Doug,

Enclosed are hardcopies of the attachments I emailed this morning. Please call with questions.

Thank you,

STANTEC CONSULTING INC.

Davina Gonzalez
Environmental Designer
Tel: (916) 569-2594
Fax: (916) 921-9274
dgonzalez@stantec.com

Attachment: Cross-section exhibit, Velocity profiles, Hydrographs, 10- and 100-year HEC-1 output reports

c. Michael O'Hagan, Stantec

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Benedict, Nathan

From: Gonzalez, Davina
Sent: Wednesday, August 09, 2006 7:27 AM
To: Doug Moore (dmoore@westyost.com)
Cc: O'Hagan, Michael
Subject: Clover Valley Lakes Hydrology/Hydraulics

Attachments: c_exh_cross-section_080706.pdf; velocity_profiles.pdf; hydrographs.pdf; 10-yr_hec1_out.doc; 100-yr_hec1_out.doc

Doug,

Below are responses to your Hydrology/Hydraulics concerns.

1) The page titled Creek Watershed Exhibit Cross Section Locations that was attached to the velocity profile appears to have the sections labeled incorrectly. For example, the low velocity data point for pond 2 on the velocity profile is at about section 14,700. But from the Cross Section Location sheet, this would be downstream of pond 2 (Nature Trail Way). This confused me and I think it will confuse the public. Thank you for your input, attached is a revised cross-section exhibit.

c_exh_cross-sectio n_080706.pdf...

2) The velocity profile has omitted many data points (versus what is provided in the CLOMR application). For example, downstream of pond 2, your profile shows only a peak velocity of 4.4 feet per second. The CLOMR data indicates that at station 17,260 (just downstream of the pond), the 100-year velocity is 9.4 feet per second. A velocity of 9.4 feet per second will cause scour of the channel, which may undermine the roadway crossing. Please revise the velocity profile and include all the data points. Please provide velocity profiles for the 10-year and 2-year storms (if available). Please address how this scour problem will be resolved, particularly since the soils are silty sands. Thank you for your input. I have generated new velocity profiles to include all velocity points. One area of discrepancy is with velocites from the FEMA model (HEC-2) compared to velocities from the HEC-RAS model (utilizing HEC-1 generated proposed-condition flows). The FEMA model uses a peak flow of 740 cfs, higher than the HEC-1 existing flow of 610 cfs. Also, the FEMA model does not place a cross section at the project's downstream boundary, thus the existing vs. proposed condtion velocities are not a direct comparison at the downstream boundary. On the other hand, the HEC-RAS velocities are modeled with proposed condition flows only. This may be the closer comparison given the fact that the existing and proposed flows at the ponds differ by approximately 5%. I have included both scenarios, and recommend drawing a comparison from the HEC-RAS velocities. Velocity profiles attached.

velocity_profiles.pd f

With regards to a velocity of 7-8 ft/s at the road crossings, velocity dissipators will be placed downstream of the road crossings to reduce scour. An energy dissipator device will be chosen at a later time that reduces scour and minimizes to the maximum extent practicable the impacts of a rough channel bottom on the creek habitat.

3) Hydrographs - Please add the section location of the hydrograph and add the peak velocities. The hydrograph for Outfall of Pond 1 shows a peak flow of about 970 cfs. This is inconsistent with EIR, Appendix O, Table 3 which list the peak flow as 659 cfs. The hydrographs at the south project boundary also do not agree with the values in Table 3. Table 3 was developed from data from the Spink Tech Memo dated 2-20-2001. Also, please provide similar hydrographs for the 10-year and 2-year storms. The input rain data for the HEC 1 model was in 5 minute increments. Please provide the output data in 5 minute increments also (since providing hourly data points may miss the peak flows). The hydrographs (10- and 100-year) have been redone to represent peak flows in the ponds, which are the flows presented in Appendix O, Table 3. Cross-section labels have been added to correspond with the cross-section exhibit. Also included are the HEC-1 outputs for 10- and 100-yr events.



hydrographs.pdf 10-yr_hec1_out.doc 100-yr_hec1_out.doc

4) The CLOMR data indicates low velocities for 400 to 600 feet upstream of the detention basin road crossings (even in the 10-year storm). These low velocities will cause sediment to accumulate in these areas. How will sediment be removed from these areas so that the detention storage volume is maintained? In regards to sediment, there are no plans to harvest sediment other than at the road crossings. The existing and future velocities are low; sediment will continue to move along the creek with or without the project upstream and downstream of crossings.

5) On the figure showing the existing and proposed flood plains, the proposed plain just downstream of pond 1 is smaller than the existing plain. Please explain why. The proposed flood plain is more confined due to the use of culverts . The existing flood plain is quite wide and not restrained; the placement of the roadway will restrict the flow in the overbank area to the easterly side with flows being "forced" through the culverts located more on the westerly side of the creek area.

I hope we have clarified your concerns, please call with any questions. A hard-copy of all attached information will follow today via courier service.

Thank you,

Davina R. Gonzalez, EIT
Environmental Designer
Stantec
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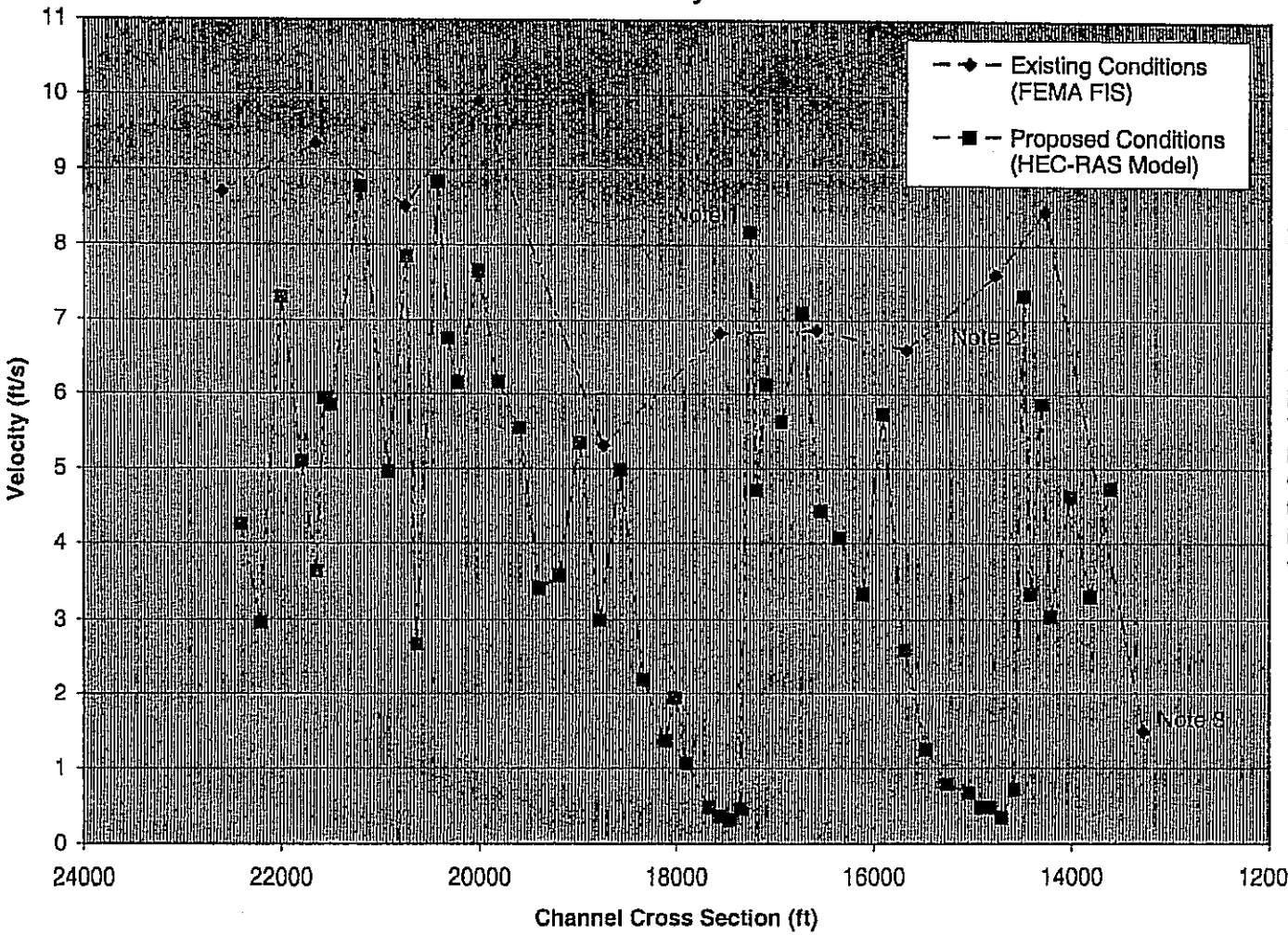
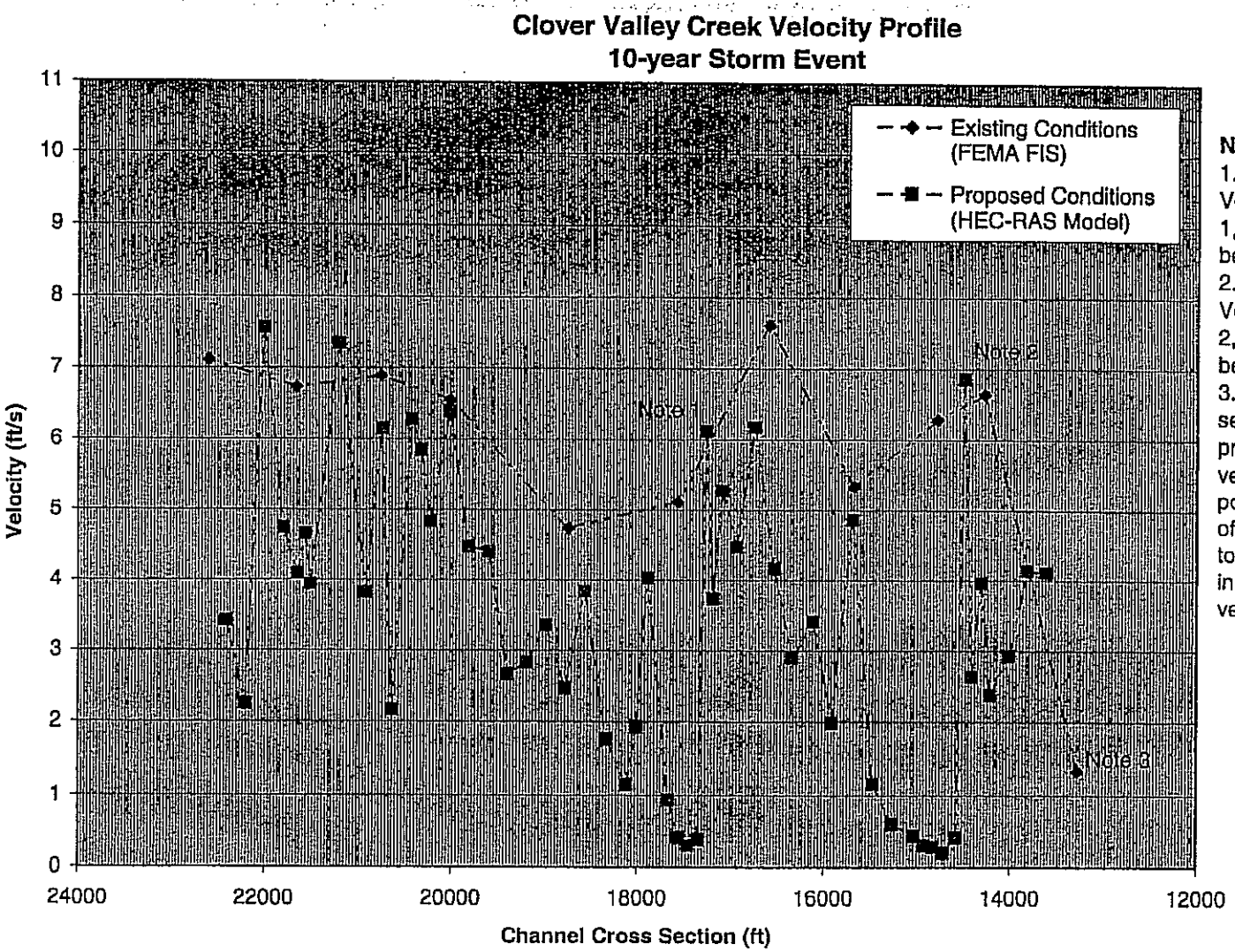
Tel: (916) 569-2500
Fax: (916) 921-9274
dgonzalez@stantec.com
www.stantec.com

Clover Valley Creek Velocity Profile
100-year Storm Event



Notes

1. Cross-section 17260. Velocity at outlet of Pond 1, energy dissipators to be provided
2. Cross-section 14497. Velocity at outlet of Pond 2, energy dissipators to be provided
3. No existing cross section at downstream project boundary. This velocity represents a point further downstream of boundary, where topwidth drastically increases, lowering velocity



Notes

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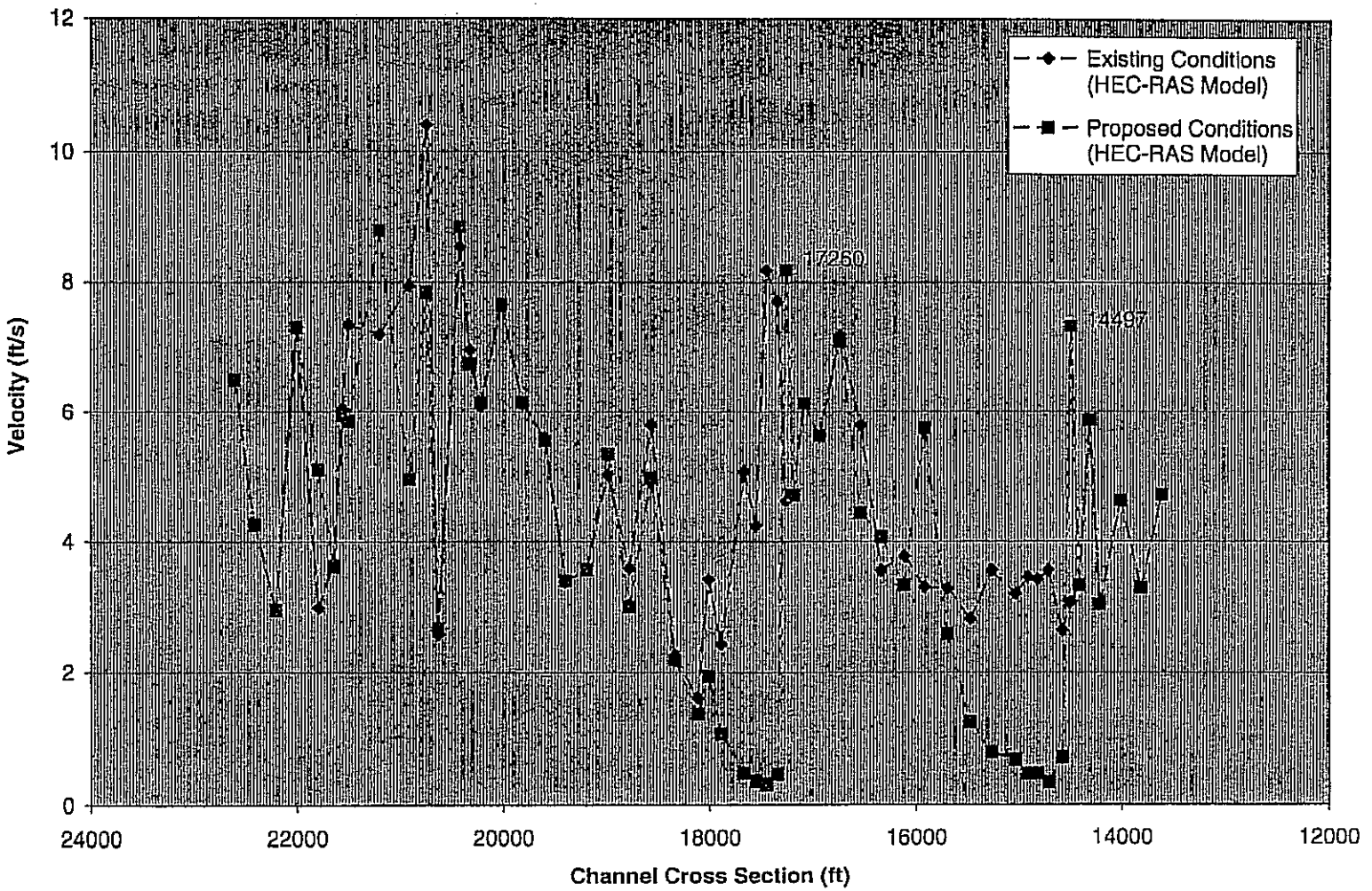
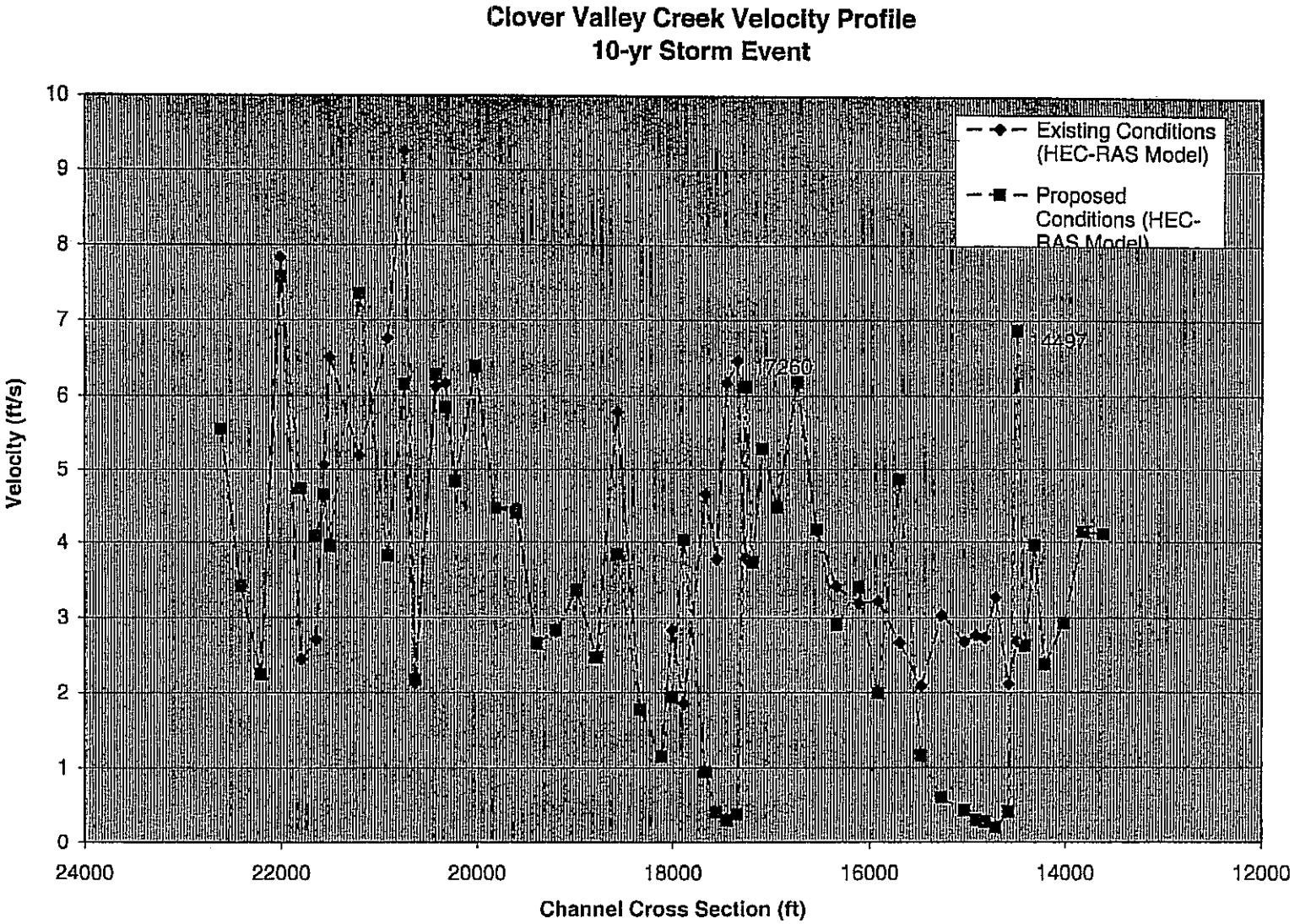
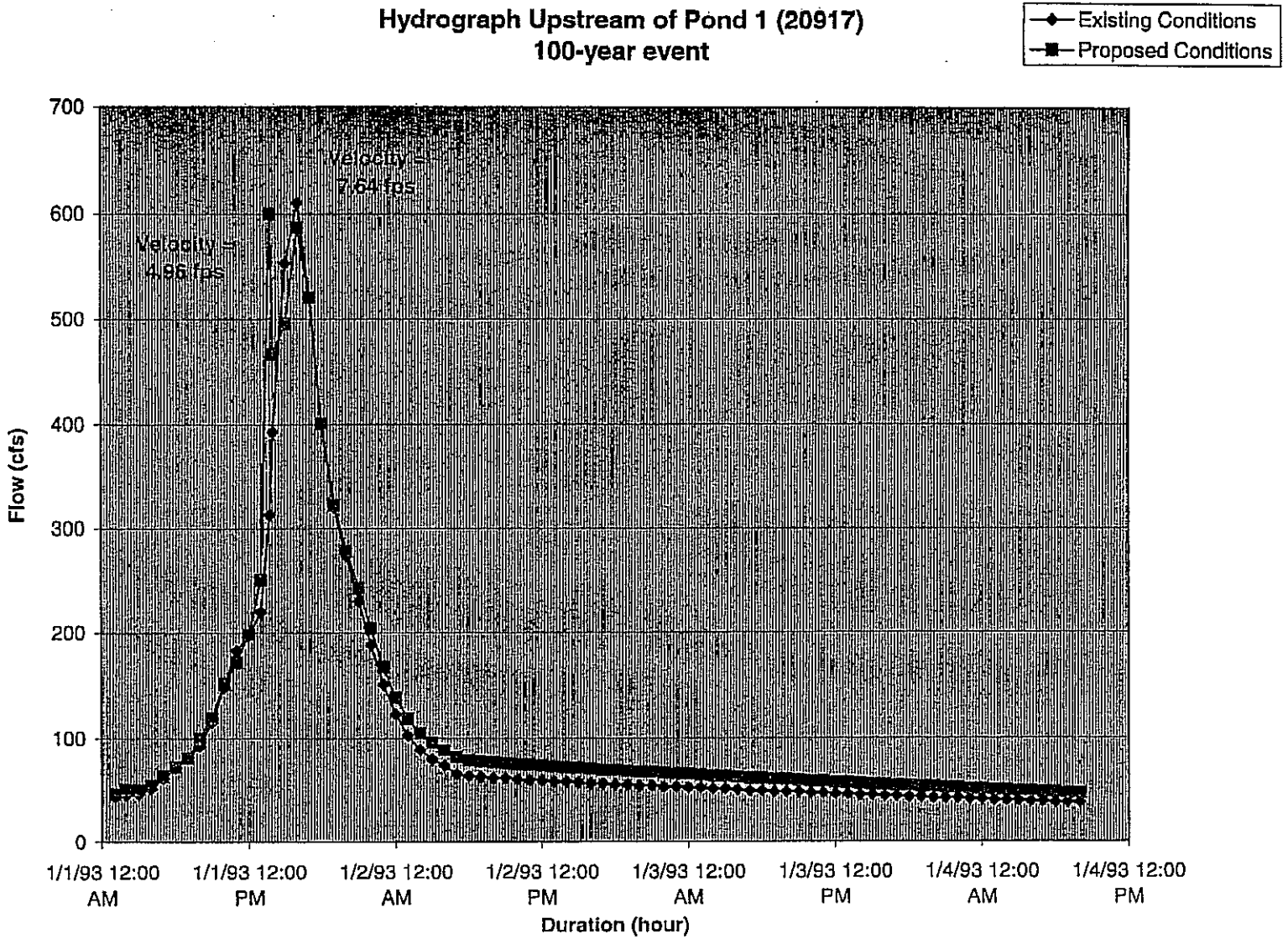
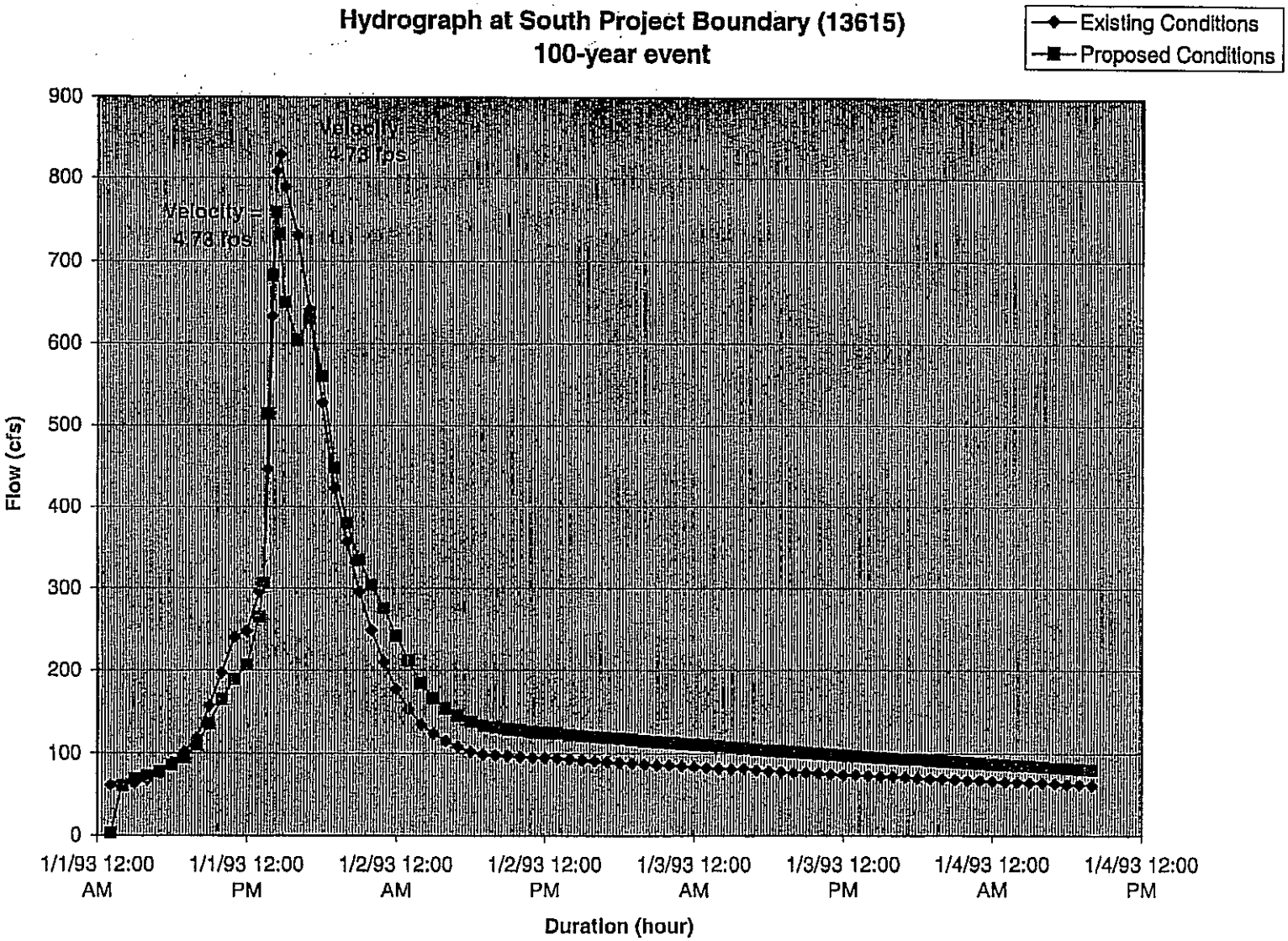
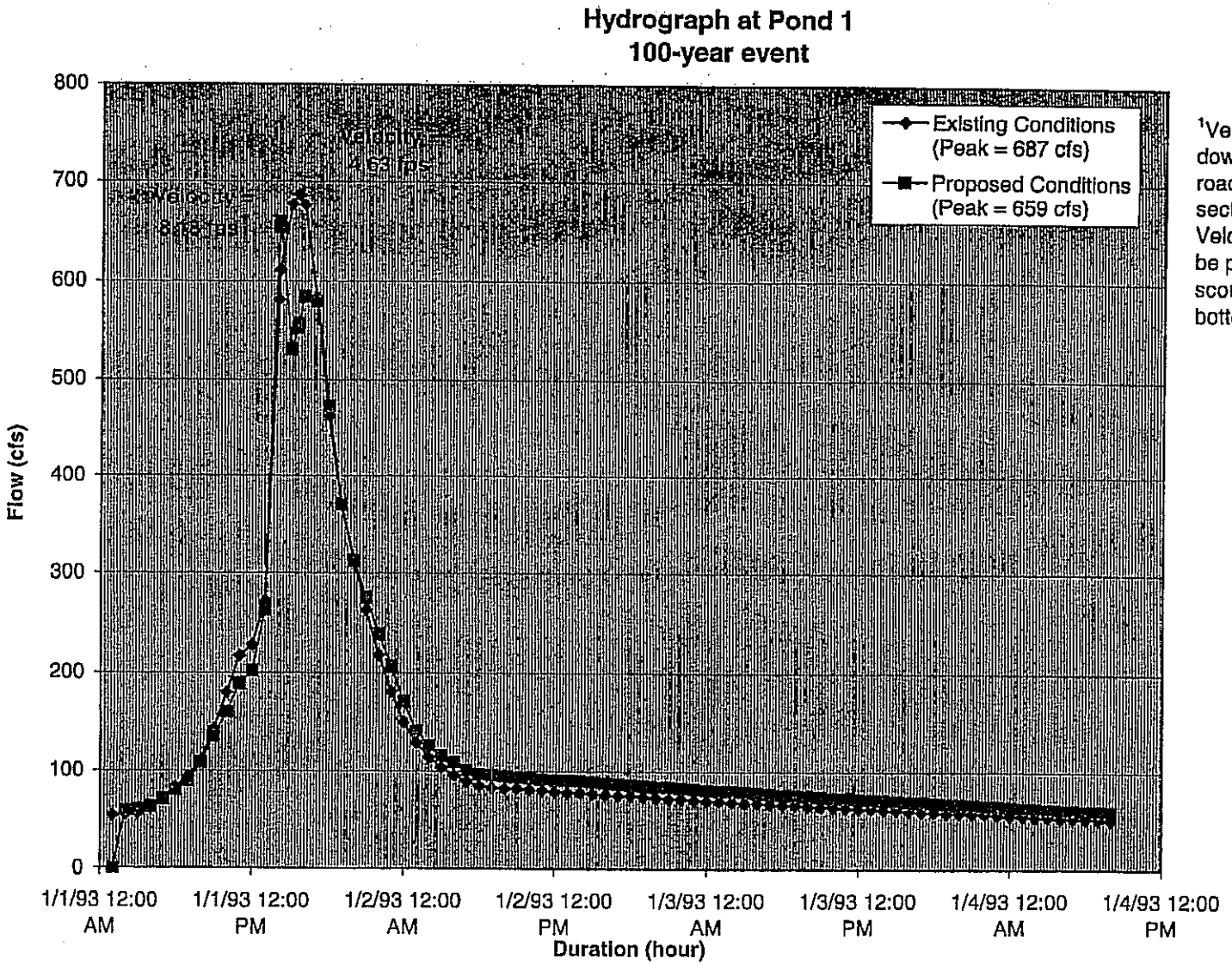
Clover Valley Creek Velocity Profile
100-yr Storm Event



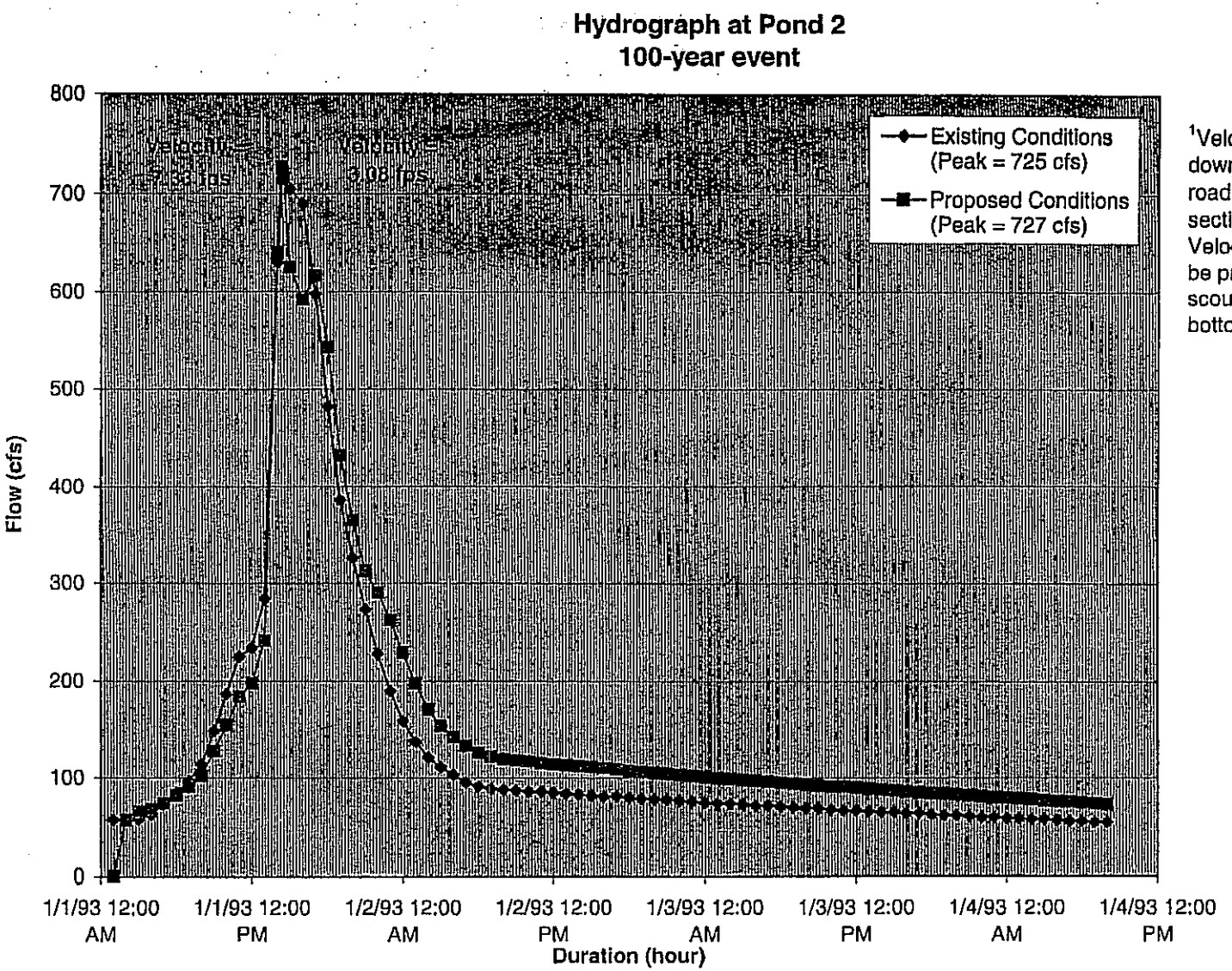

Clover Valley Creek Velocity Profile
10-yr Storm Event
Velocity (ft/s)
Channel Cross Section (ft)
Existing Conditions (HEC-RAS Model)
Proposed Conditions (HEC-RAS Model)
7250
4497
10
9
8
7
6
5
4
3
2
1
0
24000
22000
20000
18000
16000
14000
12000


Hydrograph Upstream of Pond 1 (20917)
100-year event
Existing Conditions
Proposed Conditions
Velocity =
7.64 fps
Velocity =
4.96 fps
Flow (cfs)
700
600
500
400
300
200
100
0
1/1/93 12:00 AM
1/1/93 12:00 PM
1/2/93 12:00 AM
1/2/93 12:00 PM
1/3/93 12:00 AM
1/3/93 12:00 PM
1/4/93 12:00 AM
1/4/93 12:00 PM
Duration (hour)


Hydrograph at South Project Boundary (13615)
100-year event
Existing Conditions
Proposed Conditions
Velocity = 4.78 fps
Velocity = 4.78 fps
Flow (cfs)
900
800
700
600
500
400
300
200
100
0
1/1/93 12:00 AM
1/1/93 12:00 PM
1/2/93 12:00 AM
1/2/93 12:00 PM
1/3/93 12:00 AM
1/3/93 12:00 PM
1/4/93 12:00 AM
1/4/93 12:00 PM
Duration (hour)



[1]Velocity occurs at downstream side of road crossing (cross-section 17260). Velocity dissipator do be provided to reduce scour of channel bottom.



[1]Velocity occurs at downstream side of road crossing (cross-section 14497). Velocity dissipator do be provided to reduce scour of channel bottom.

March 21, 2007

Mr. Tim Raney
Raney Planning & Management
1401 Halyard Drive, Suite 120
West Sacramento CA 95691

SUBJECT: Clover Valley Project No.: 279-00-05-04.06

Dear Mr. Raney:

West Yost Associates (WYA) has reviewed the information provided by Stantec at the meeting on March 1, 2007, and the model files provided on March 2, 2007, and we have the following comments. From that meeting there were two outstanding issues:

1. Will the proposed on-line detention basins cause sediment to accumulate in Clover Valley Creek?
2. Will the proposed culvert structures cause scouring of the channel either entering the culvert, through the culvert, or exiting the culvert?

Each of these issues is discussed below:

SEDIMENTATION IN CLOVER VALLEY CREEK

The range of flows evaluated are from 50 cfs to 860 cfs, and these flows roughly correspond to storm flows ranging from a 1-year event to a 100-year event (see Attachment 1 for information provided by Stantec). This is the flow range of analysis we requested. Additional model output information for the existing conditions and with the proposed project are presented in Attachments 2 and 3, respectively. This information includes velocity profiles and channel cross sections for the main channel and the channel overbank areas. The analysis provided below is based on a comparison of the model output under existing conditions with the output with the proposed project.

- In the 1-year, 2-year, and 4-year storm events the velocity profiles with the proposed project are not significantly different than under existing conditions.
- During the 10-year and 50-year storms, the water velocity slows to about 0.5 feet per second at the downstream detention basin with the proposed project, which will cause increased sediment depositions. At the upstream detention basin there is not a significant change in the water velocity resulting from the proposed project during the 10-year and 50-year storms.
- In the 100-year storm, the water upstream of both detention basins slows to less than 1 foot per second, which will cause increased sedimentation in the main channel.

- By comparing the channel cross sections, it is clear that in storms as small as the 4-year event the proposed project will result in an increased frequency of flooding of channel overbank areas and increased sediment deposition in the channel overbank areas. Also, the elevation of flood water through the detention basins will increase significantly, resulting in flooding of areas that haven't flooded before.

In summary, there will be increased sediment deposition in the main channel and the overbank areas during storms from the 4-year to 100-year events. Sediment that is deposited in the main channel during these storms will probably be resuspended during smaller storms and conveyed downstream (as occurs under existing conditions). Sediment deposited in the overbank areas will probably remain indefinitely, unless removed through maintenance activities. This creek is known to carry a significant sediment load, thus the level of sediment deposition may be significant and could over time significantly reduce the detention storage volumes in the detention basins.

We recommend that a quantitative sediment load evaluation be prepared, and then, if necessary, maintenance provisions for removal of sediment be included in the project (as in the RDEIR, Page 4 11-13). We also recommend that a wildlife biologist review these findings to determine if these changed conditions represent a significant impact to the existing habitat within the main channel and in the overbank areas.

CULVERT SCOUR

The velocity profiles provided by Stantec (Attachment 1) show the water velocity in the main channel, but not the actual velocity through the culverts. Additional model output for these culverts is presented in Attachment 4.

At the downstream crossing, the water velocity through the low flow culvert during the 100-year storm event,will be about 12.8 feet per second. There are many methods for sizing rock riprap, and the various methods can provide somewhat different results (rock sizes). Using the Isbash method (for preliminary sizing of rock) for this water velocity, the riprap rocks should range from a lower limit about 10 to 17-inches to an upper limit of 24 to 38 inches in diameter (or from a lower limit of 60 to 300 lbs to an upper limit of 880 to 3,400 lbs). Thus the proposed range of rock from 15-inch to 2,000 lbs (see the Conceptual Creek Armoring at Culvert/Road Crossings in Attachment 1) is in the appropriate range.

At the upstream crossing, the water velocity exiting the low flow culvert during the 100-year storm event,will be about 17.2 feet per second, and will be supercritical flow. Using the Isbash method, for this water velocity, the riprap rocks should range from a lower limit about 18 to 31-inches to an upper limit of 44 to 69-inches in diameter (or from a lower limit of 350 to 1,800 lbs to an upper limit of 5,100 to 19,600 lbs). Thus the proposed range of rock from 15-inch to 2,000 lbs is too small for the upper detention basin culvert. For this culvert the rock sizing needs to be increased or the rock needs to be embedded in concrete.

For reference, the Isbash rock sizing charts are also included in Attachment 4.

Because the flow through the upstream culvert will be supercritical (fast and shallow), the flow will have to "jump" back to subcritical flow (slower and deeper). During this hydraulic jump, there is extreme turbulence, and channel scour and erosion will occur. The length of the jump from supercritical to subcritical flow should be about 20 feet long. Thus, downstream of the culvert the channel will need to be stabilized with riprap for a length of about 25 feet.

We recommend that a wildlife biologist review these findings to determine if this extent and size of rock riprap represent a significant impact to the existing habitat within the main creek and channel banks.

Please call if you have any questions or comments.

Sincerely,

WEST YOST ASSOCIATES

Douglas T. Moore
Engineering Manager

DTM:nmp

attachments

ATTACHMENT 1